



Advanced Cisco Collaboration Guide V3.0

(On-Prem, Edge & Cloud Collaboration Solutions)

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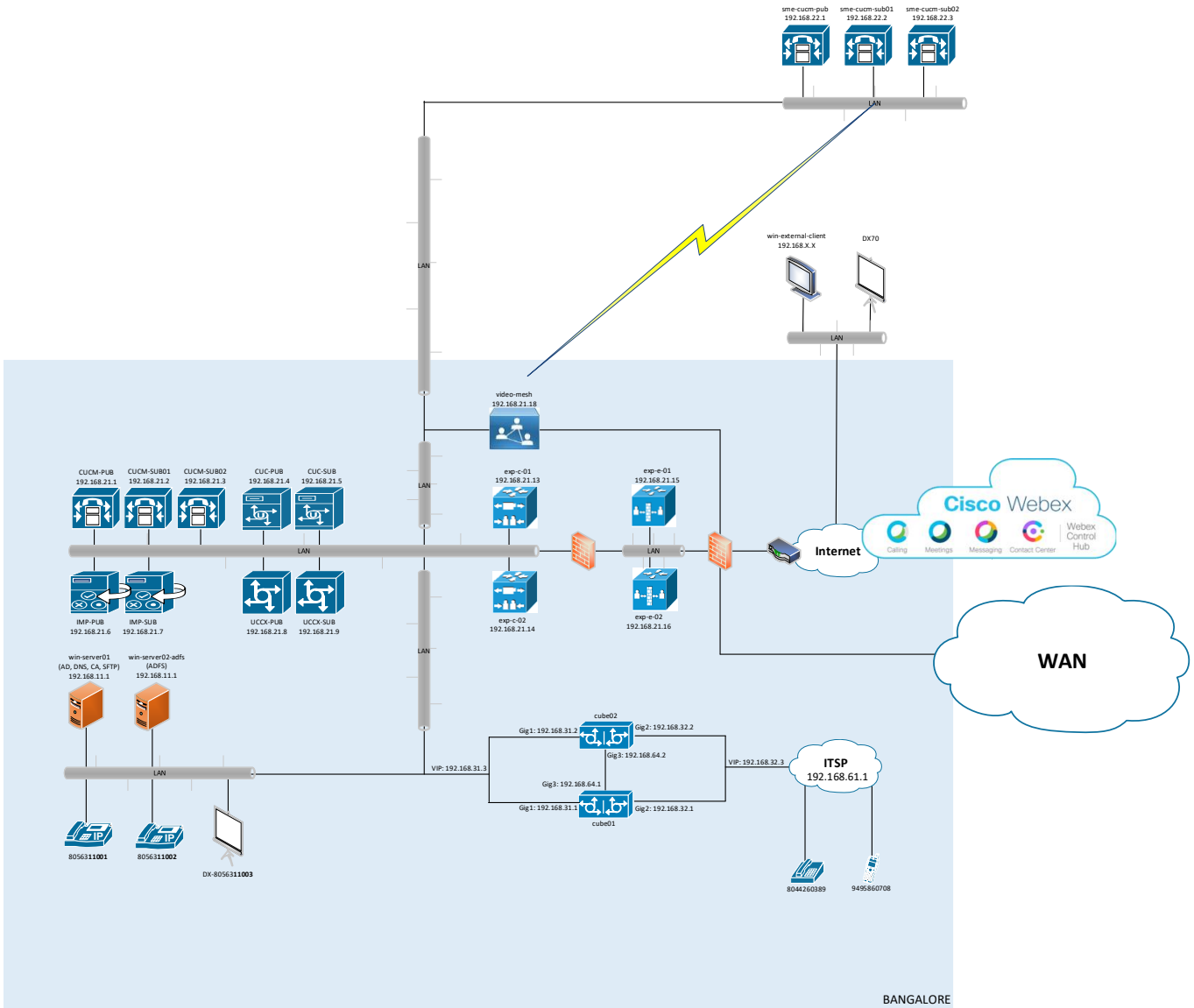
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Lab Topology



Chapter 1 Module 1 - Windows, vmware Windows, AD, DNS, vmware Basics



Introduction to vmware Virtualization



- VMware, Inc. is an American virtualization and cloud computing technology company headquartered in California. VMware was the first commercially successful company to virtualize the x86 architecture
- VMware technology allows to run multiple Operating Systems on single hardware machine thus enabling better resource management
- VMware developed ESXi (Elastic Sky X Integrated) Hypervisor operating system that creates a virtualization layer on top of a physical machine.
- The hardware components (CPU, RAM, HDD, Network, etc.) of the physical machine are shared to the multiple operating systems running on ESXi
- Virtualization provides high availability, Cloning, Templating, Storage Optimization, Network Optimization, etc.

Components of vmware Virtualization



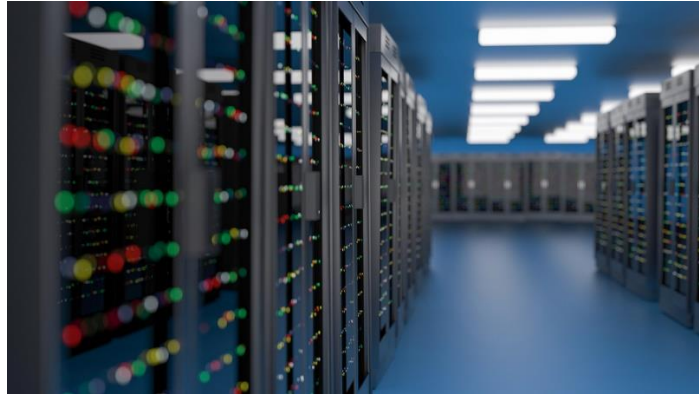
- **Virtual Machine (VM):** Software representation of a computer as a set of files. It is portable
- **Hypervisor:** Operating System or Software that enables us to run multiple VMs on it
- **Type 1 Hypervisor:** Operating system and runs directly on the hardware. Examples vmware ESXi, Microsoft Hyper-V, Oracle VM
- **Type 2 Hypervisor:** Runs as a software layer on an operating system. Example vmware Workstation, Microsoft Virtual PC, Oracle VirtualBox
- **ESXi:** Popular, widely adopted Type 1 Hypervisor developed by vmware
- **vCenter:** A tool (Operating System) that used to manage and orchestrate multiple ESXi Hosts
- **vSphere:** Suit of protocols and tools from vmware that makes virtualization and management of virtual environment. Example combination of ESXi and vCenter
- **Open Virtualization Format (OVF):** Open standard for packaging and distributing a virtual Machines as files
- **Open Virtualization Appliance (OVA):** OVF Package in single file archive file format. It may contain complete operating system (e.g. Expressway OVA) or just the virtual hardware (e.g. CUCM OVA)
- **Datastore:** Storage space visible to ESXi OS. This can be DAS (Direct Attached Storage) or NAS (Network Attached Storage)
- **Virtual Switch:** It is like a network switch used to connect VMs. Virtual Switch makes networking possible in ESXi. Multiple Virtual Switch can be crated. Virtual Switch interacts to the external network using uplinks.

Windows Active Directory (AD)



- Active Directory is a directory service developed by Microsoft; it stores the information about the user account
- A server running the Active Directory Domain Service (AD DS) role is called a domain controller
- It **Authenticates** and **Authorizes** all users and computers in a Windows domain network
- It can be used by other systems for Authentication via LDAP (Light Weight Directory Access Protocol)
- ADDS is the first server that most organizations install in their Data Center
- We should have a Windows Server to setup AD (I have used Windows Server 2019)
- **Organizational Unit (OU):** Represented by a folder in AD, provide hierarchy of a domain
- **Objects:** Users and Computers
- **LDAP Filter:** Query string to specify certain objects (or to filter certain objects)

Domain Name System (DNS)



- DNS facilitates IP to Domain name and Domain name to IP mapping
- An internal DNS server hold all the server names and IP addresses for their domains and enable DNS lookup (IP to Domain Name and vice versa)
- A Public DNS Server is a central part of the internet, providing Public IP address to corresponding DNS name and reverse

[Lab] Install Windows Server on vmware ESXi

The screenshot shows the VMware ESXi web interface for the 'esxi-secondary' host. The browser address bar indicates the URL '192.168.10.3/ui/#/host'. The interface includes a left-hand 'Navigator' pane with sections for Host, Virtual Machines, Storage, and Networking. The main content area displays the host's status and configuration. A red box highlights the 'Create/Register VM' button in the top action bar. Below this, a summary of the host's version and state is shown, followed by resource usage bars for CPU, Memory, and Storage. A blue notification banner states: 'You are currently using ESXi in evaluation mode. This license will expire in 60 days.' The 'Hardware' section provides detailed specifications for the host, including CPU, Memory, and Networking. At the bottom, the 'Recent tasks' table shows a successful 'Auto Start Power On' task.

Host Summary:

- Version: 6.7.0 Update 3 (Build 14320388)
- State: Normal (not connected to any vCent...)
- Uptime: 0 days

Resource Usage:

- CPU:** FREE: 6.9 GHz, USED: 85 MHz, CAPACITY: 7 GHz
- MEMORY:** FREE: 14.69 GB, USED: 1.3 GB, CAPACITY: 16 GB
- STORAGE:** FREE: 91.09 GB, USED: 1.41 GB, CAPACITY: 92.5 GB

Hardware Specifications:

Hardware	
Manufacturer	VMware, Inc.
Model	VMware7,1
CPU	2 CPUs x Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
Memory	16 GB
Persistent Memory	0 B
Virtual flash	0 B used, 0 B capacity
Networking	
Hostname	esxi-secondary
IP addresses	1. vmk0: 192.168.10.3 2. vmk0: fe80::250:56ff:febb:faf9
DNS servers	1. 192.168.111.1 2. 192.168.0.1
Default gateway	192.168.0.254

Recent tasks

Task	Target	Initiator	Queued	Started	Result	Comple...
Auto Start Power On	esxi-secondary	root	06/20/2021 1...	06/20/2021 1...	Completed successf...	06/20/2021 1...

New virtual machine

1 Select creation type

2 Select a name and guest OS

3 Select storage

4 Customize settings

5 Ready to complete

Select creation type

How would you like to create a Virtual Machine?

Create a new virtual machine

Deploy a virtual machine from an OVF or OVA file

Register an existing virtual machine

This option guides you through creating a new virtual machine. You will be able to customize processors, memory, network connections, and storage. You will need to install a guest operating system after creation.

Back

Next

Finish

Cancel

New virtual machine - colpod1_win-server-ad-dns-ca_192.168.11.1 (ESXi 6.7 virtual machine)

1 Select creation type

2 Select a name and guest OS

3 Select storage

4 Customize settings

5 Ready to complete

Select a name and guest OS

Specify a unique name and OS

Name

colpod1_win-server-ad-dns-ca_192.168.11.1

Virtual machine names can contain up to 80 characters and they must be unique within each ESXi instance.

Identifying the guest operating system here allows the wizard to provide the appropriate defaults for the operating system installation.

Compatibility

ESXi 6.7 virtual machine

Guest OS family

Windows

Guest OS version

Microsoft Windows Server 2016 or later (64-bit)

☐ Enable Windows Virtualization Based Security

Back

Next

Finish

Cancel

9

New virtual machine - colpod1_win-server-ad-dns-ca_192.168.11.1 (ESXi 6.7 virtual machine)

- 1 Select creation type
- 2 Select a name and guest OS
- 3 Select storage
- 4 Customize settings
- 5 Ready to complete

Select storage

Select the storage type and datastore

Standard Persistent Memory

Select a datastore for the virtual machine's configuration files and all of its' virtual disks.

Name	Capacity	Free	Type	Thin pro...	Access
datastore1	92.5 GB	91.09 GB	VMFS6	Supported	Single

1 items

Back Next Finish Cancel

New virtual machine - colpod1_win-server-ad-dns-ca_192.168.11.1 (ESXi 6.7 virtual machine)

- 1 Select creation type
- 2 Select a name and guest OS
- 3 Select storage
- 4 Customize settings
- 5 Ready to complete

Customize settings

Configure the virtual machine hardware and virtual machine additional options

Virtual Hardware VM Options

Add hard disk Add network adapter Add other device

CPU

2

Cores per Socket Sockets: 1

CPU Hot Plug ☒ Enable CPU Hot Add

Reservation None MHz

Limit Unlimited MHz

Shares Normal 1000

Hardware virtualization ☐ Expose hardware assisted virtualization to the guest OS

IOMMU ☐ Expose IOMMU to the guest OS

Performance counters ☐ Enable virtualized CPU performance counters

Back Next Finish Cancel

New virtual machine - colpod1_win-server-ad-dns-ca_192.168.11.1 (ESXi 6.7 virtual machine)

1 Select creation type

2 Select a name and guest OS

3 Select storage

4 **Customize settings**

5 Ready to complete

Customize settings

Configure the virtual machine hardware and virtual machine additional options

Virtual Hardware VM Options

Add hard disk Add network adapter Add other device

CPU

2

Memory

RAM

4096

MB

Reservation

None

MB

☐ Reserve all guest memory (All locked)

Limit

Unlimited

MB

Shares

Normal

1000

Memory Hot Plug

☒ Enabled

Hard disk 1

50

GB

Back Next Finish Cancel

New virtual machine - colpod1_win-server-ad-dns-ca_192.168.11.1 (ESXi 6.7 virtual machine)

1 Select creation type

2 Select a name and guest OS

3 Select storage

4 **Customize settings**

5 Ready to complete

Customize settings

Configure the virtual machine hardware and virtual machine additional options

Virtual Hardware VM Options

Add hard disk Add network adapter Add other device

CPU

2

Memory

4096

MB

Hard disk 1

50

GB

Maximum Size

91.09 GB

Location

[datastore1] colpod1_win-server-ad-dns-ca_192.168.1

Browse...

Disk Provisioning

☒ Thin provisioned

☐ Thick provisioned, lazily zeroed

☐ Thick provisioned, eagerly zeroed

Shares

Normal

1000

Limit - IOPs

Unlimited

Back Next Finish Cancel

New virtual machine - colpod1_win-server-ad-dns-ca_192.168.11.1 (ESXi 6.7 virtual machine)

- 1 Select creation type
- 2 Select a name and guest OS
- 3 Select storage
- 4 Customize settings**
- 5 Ready to complete

Customize settings

Configure the virtual machine hardware and virtual machine additional options

Add hard disk
 Add network adapter
 Add other device

CPU	2		
Memory	4096	MB	
Hard disk 1	50	GB	
SCSI Controller 0	LSI Logic SAS		
SATA Controller 0			
USB controller 1	USB 3.0		
Network Adapter 1	VM Network	<input checked="" type="checkbox"/> Connect	
CD/DVD Drive 1	Host device	<input checked="" type="checkbox"/> Connect	
Video Card	Default settings		

Back Next Finish Cancel

New virtual machine - colpod1_win-server-ad-dns-ca_192.168.11.1 (ESXi 6.7 virtual machine)

- 1 Select creation type
- 2 Select a name and guest OS
- 3 Select storage
- 4 Customize settings
- 5 Ready to complete**

Ready to complete

Review your settings selection before finishing the wizard

Name	colpod1_win-server-ad-dns-ca_192.168.11.1
Datastore	datastore1
Guest OS name	Microsoft Windows Server 2016 or later (64-bit)
Compatibility	ESXi 6.7 virtual machine
vCPUs	2
Memory	4096 MB
Network adapters	1
Network adapter 1 network	VM Network
Network adapter 1 type	E1000e
IDE controller 0	IDE 0
IDE controller 1	IDE 1
SCSI controller 0	LSI Logic SAS
SATA controller 0	New SATA controller
Hard disk 1	
Capacity	50GB
Datastore	[datastore1] colpod1_win-server-ad-dns-ca_192.168.11.1/

Back Next **Finish** Cancel

- Upload Windows Server ISO File to the Datastore

The screenshot displays the VMware ESXi web interface. The top navigation bar shows the host name 'esxi-sec.ajcollab.com' and the user 'root@192.168.10.3'. The left sidebar contains the 'Navigator' pane with categories like Host, Virtual Machines, Storage, and Networking. The 'Storage' category is expanded, showing 'datastore1' selected. The main pane displays details for 'datastore1', including its type (VMFS6), location, UUID, and hosts. A red arrow points to the 'Datastore browser' icon in the top toolbar. Below the main pane, the 'Datastore browser' window is open, showing a file list with folders like '.sdd.sf', 'colpod1_win-serve...', and 'ISO Files'. The 'Upload' button in the toolbar is highlighted with a red box. The bottom status bar shows the current path as '[datastore1] ISO Files/' and a 'Close' button.

vmware ESXi™

root@192.168.10.3 | Help | Search

datastore1

Register a VM | Datastore browser | Increase capacity | Refresh

STORAGE: FREE: 185.5 GB, USED: 7 GB, CAPACITY: 192.5 GB

datastore1

Type: VMFS6

Location: /vmfs/volumes/60cede5f-d990ae9e-2c3a-000c29460c78

UUID: 60cede5f-d990ae9e-2c3a-000c29460c78

Hosts: 1

Virtual Machines: 1

VMFS details

Version	6.82
Local	Yes
Block size	1 MB
UUID	60cede5f-d990ae9e-2c3a-000c29460c78
Extent 0	mpx.vmhba1:C0:T0:L0, partition 3

Datastore browser

Upload | Download | Delete | Move | Copy | Create directory | Refresh

1 file(s) 22%

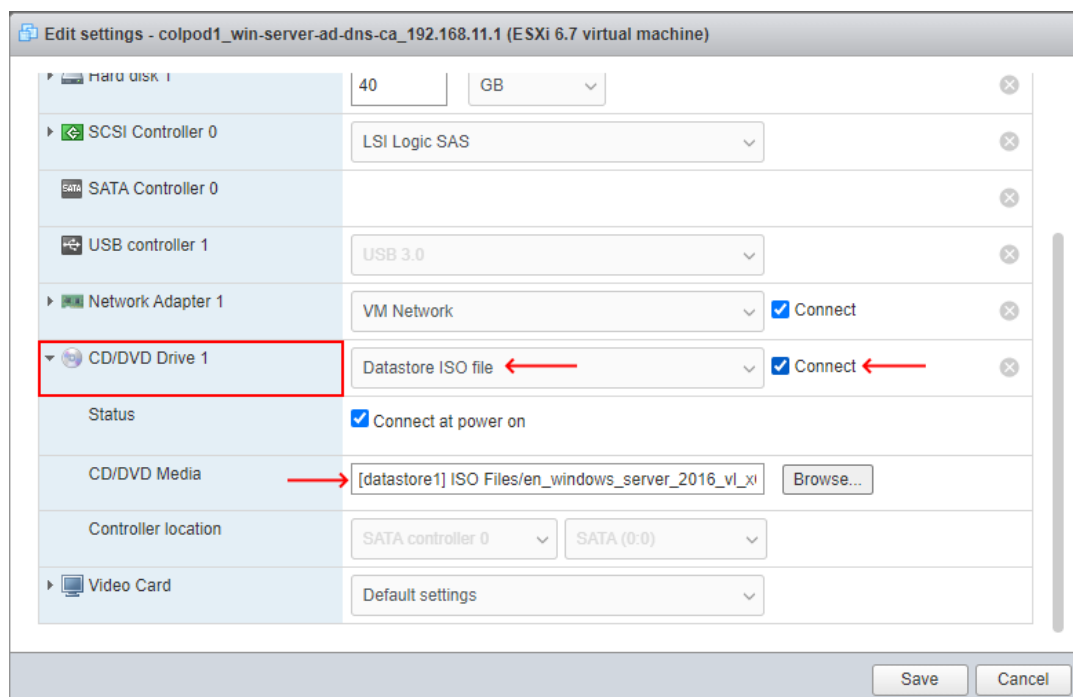
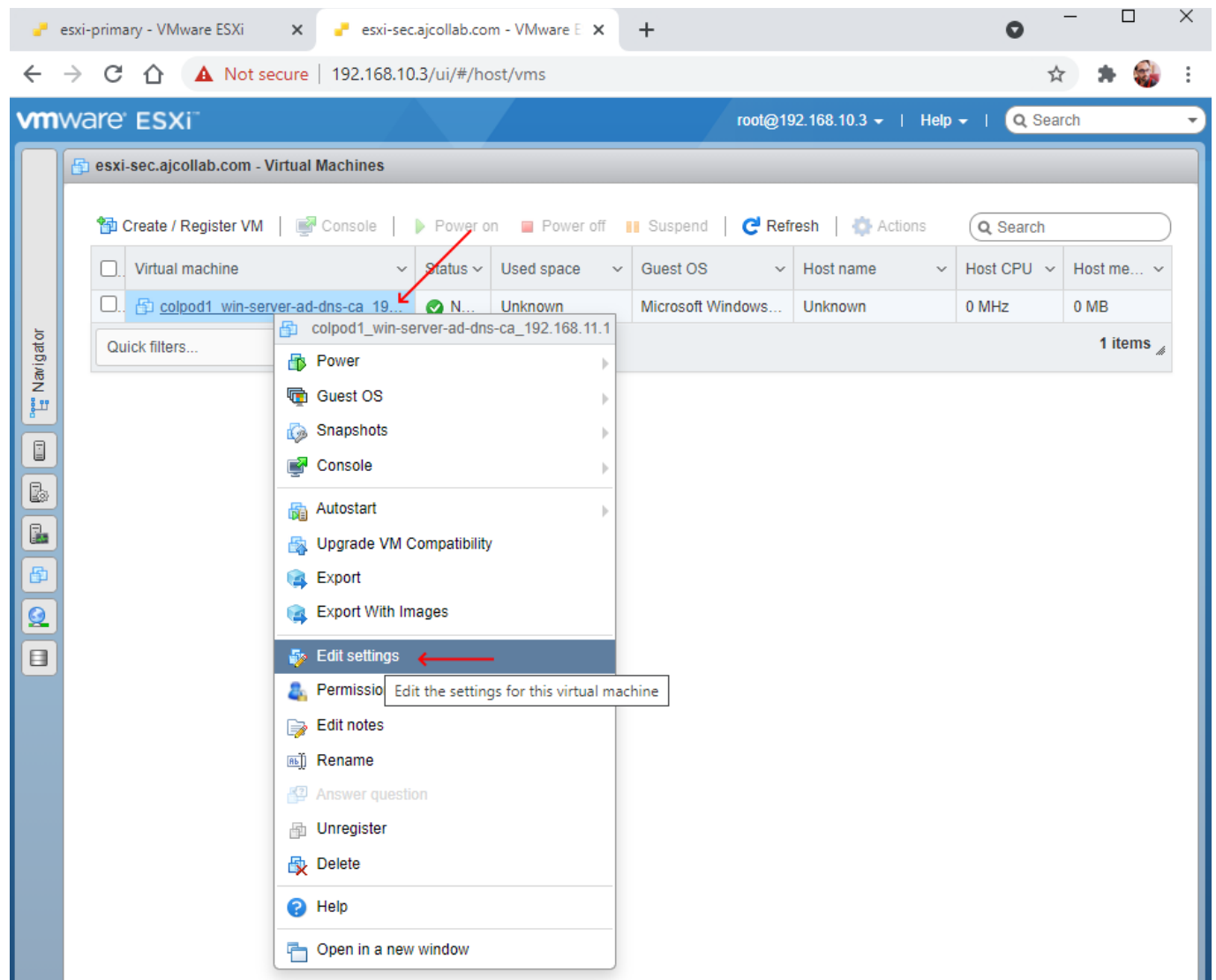
datastore1

- .sdd.sf
- colpod1_win-serve...
- ISO Files

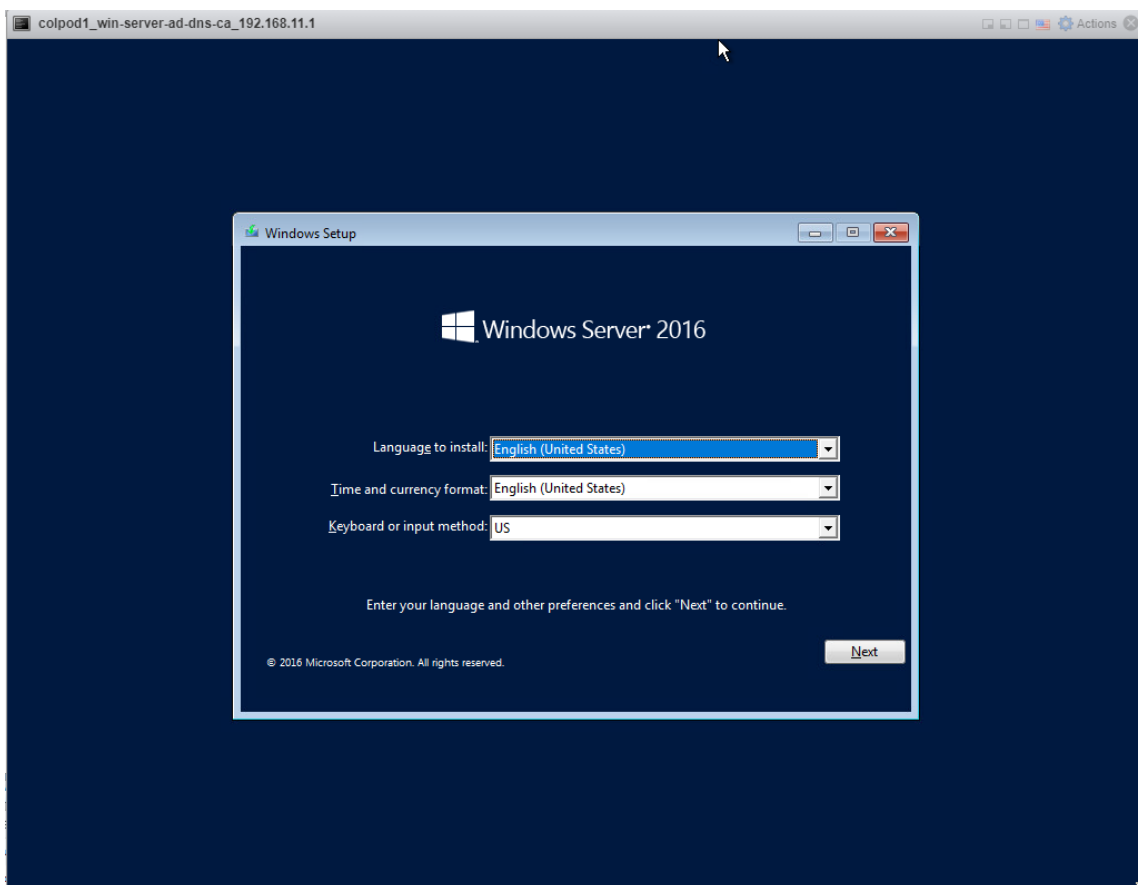
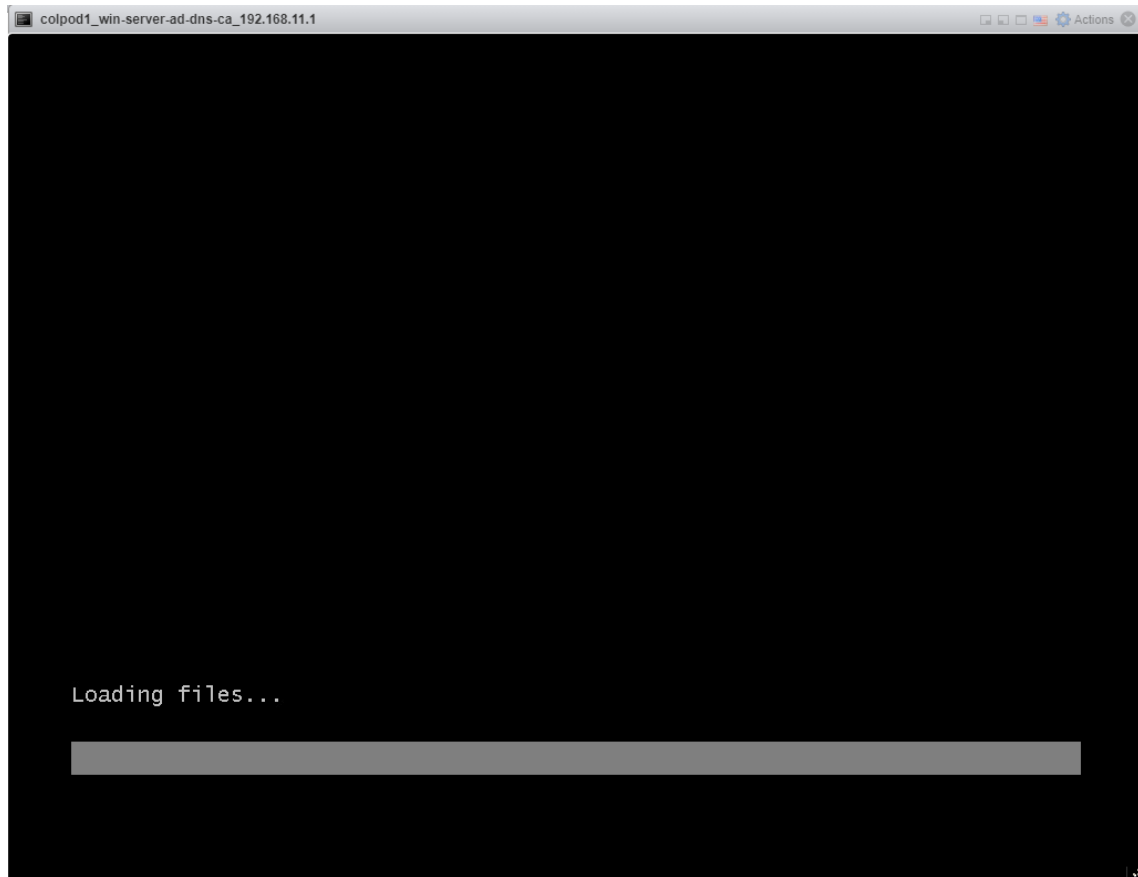
[datastore1] ISO Files/

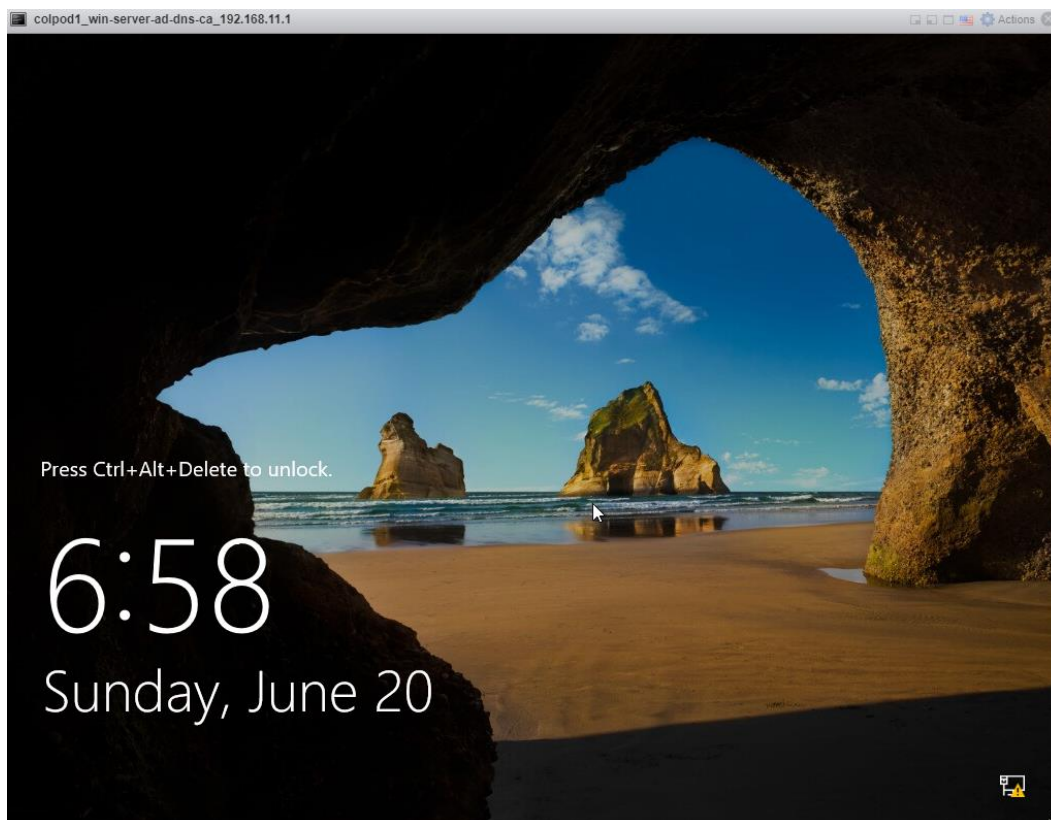
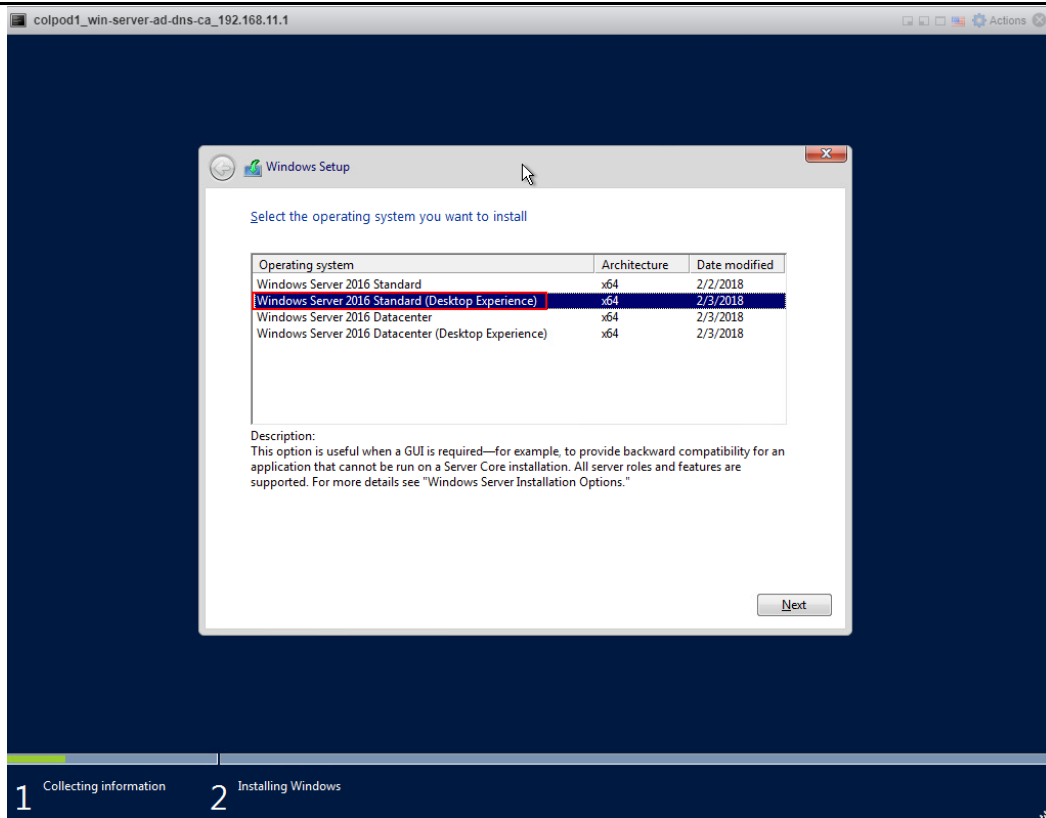
Close

Mount the Iso File to the VM that we created



-
- Power on the virtual machine and continue installing Windows

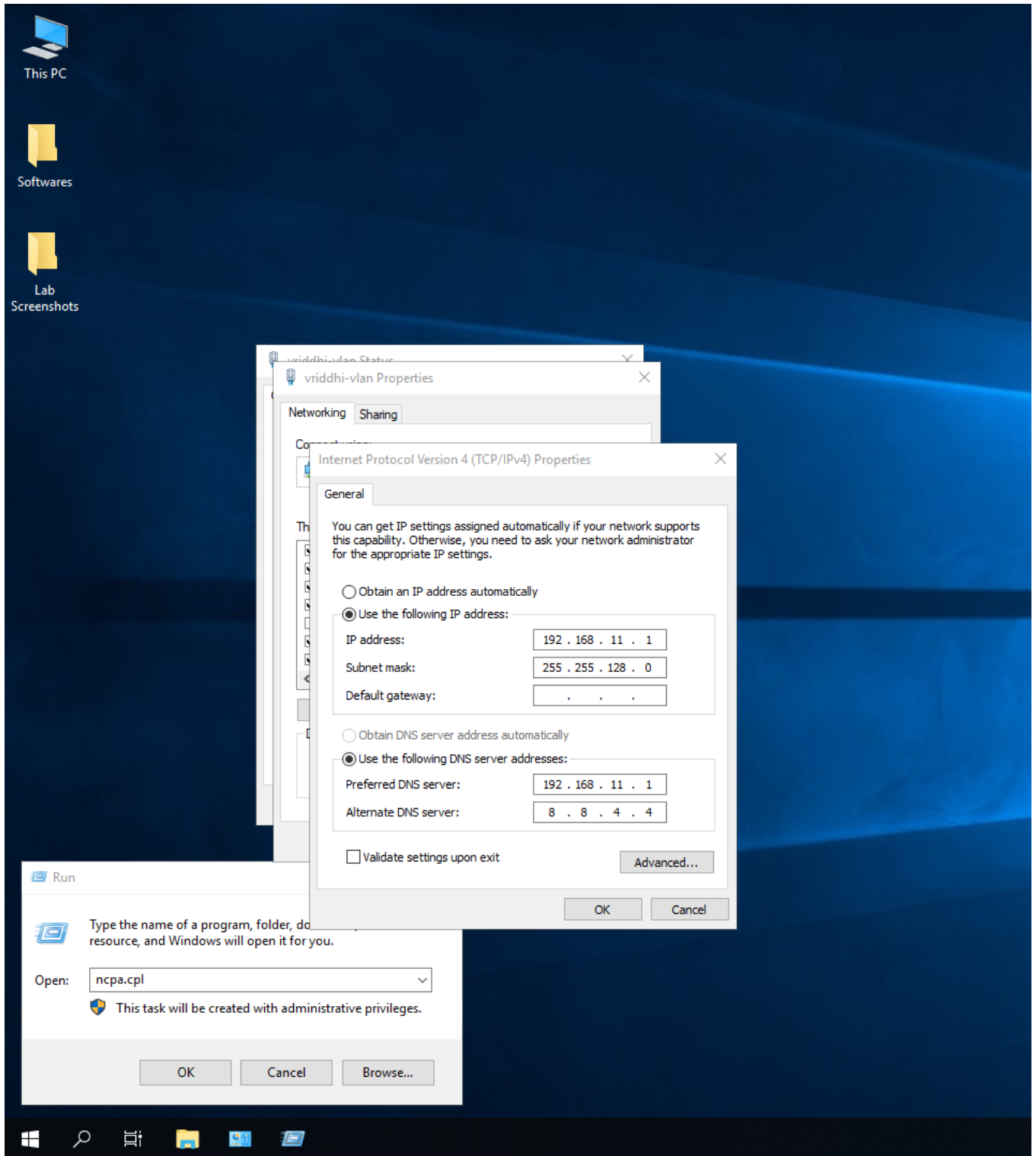




- Now you can configure IP Address and enable RDP (Remote Desktop Protocol) on the Windows from the vmware console and access it remotely

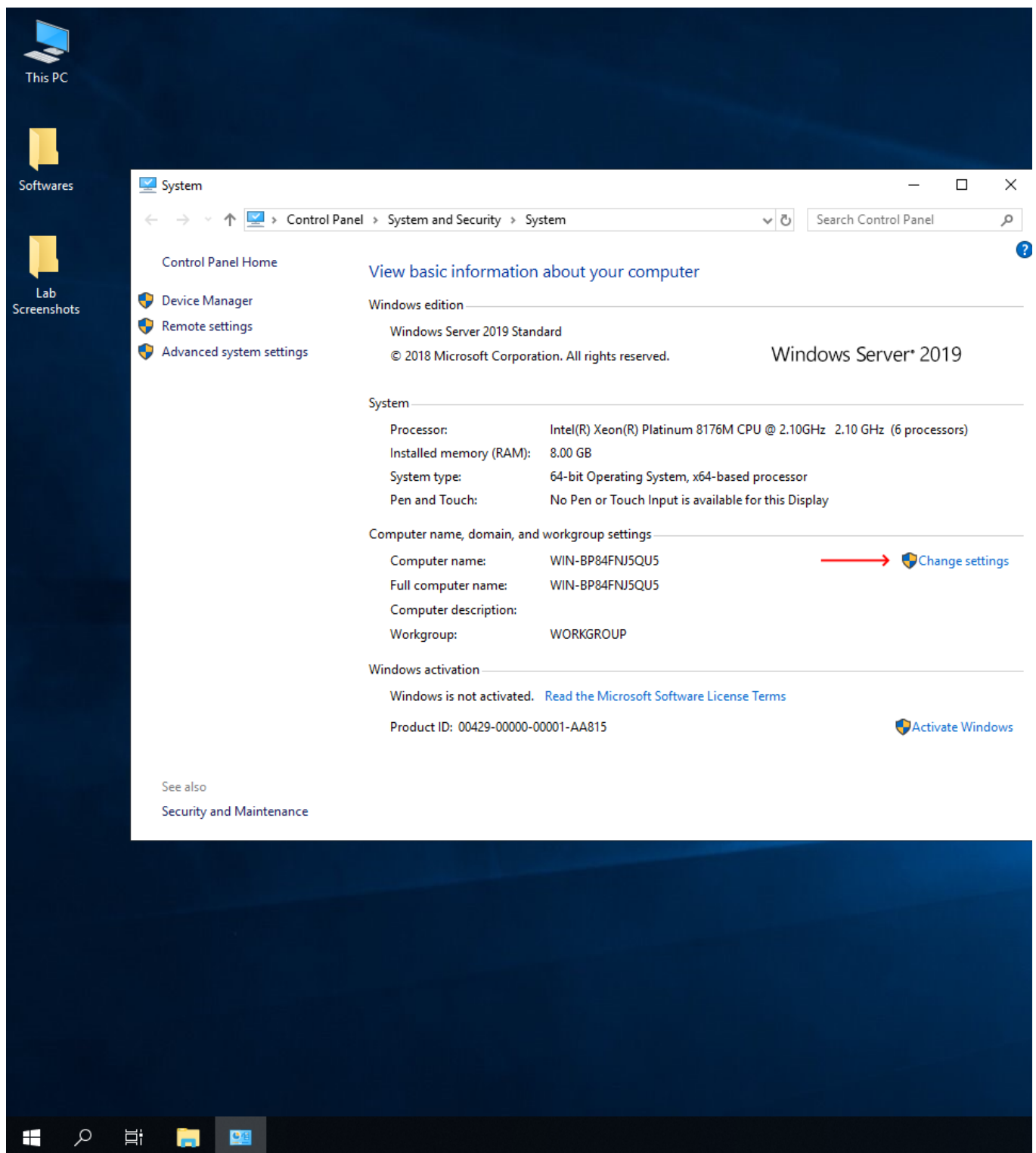
[Lab] Configure AD & DNS in Windows Server 2019

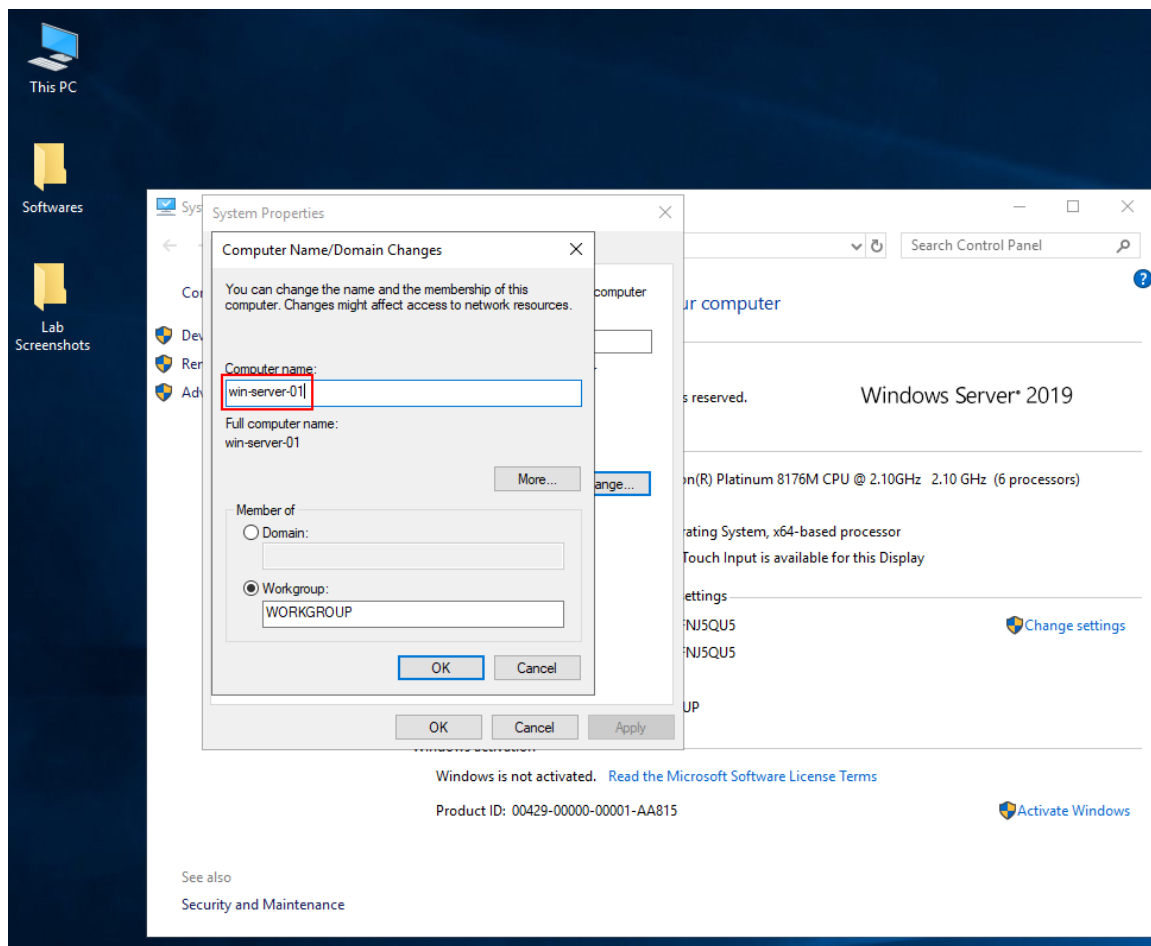
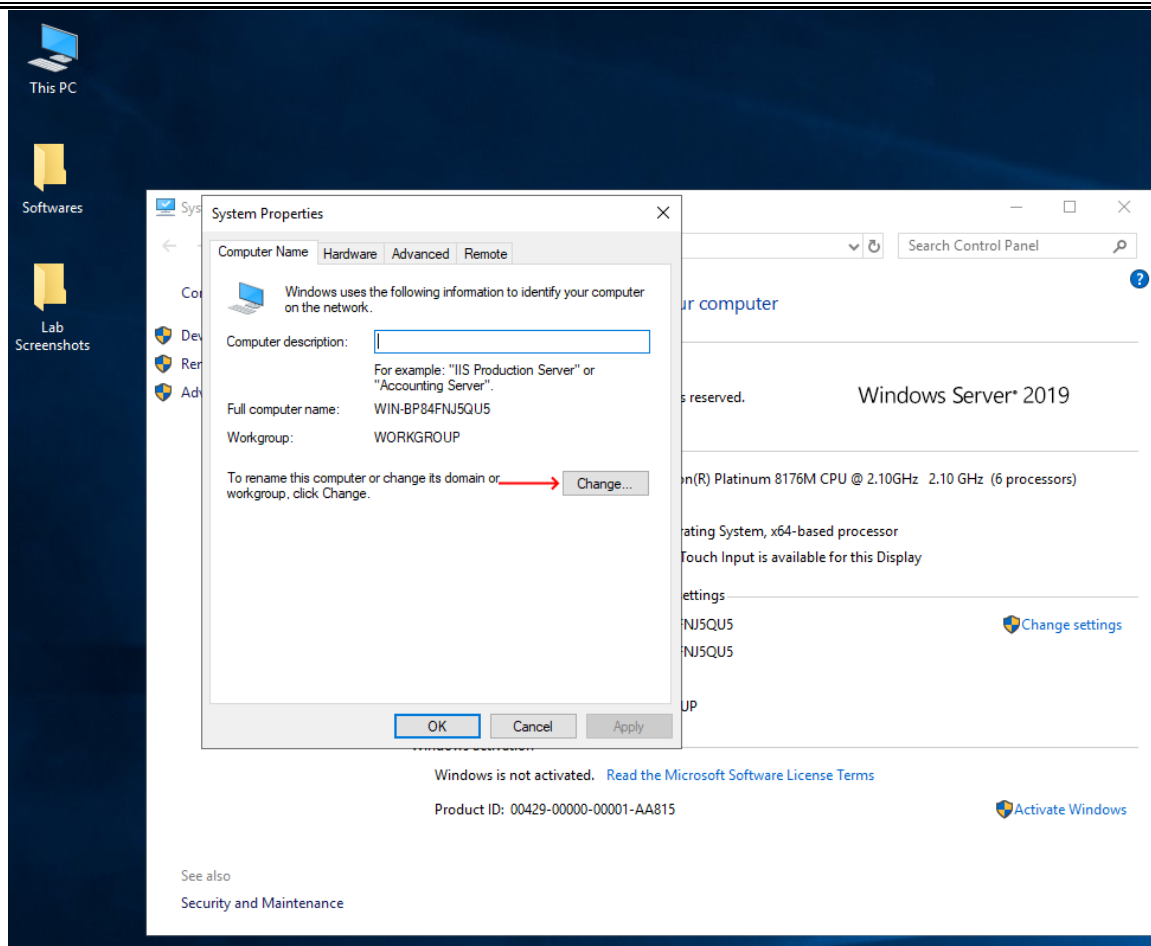
- We configure AD and DNS together on a Windows Server 2019. This will be our main server for many different purposes
- Installation of Windows Server is not the scope of this article

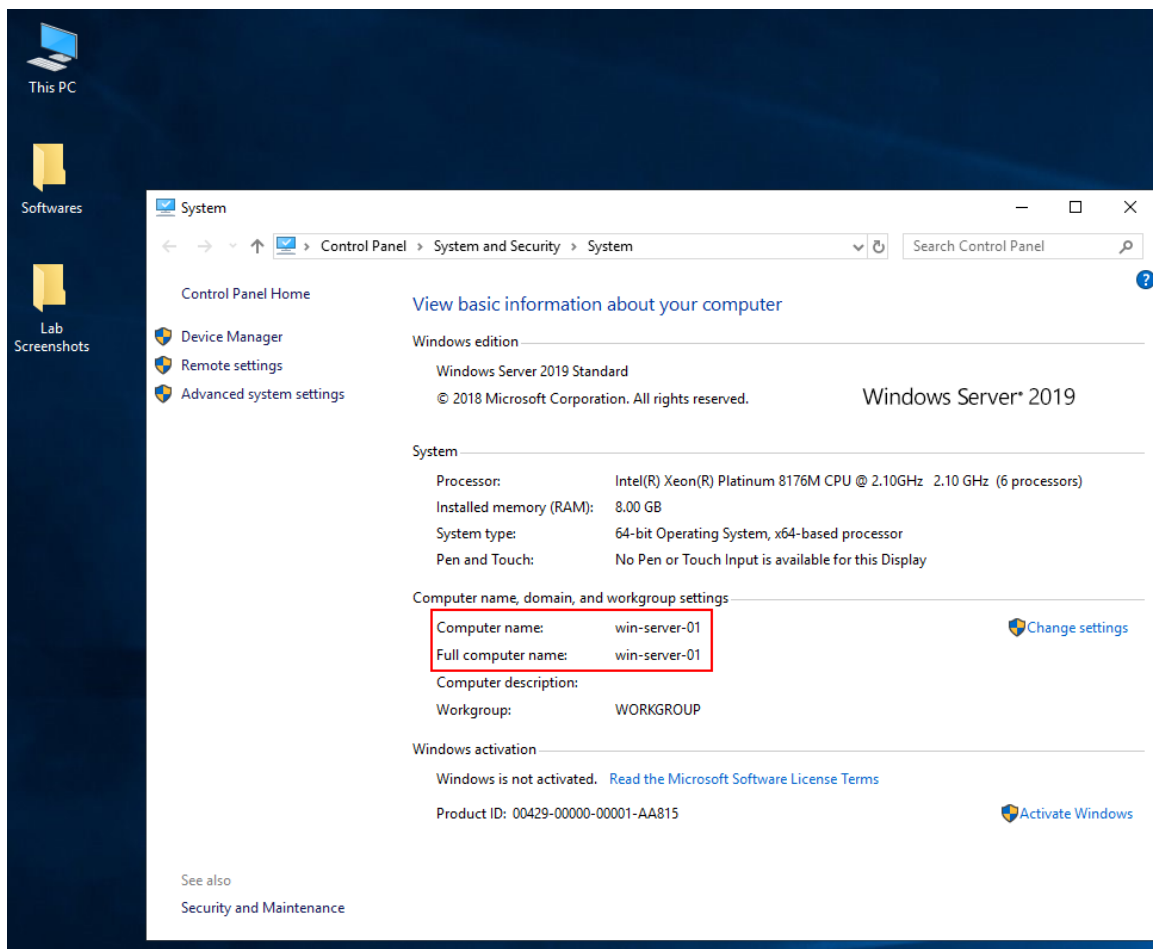
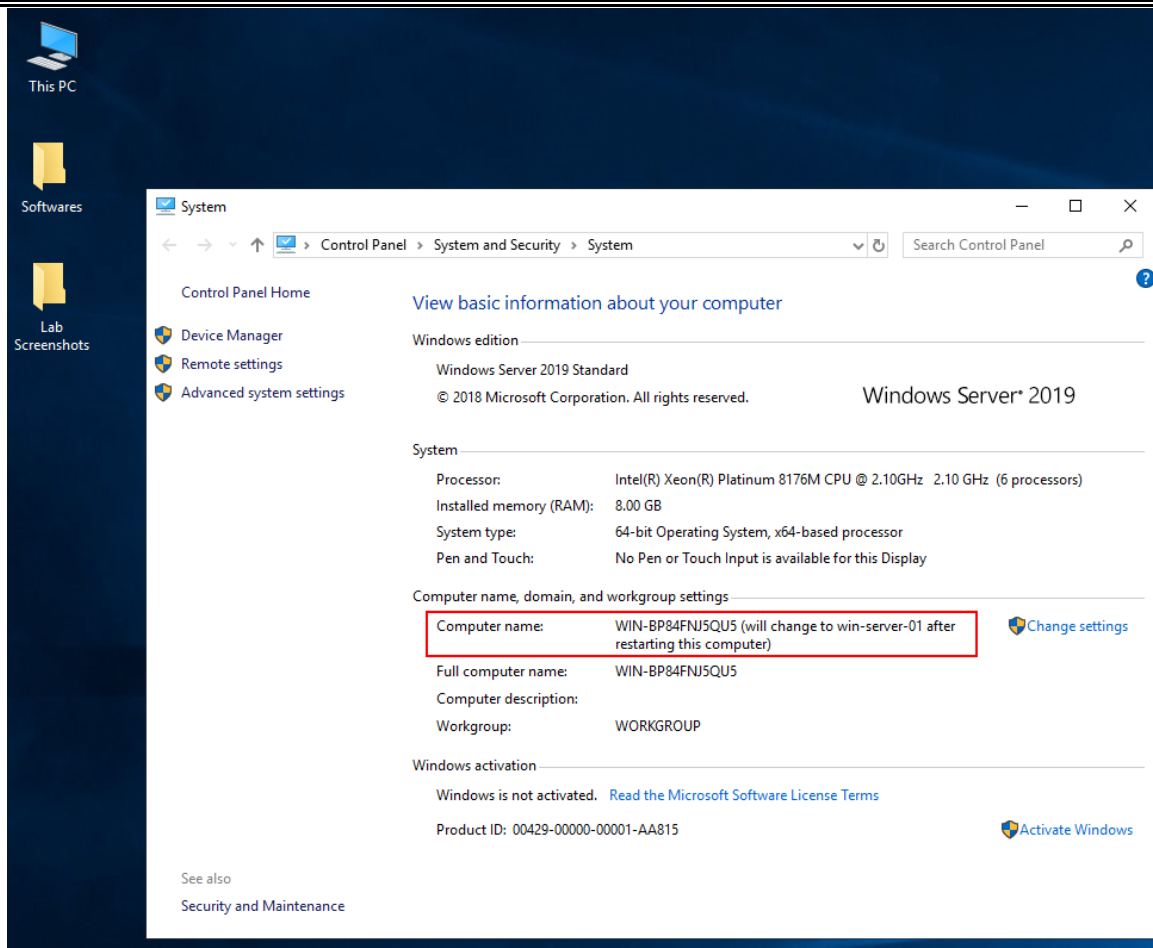


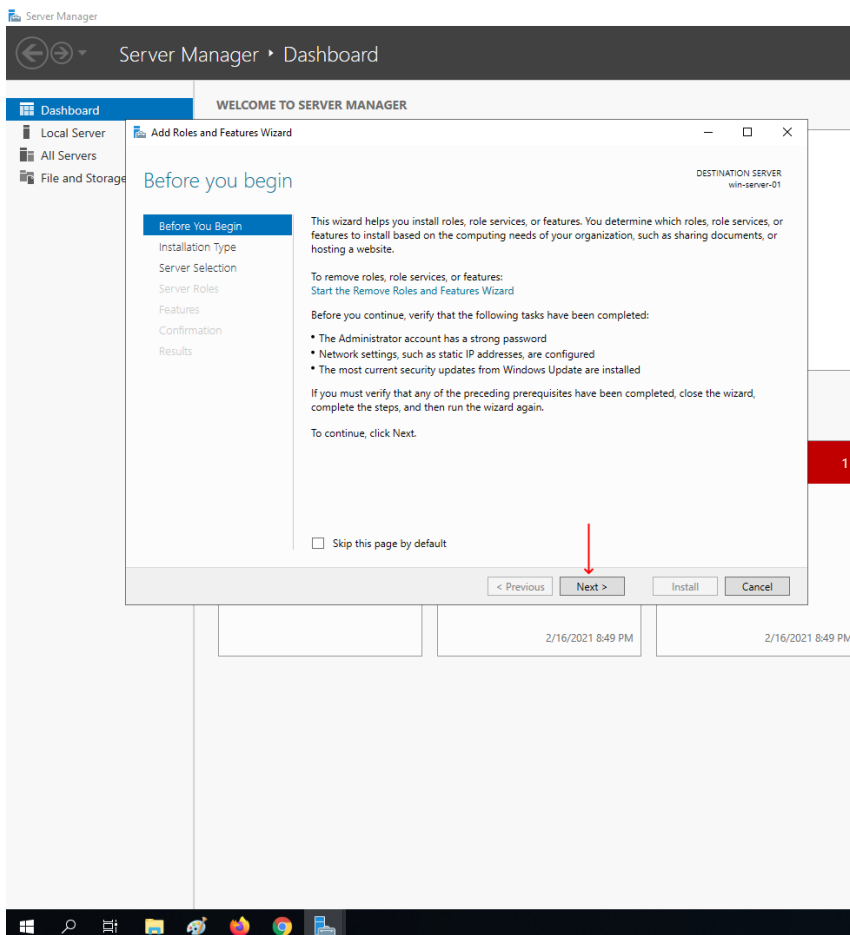
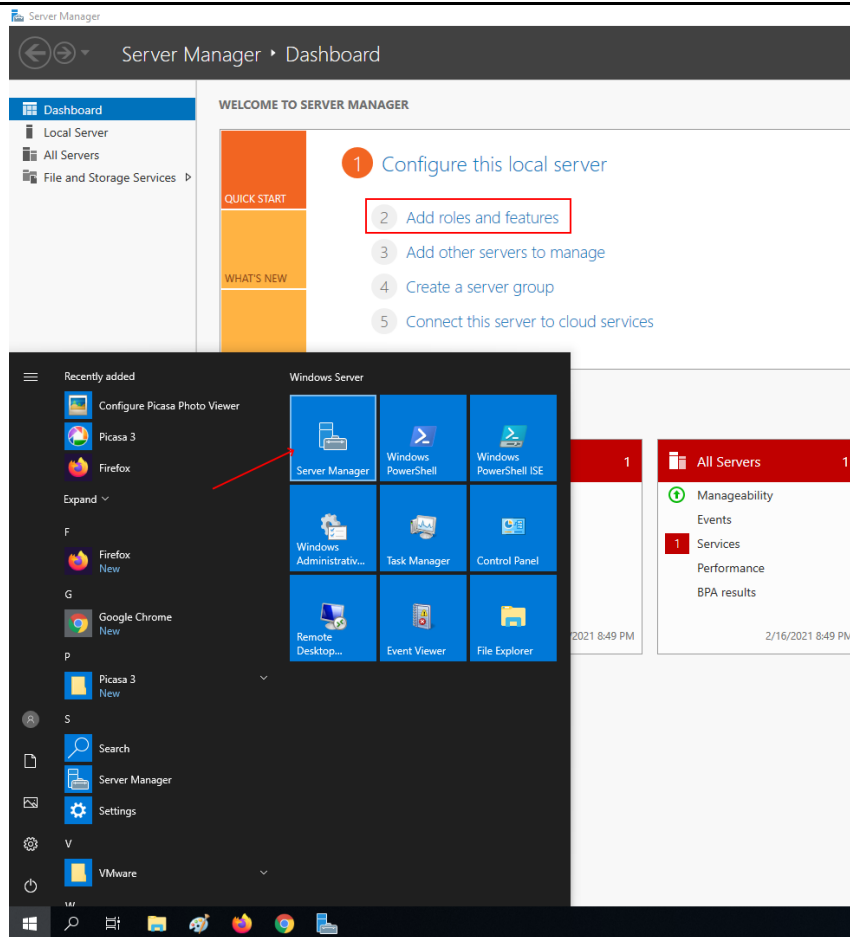
- After you done with Windows Server 2019 installation, make sure it has a static IP configured
- It is always recommended to have static IPs for servers

- Let's configure a hostname for the server
- Click on the Change Settings >>









Add Roles and Features Wizard

Select installation type

DESTINATION SERVER
win-server-01

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

☒ **Role-based or feature-based installation**
Configure a single server by adding roles, role services, and features.

☐ **Remote Desktop Services installation**
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

< Previous Next > Install Cancel

Add Roles and Features Wizard

Select destination server

DESTINATION SERVER
win-server-01

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results

Select a server or a virtual hard disk on which to install roles and features.

☒ Select a server from the server pool
☐ Select a virtual hard disk

Server Pool

Filter:

Name	IP Address	Operating System
win-server-01	10.106.79.66,1...	Microsoft Windows Server 2019 Standard

1 Computer(s) found

This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

< Previous Next > Install Cancel

Add Roles and Features Wizard

Select server roles

DESTINATION SERVER
win-server-01

Before You Begin
Installation Type
Server Selection
Server Roles
Features
DNS Server
AD DS
Confirmation
Results

Select one or more roles to install on the selected server.

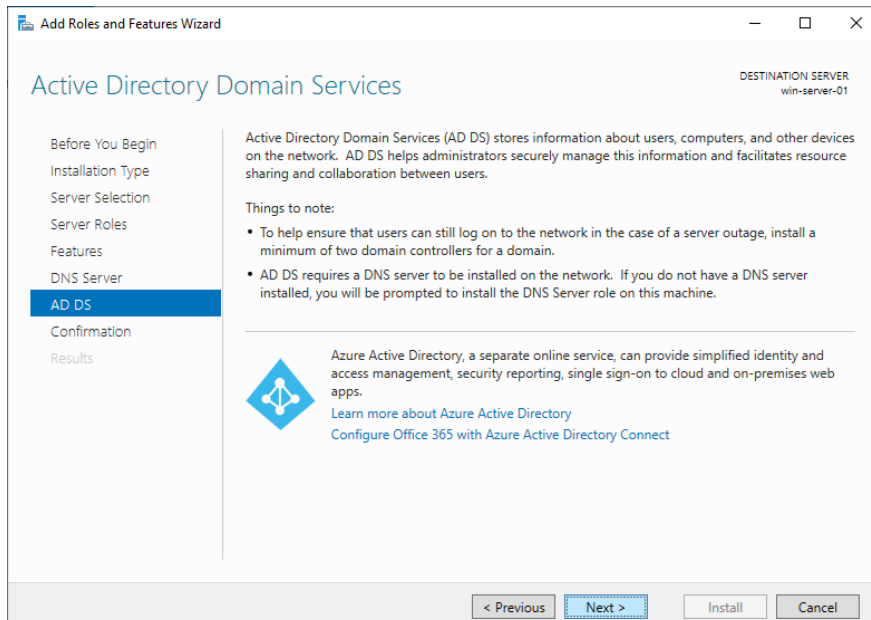
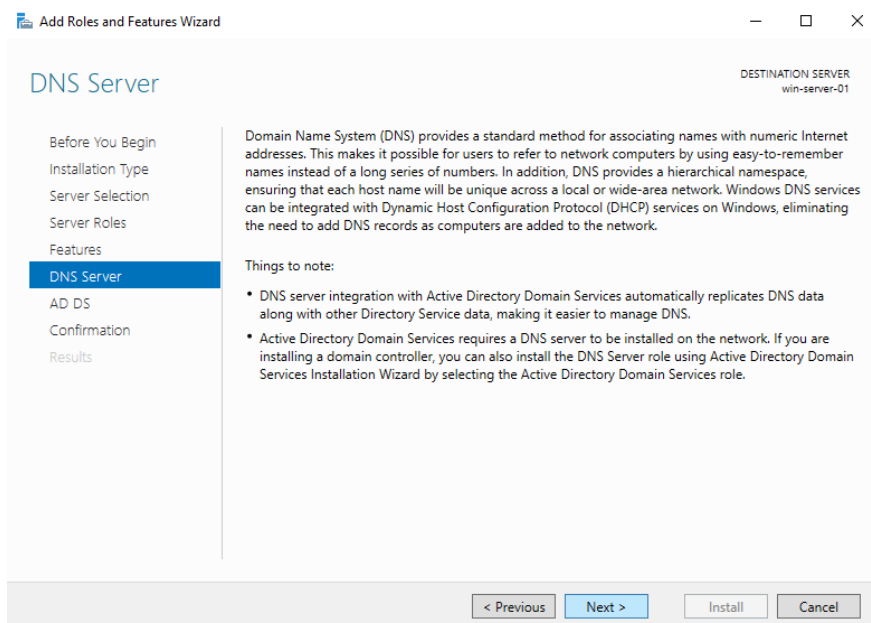
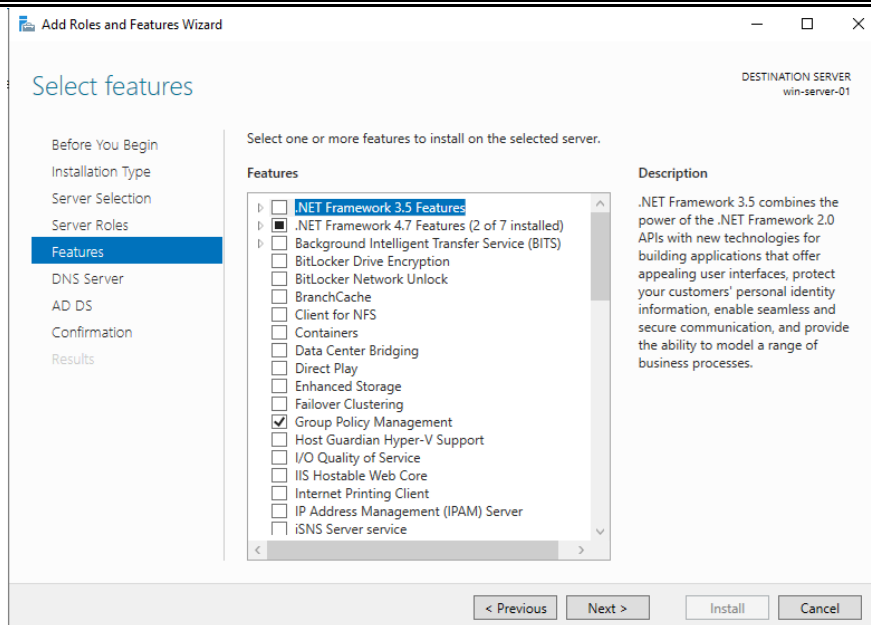
Roles

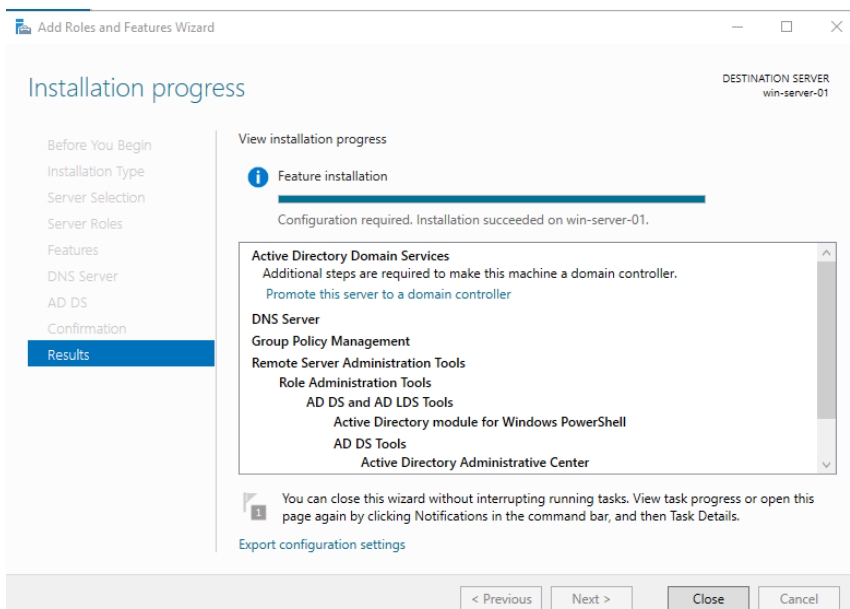
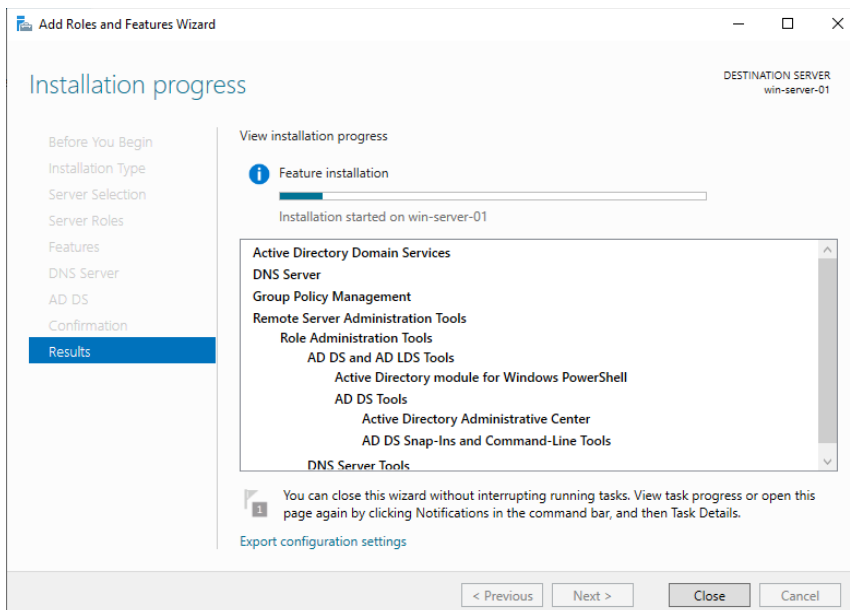
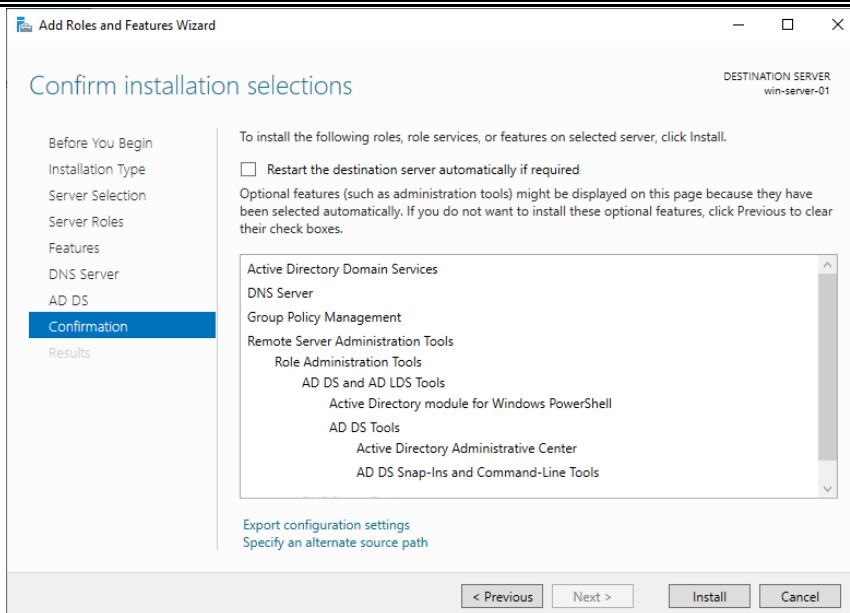
- ☐ Active Directory Certificate Services
- ☒ **Active Directory Domain Services**
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☐ DHCP Server
- ☒ **DNS Server**
- ☐ Fax Server
- ☒ File and Storage Services (1 of 12 installed)
- ☐ Host Guardian Service
- ☐ Hyper-V
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services
- ☐ Web Server (IIS)
- ☐ Windows Deployment Services
- ☐ Windows Server Update Services

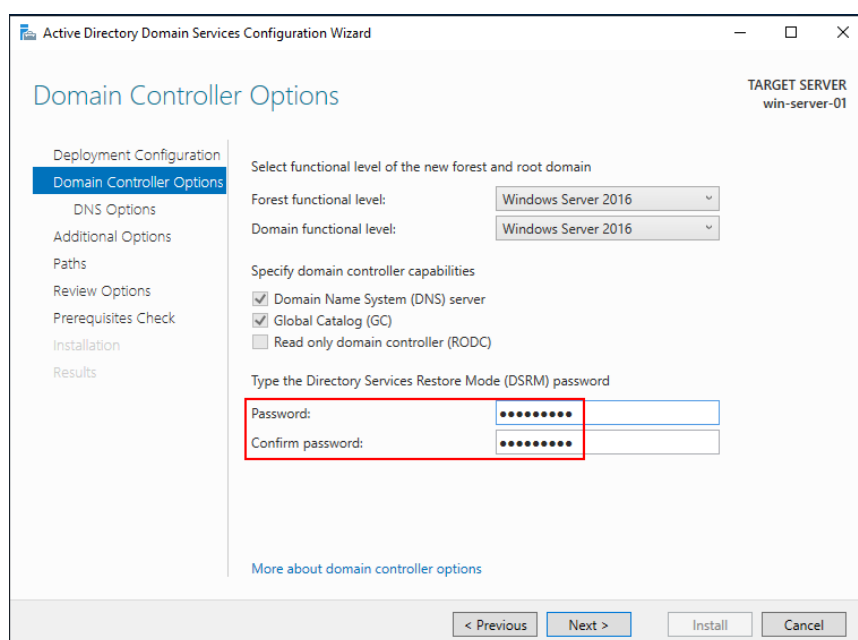
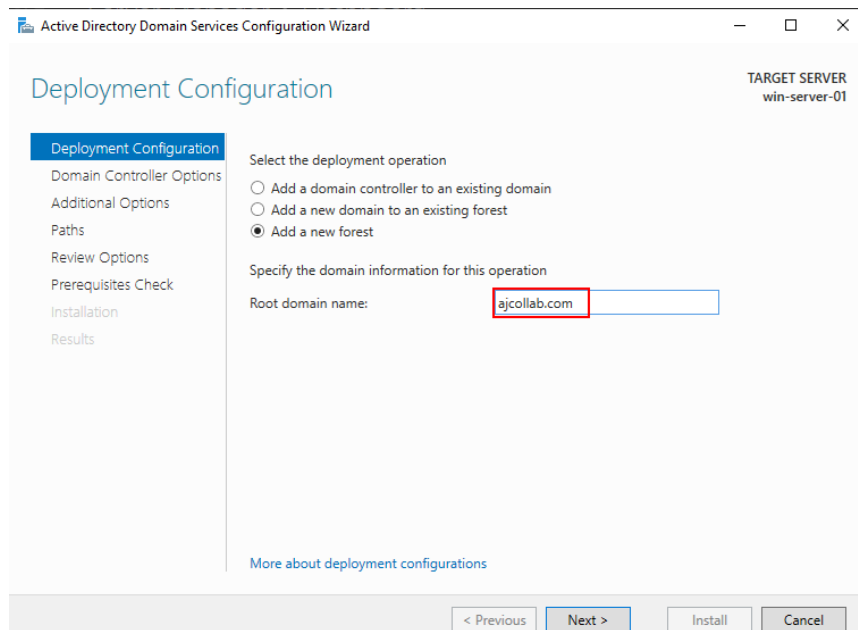
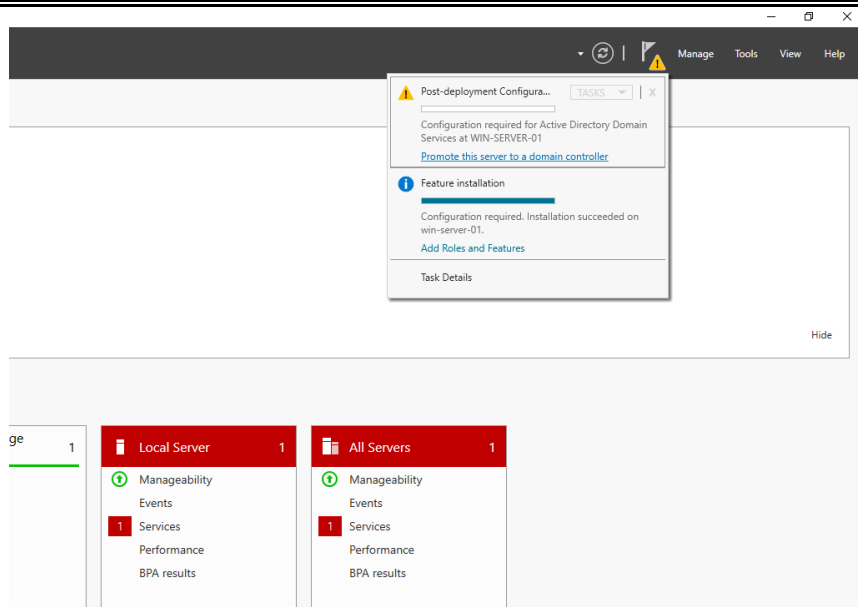
Description

Active Directory Domain Services (AD DS) stores information about objects on the network and makes this information available to users and network administrators. AD DS uses domain controllers to give network users access to permitted resources anywhere on the network through a single logon process.

< Previous Next > Install Cancel







Active Directory Domain Services Configuration Wizard

DNS Options

TARGET SERVER
win-server-01

⚠ A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found... [Show more](#) ✕

Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results

Specify DNS delegation options

☐ Create DNS delegation

[More about DNS delegation](#)

< Previous Next > Install Cancel

Active Directory Domain Services Configuration Wizard

Additional Options

TARGET SERVER
win-server-01

Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results

Verify the NetBIOS name assigned to the domain and change it if necessary

The NetBIOS domain name:

[More about additional options](#)

< Previous Next > Install Cancel

Active Directory Domain Services Configuration Wizard

Paths

TARGET SERVER
win-server-01

Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results

Specify the location of the AD DS database, log files, and SYSVOL

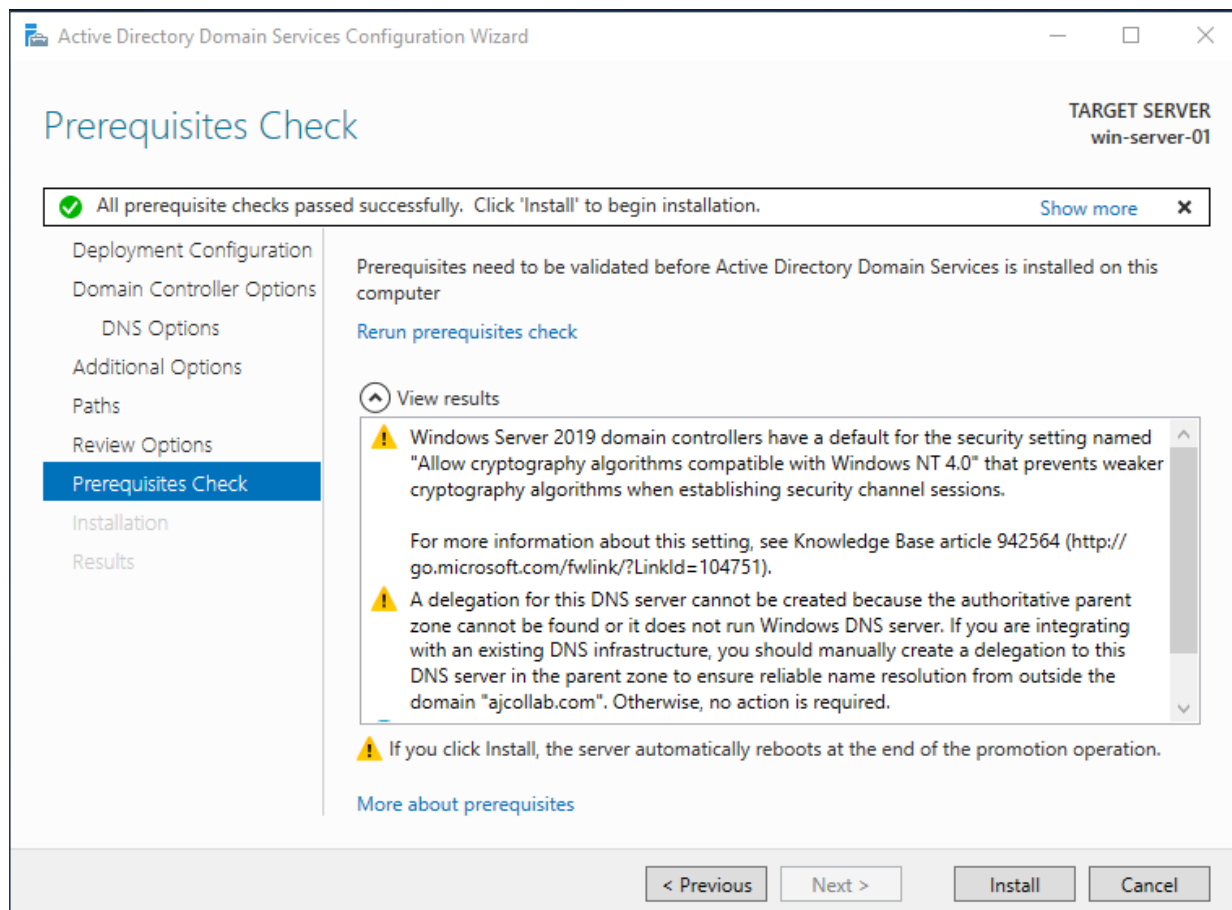
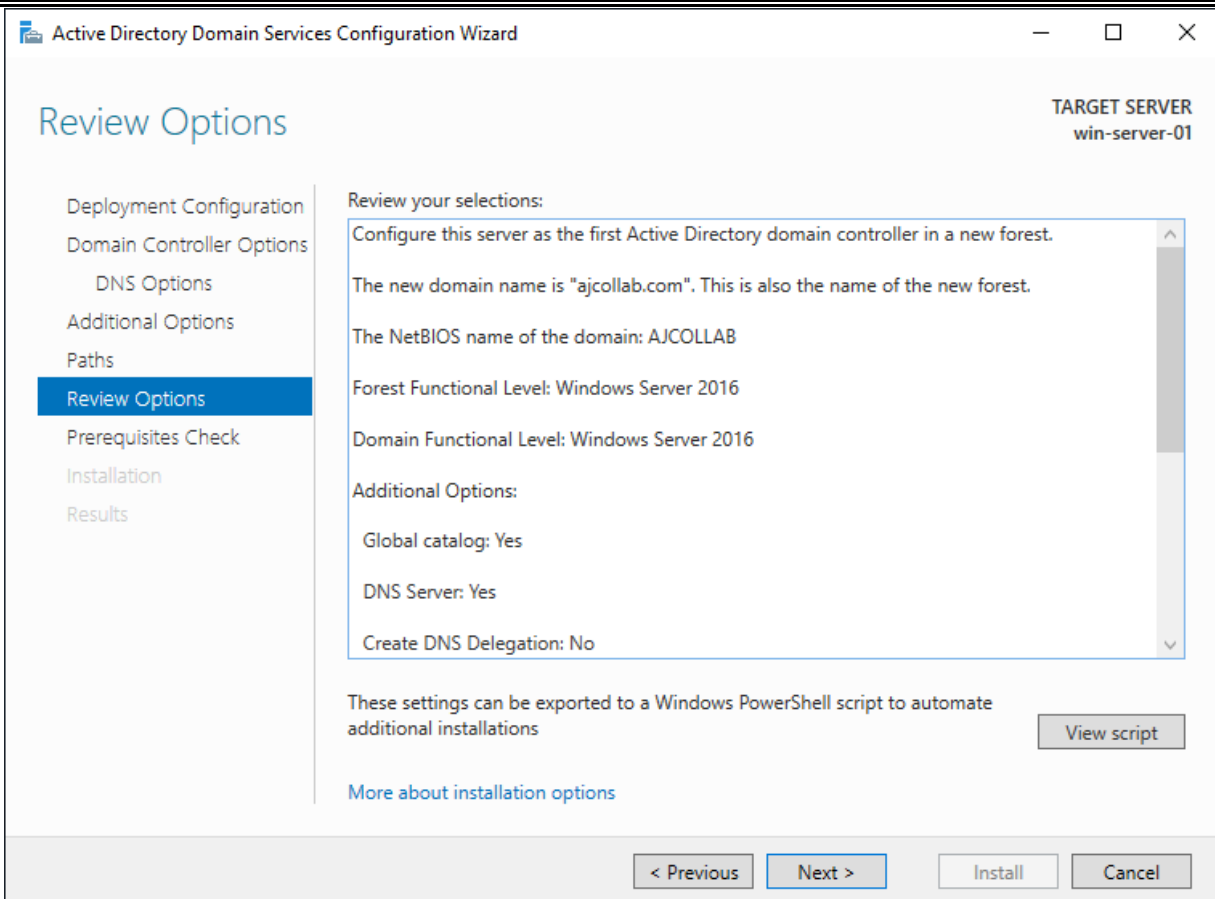
Database folder: ...

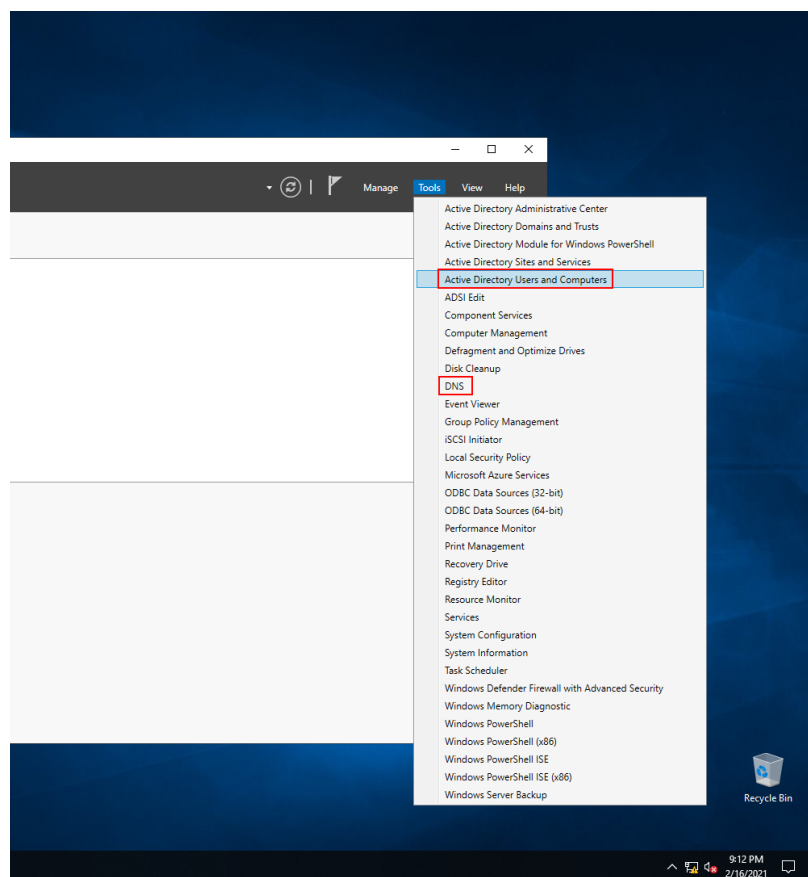
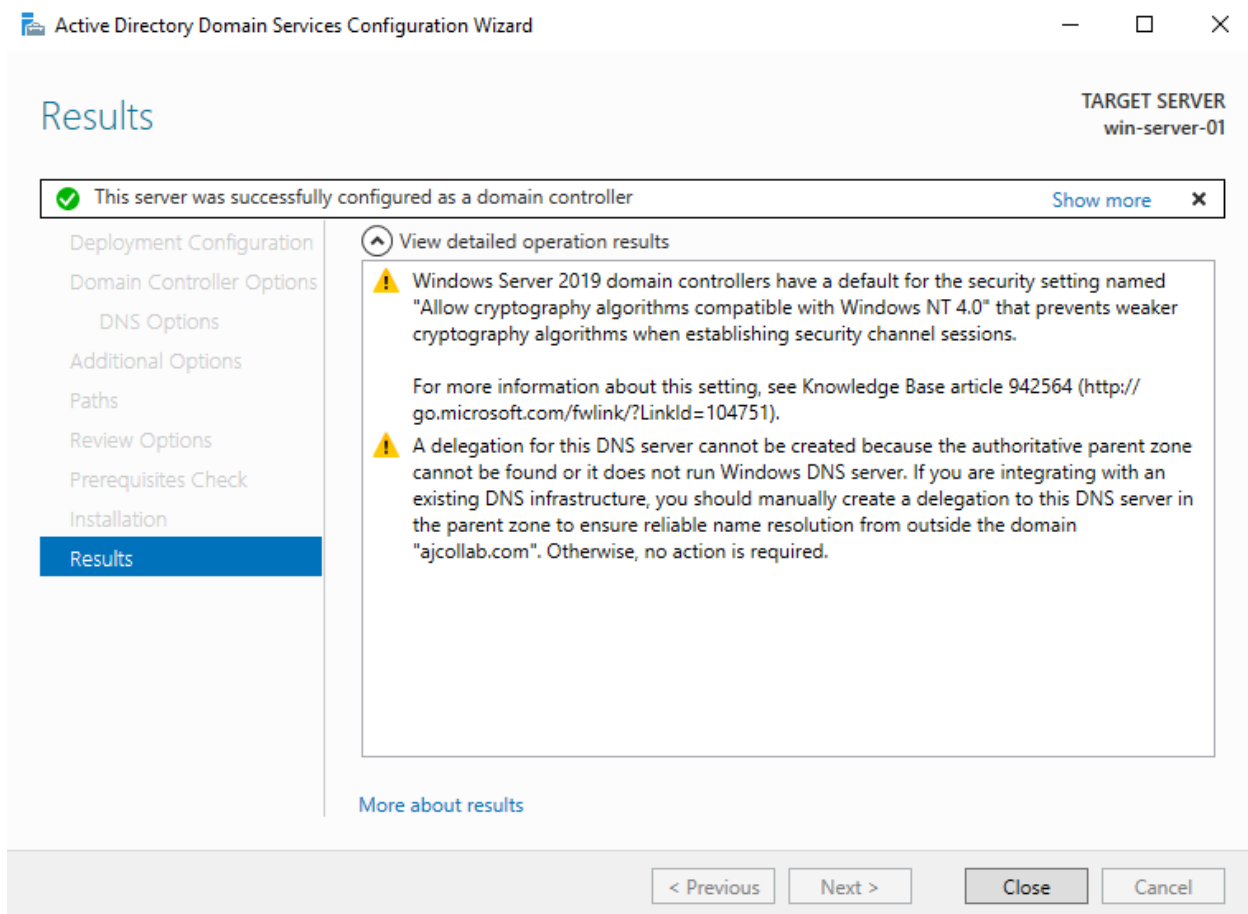
Log files folder: ...

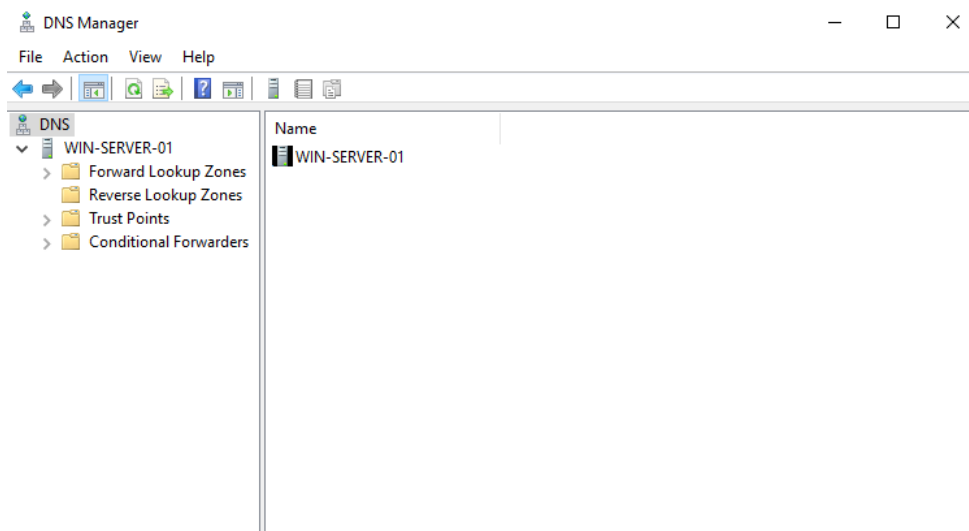
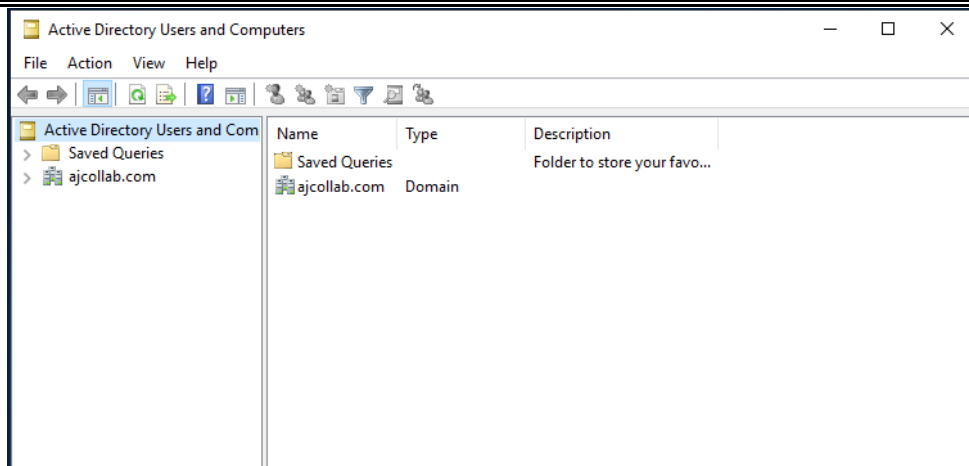
SYSVOL folder: ...

[More about Active Directory paths](#)

< Previous Next > Install Cancel

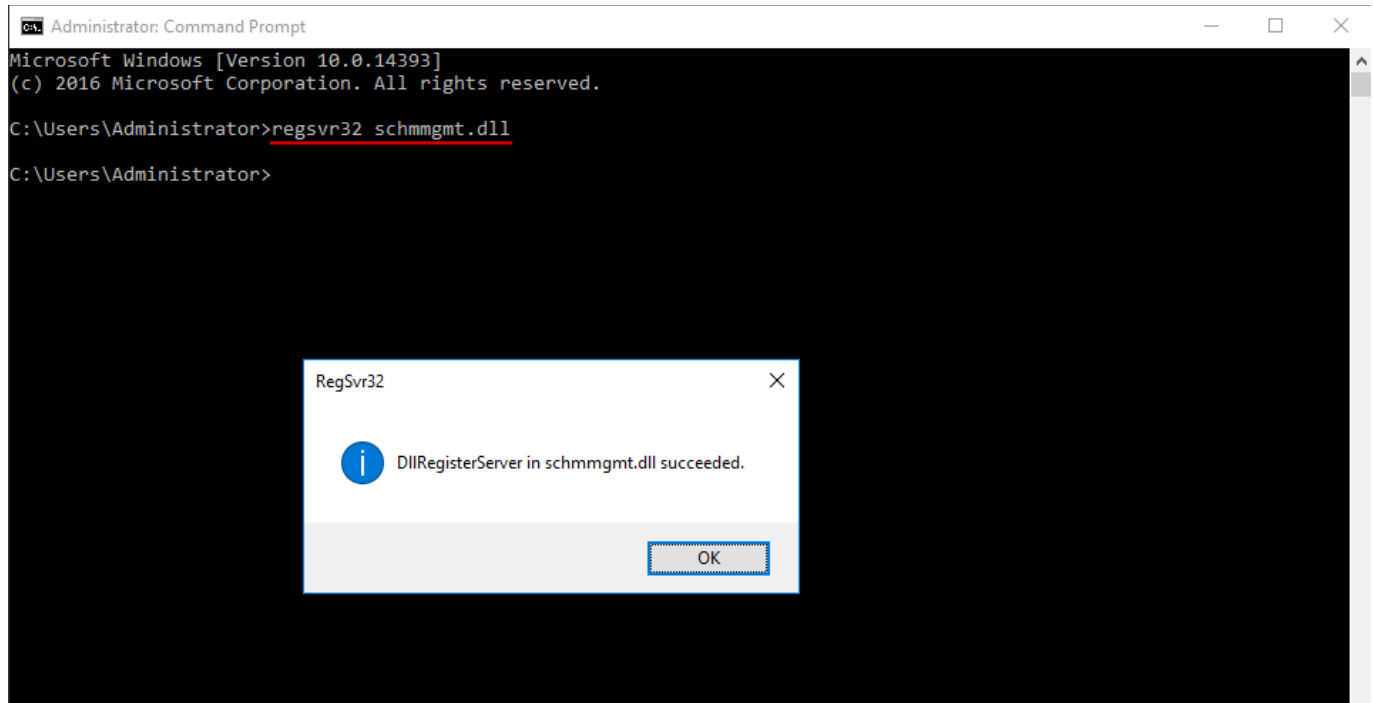




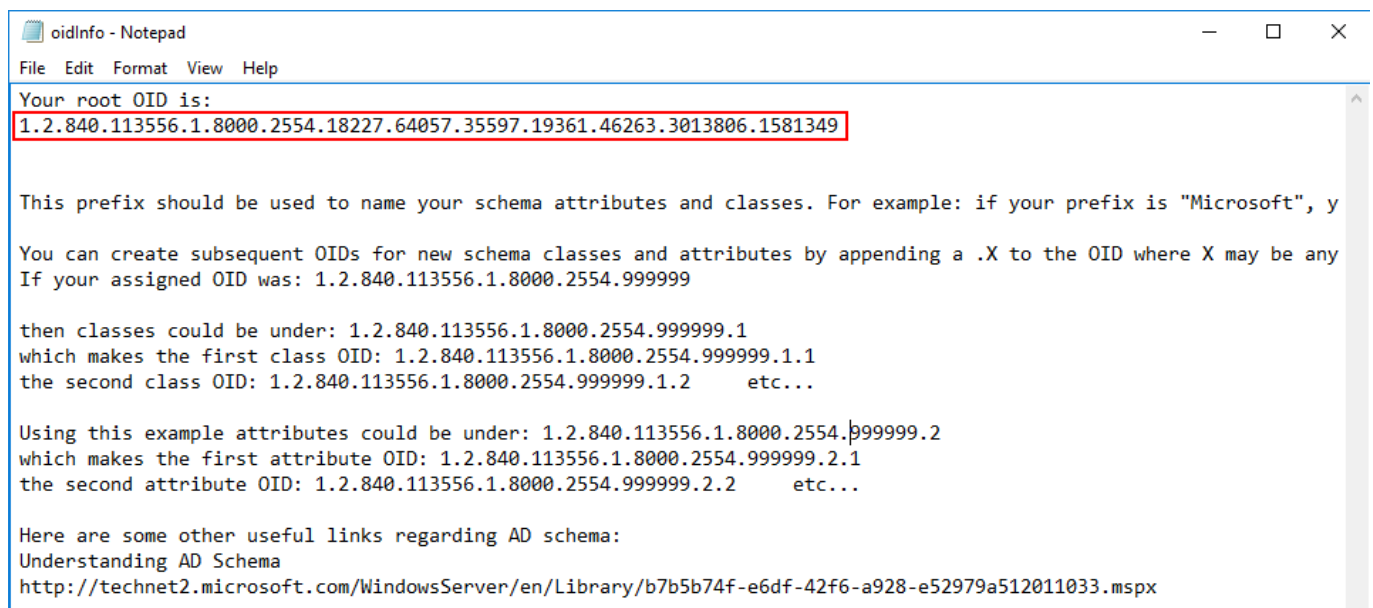


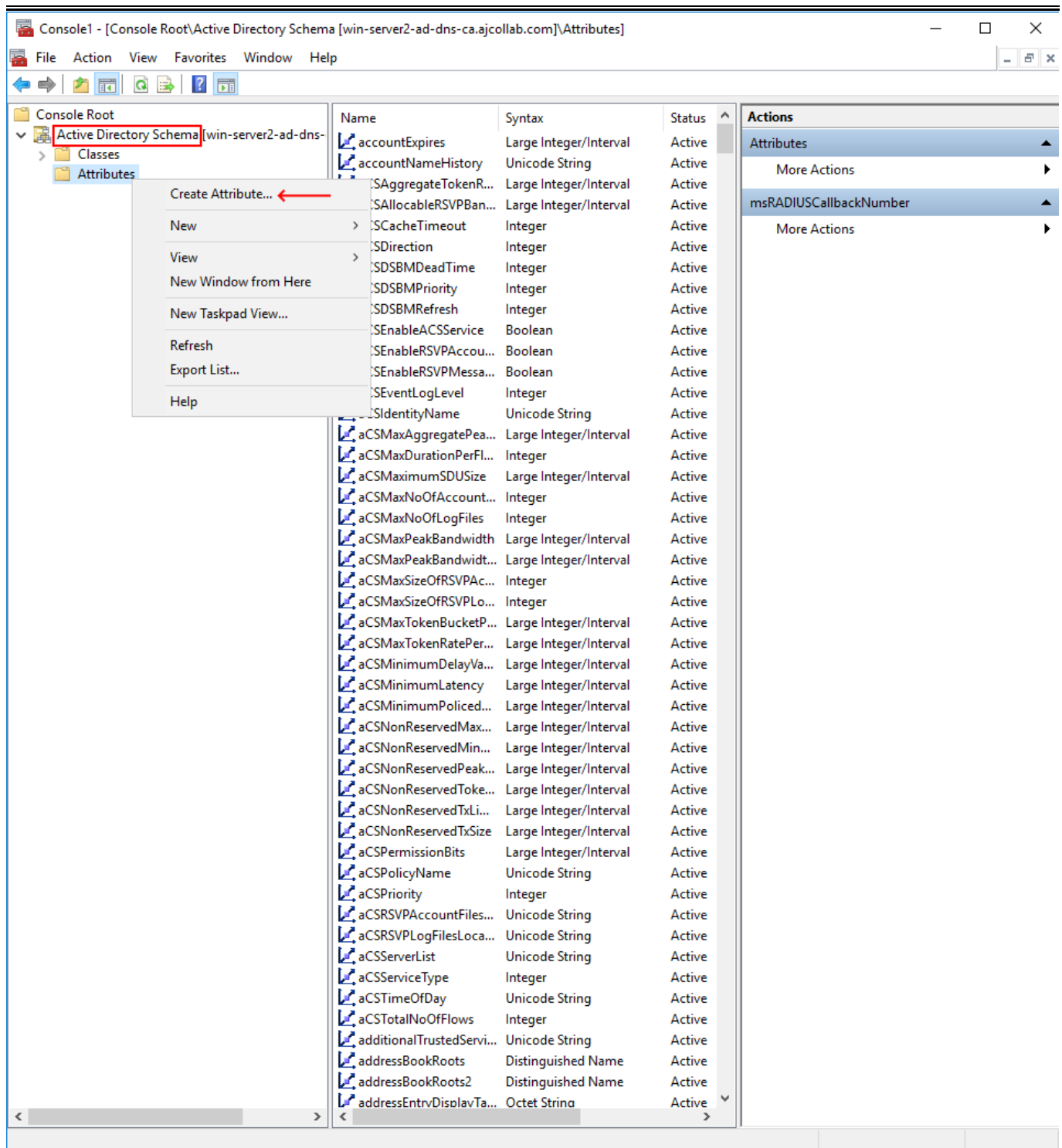
[Lab] Extending Active Directory Schema

- Ideally an attribute in AD called 'msRTCSIP-PrimaryUserAddress' maps to CUCM as SIP URI. You can simply map email ID as well
- The attribute 'msRTCSIP-PrimaryUserAddress' is not available by default, for that you need to extend your AD Schema
- On your AD Server, open command prompt and enter **regsvr32 schmmgmt.dll**



- Go to the link and copy the Script, paste it in to Notepad and save as OID.vbs
- Run the script and note the OID of your System





Create New Attribute

Create a New Attribute Object

Identification

Common Name: msRTCSIP-PrimaryUserAddress

LDAP Display Name: msRTCSIPPrimaryUserAddress

Unique X500 Object ID: 057.35597.19361.46263.3013806.1581349

Description: msRTCSIP-PrimaryUserAddress

Syntax and Range

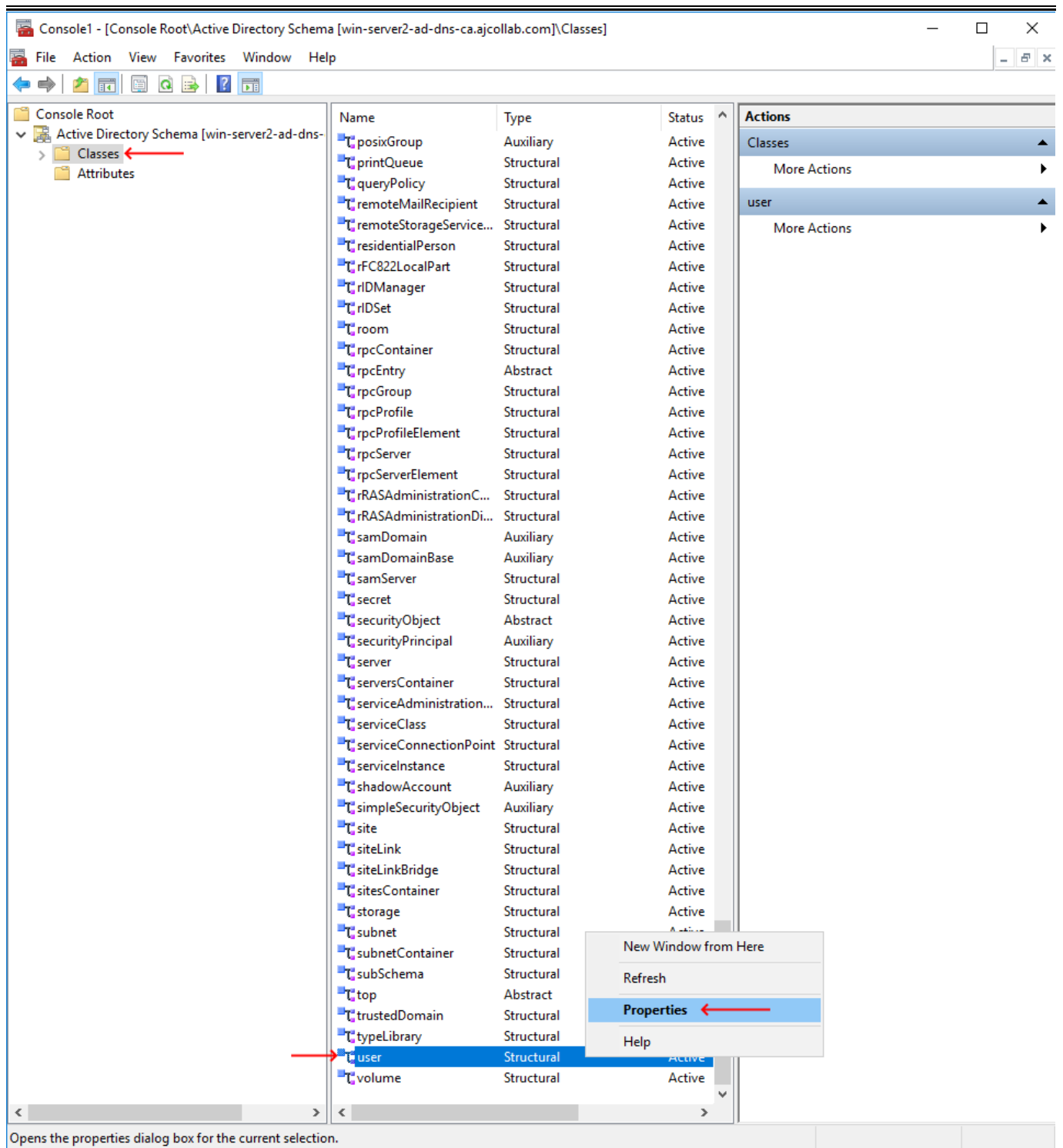
Syntax: Case Sensitive String

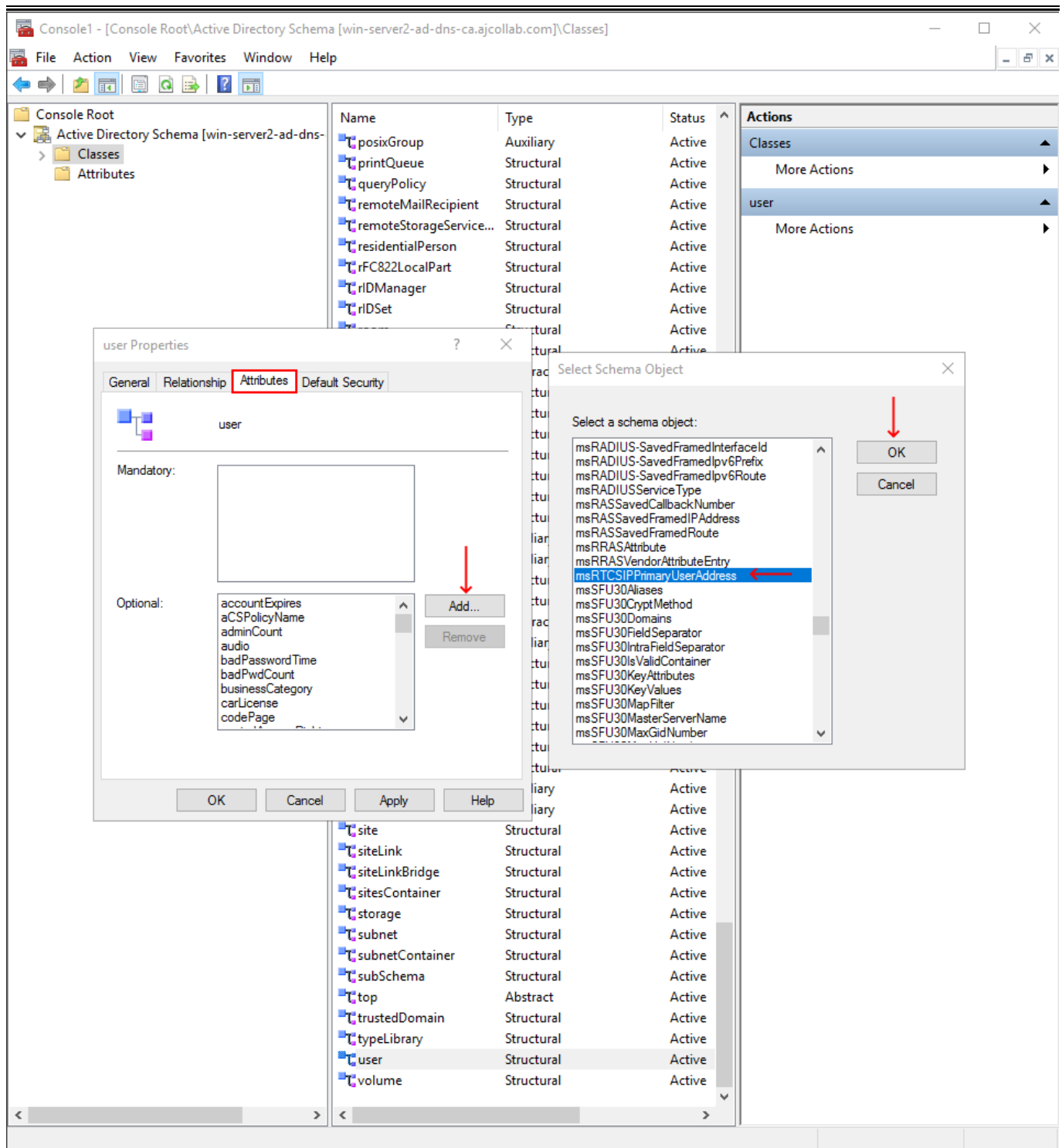
Minimum: |

Maximum:

☐ Multi-Valued

OK Cancel Help





Services

File Action View Help

Services (Local)

Services (Local)

Active Directory Domain Services

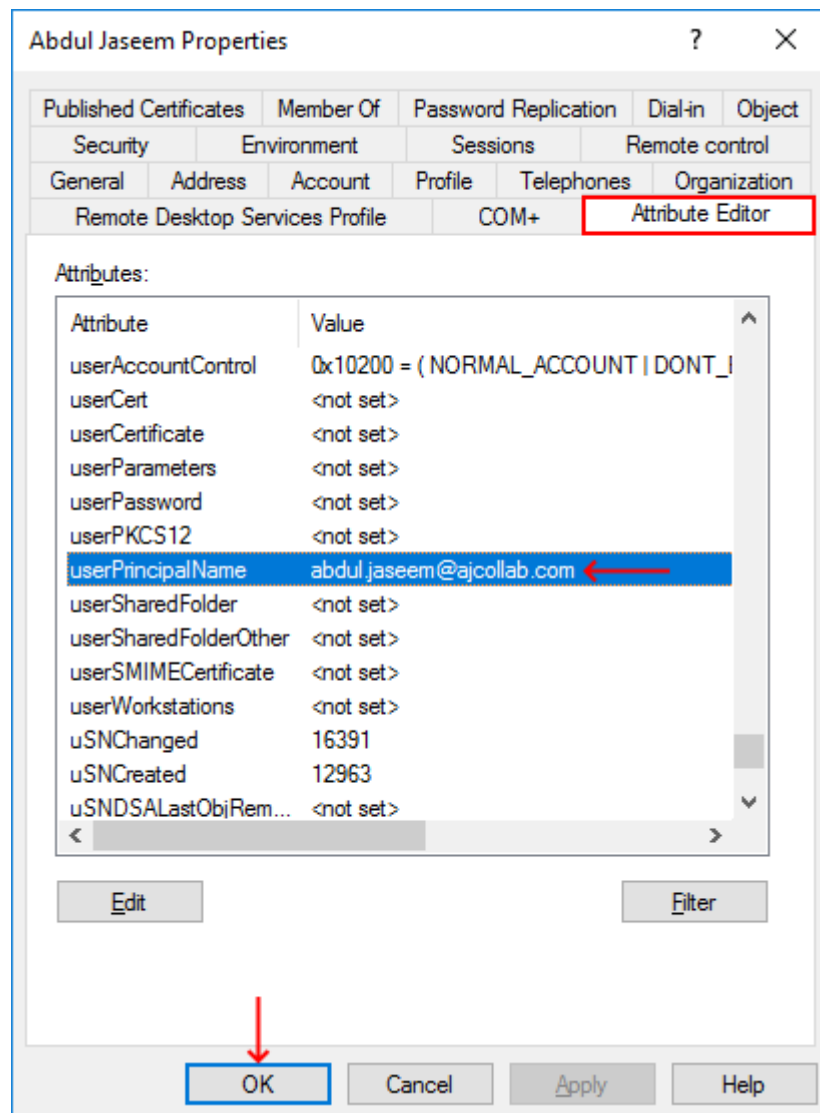
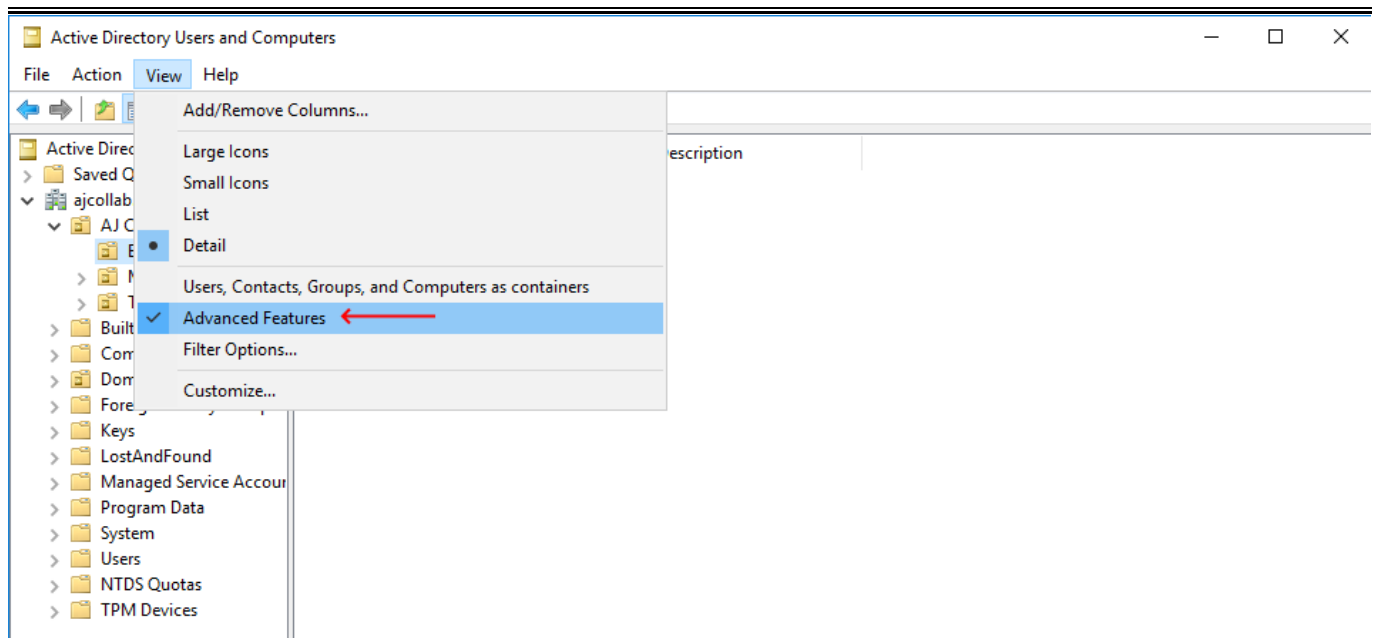
[Stop](#) the service
[Restart](#) the service

Description:
AD DS Domain Controller service. If this service is stopped, users will be unable to log on to the network. If this service is disabled, any services that explicitly depend on it will fail to start.

Name	Description	Status	Startup Type	Log On As
Active Directory Domain Services	AD DS Domain Controller service	Stopped	Automatic	Local System...
Active Directory Web Services	This service provides a web-based interface to Active Directory	Stopped	Automatic	Local System...
ActiveX Installer (AxInstSV)	Provides a service for installing ActiveX controls	Stopped	Automatic	Local System...
AllJoyn Router Service	Routes messages between devices	Stopped	Automatic (Trig...)	Local Service
App Readiness	Gets applications ready to run	Stopped	Automatic	Local System...
Application Identity	Determines the identity of applications	Stopped	Automatic (Trig...)	Local Service
Application Information	Facilitates the management of applications	Stopped	Automatic (Trig...)	Local System...
Application Layer Gateway Service	Provides a service for managing application layer gateways	Stopped	Automatic	Local Service
Application Management	Processes application management requests	Stopped	Automatic	Local System...
AppX Deployment Service (AppXSvc)	Provides a service for deploying AppX packages	Stopped	Automatic	Local System...
Auto Time Zone Updater	Automatically updates the system time zone	Stopped	Automatic	Local Service
Background Intelligent Transfer Service	Transfers data in the background	Stopped	Automatic	Local System...
Background Tasks Infrastructure	Windows background tasks infrastructure	Running	Automatic	Local System...
Base Filtering Engine	The Base Filtering Engine	Running	Automatic	Local Service
Bluetooth Support Service	The Bluetooth support service	Running	Manual (Trig...)	Local Service
CDPSvc	Failed to start	Running	Automatic	Local System...
Certificate Propagation	Copies user certificates	Running	Manual	Local System...
Client License Service (ClipSVC)	Provides information about client licenses	Running	Manual (Trig...)	Local System...
CNG Key Isolation	The CNG key isolation service	Running	Manual (Trig...)	Local System...
COM+ Event System	Supports COM+ events	Running	Automatic	Local Service
COM+ System Application	Manages COM+ system applications	Running	Manual	Local System...
Computer Browser	Maintains a list of computers on the network	Running	Disabled	Local System...
Connected Devices Platform Service	This service manages connected devices	Running	Automatic (D...)	Local Service
Connected User Experiences and Telemetry	The Connected User Experiences and Telemetry service	Running	Automatic	Local System...
Contact Data	Indexes contact data	Running	Manual	Local System...
CoreMessaging	Manages core messaging	Running	Automatic	Local Service
Credential Manager	Provides secure storage for credentials	Running	Manual	Local System...
Cryptographic Services	Provides cryptographic services	Running	Automatic	Network Service
Data Sharing Service	Provides data sharing services	Running	Manual (Trig...)	Local System...
DataCollectionPublishingService	The Data Collection Publishing Service	Running	Manual (Trig...)	Local System...
DCOM Server Process Launcher	The DCOM server process launcher	Running	Automatic	Local System...
Device Association Service	Enables pairing of devices	Running	Manual (Trig...)	Local System...
Device Install Service	Enables a device to be installed	Running	Manual (Trig...)	Local System...
Device Management Enrollment Service	Performs device management enrollment	Running	Manual	Local System...
Device Setup Manager	Enables the setup of devices	Running	Manual (Trig...)	Local System...
DevQuery Background Disc...	Enables application background discovery	Running	Manual (Trig...)	Local System...
DFS Namespace	Enables you to use a single namespace to access files and folders on multiple servers	Running	Automatic	Local System...
DFS Replication	Enables you to replicate files and folders across multiple servers	Running	Automatic	Local System...
DHCP Client	Registers an IP address with a DHCP server	Running	Automatic	Local Service
Diagnostic Policy Service	The Diagnostic Policy Service	Running	Automatic (D...)	Local Service
Diagnostic Service Host	The Diagnostic Service Host	Running	Manual	Local Service
Diagnostic System Host	The Diagnostic System Host	Running	Manual	Local System...
Distributed Link Tracking Client	Maintains links to files and folders on remote servers	Running	Manual	Local System...
Distributed Transaction Coordinator	Coordinates distributed transactions	Running	Automatic (D...)	Network Service
dmwappushsvc	WAP Push Service	Running	Manual (Trig...)	Local System...

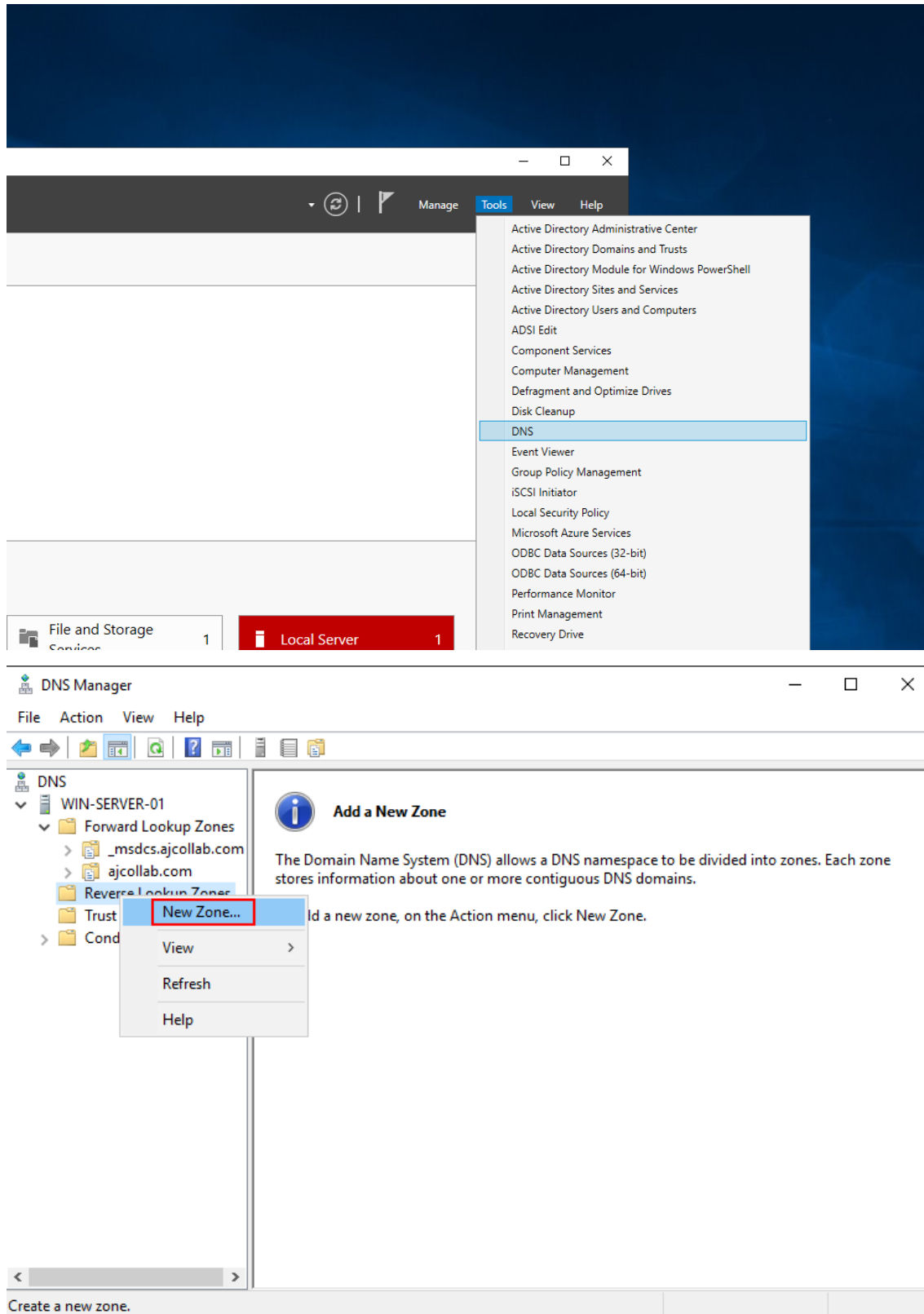
Extended Standard

Stop and Start service Active Directory Domain Services on Local Computer




[Lab] Configure Reverse Lookup Zone in Windows DNS Server

- After adding DNS feature on the Windows Server, we need to manually add Reverse Lookup zone for the domain
- Forward Lookup Zone will be created automatically, we don't need to worry about it



New Zone Wizard



Welcome to the New Zone Wizard

This wizard helps you create a new zone for your DNS server.

A zone translates DNS names to related data, such as IP addresses or network services.

To continue, click Next.


< Back

Next >

Cancel

New Zone Wizard

Zone Type
The DNS server supports various types of zones and storage.



Select the type of zone you want to create:

☒ Primary zone
Creates a copy of a zone that can be updated directly on this server.

☐ Secondary zone
Creates a copy of a zone that exists on another server. This option helps balance the processing load of primary servers and provides fault tolerance.

☐ Stub zone
Creates a copy of a zone containing only Name Server (NS), Start of Authority (SOA), and possibly glue Host (A) records. A server containing a stub zone is not authoritative for that zone.

☒ Store the zone in Active Directory (available only if DNS server is a writeable domain controller)


< Back

Next >

Cancel

New Zone Wizard

Active Directory Zone Replication Scope
You can select how you want DNS data replicated throughout your network.



Select how you want zone data replicated:

☐ To all DNS servers running on domain controllers in this forest: ajcollab.com

☒ To all DNS servers running on domain controllers in this domain: ajcollab.com

☐ To all domain controllers in this domain (for Windows 2000 compatibility): ajcollab.com

☐ To all domain controllers specified in the scope of this directory partition:

< Back

Next >

Cancel

New Zone Wizard

Reverse Lookup Zone Name

A reverse lookup zone translates IP addresses into DNS names.

Choose whether you want to create a reverse lookup zone for IPv4 addresses or IPv6 addresses.

☒ IPv4 Reverse Lookup Zone

☐ IPv6 Reverse Lookup Zone

< Back

Next >

Cancel

New Zone Wizard

Reverse Lookup Zone Name

A reverse lookup zone translates IP addresses into DNS names.

To identify the reverse lookup zone, type the network ID or the name of the zone.

☒ Network ID:

192 .168 .11

The network ID is the portion of the IP addresses that belongs to this zone. Enter the network ID in its normal (not reversed) order.

If you use a zero in the network ID, it will appear in the zone name. For example, network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa.

☐ Reverse lookup zone name:

11.168.192.in-addr.arpa

< Back

Next >

Cancel

New Zone Wizard

Dynamic Update

You can specify that this DNS zone accepts secure, nonsecure, or no dynamic updates.

Dynamic updates enable DNS client computers to register and dynamically update their resource records with a DNS server whenever changes occur.


Select the type of dynamic updates you want to allow:

☒ Allow only secure dynamic updates (recommended for Active Directory)

This option is available only for Active Directory-integrated zones.

☐ Allow both nonsecure and secure dynamic updates

Dynamic updates of resource records are accepted from any client.

 This option is a significant security vulnerability because updates can be accepted from untrusted sources.


☐ Do not allow dynamic updates

Dynamic updates of resource records are not accepted by this zone. You must update these records manually.

< Back

Next >

Cancel



Completing the New Zone Wizard

You have successfully completed the New Zone Wizard. You specified the following settings:

Name:	11.168.192.in-addr.arpa
Type:	Active Directory-Integrated Primary
Lookup type:	Reverse

Note: You should now add records to the zone or ensure that records are updated dynamically. You can then verify name resolution using nslookup.

To close this wizard and create the new zone, click Finish.

< Back Finish Cancel

- You need to add other IP Ranges as well
- I have added 192.168.21.X range here again

Reverse Lookup Zone Name

A reverse lookup zone translates IP addresses into DNS names.



To identify the reverse lookup zone, type the network ID or the name of the zone.

☒ Network ID:

.

The network ID is the portion of the IP addresses that belongs to this zone. Enter the network ID in its normal (not reversed) order.

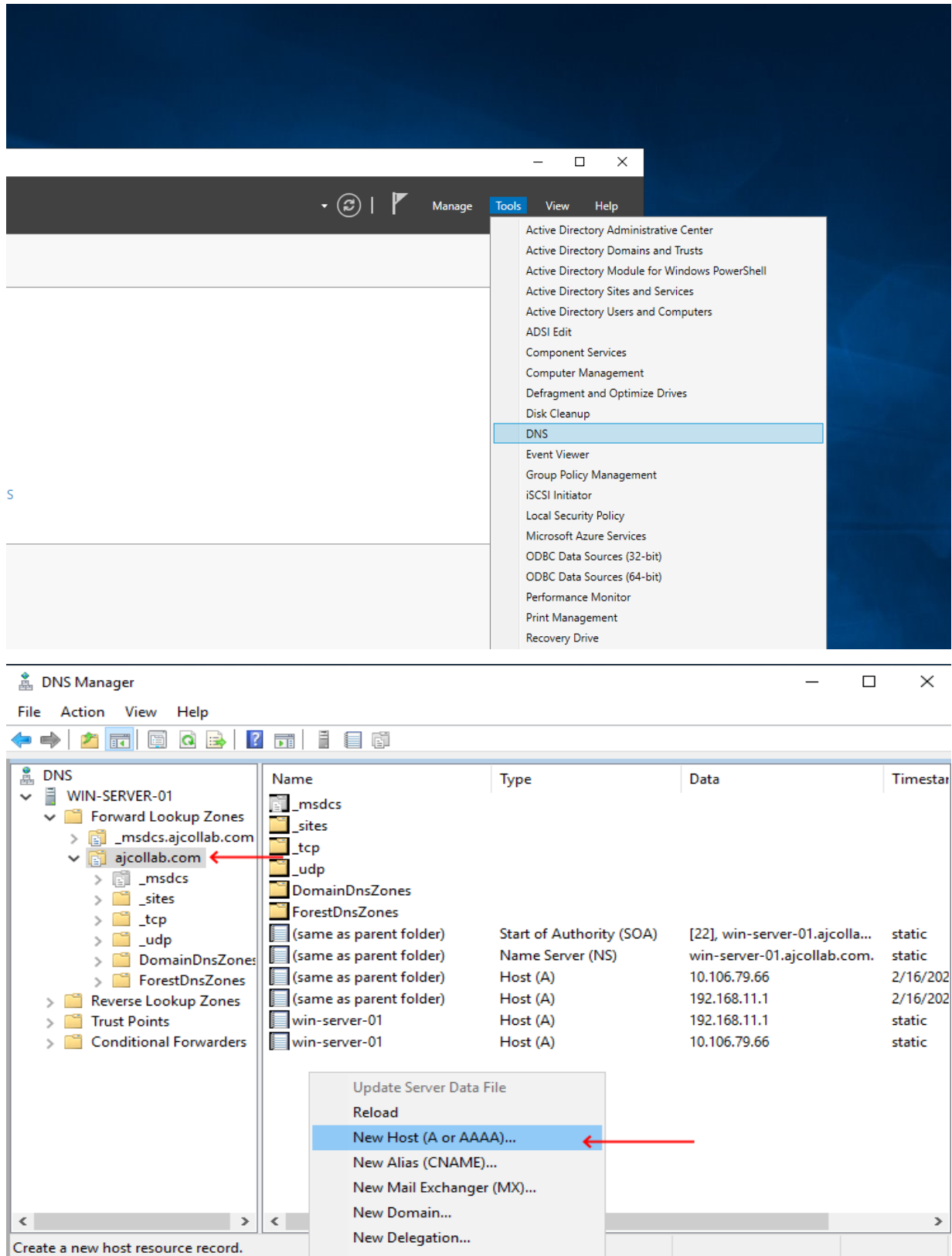
If you use a zero in the network ID, it will appear in the zone name. For example, network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa.

☐ Reverse lookup zone name:

< Back Next > Cancel

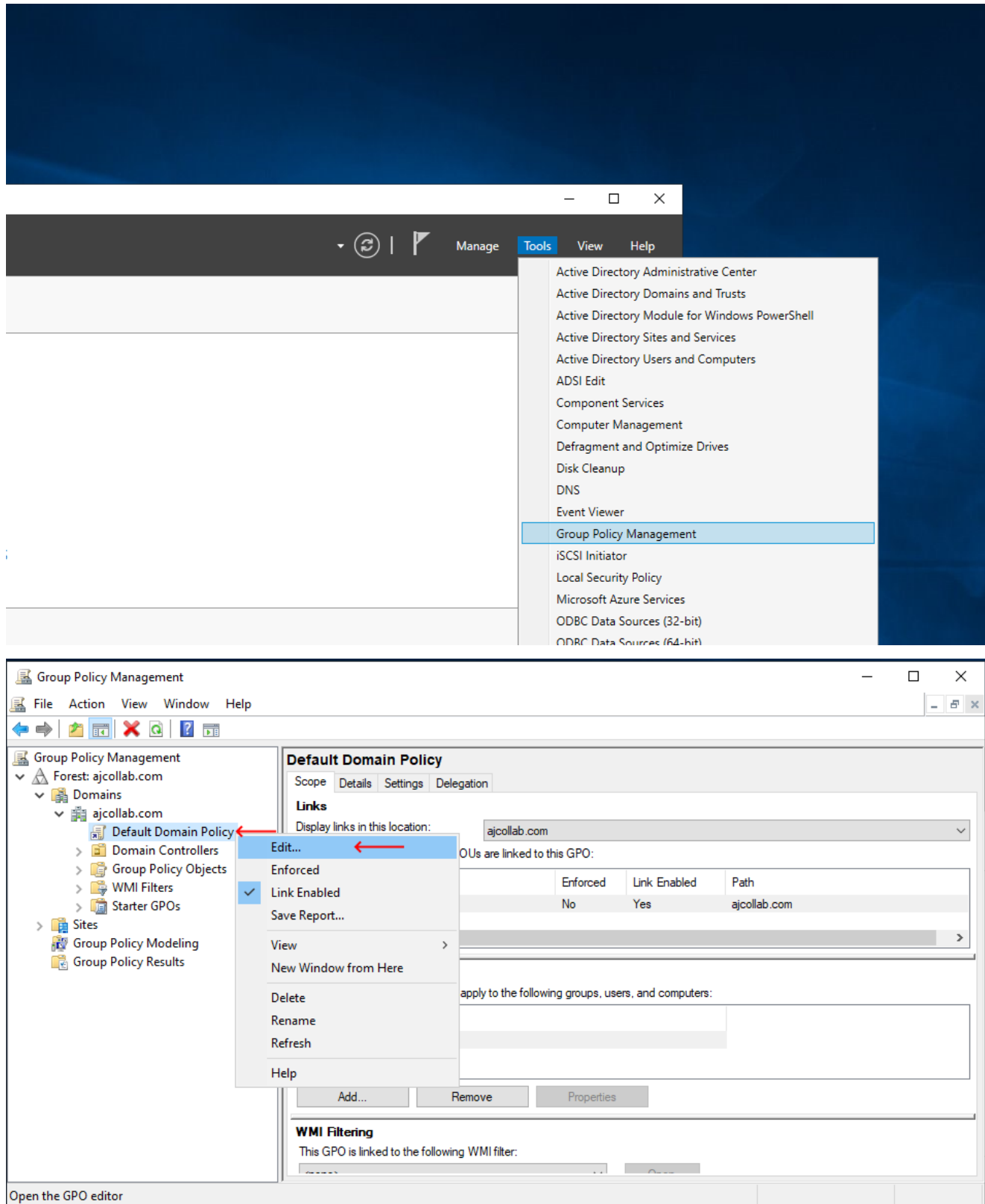
[Lab] Add UC Servers DNS Entries

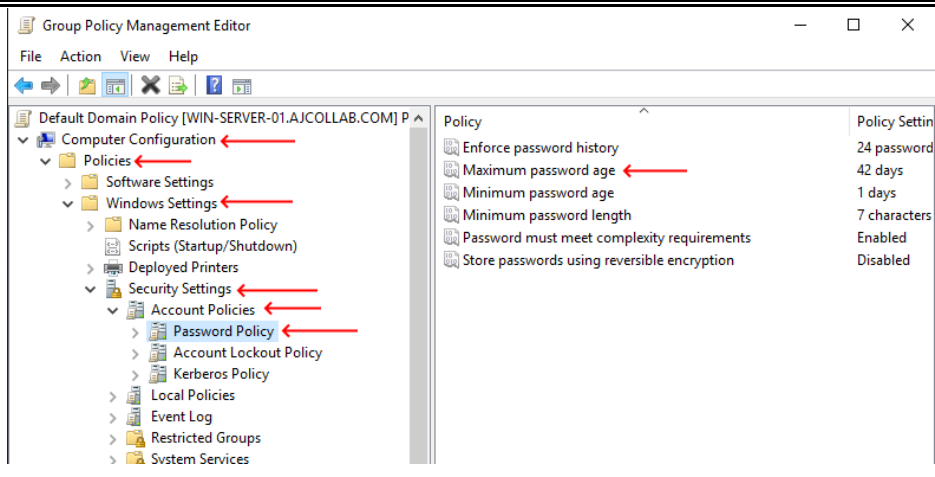
- Before installing CUCM or any other UC Server, we need to make sure that we have proper DNS records for the server that we are going to install
- In this Lab we will add CUCM-PUB server's IP Address as a DNS A Record



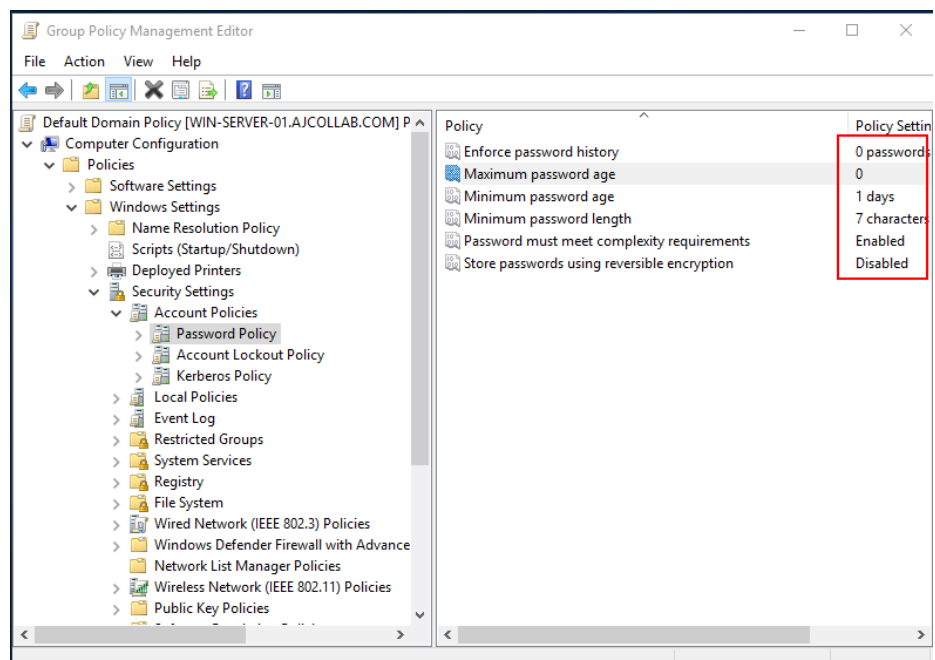
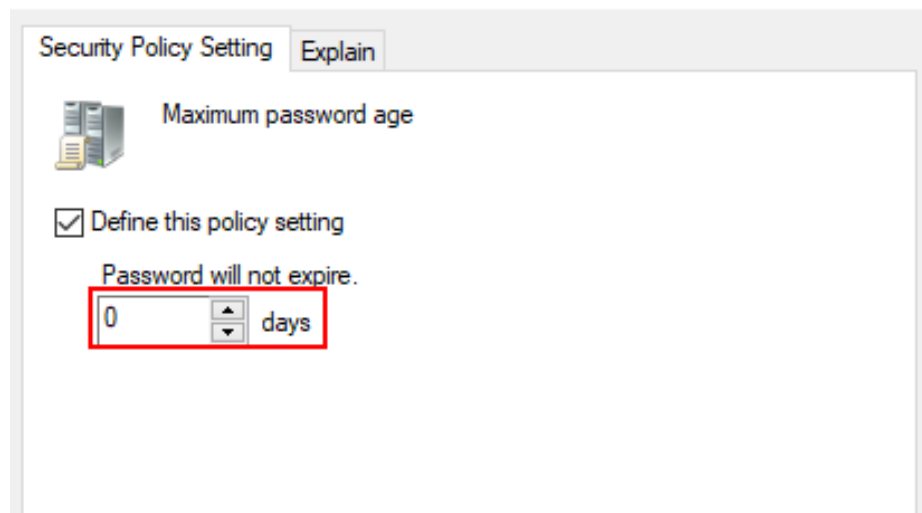
[Lab] Disable Windows Password Auto Expiry Group Policy

- By default, there is a password policy in-place for every Windows Server. Our password will be expired after some days
- Let us disable that for the lab environment





Maximum password age Properties



- You can customize other password policies here
- E.g. Password Complexity

[Lab] Deploying CSR 1000v as NTP Server

- While setting up any UC lab, NTP is an important component, it maintains accurate time across all servers
- NTP can be configured on any Cisco Routers, Linux. Windows based NTPs are not supported for UC infrastructure
- I have used Cisco CSR 1000v as my NTP Server, it is an IOS XE Virtual Router. I will be using the same router as CUBE in future lectures
- Download CSR 1000v from Cisco Software Portal

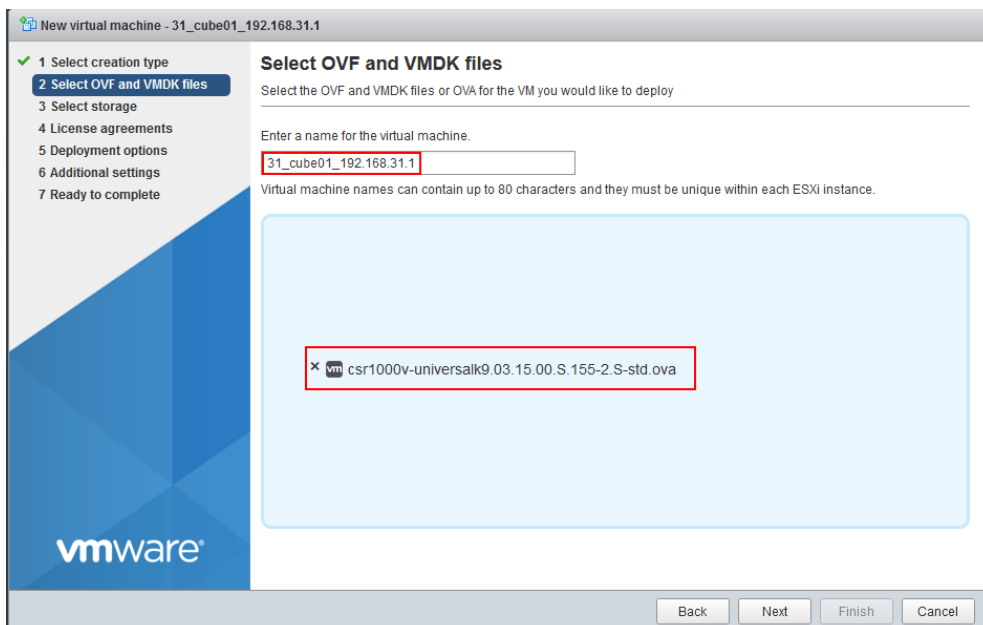
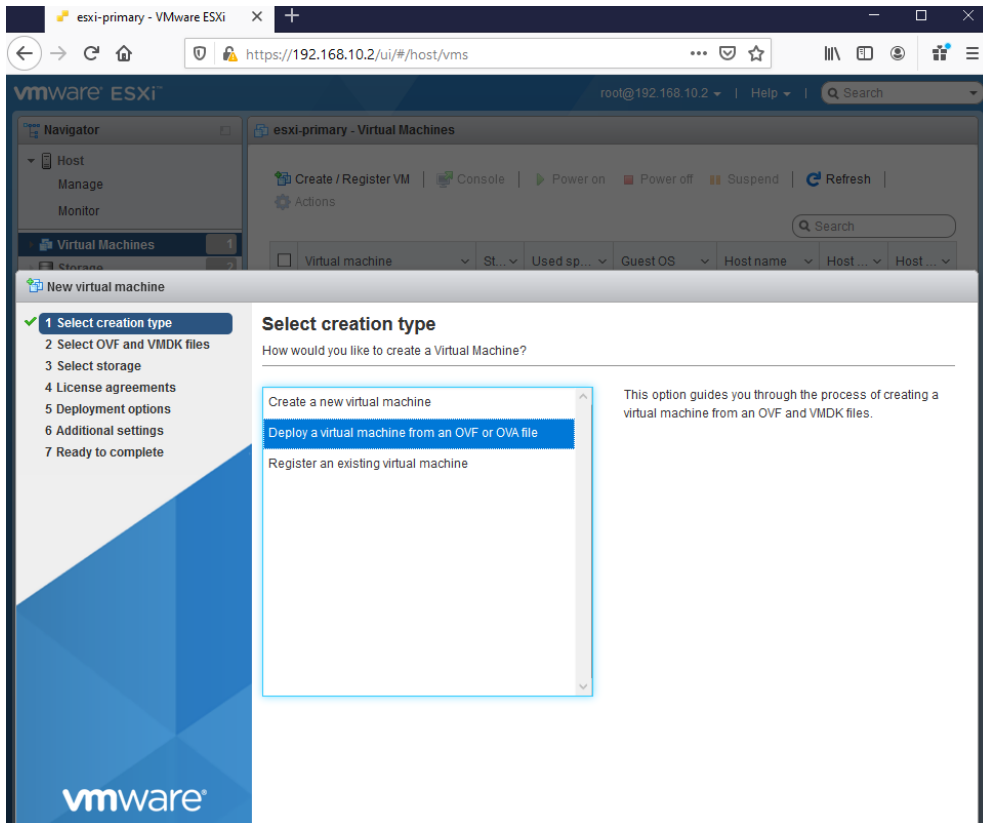
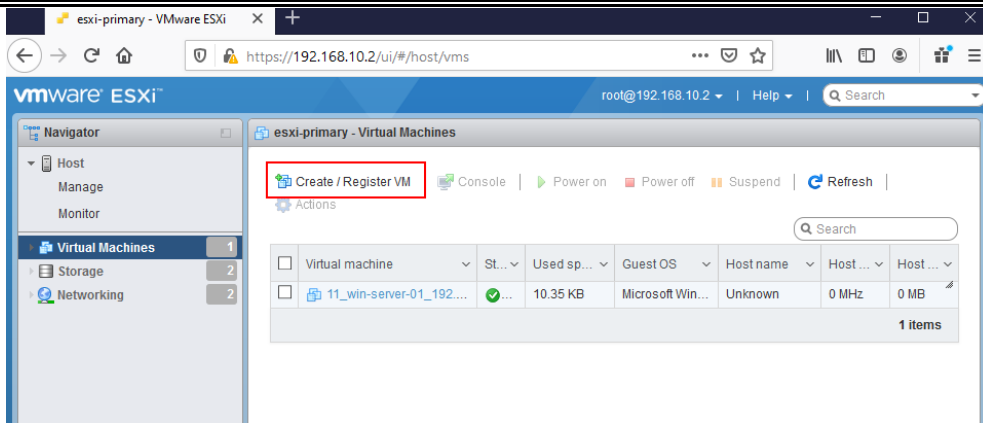
The screenshot shows the Cisco Software Download page for the Cloud Services Router 1000V Series, Release 3.15.0S(ED). The page includes a search bar, navigation links, and a list of software files for download. The OVA file is highlighted with a red box.

Cloud Services Router 1000V

Release 3.15.0S **ED**

Related Links and Documentation
[Release Notes for 3.15.0S](#)

File Information	Release Date	Size
Cisco CSR 1000V Series ADVANCED ENTERPRISE SERVICES - BIN csr1000v-universalk9.03.15.00.S.155-2.S-std.SPA.bin	15-Jan-2017	334.74 MB
Cisco CSR 1000V Series Advanced Enterprise Services - ISO csr1000v-universalk9.03.15.00.S.155-2.S-std.iso	15-Jan-2017	335.19 MB
Cisco CSR 1000V Series ADVANCED ENTERPRISE SERVICES - OVA csr1000v-universalk9.03.15.00.S.155-2.S-std.ova	15-Jan-2017	335.47 MB
Cisco CSR 1000V Series Advanced Enterprise Services - QCOW2 csr1000v-universalk9.03.15.00.S.155-2.S-std.qcow2	15-Jan-2017	1273.56 MB



New virtual machine - 31_cube01_192.168.31.1

- ✓ 1 Select creation type
- ✓ 2 Select OVF and VMDK files
- ✓ 3 Select storage
- 4 License agreements
- 5 Deployment options
- 6 Additional settings
- 7 Ready to complete

Select storage

Select the datastore in which to store the configuration and disk files.

The following datastores are accessible from the destination resource that you selected. Select the destination datastore for the virtual machine configuration files and all of the virtual disks.

Name	Capacity	Free	Type	Thin pro...	Access
datastore1	1.08 TB	1.08 TB	VMFSS	Supported	Single
datastore2	1.09 TB	1.09 TB	VMFSS	Supported	Single

2 items

Back Next Finish Cancel

New virtual machine - 31_cube01_192.168.31.1

- ✓ 1 Select creation type
- ✓ 2 Select OVF and VMDK files
- ✓ 3 Select storage
- ✓ 4 Deployment options
- 5 Ready to complete

Deployment options

Select deployment options

Disk provisioning ☒ Thin ☐ Thick

Back Next Finish Cancel

New virtual machine - 31_cube01_192.168.31.1

- ✓ 1 Select creation type
- ✓ 2 Select OVF and VMDK files
- ✓ 3 Select storage
- ✓ 4 Deployment options
- 5 Ready to complete

Deployment options

Select deployment options

Network mappings	GigabitEthernet1	VM Network
	GigabitEthernet2	VM Network
	GigabitEthernet3	VM Network
Deployment type	Small Minimal hardware profile - 1 vCPU, 4 GB RAM	
Disk provisioning	<input checked="" type="radio"/> Thin <input type="radio"/> Thick	
Power on automatically	<input checked="" type="checkbox"/>	

Back Next Finish Cancel


New virtual machine - 31_cube01_192.168.31.1

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 Deployment options
- 5 Ready to complete

Ready to complete

Review your settings selection before finishing the wizard

Product	Cisco CSR 1000V Cloud Services Router
VM Name	31_cube01_192.168.31.1
Files	csr1000v_hddisk.vmdk csr1000v-universalk9.03.15.00.S.155-2.S-std.iso
Datastore	datastore1
Provisioning type	Thin
Network mappings	GigabitEthernet1: VM Network, GigabitEthernet2: VM Network, GigabitEthernet3: VM Network
Guest OS Name	Cisco IOS-XE Software
Profile	Minimal hardware profile - 1 vCPU, 4 GB RAM

 Do not refresh your browser while this VM is being deployed.

Back Next Finish Cancel

esxi-primary - VMware ESXi

https://192.168.10.2/ui/#/host/vms/2

vmware ESXi root@192.168.10.2 | Help | Search

Navigator

- Host
 - Manage
 - Monitor
- Virtual Machines 2
 - 31_cube01_192.168.31.1
 - More VMs...
- Storage 2
- Networking 1

31_cube01_192.168.31.1

```

31_cube01_192.168.31.1
%IOSXEBOOT-4-WAIT_FOR_DEVICES: (rp/0): Partition "/dev/bootflash1" missing at 20
210306182132 Continuing to initialization
%IOSXEBOOT-4-PART_INVALID: (rp/0): /dev/bootflash has an invalid partition table
that must be repaired.9660, using whole disk
%IOSXEBOOT-4-PART_REPAIR: (rp/0): The system will repair /dev/bootflash now.u/r
%IOSXEBOOT-4-PART_REPAIR: (rp/0): This may cause loss of data and configuration
on /dev/bootflash.15.00.S.155-2.S-std.iso
package header rev 1 structure detected
Calculating SHA-1 hash...done
SHA-1 hash:
  calculated d2da1aa5:24bc83ed:593fa9cf:4708dba0:6ab3b22d
  expected d2da1aa5:24bc83ed:593fa9cf:4708dba0:6ab3b22d
Package type:0x7530, flags:0x0
[Linux-bzImage, setup=0x2e00, size=0x14eb93e0]
[isord @ 0x6c77d000, 0x13872000 bytes]

```

Notes Edit notes

31_cube01_192.168.31.1

```

use. Delivery of Cisco cryptographic products does not imply
third-party authority to import, export, distribute or use encryption.
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

cisco CSR1000V (UXE) processor (revision UXE) with 2067410K/6147K bytes of memor
y.
Processor board ID 9HTK9Z1YUU0
3 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
3988304K bytes of physical memory.
7774207K bytes of virtual hard disk at bootflash:.

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

```



```
31_cube01_192.168.31.1
cube01(config)#line vt
cube01(config)#line vty 0 4
cube01(config-line)#login lo
cube01(config-line)#login local
cube01(config-line)#trans
cube01(config-line)#transport in
cube01(config-line)#transport input all
cube01(config-line)#
cube01(config-line)#
cube01(config-line)#
cube01(config-line)#exi
cube01(config)#ntp sou
cube01(config)#ntp source gi
cube01(config)#ntp source gigabitEthernet 1
cube01(config)#ntp master 1
cube01(config)#ntp ser
cube01(config)#ntp server 192.168.31.1 sou
cube01(config)#ntp server 192.168.31.1 source gi
cube01(config)#ntp server 192.168.31.1 source gigabitEthernet 1
cube01(config)#
cube01#wr
Building configuration...

*Mar 6 19:08:49.505: %SYS-5-CONFIG_I: Configured from console by console[OK]
cube01#_
```

- Below configurations will enable SSH and NTP on the virtual router

```
!
hostname cube01
enable secret Ajcollab@1
username admin password 7 Ajcollab@1
!
interface GigabitEthernet1
ip address 192.168.31.1 255.255.224.0
no shut
!
ip domain name ajcollab.com
ip name-server 192.168.11.1
ip name-server 192.168.0.1
!
crypto key generate rsa
ip ssh version 2
!
line vty 0 4
login local
transport input all
!
ntp server time.google.com source gigabitEthernet 1
ntp master 2
ntp source gigabitEthernet 1
!
clock timezone IST +5 30
!
```

```
22_cucm-sub01_192.168.21.2 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
31_cube01_192.168.31.1 x 21_cucm-pub_192.168.21.1 24_cuc-pub_192.168.21.4 sme-pub_192.168.22.1 sme-sub_192.168.22.2

cube01#
cube01#show ntp associations

address      ref clock    st  when  poll reach  delay  offset  disp
~127.127.1.1  .LOCL.       1   14    16   377  0.000  0.000  1.204
*~216.239.35.12 .GOOG.       1   63    64   175 115.99 33.669 5.581
* sys.peer, # selected, + candidate, - outlyer, x falseticker, ~ configured
cube01#
cube01#
cube01#show ntp status
Clock is synchronized, stratum 2, reference is 216.239.35.12
nominal freq is 250.0000 Hz, actual freq is 249.9998 Hz, precision is 2**10
ntp uptime is 75500 (1/100 of seconds), resolution is 4016
reference time is E425217E.11EB8550 (14:27:34.070 IST Sat Apr 17 2021)
clock offset is 33.6691 msec, root delay is 115.99 msec
root dispersion is 52.78 msec, peer dispersion is 5.58 msec
loopfilter state is 'CTRL' (Normal Controlled Loop), drift is 0.000000696 s/s
system poll interval is 64, last update was 66 sec ago.
cube01#
cube01#
cube01#
```

- If you are going with ISO based CSR 1000v VM, below are the virtual hardware specification
 - Compatibility: ESXi 5.5 Virtual Machine
 - Guest OS Family: Linux
 - Guest OS Version: Other 2.6 Linux (64 bit)
 - 1 vCPU
 - 4 GB RAM (2GB RAM will also work)
 - 8GB HDD
 - 3 NICs

How to Build Your Own Home UC Lab in vmware Workstation

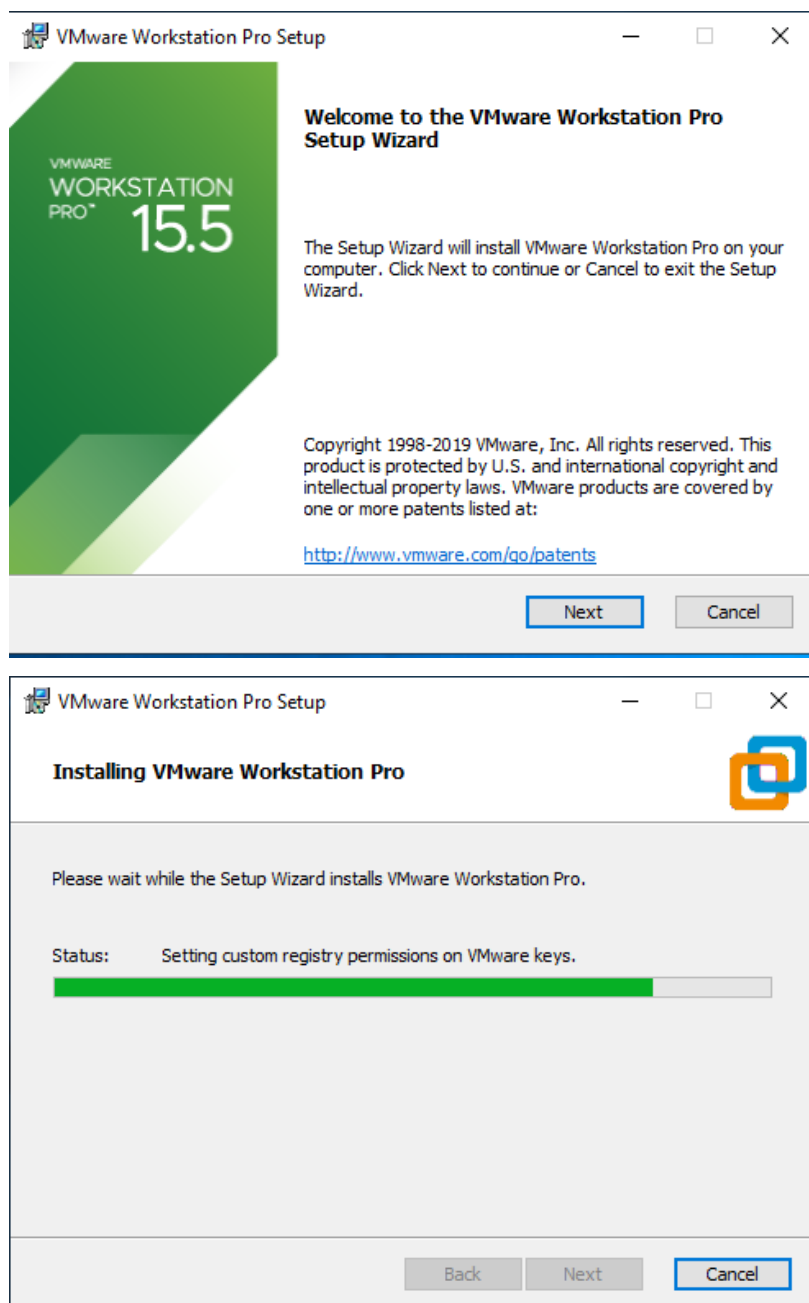
- The complete UC lab you can set up on your laptop / workstation if you have enough RAM
- Even without large amount of RAM, you can still setup a miniature lab for practice
- You need to have vmware Workstation to build the lab, download and install vmware workstation

Step 1: Enable virtualization Intel VT-X from BIOS

- This step differs for each laptop / desktop manufacture
- You should find a way to enable Intel VT-X from BIOS. Google to find the way to enable it based on you manufacture

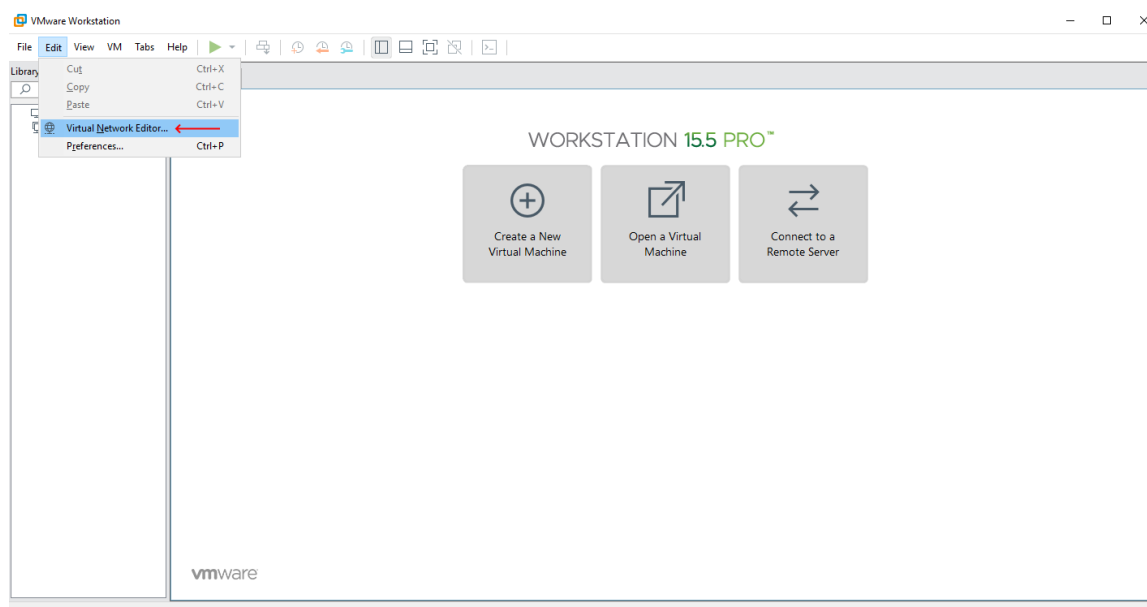
Step 2: Install vmware Workstation

- Installation is pretty straight forward, just Next, Next, Finish

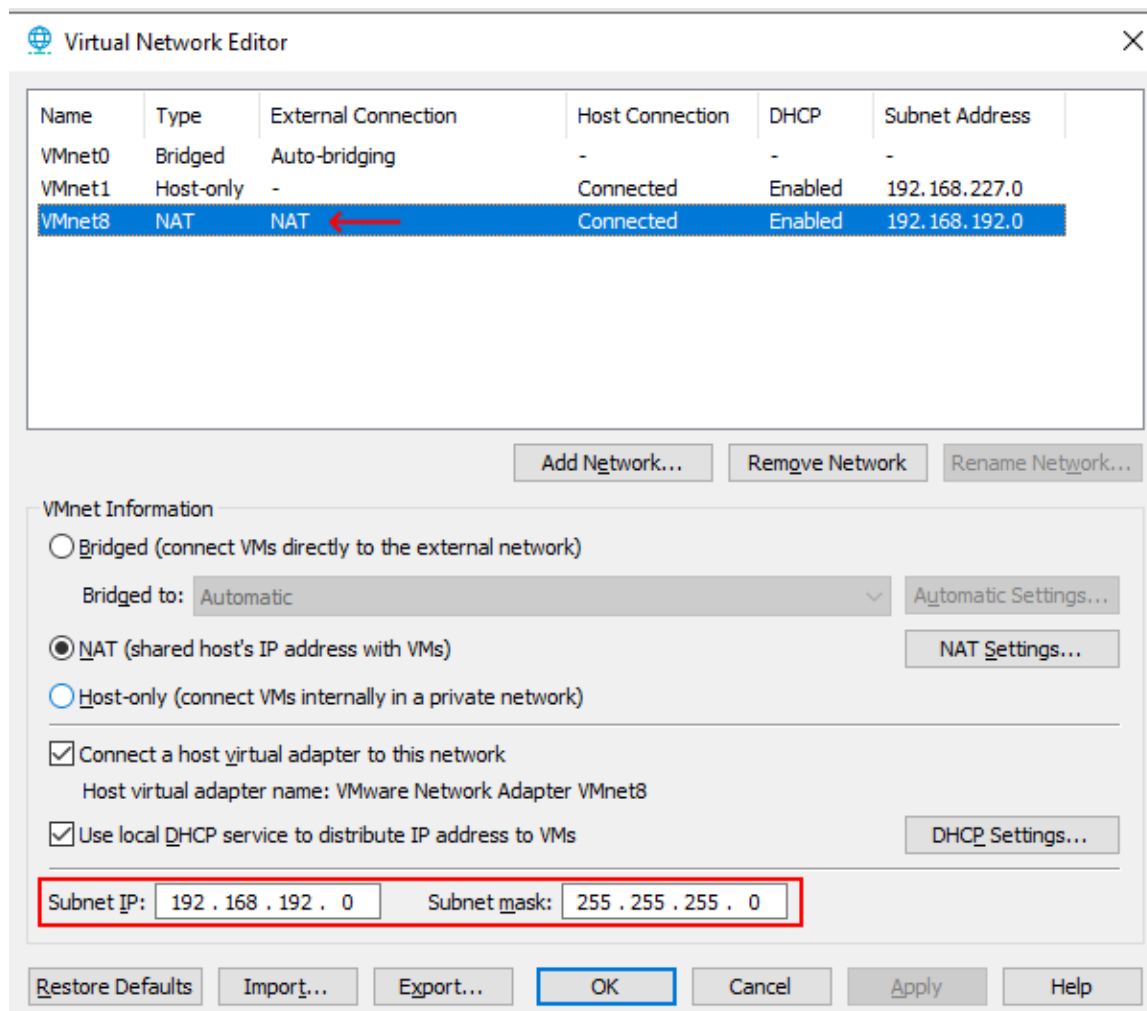


Step 3: Identify vmware NAT Network Settings

- Once you complete the installation, open vmware Workstation
- Go to Edit >> Virtual Network Editor



- Select the VMnet8 (NAT) and check the IP Subnet

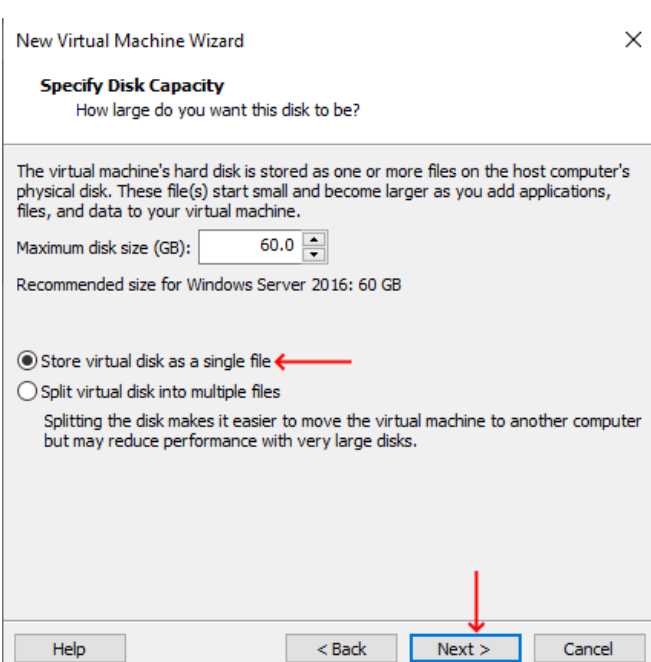
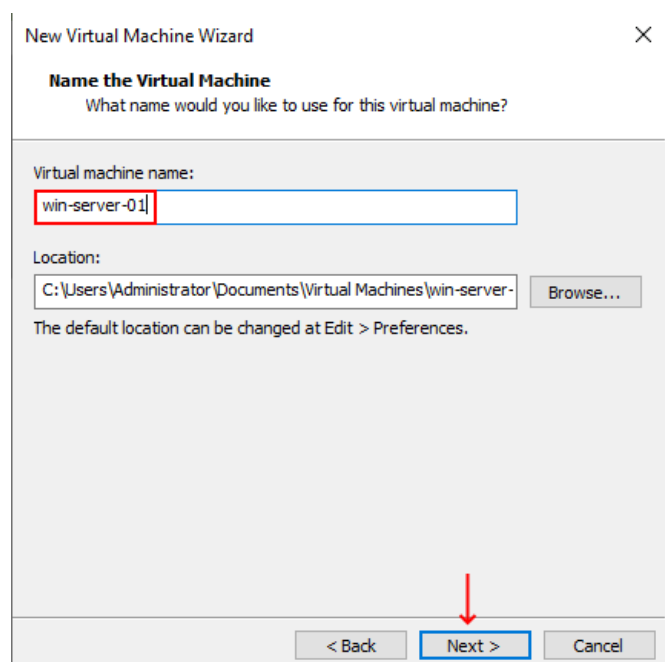
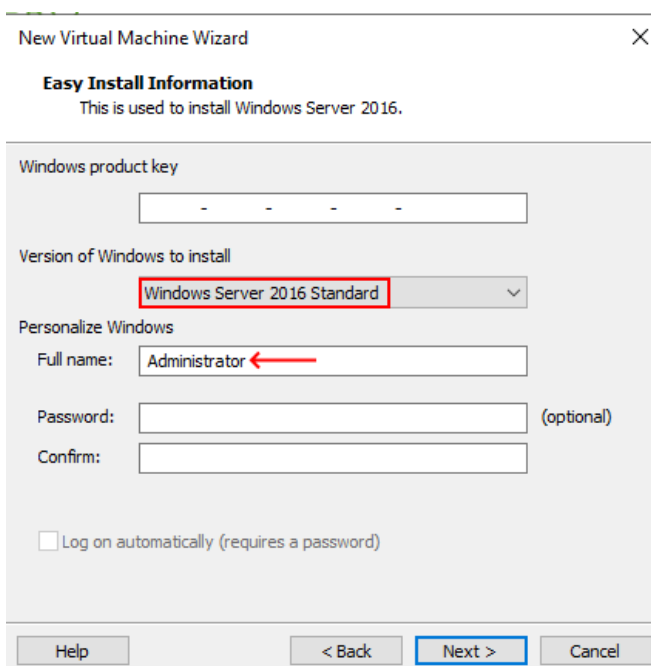
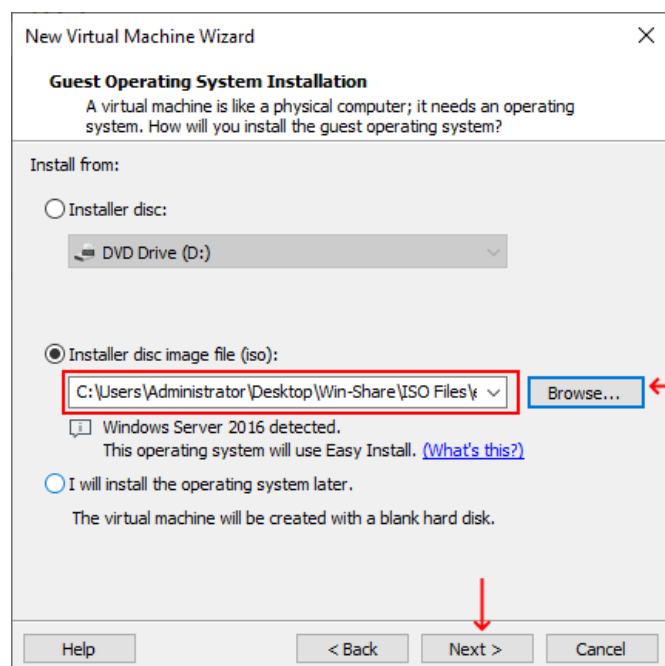
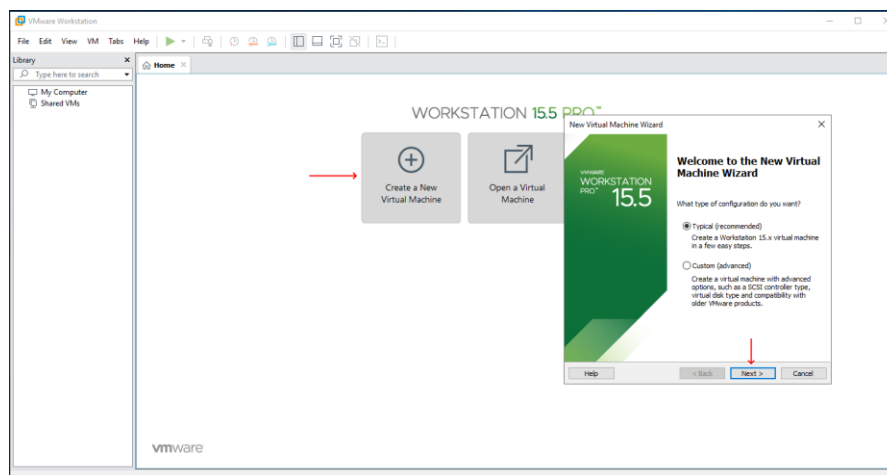


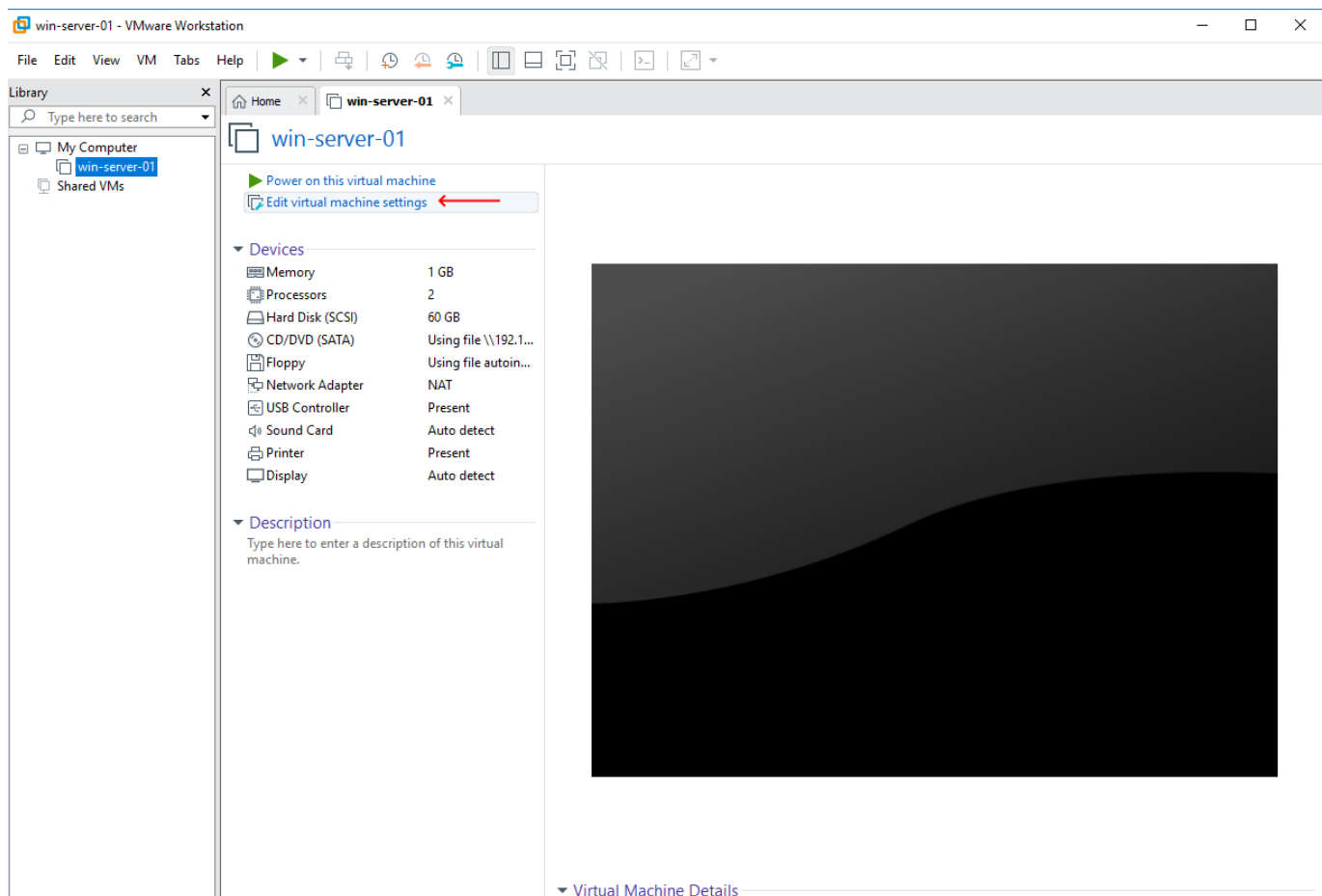
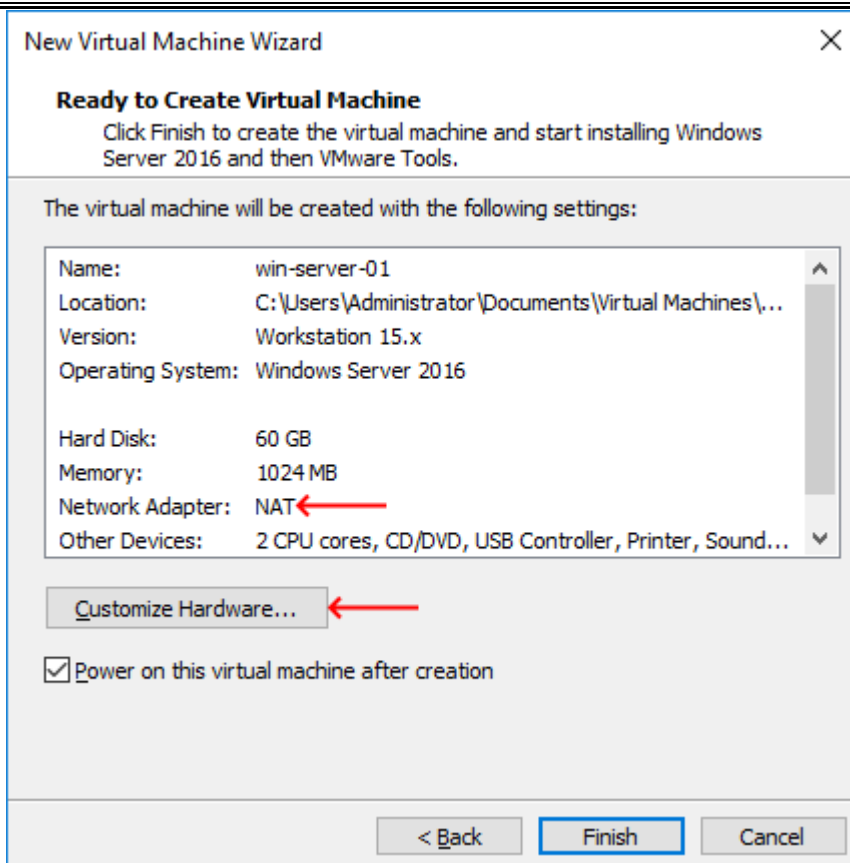
-
- Here my NAT Network is 192.168.192.0 and Subnet Mask is 255.255.255.0, hence below IP configurations can be used for UC Servers

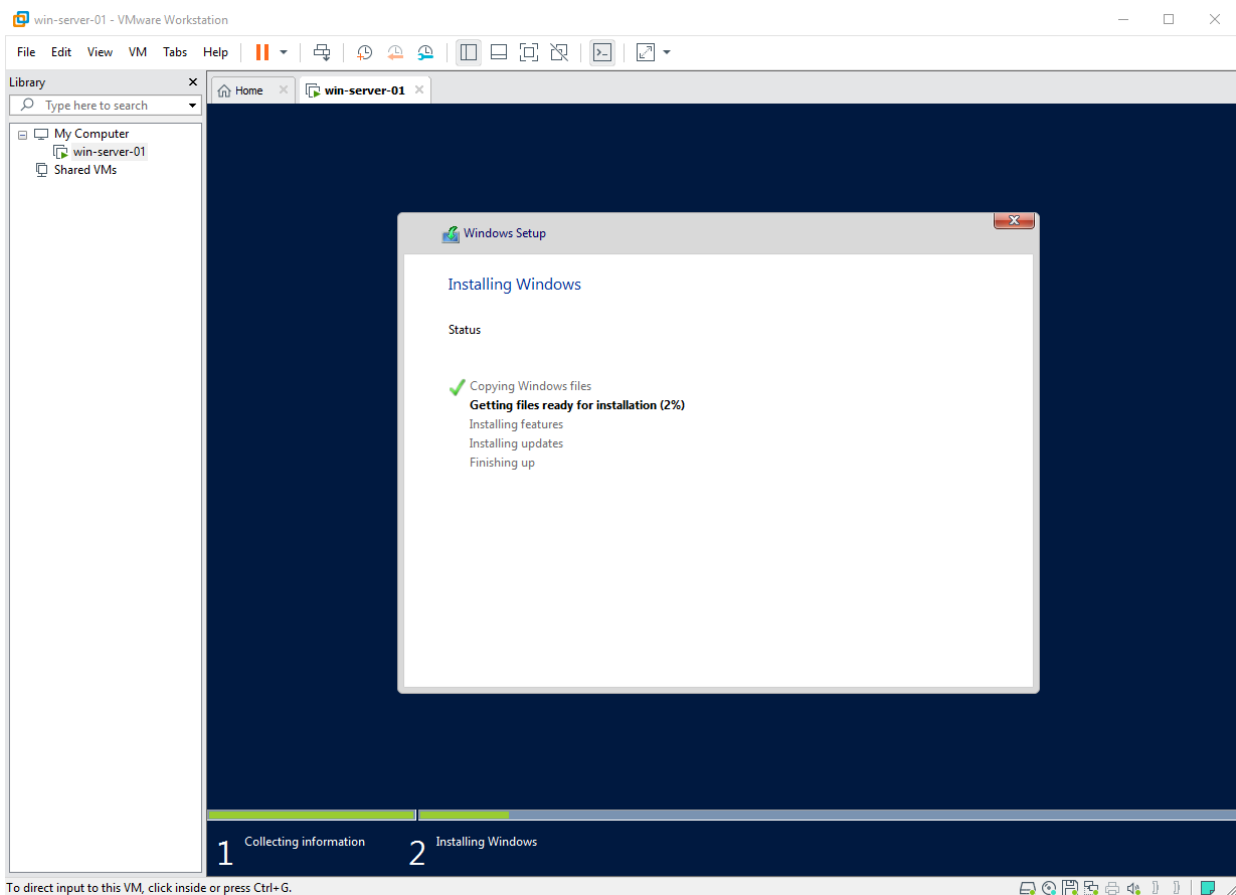
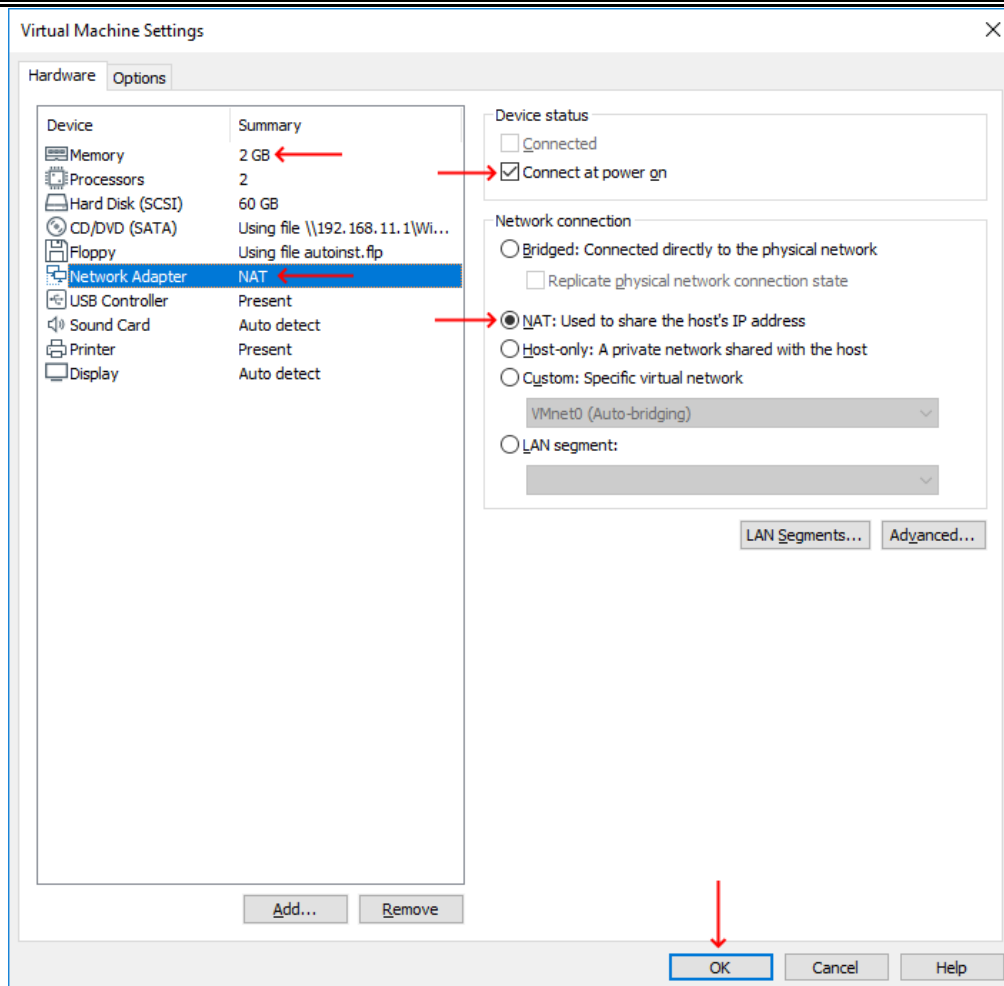
Network	192.168.192.X / 24
Subnet Mask	255.255.255.0
Starting IP Address	192.168.192.3
Ending IP Address	192.168.192.254
Default Gateway	192.168.192.2
NTP	216.239.35.8 (Google NTP)

- While installing UC Servers, make sure you are connected to Internet since we use Public NTP that is available over internet
- Now you can deploy Windows Server for AD and DNS purpose and then UC Servers can be deployed
- Network Adapter of all VMs must be in NAT
- For CUCM installation, DNS server is optional, you can install without DNS Server as well but for UCCX installation, DNS is mandatory
- Here you don't need local any NTP Server, we have used public NTP

Step 4: Install Windows Server



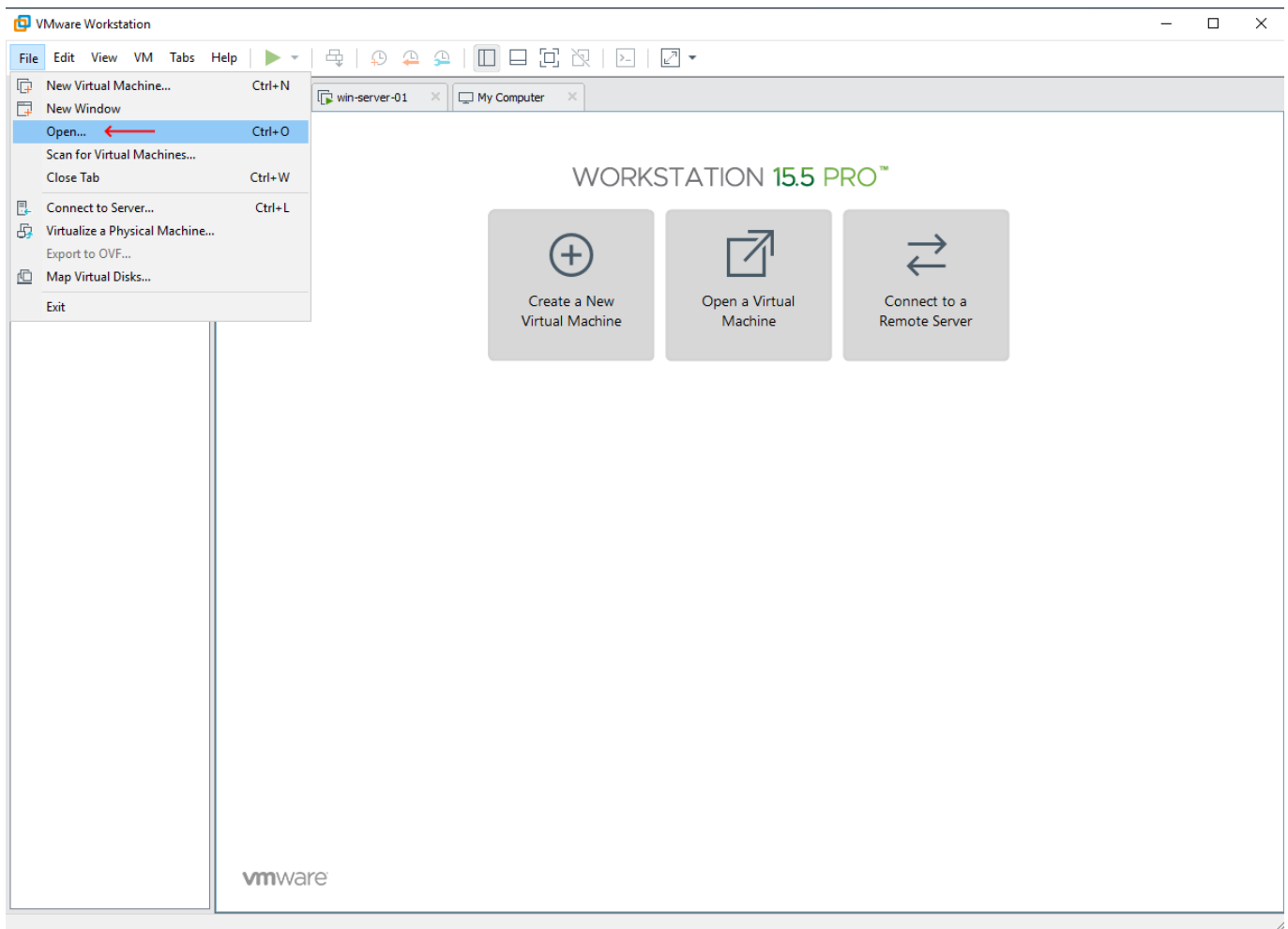


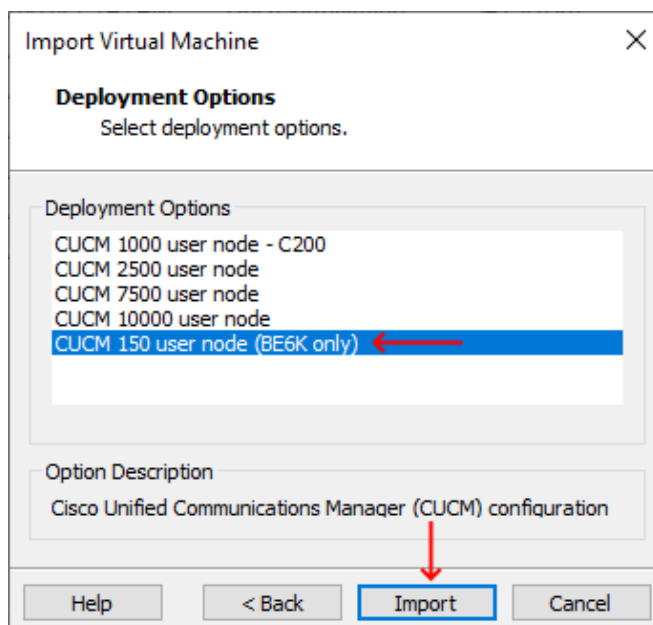
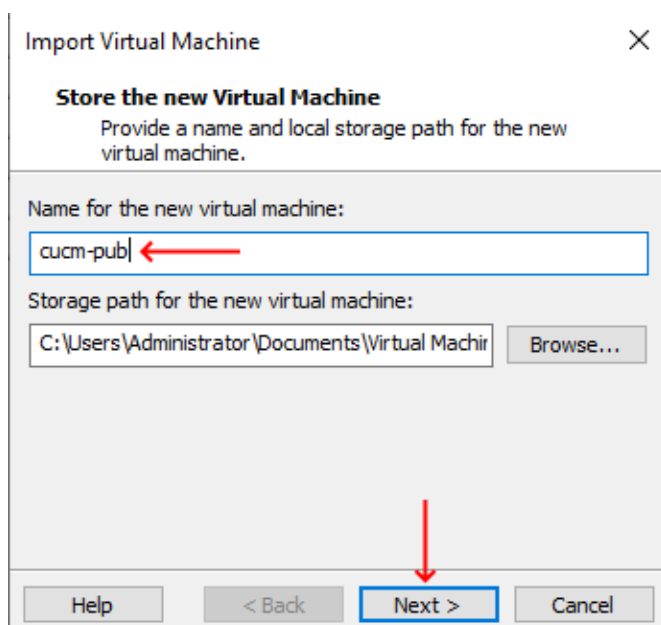
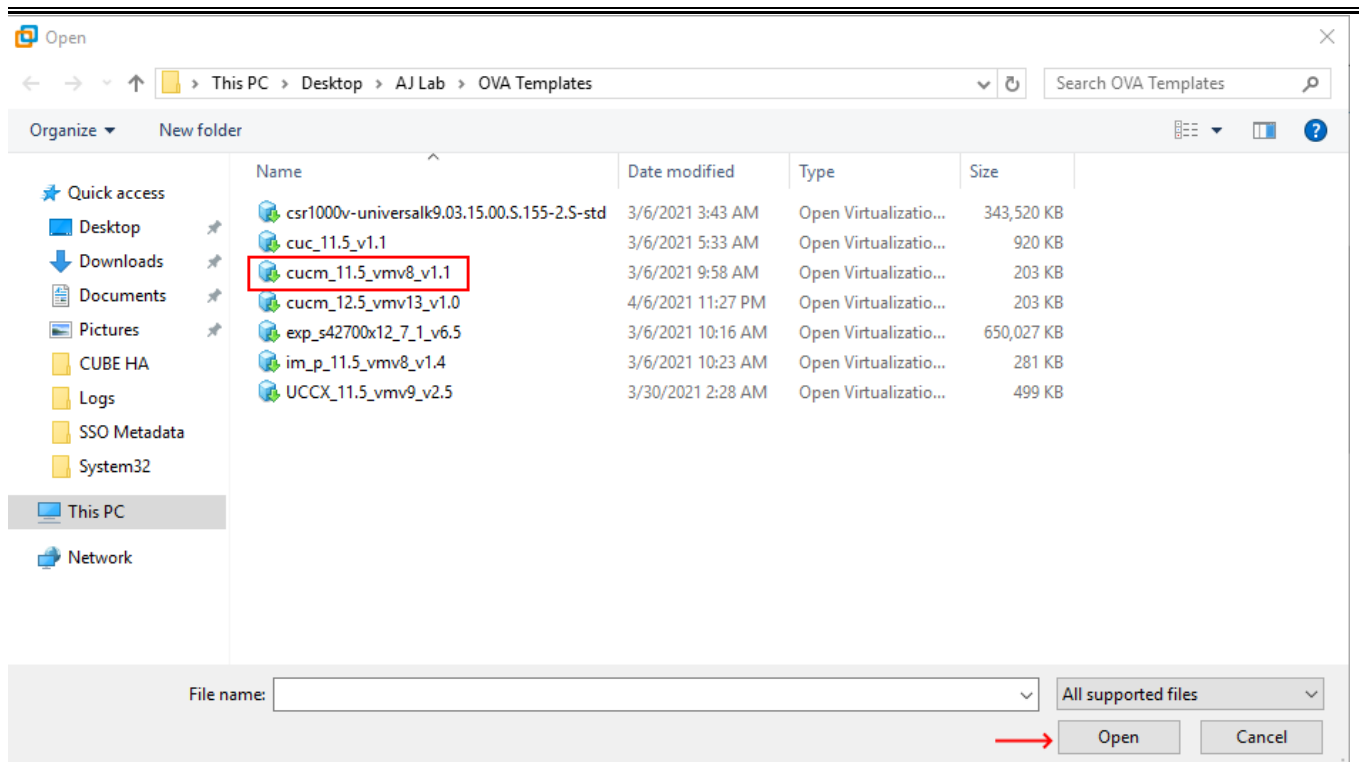


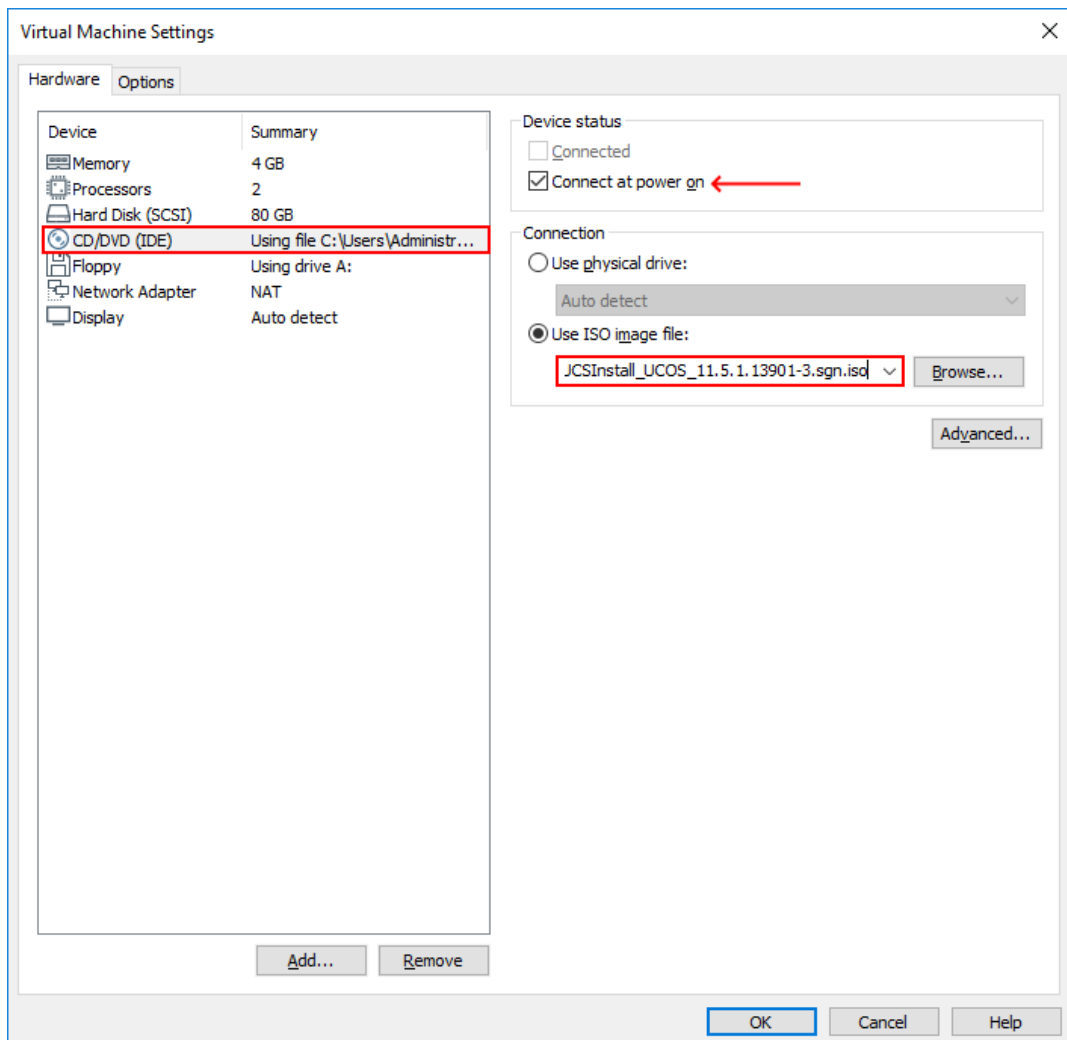
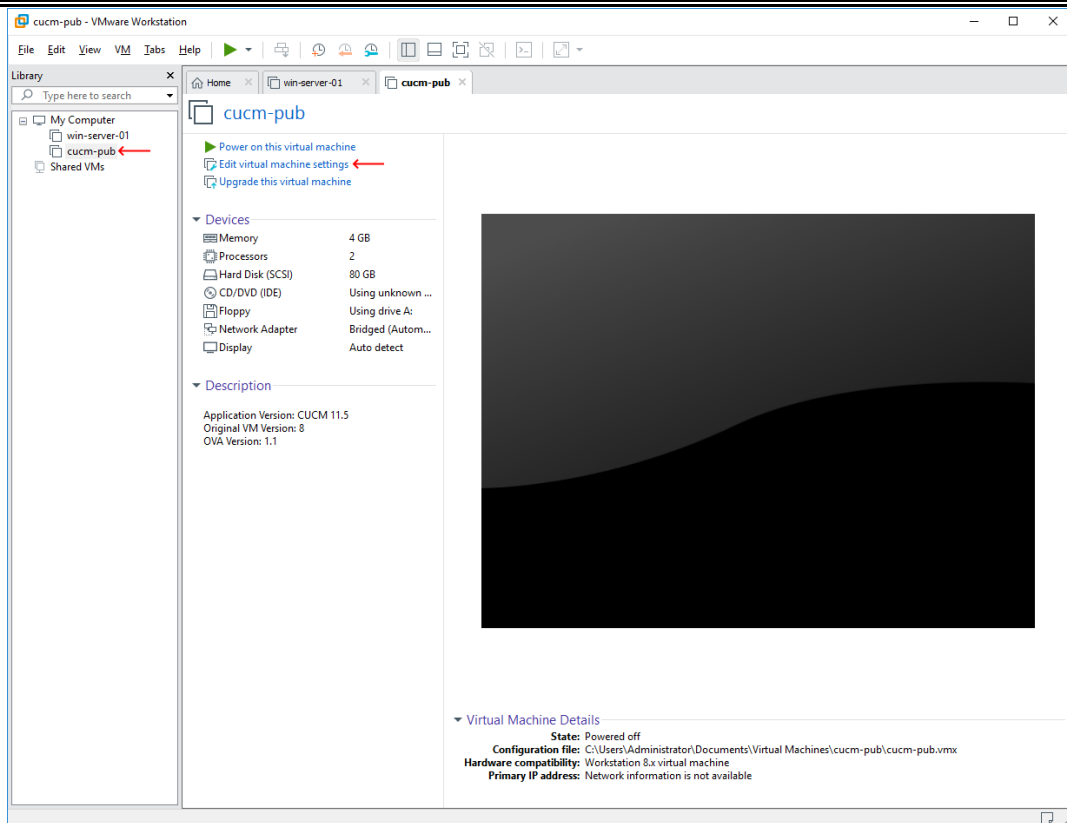
- Once windows installation completed, set a static IP address for it with default gateway 192.168.192.2
- Make sure you are able to access internet from the Windows Machine
- Setup AD and DNS on the windows server and add UC Server DNS A Records before installing CUCM

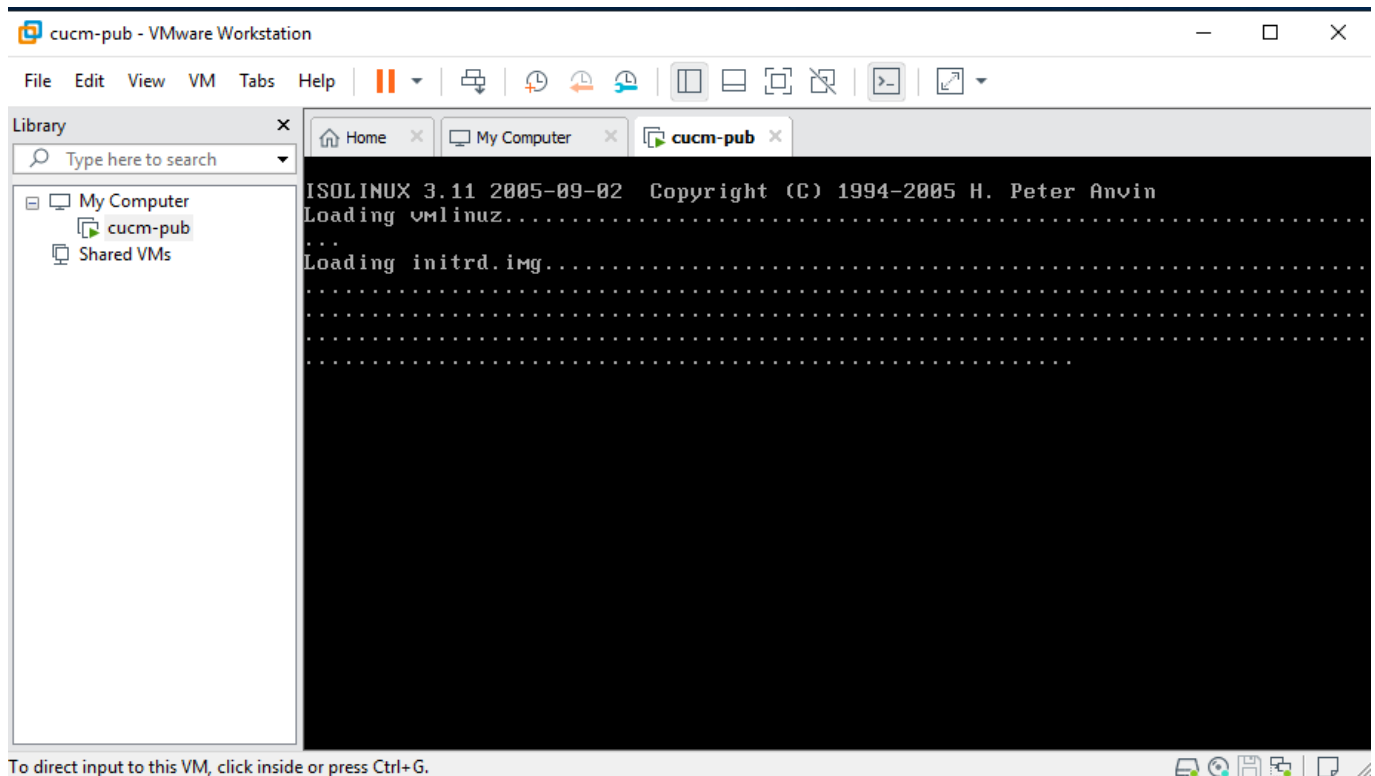
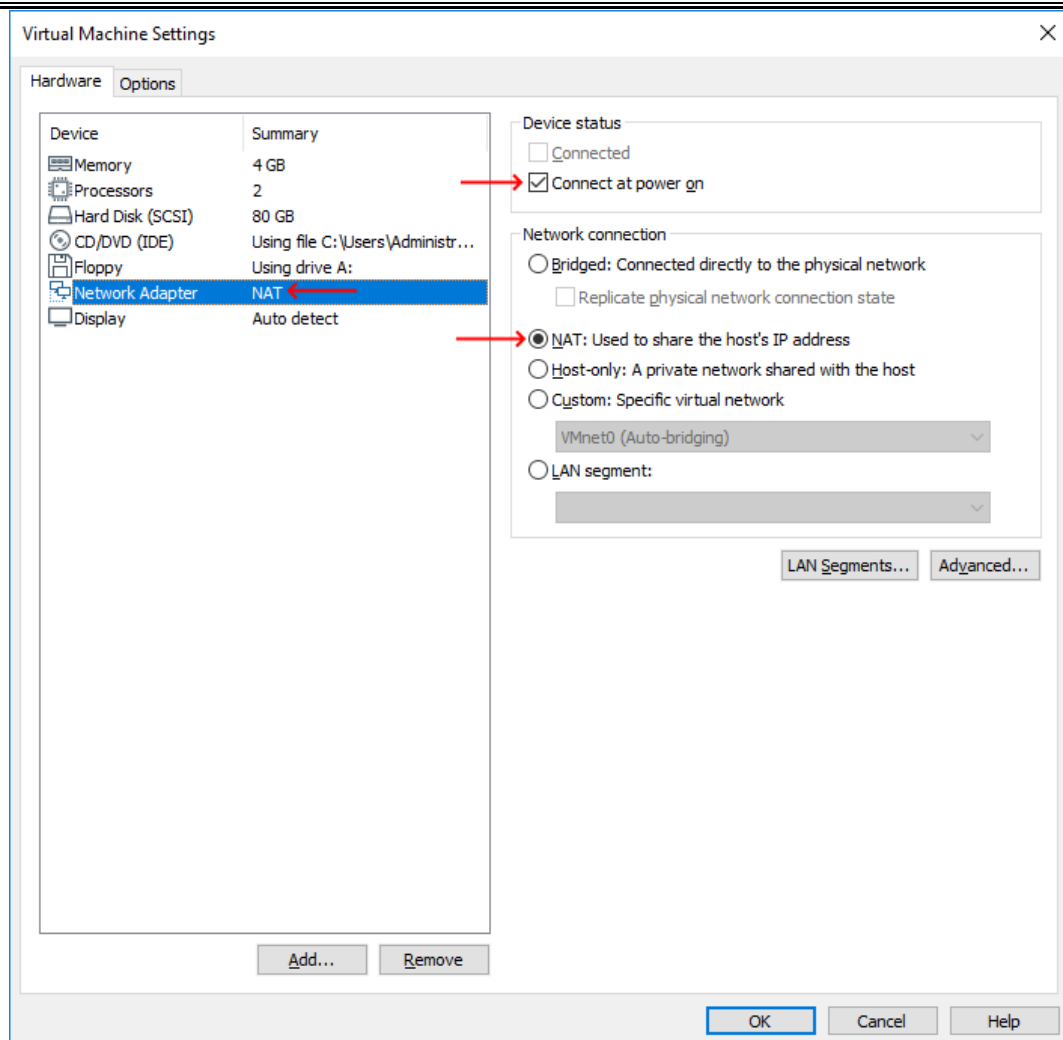
Step 5: Install CUCM

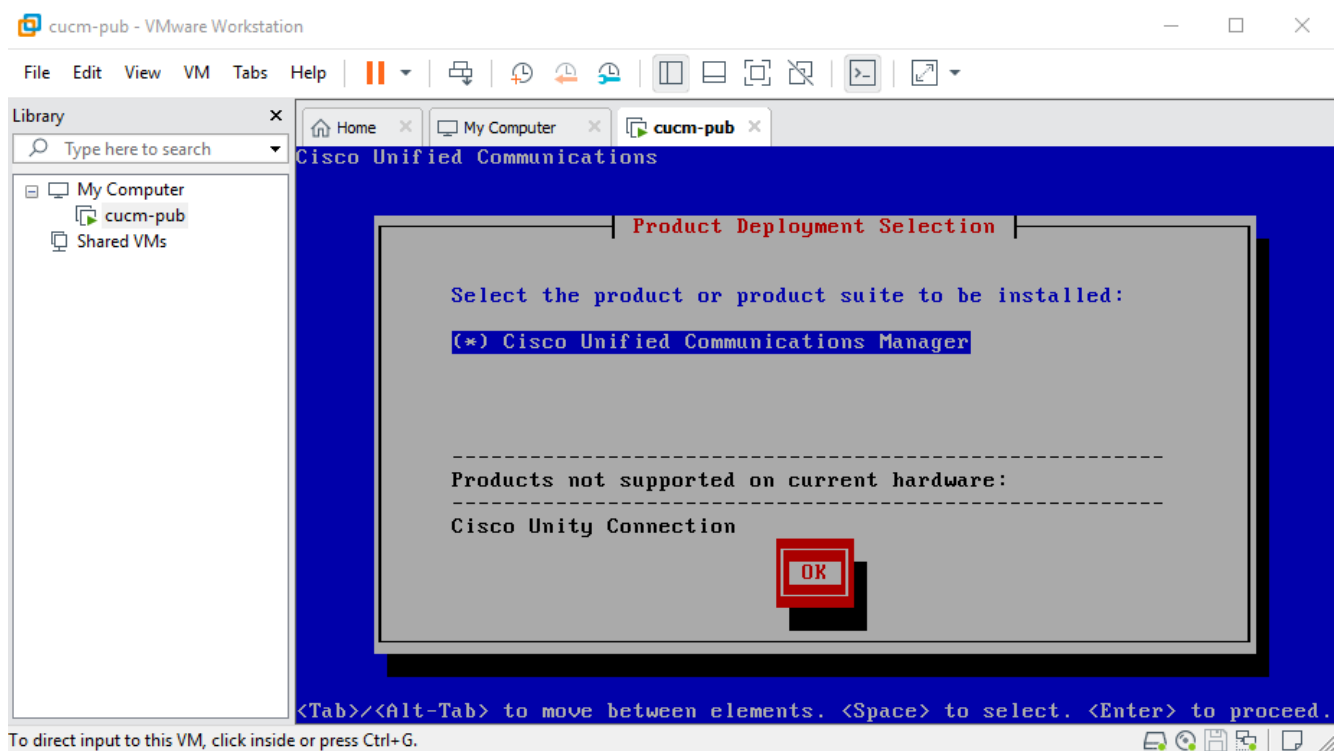
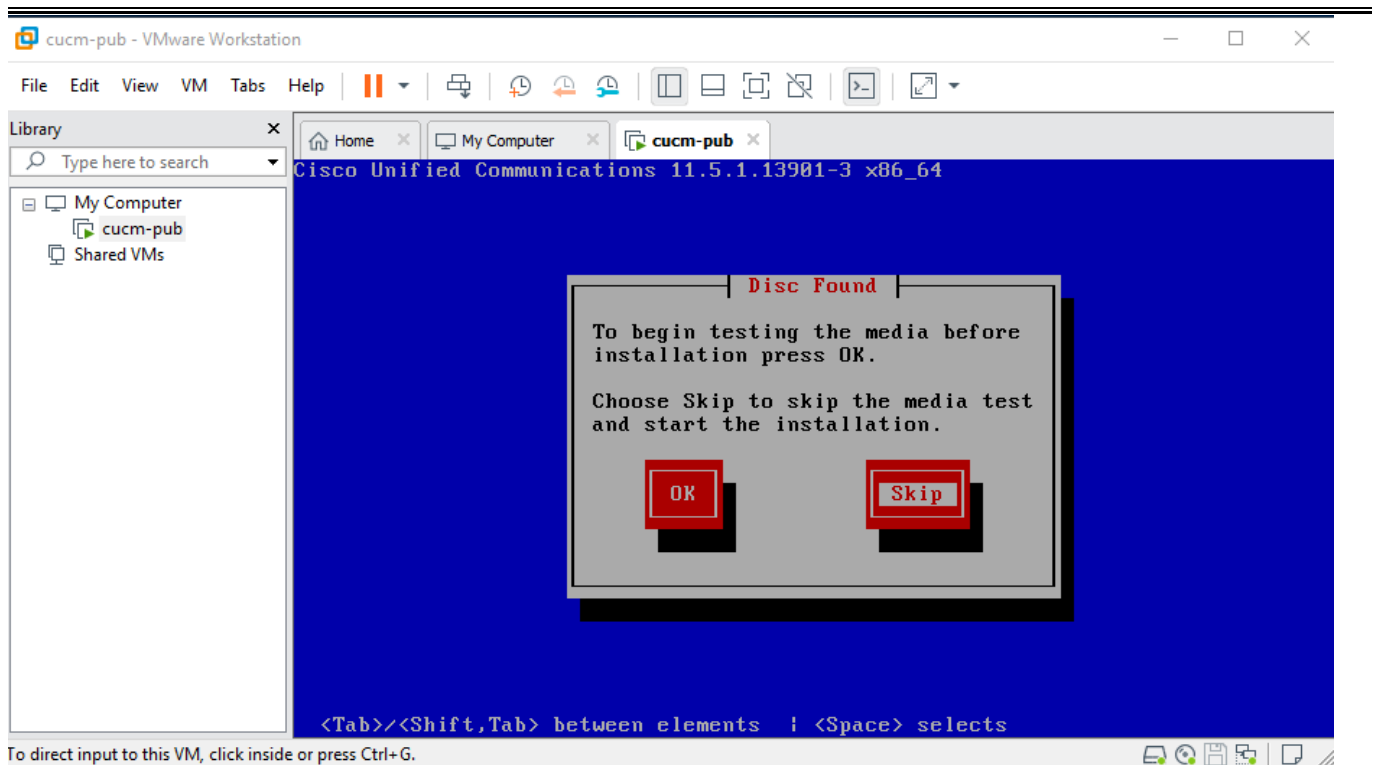
- Download the CUCM OVA
- Open the OVA from vmware Workstation











- You can continue the installation, with below Network Settings

IP Address	192.168.192.X
Subnet Mask	255.255.255.0
Default Gateway	192.168.192.2
NTP	216.239.35.8
DNS Server	Windows Server IP

- It is important to select Network Adapter as NAT

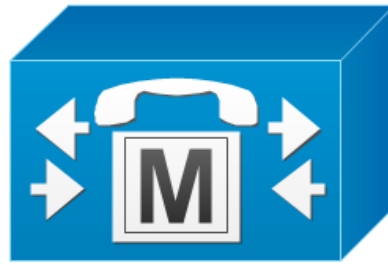
Chapter 1 Module 2 - CUCM

Cisco On-Premise Collaboration Solution

Cisco Unified Communications Manager (CUCM)



Cisco Unified Communications Manager (CUCM)



CallManager

- Cisco Unified Communications Manager (CUCM or CallManager) is an IP-based communications system. It enables VoIP (Voice and Video Over IP Network)
- Acts as a soft switch that switches voice and video traffics
- CUCM is deployed as a cluster and the primary server in the cluster is called Publisher and other servers are known as Subscribers
- We can have multiple subscriber servers in the cluster based on the number of users and features
- CUCM Publisher maintains read-write copy of Database where CUCM Subscriber retains read only copy of Database
- IBM IDS (Informix Dynamic Server) is the database of CUCM
- IP Phones and Telepresence endpoints register with CUCM using SIP protocol (SCCP protocol was used in the older IP Phones)
- External PSTN integration is possible via PRIs on Voice Gateways (Voice Capable IOS Routers) and SIP Trunking on CUBE (Cisco Unified Border Element)
- Voice Gateway uses SIP, MGCP or H.323 to communicate with CUCM whereas CUBE uses only SIP

CUCM Installation - Publisher

- CUCM OS is a Cisco customized RedHat or CentOS Linux and installed as a Virtual Machine in vmware environment
- We need to download CUCM OVA (preconfigured virtual hardware file without OS installed) and then install the CUCM OS on top of it in a virtualized environment
- We must have a proper network connectivity and a working NTP server to complete CUCM installation
- Production grade CUCM cluster is installed on vmware ESXi. For learning purpose, you can install in on vmware workstation
- We will be dealing with CUCM 11.5 Version throughout this course

[Lab] Installing CUCM on vmware ESXi

Step 1: Download the CUCM 11.5 OVA from Cisco Downloads

- For lab environment, you can download it from here.

The screenshot shows the Cisco Software Download page for Unified Communications Manager Version 11.5. The page has a breadcrumb trail: Downloads Home / Unified Communications / Call Control / Unified Communications Manager (CallManager) / Unified Communications Manager Version 11.5 / Unified Communications Manager Virtual Machine Templates- 11.5. On the left, there is a search bar and a filter menu with 'Expand All' and 'Collapse All' buttons. The filter menu shows 'Latest Release' with a dropdown arrow, and '11.5' is selected. Below this, 'All Release' is also shown with a dropdown arrow, and '11.5' is selected. The main content area is titled 'Unified Communications Manager Version 11.5'. It includes a 'Release 11.5' section with a 'My Notifications' bell icon and a 'Related Links and Documentation' section with the text '- No related links or documentation -'. Below this is a table with columns 'File Information', 'Release Date', and 'Size'. The table lists two Virtual Server Template (OVA file) for Cisco Unified Communications Manager (CUCM), used for creation of a virtual machine (VM) on all supported servers. The first entry is 'cucm_11.5_vmv8_v1.1.ova' with a release date of '08-May-2017' and a size of '0.20 MB'. The second entry is 'cucm_11.5_vmv8_v1.0.ova' with a release date of '21-Sep-2016' and a size of '0.20 MB'. Each entry has download, shopping cart, and document icons.

Step 2: Deploy the OVA File in vmware ESXi

- Use the ESXi web interface to deploy the OVA file

The screenshot shows the VMware ESXi web interface. The left sidebar contains a 'Navigator' pane with 'Host', 'Virtual Machines', 'Storage', 'Windows-NFS', and 'Networking' sections. The 'Virtual Machines' section is selected. The main area displays the 'New virtual machine' wizard. The wizard has a progress bar with steps: 1 Select creation type, 2 Select OVF and VMDK files, 3 Select storage, 4 License agreements, 5 Deployment options, 6 Additional settings, and 7 Ready to complete. Step 1 is currently selected. The 'Select creation type' screen asks 'How would you like to create a Virtual Machine?'. It offers three options: 'Create a new virtual machine', 'Deploy a virtual machine from an OVF or OVA file' (which is highlighted with a red arrow), and 'Register an existing virtual machine'. A red arrow also points to the 'Deploy a virtual machine from an OVF or OVA file' option. The bottom of the wizard has 'Back', 'Next', 'Finish', and 'Cancel' buttons.

New virtual machine - cucm-pub

1 Select creation type

2 Select OVF and VMDK files

3 Select storage

4 License agreements

5 Deployment options

6 Additional settings

7 Ready to complete

Select OVF and VMDK files

Select the OVF and VMDK files or OVA for the VM you would like to deploy

Enter a name for the virtual machine.

cucm-pub

Virtual machine names can contain up to 80 characters and they must be unique within each ESXi instance.

vm cucm_11.5_vmv8_v1.1.ova

Back

Next

Finish

Cancel

New virtual machine - cucm-pub

1 Select creation type

2 Select OVF and VMDK files

3 Select storage

4 Deployment options

5 Ready to complete

Select storage

Select the storage type and datastore

Standard

Persistent Memory

Select a datastore for the virtual machine's configuration files and all of its' virtual disks.

Name	Capacity	Free	Type	Thin pro...	Access
esxi-host-01-Datastore1	192.5 GB	191.09 GB	VMFS6	Supported	Single
vsanDatastore	199.99 GB	185.5 GB	vsan	Supported	Single
Windows-iSCSI-DISK01	199.75 GB	189.31 GB	VMFS6	Supported	Single
Windows-NFS	998.46 GB	478.4 GB	NFS	Supported	Single

4 items

Back

Next

Finish

Cancel

New virtual machine - cucm-pub

1 Select creation type

2 Select OVF and VMDK files

3 Select storage

4 Deployment options

5 Ready to complete

Deployment options

Select deployment options

Network mappings

eth0

INTERNET-ACCESS-PORT-GROUP

Deployment type

CUCM 7500 user node

Cisco Unified Communications Manager (CUCM) configuration that supports up to 7500 users per node. Details: Red Hat Enterprise Linux 6 (64-bit) CPU: 2 vCPU with 3600 MHz reservation Memory: 8 GB with 8 GB reservation Disk: 1 - 110 GB disk

Disk provisioning

☐ Thin
 ☒ Thick

Power on automatically

☒

Back

Next

Finish

Cancel


New virtual machine - cucm-pub

✓ 1 Select creation type
 ✓ 2 Select OVF and VMDK files
 ✓ 3 Select storage
 ✓ 4 Deployment options
 ✓ 5 Ready to complete

Ready to complete

Review your settings selection before finishing the wizard

Product	Cisco Unified Communications Manager (CUCM)
VM Name	cucm-pub
Files	cucm_11.5_vmv8_v1.1-disk1.vmdk cucm_11.5_vmv8_v1.1-disk2.vmdk
Datastore	esxi-host-01-Datastore1
Provisioning type	Thick
Network mappings	eth0: INTERNET-ACCESS-PORT-GROUP
Guest OS Name	Red Hat Enterprise Linux 6 (64-bit)
Profile	Cisco Unified Communications Manager (CUCM) configuration that supports up to 75 00 users per node. Details: Red Hat Enterprise Linux 6 (64-bit) CPU: 2 vCPU with 36 00 MHz reservation Memory: 8 GB with 8 GB reservation Disk: 1 - 110 GB disk

 Do not refresh your browser while this VM is being deployed.

Back Next Finish Cancel

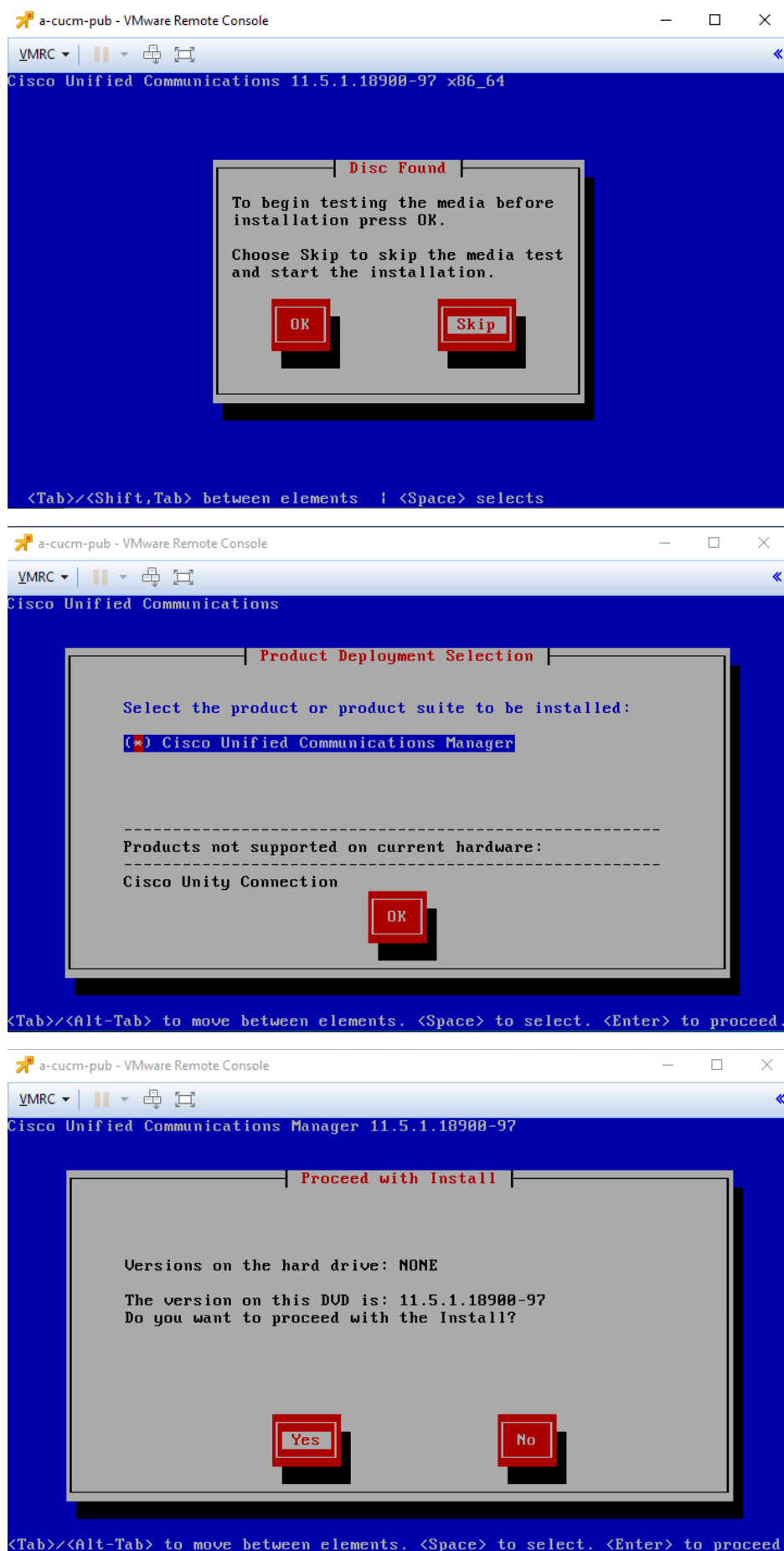
Edit settings - cucm-pub (ESXi 5.0 virtual machine)

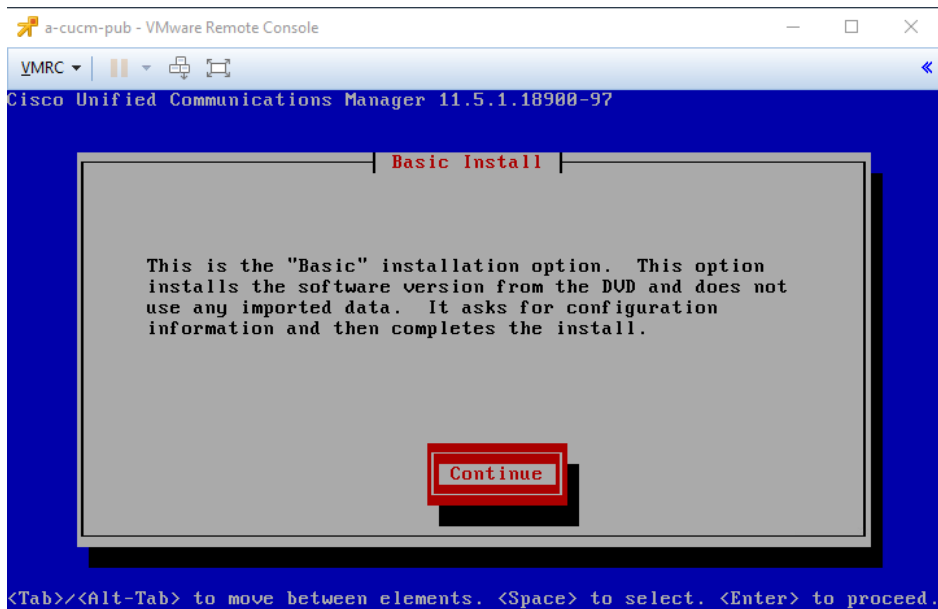
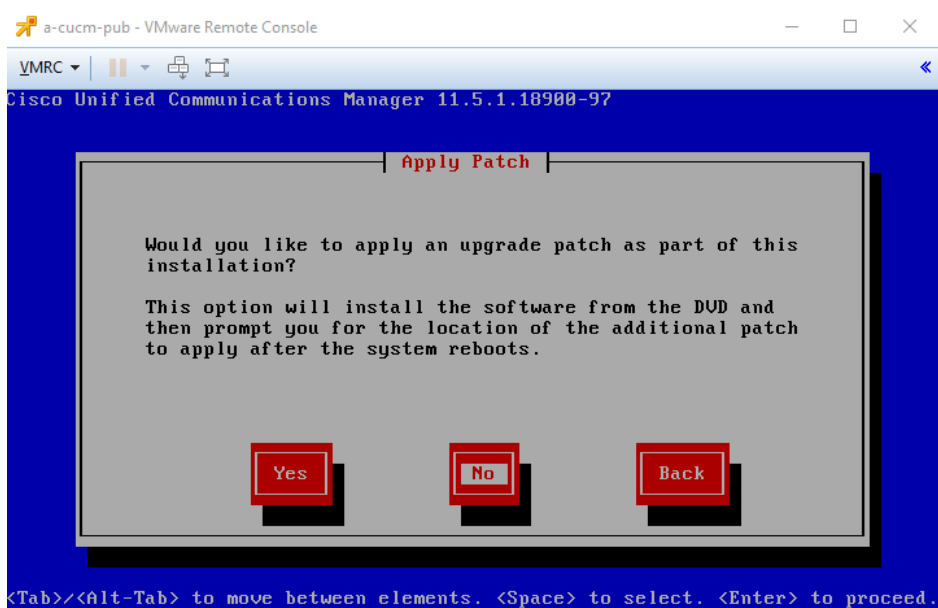
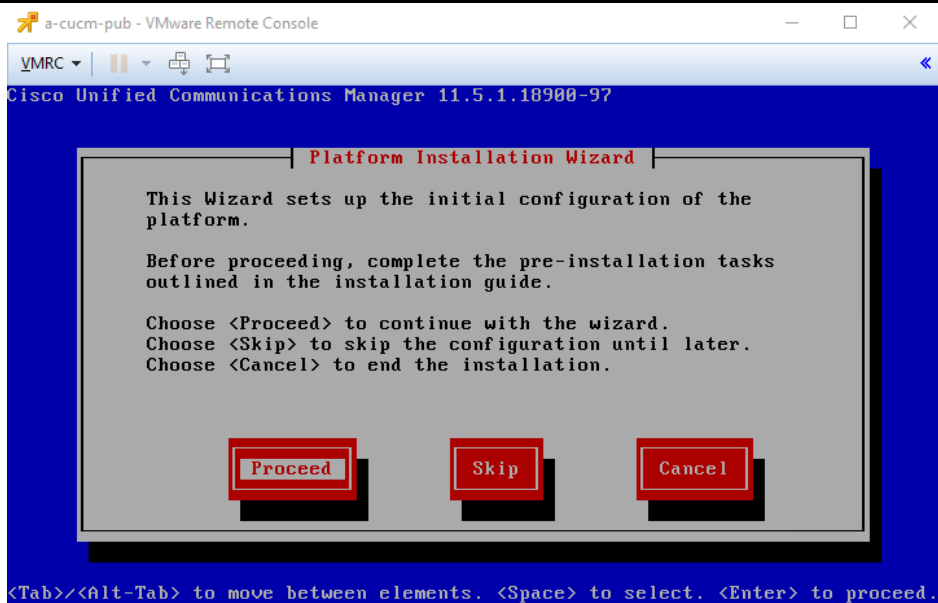
Memory	8192	MB	
Hard disk 1	110	GB	
SCSI Controller 0	LSI Logic Parallel		
Network Adapter 1	INTERNET-ACCESS-PORT-GROUP	<input checked="" type="checkbox"/> Connect	
Floppy drive 1			
CD/DVD Drive 1	Datastore ISO file	<input type="checkbox"/> Connect	
Status	<input checked="" type="checkbox"/> Connect at power on		
CD/DVD Media		Browse...	
Controller location	IDE controller 1	Master	
Video Card	Specify custom settings		

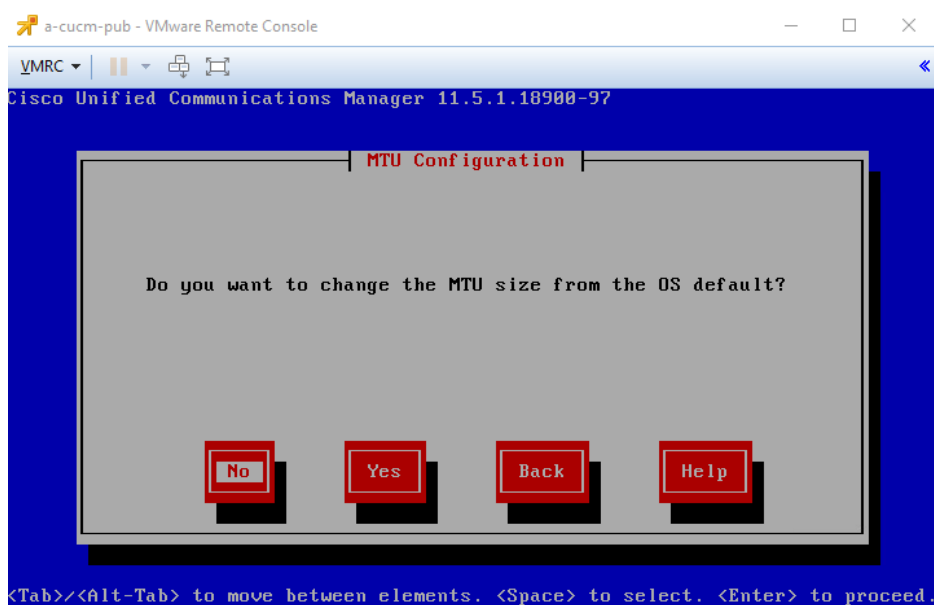
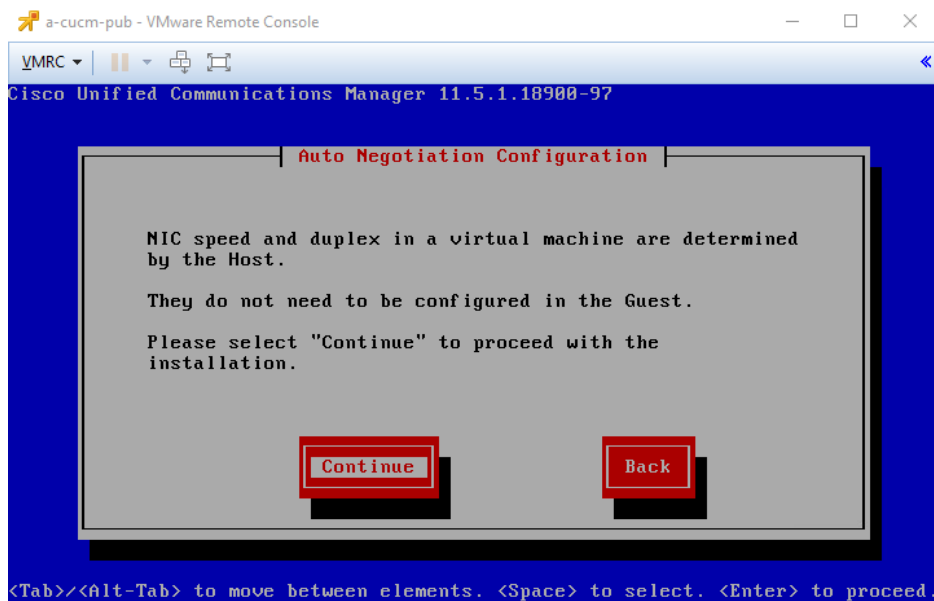
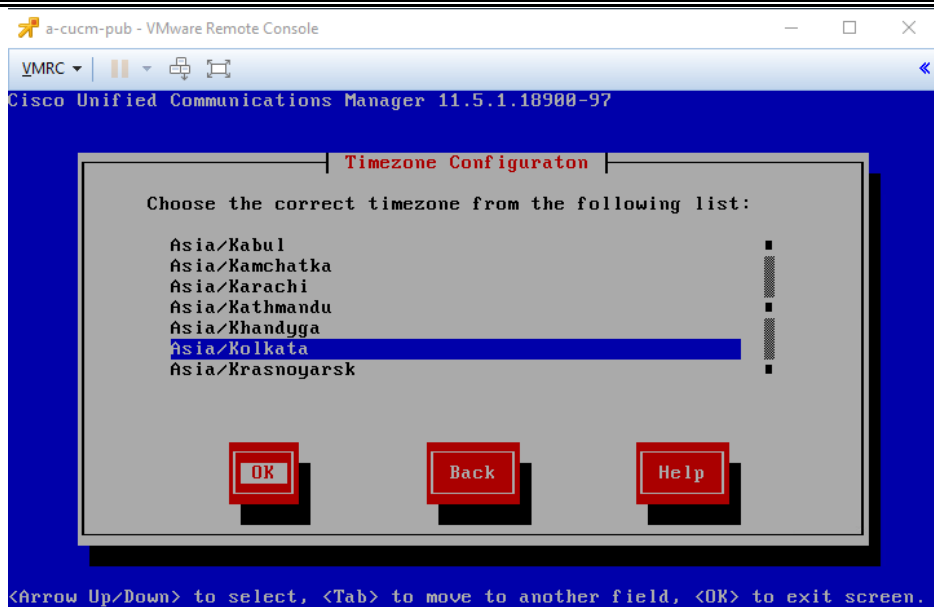
Save Cancel

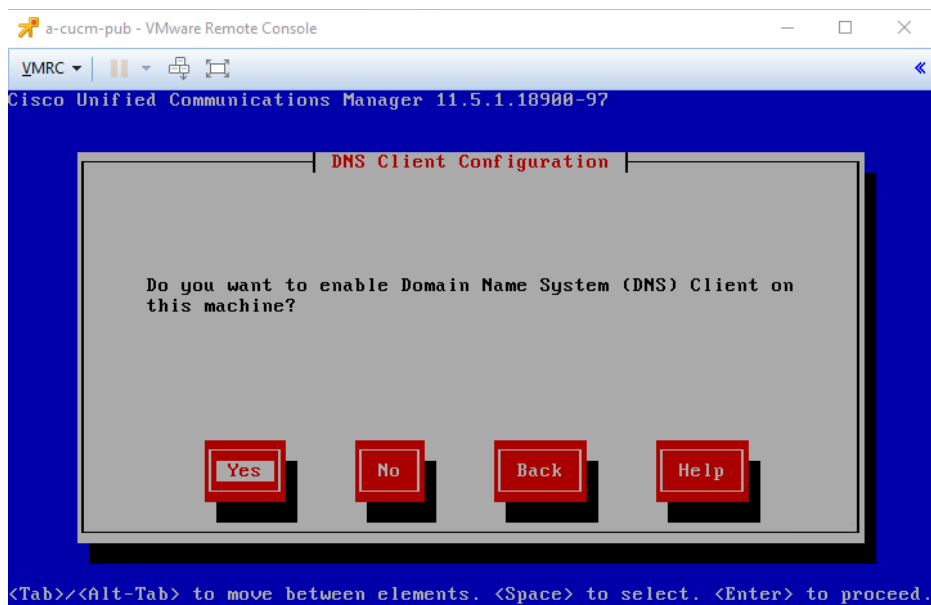
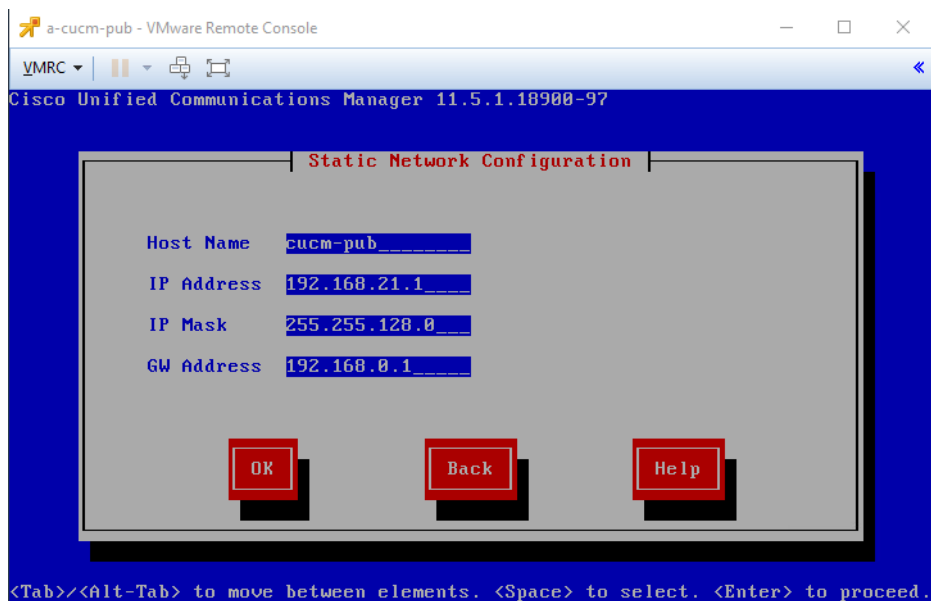
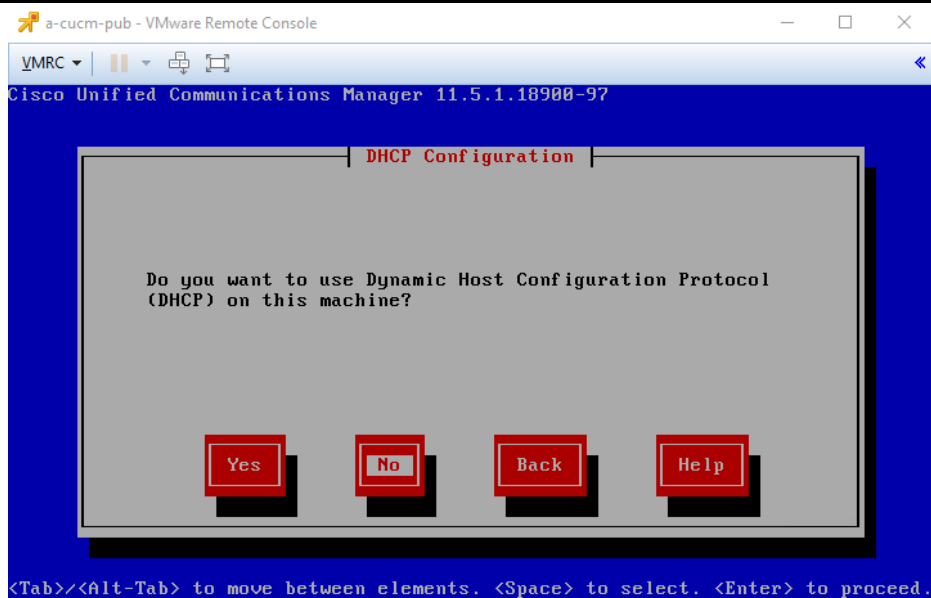
- Browse the CUCM ISO here and power on the VM
- CUCM ISO can be arranged from Cisco Partners or from TAC
- Bootable CUCM ISO is not available for direct download

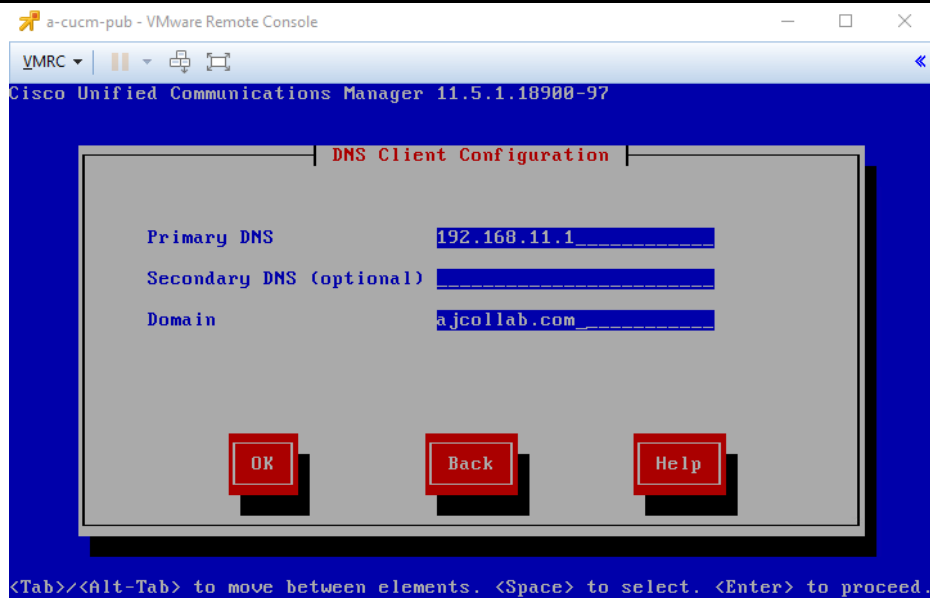
Step 3: Install CUCM Publisher



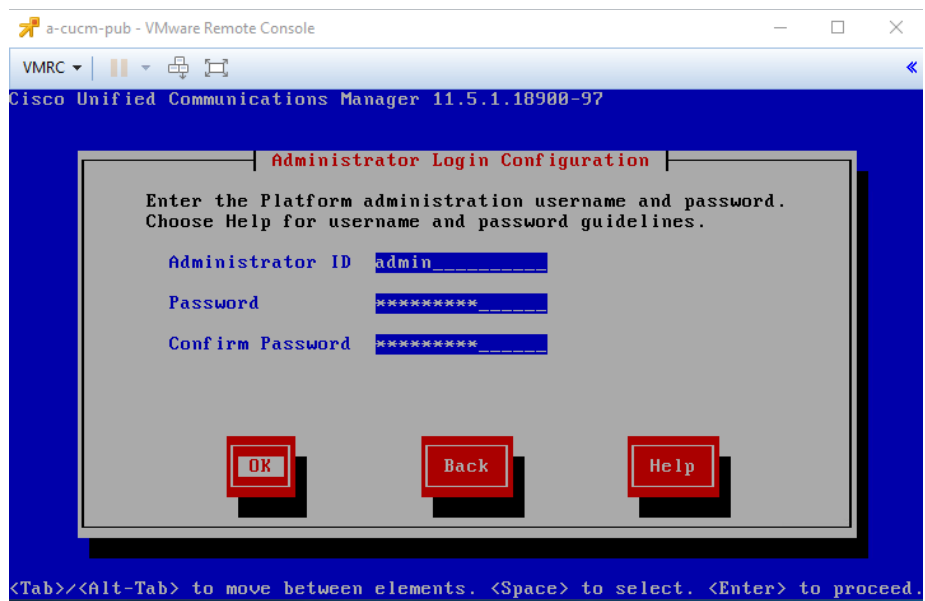




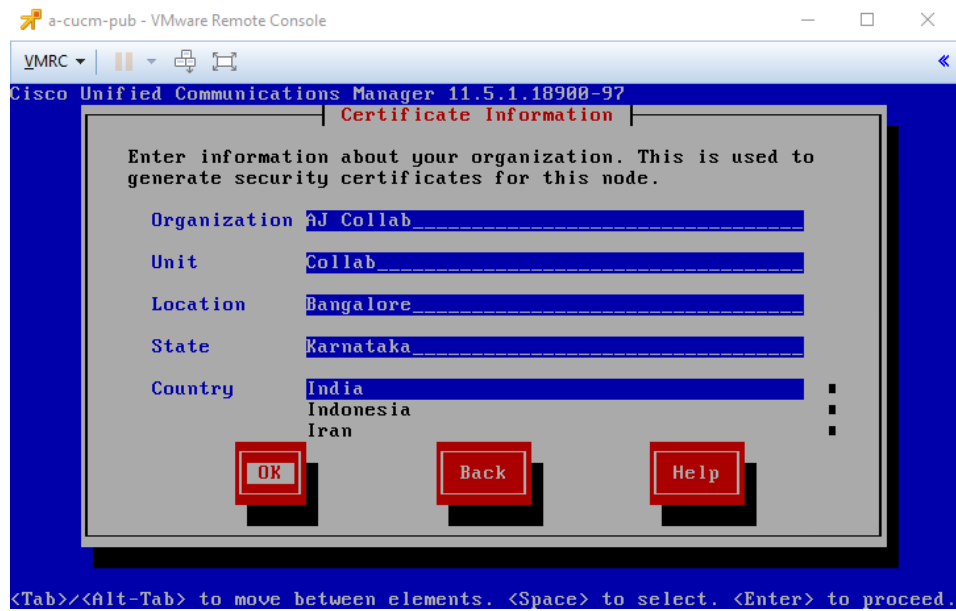




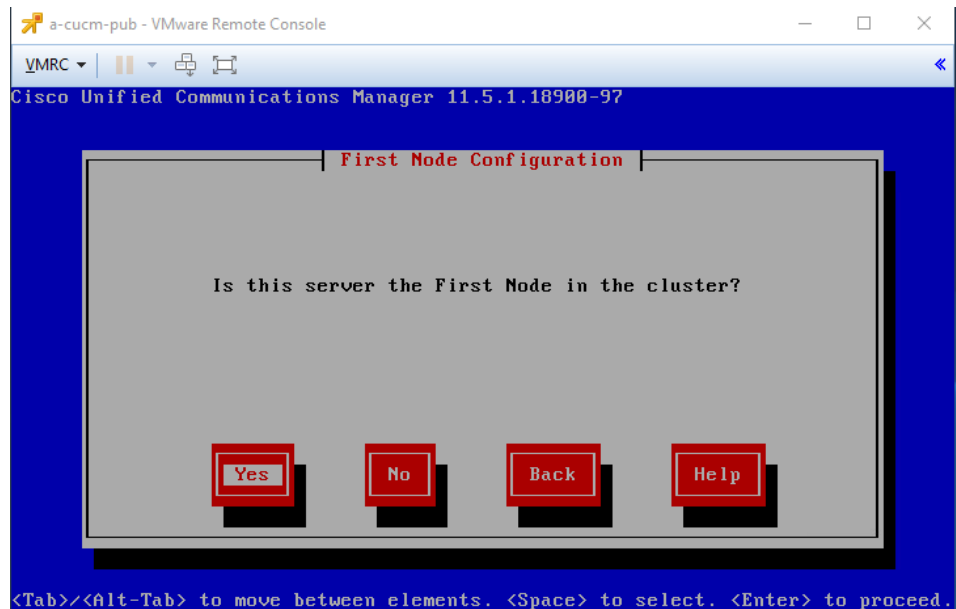
- You can also install without DNS and add DNS later



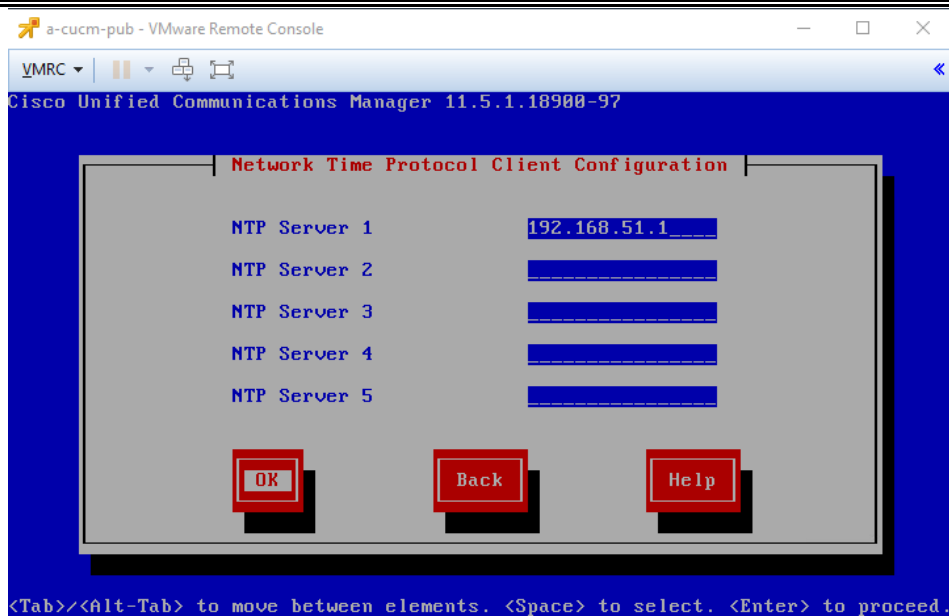
- This is the Linux OS Admin password.
- Used to login to CUCM Node CLI while troubleshooting
- This is node specific, means we need to enter this while installing CUCM Pub and CUCM Sub



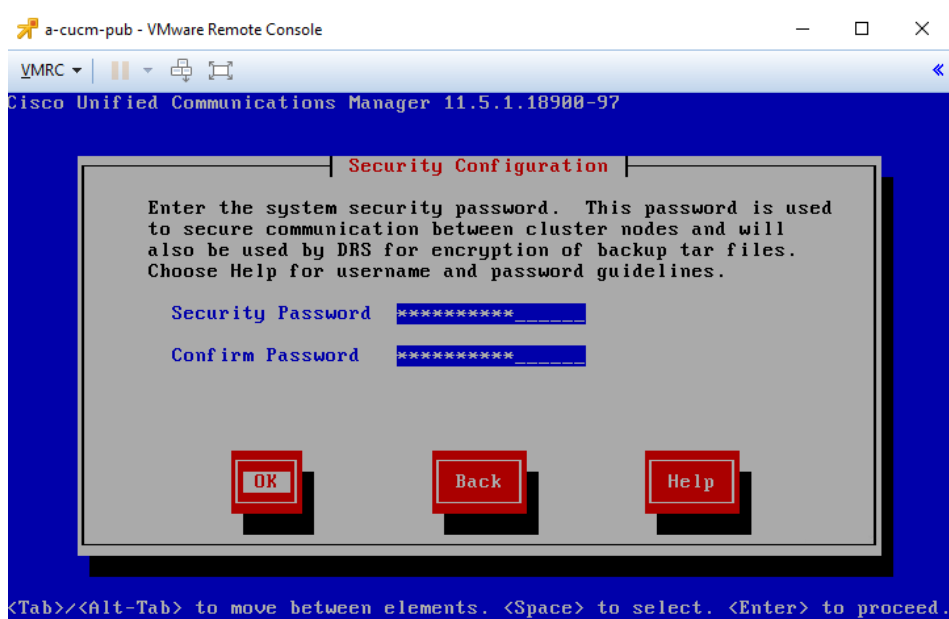
- These details are for self-signed HTTPS certificate.
- CUCM internally generates a self-signed certificate during the installation
- We can install CA Signed certificate later



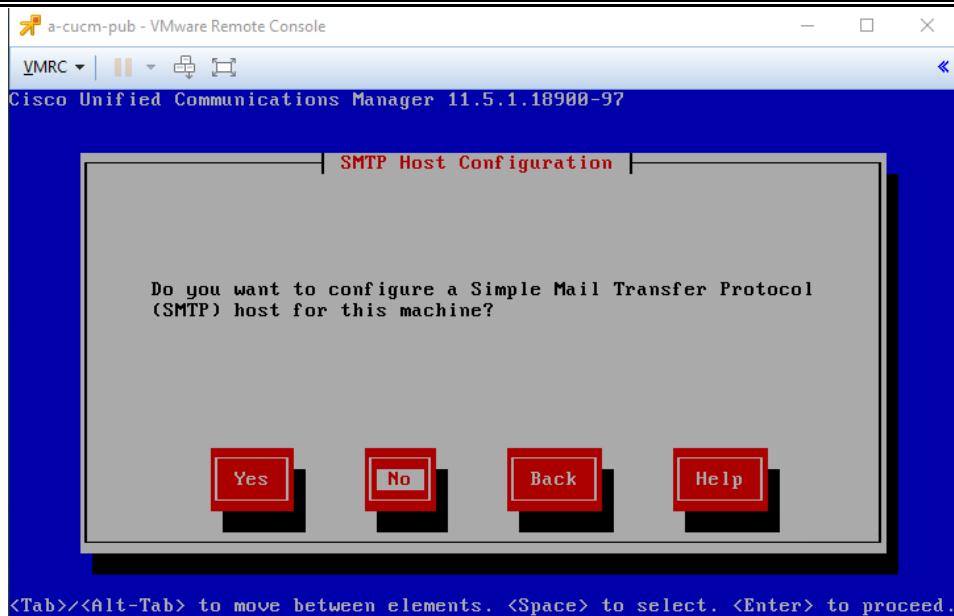
- This is the place we decide whether this is Pub or Sub.



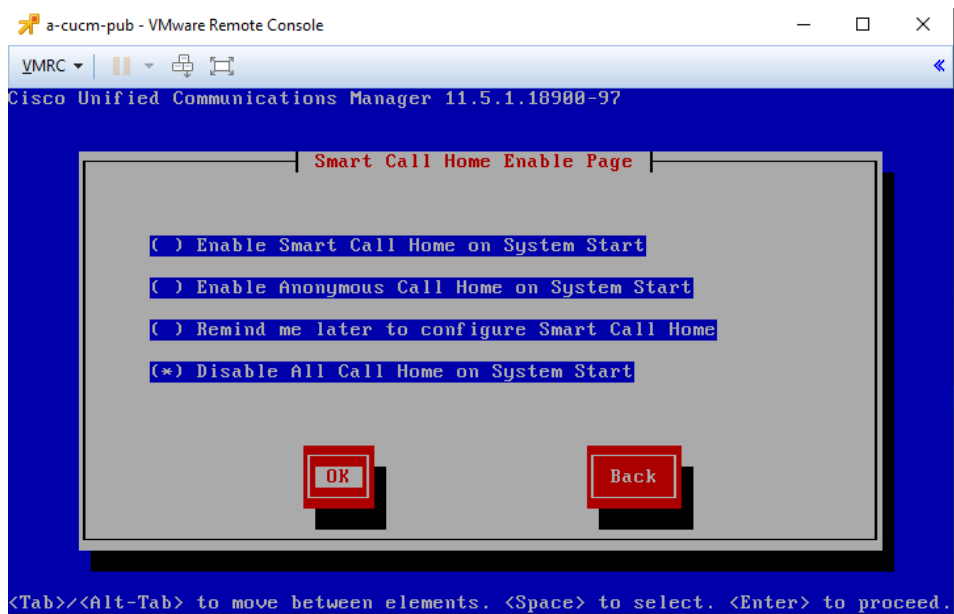
- A working NTP server is mandatory. You could configure a Cisco IOS Router as NTP server or use Public NTP servers

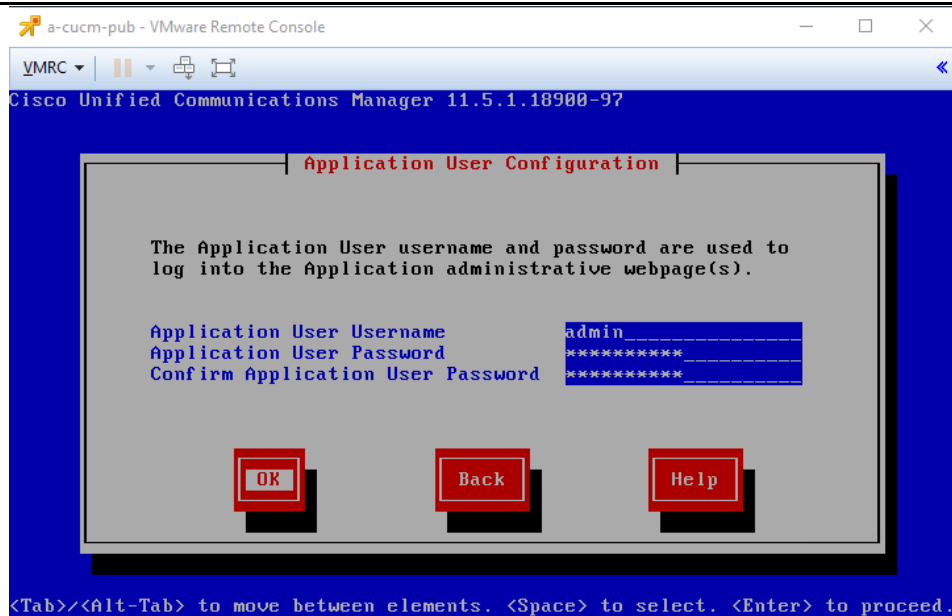


- This is the cluster security password.
- While adding other nodes (subscriber servers) to the cluster, this password is used to authenticate database each other
- During the installation of Subscriber, we should provide the exact same password

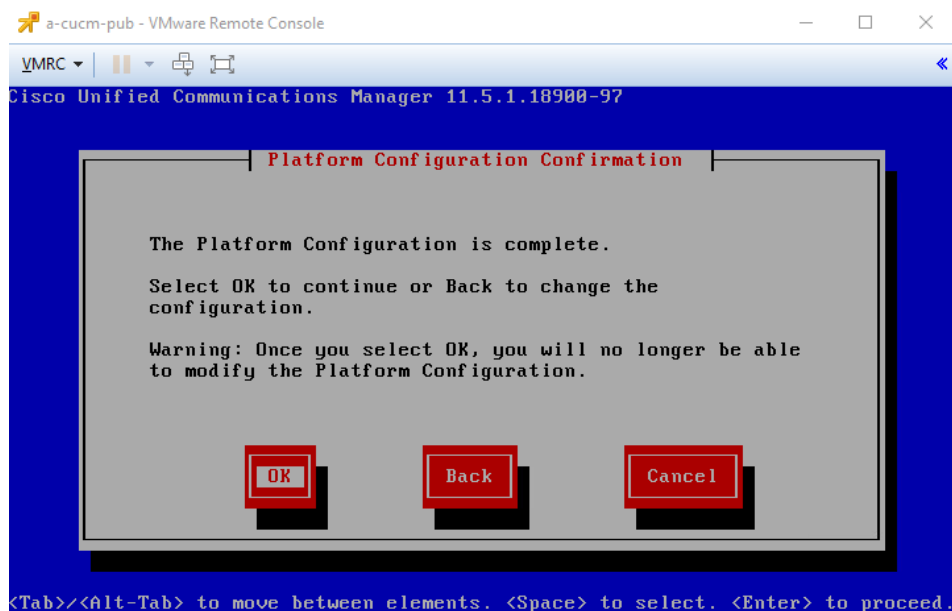


- This is used to send auto email from CUCM nodes
- Usually, we ignore this unless specific requirements are there to configure this

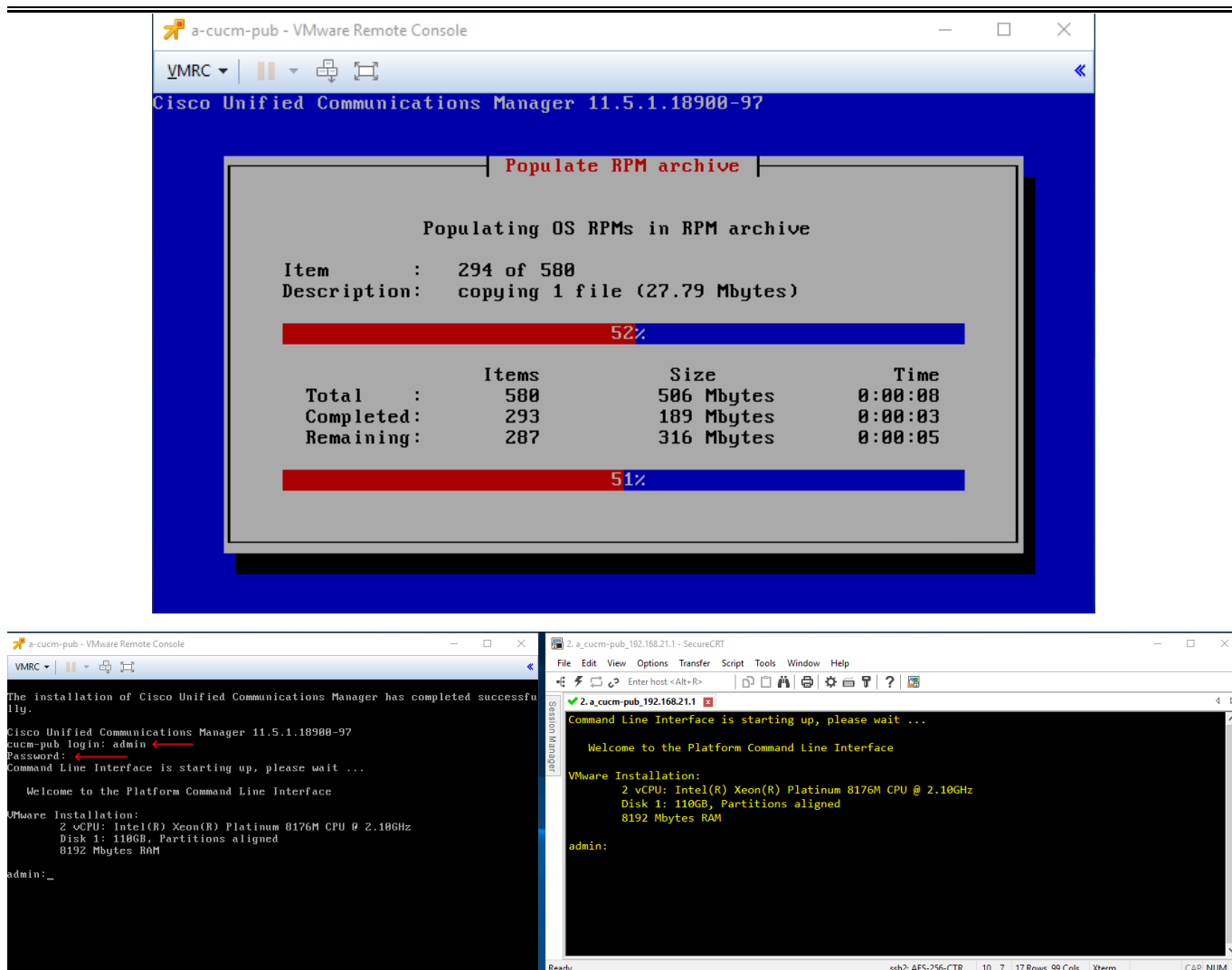




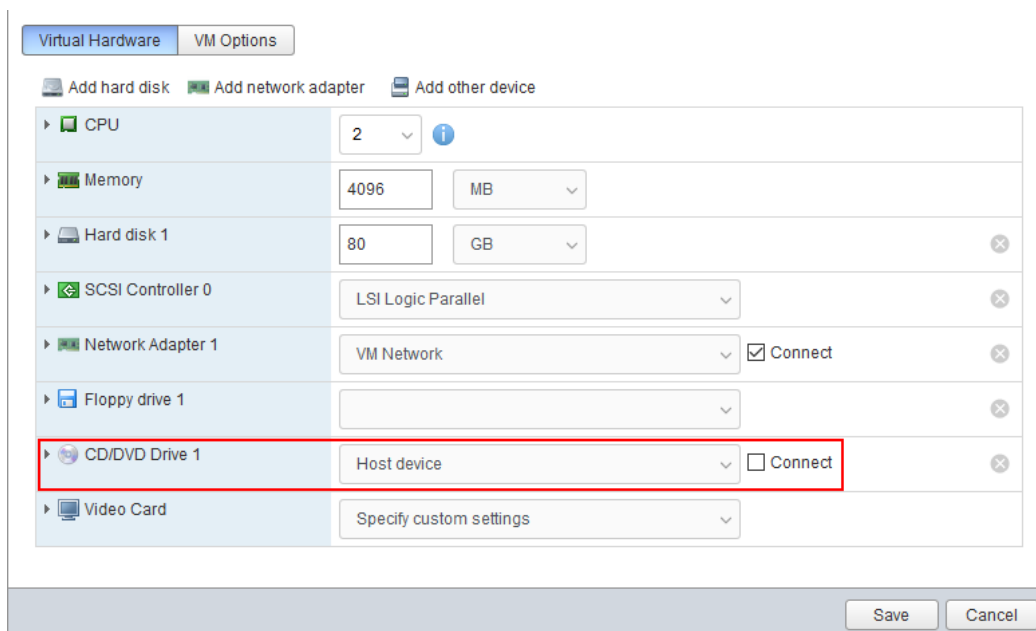
- This is the cluster wide application credentials
- After the installation we use this to login to CUCM Administration GUI
- This step is only in Publisher installation
- This credential is globally replicated hence we can use the same credentials to login to subscriber GUI

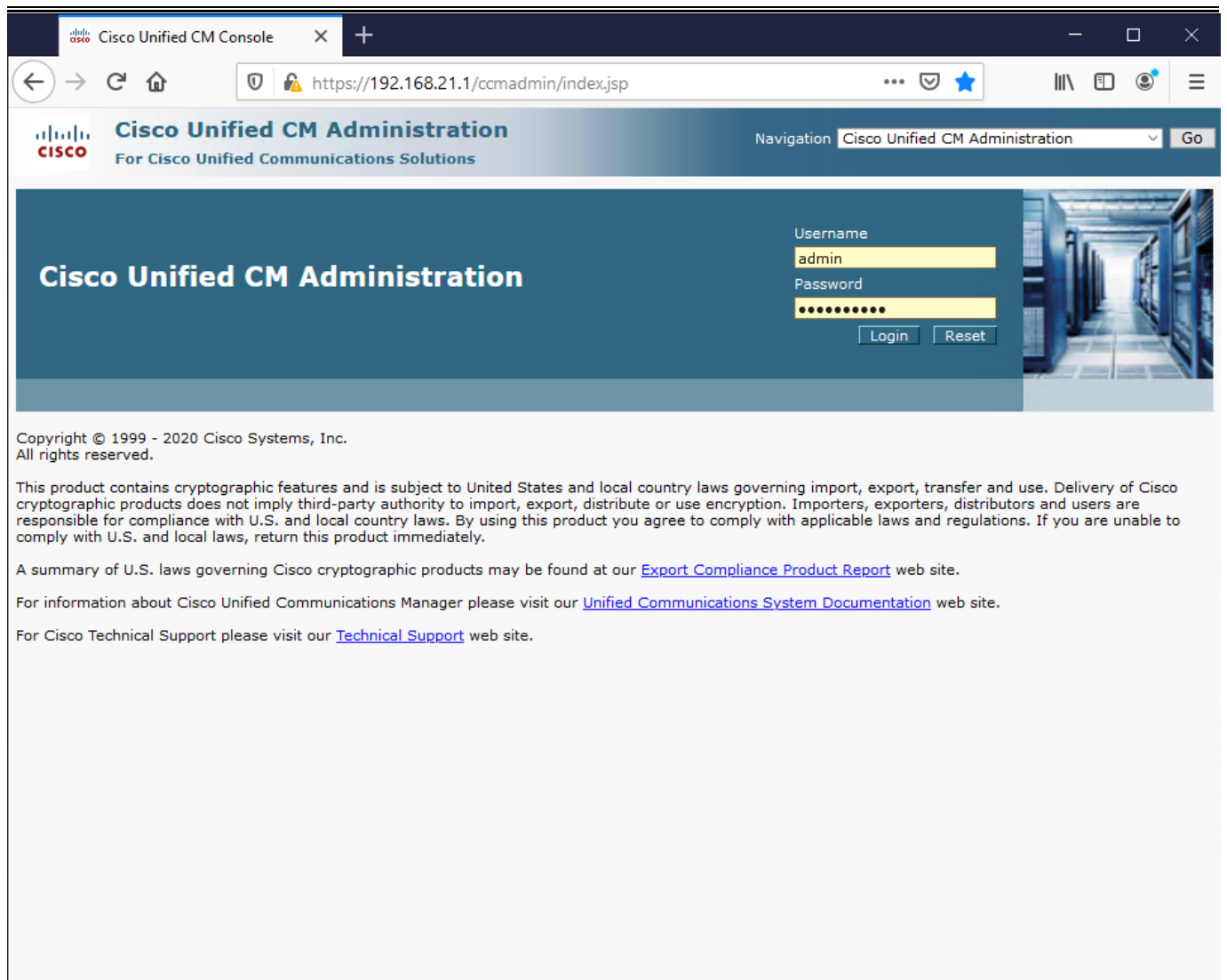


- This is the last stage and once you click 'OK', it will take some considerable amount of time to get the OS installed.
- Once it is completed, you can see CUCM Admin CLI in vmware console
- We use Platform Administration credential to login to the CLI either via vmware console or via SSH



- Right screenshot is taken from CUCM Pub via SSH. Similar interface is available on CUCM Sub as well
- This is the node specific Admin CLI where we use Platform credential to login

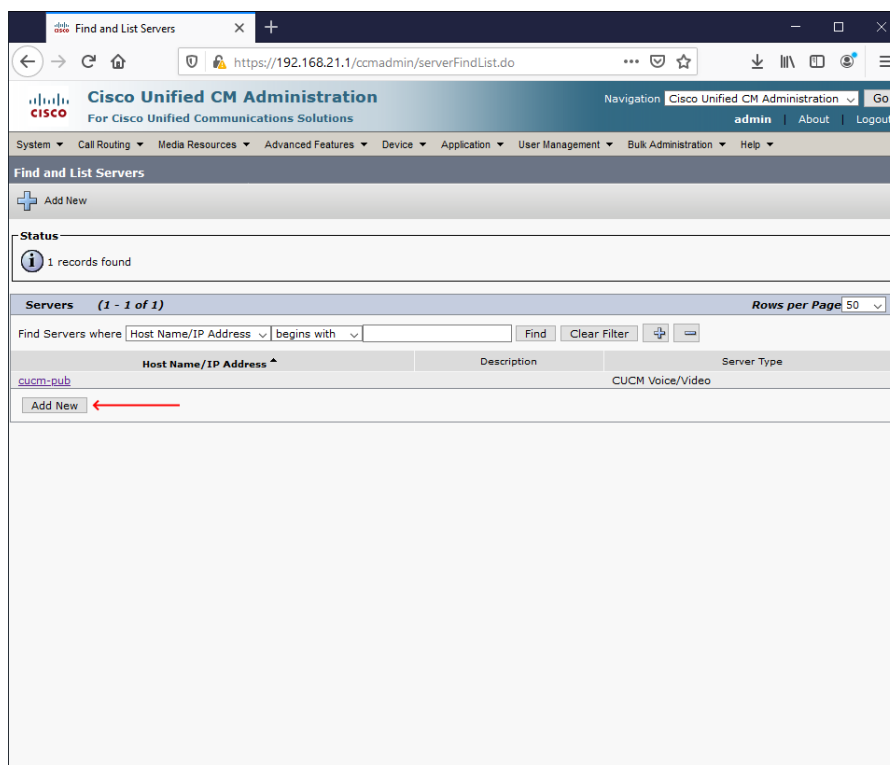
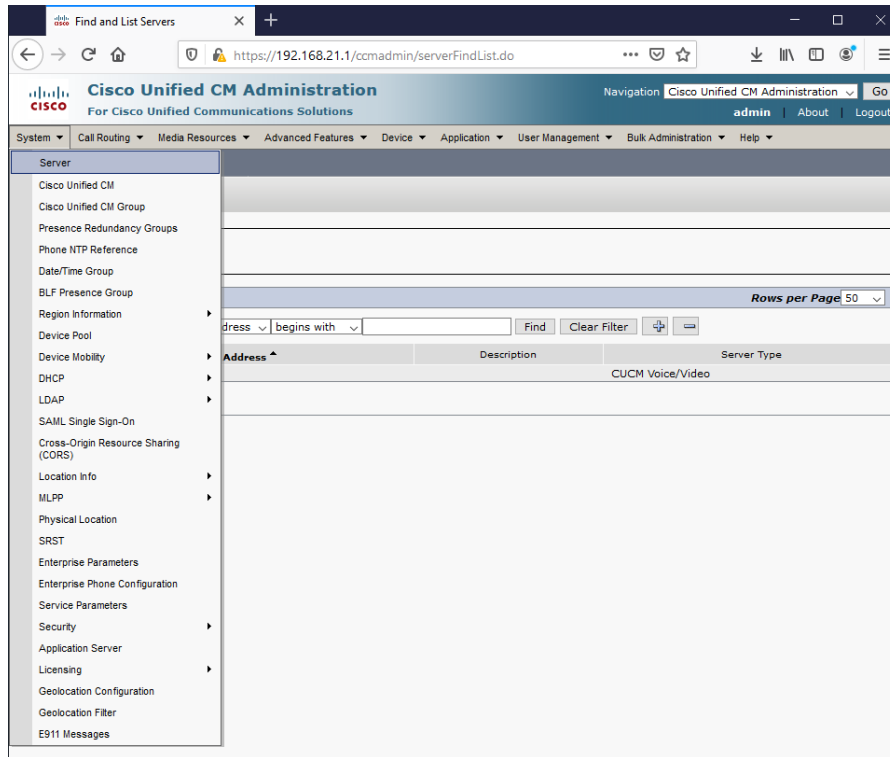




- This screenshot is taken from CUCM Pub via HTTPS
- This will be the main administration platform for CUCM
- CLI is used for some specific purpose and troubleshooting situations

Step 4: Install CUCM Subscriber

- We use the same ISO and OVA files for installing CUCM Subscriber server
- Deploy the OVA file again and map the CUCM ISO file, then power on the VM
- Most of the steps are like CUCM Publisher installation
- Install CUCM Pub first and then Subscribers, during the installation, Sub will check the connectivity to Pub. Multiple Subscribers can be installed together



Server Configuration

https://192.168.21.1/ccmadmin/serverEdit.do

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | Go | admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Server Configuration | Related Links: Back To Find/List | Go

Next

Status
Status: Ready

Add a Server
Server Type*: CUCM Voice/Video

Next

*: indicates required item.

Server Configuration

https://192.168.21.1/ccmadmin/serverEdit.do?role=1

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | Go | admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Server Configuration | Related Links: Back To Find/List | Go

Save

Status
Status: Ready

Server Information
 Server Type: CUCM Voice/Video
 Host Name/IP Address*: cucm-sub01
 IPv6 Address (for dual IPv4/IPv6):
 MAC Address:
 Description: cucm-sub01

Location Bandwidth Management Information
 LBM Intercluster Replication Group: < None > | View Details

Save

*: indicates required item.

Find and List Servers

https://192.168.21.1/ccmadmin/serverFindList.do

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | Go | admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Find and List Servers | Add New

Status
3 records found

Servers (1 - 3 of 3) Rows per Page: 50

Find Servers where: Host Name/IP Address | begins with | Find | Clear Filter

Host Name/IP Address ^	Description	Server Type
cucm-pub		CUCM Voice/Video
cucm-sub01	cucm-sub01	CUCM Voice/Video
cucm-sub02	cucm-sub02	CUCM Voice/Video

Add New

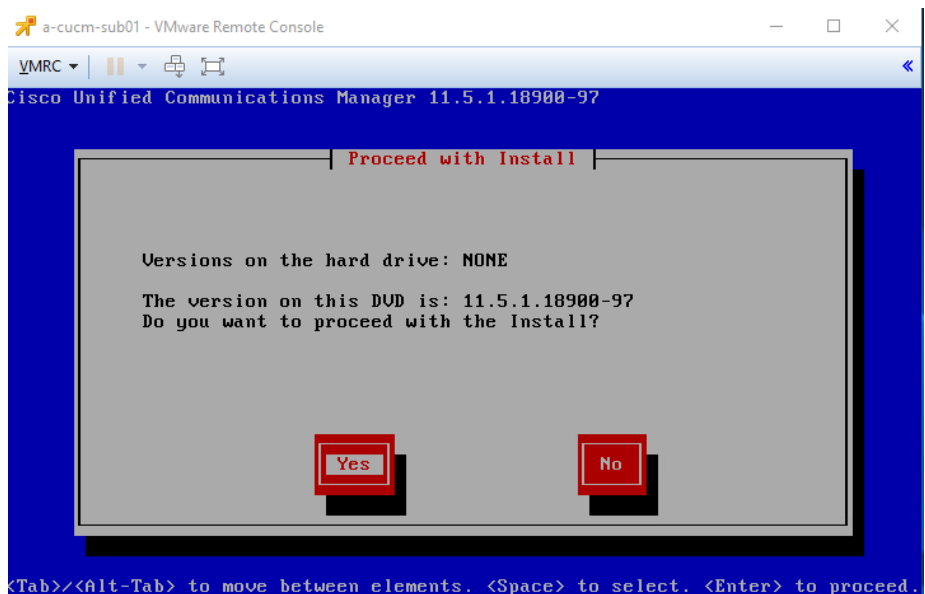
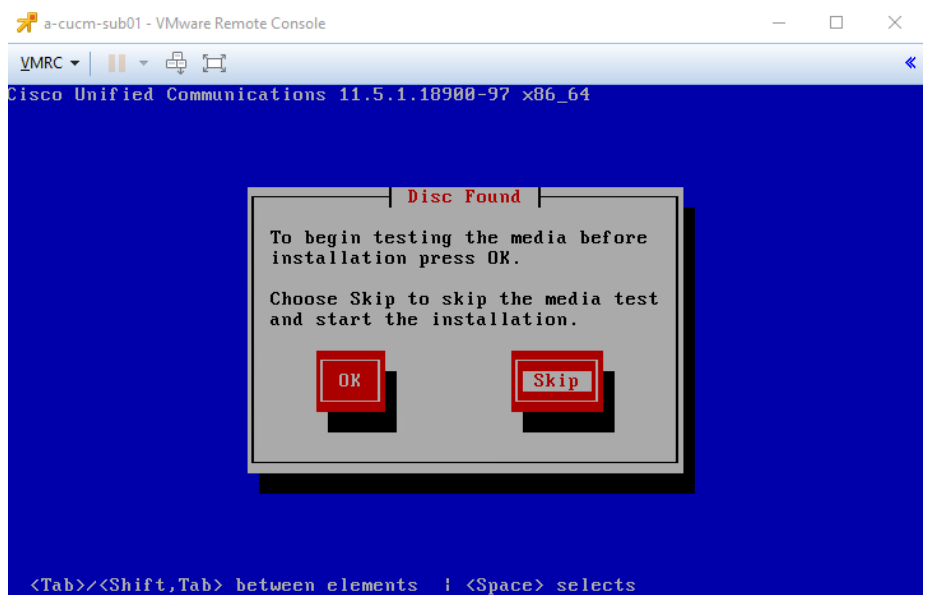
DNS Manager

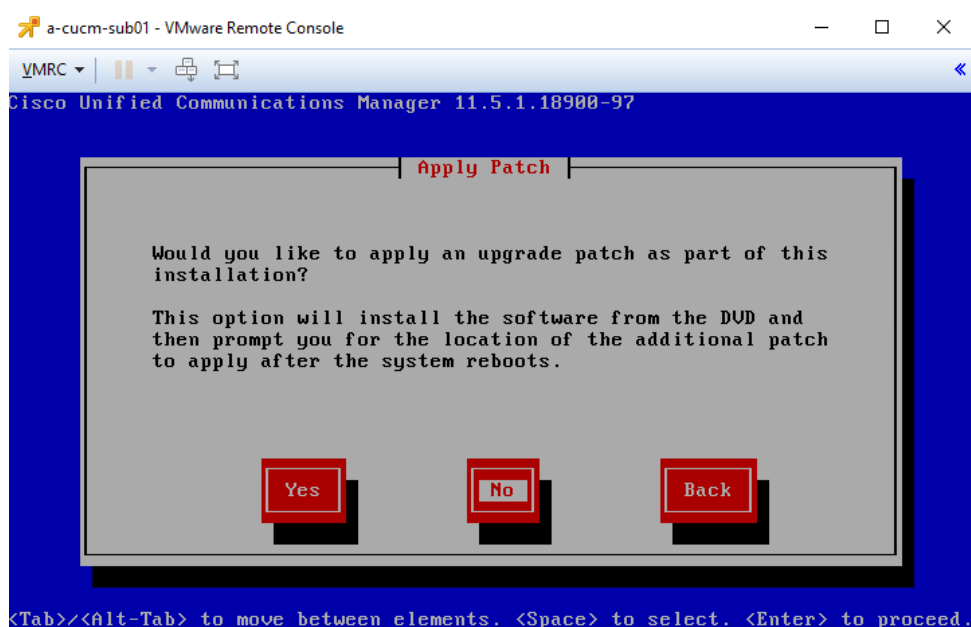
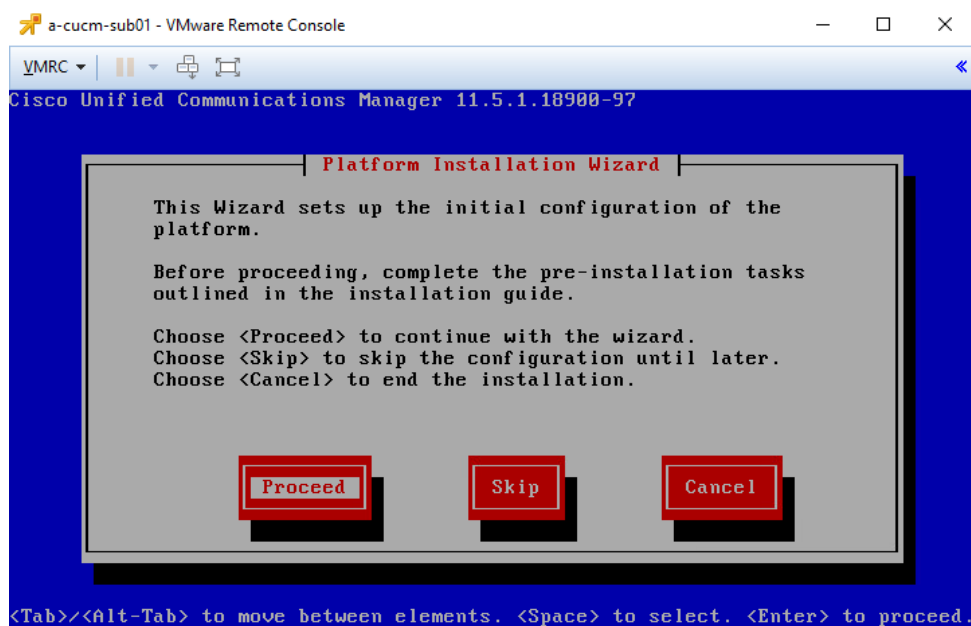
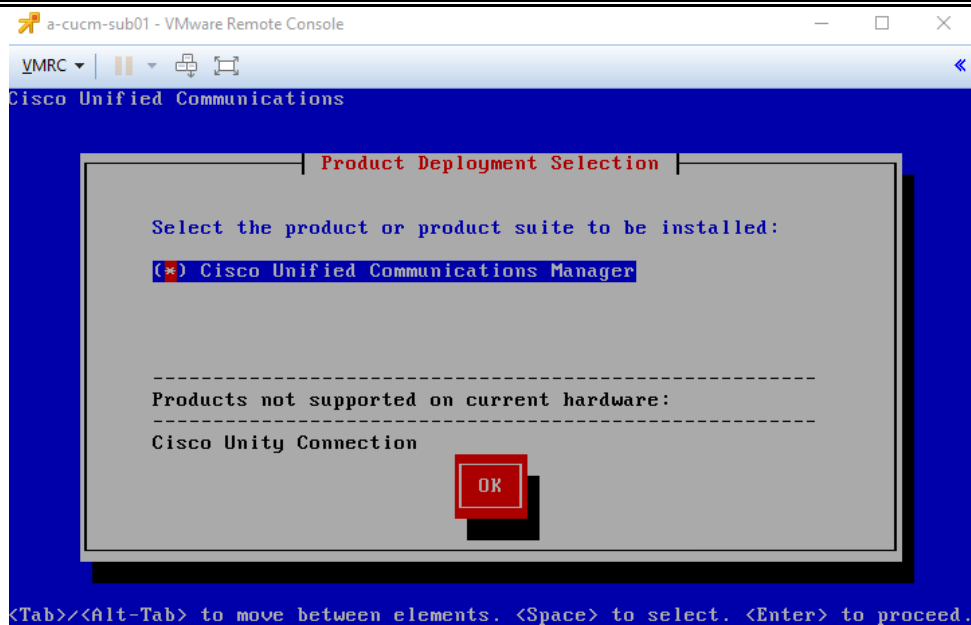
File Action View Help

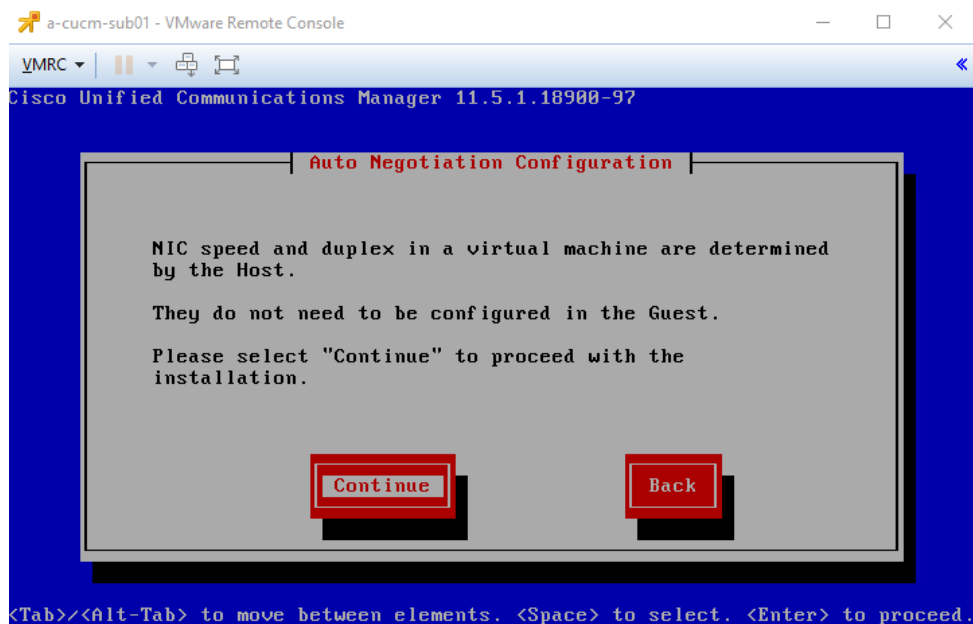
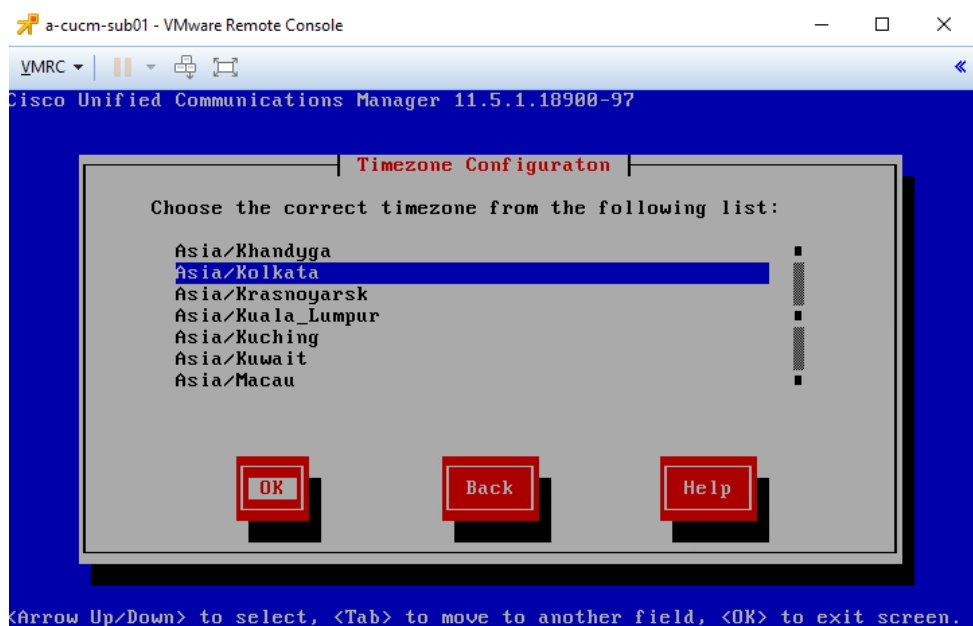
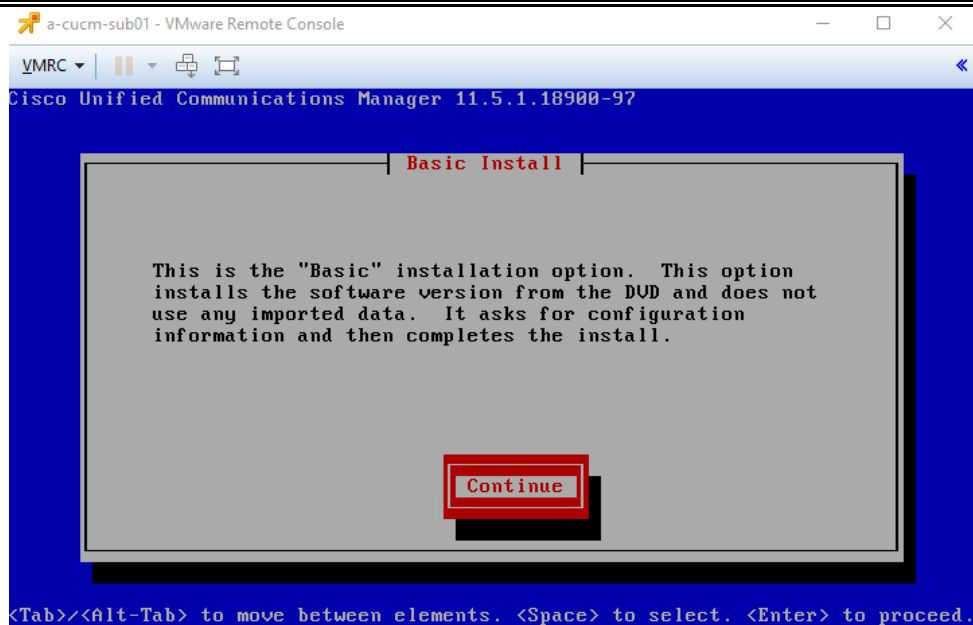
DNS

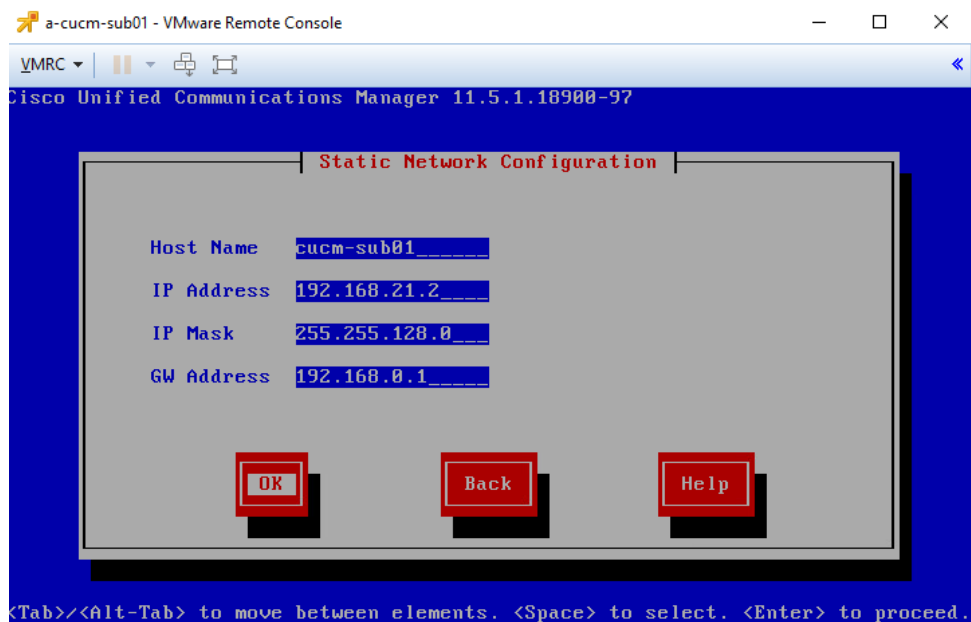
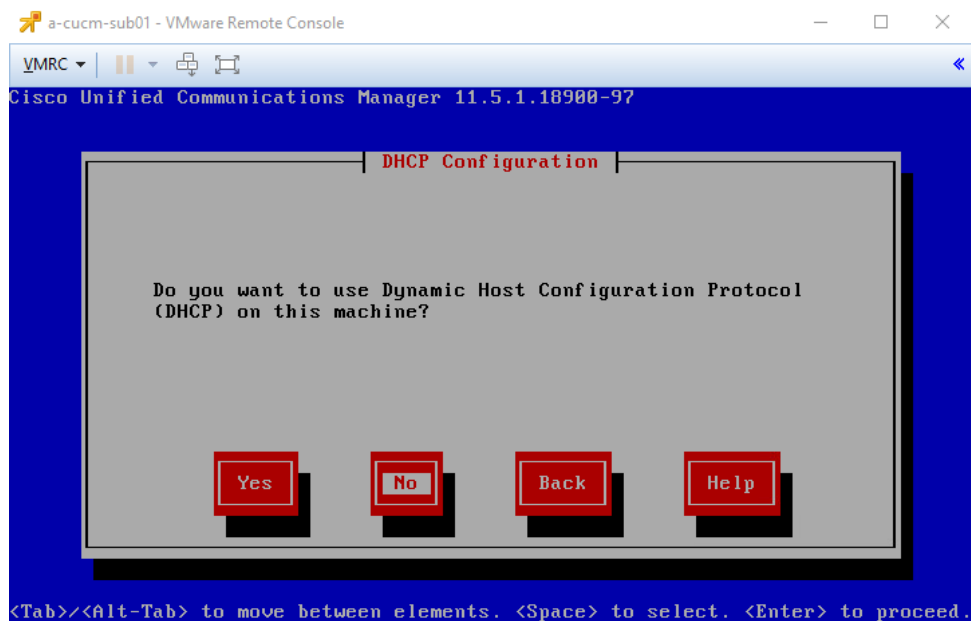
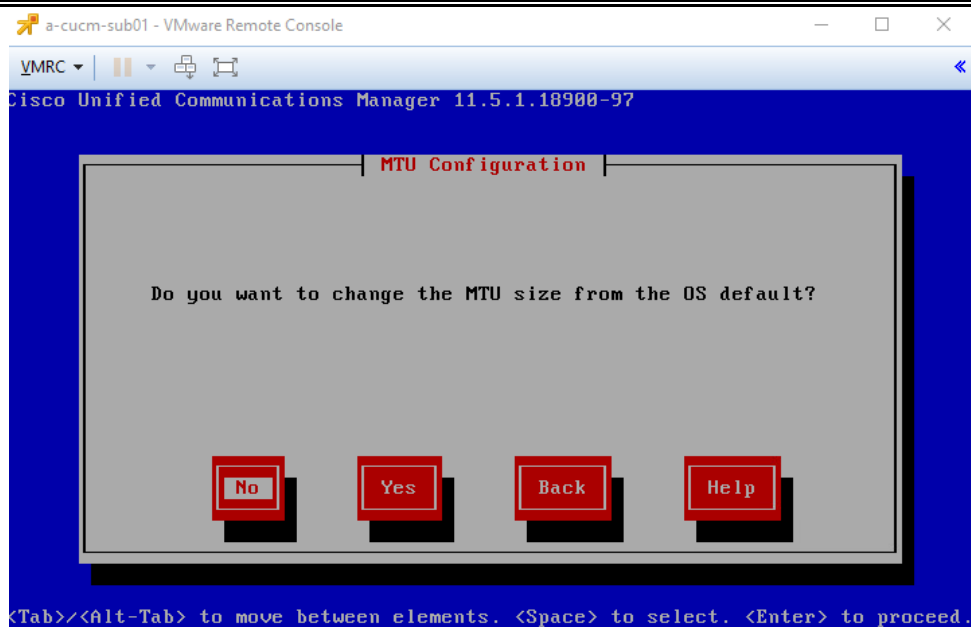
- WIN-SERVER-01
 - Forward Lookup Zones
 - _msdcs.ajcollab.com
 - ajcollab.com
 - Reverse Lookup Zones
 - 11.168.192.in-addr.arpa
 - 21.168.192.in-addr.arpa
 - Trust Points
 - Conditional Forwarders

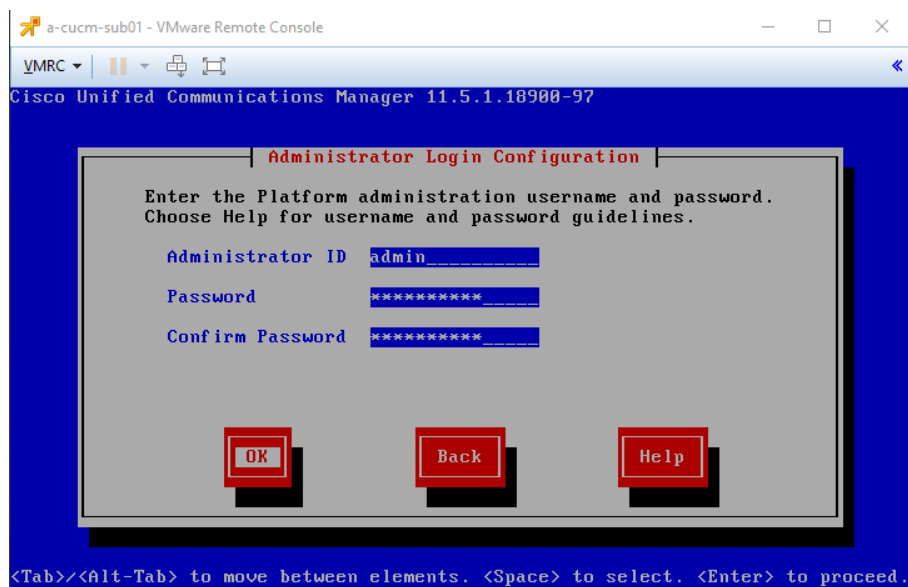
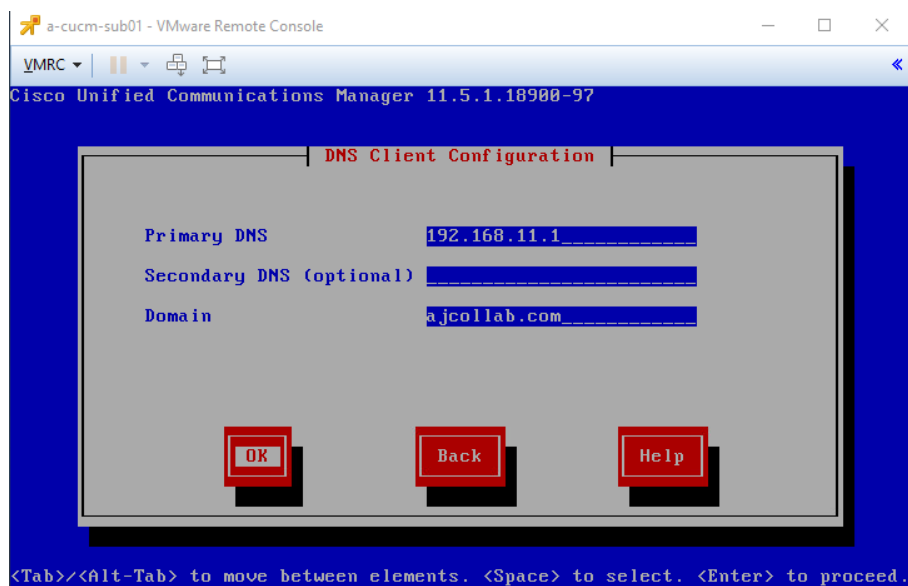
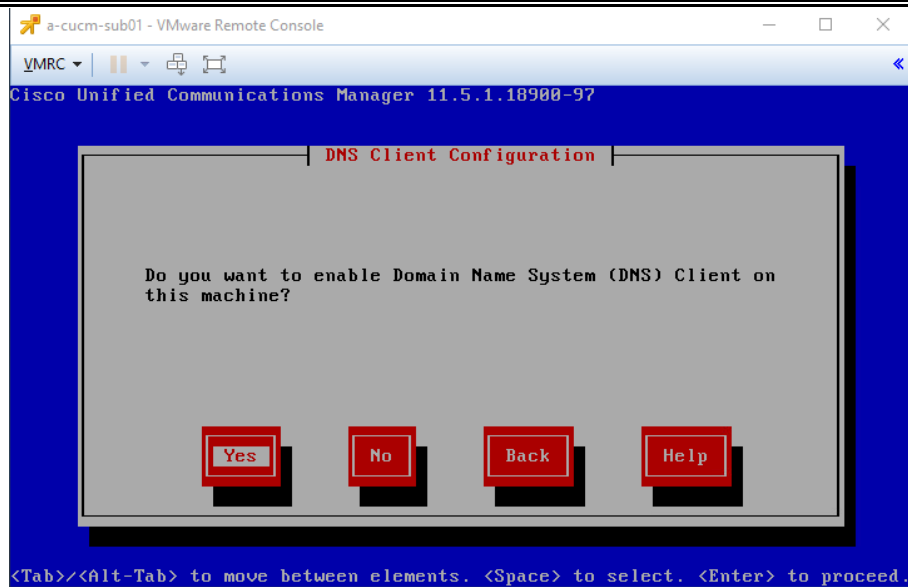
Name	Type	Data	Timestam
ForestDnsZones			
DomainDnsZones			
_udp			
_tcp			
_sites			
_msdcs			
win-server-01	Host (A)	10.106.79.66	static
win-server-01	Host (A)	192.168.11.1	static
cucm-sub02	Host (A)	192.168.21.3	
cucm-sub01	Host (A)	192.168.21.2	
cucm-pub	Host (A)	192.168.21.1	static
(same as parent folder)	Host (A)	10.106.79.66	2/16/2021
(same as parent folder)	Host (A)	192.168.11.1	2/16/2021
(same as parent folder)	Name Server (NS)	win-server-01.ajcollab.com.	static
(same as parent folder)	Start of Authority (SOA)	[26] win-server-01.ajcollab.com.	static



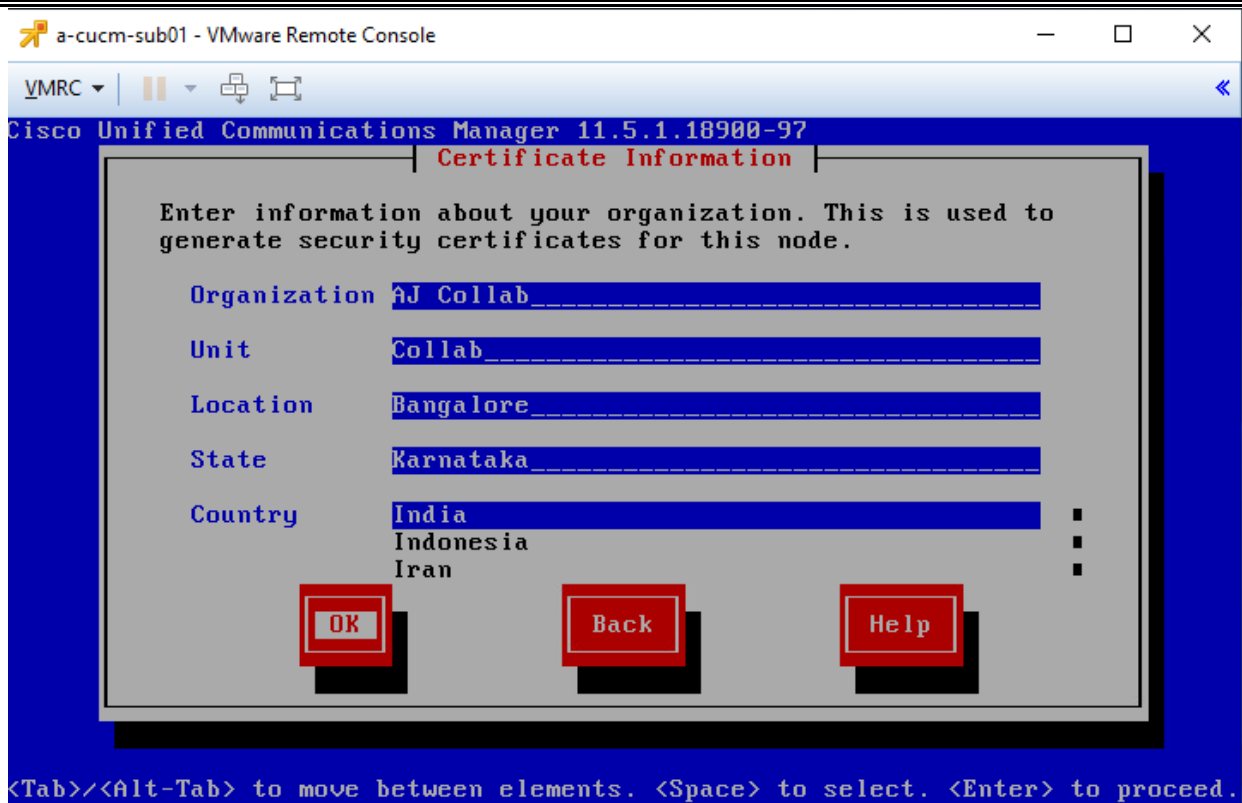




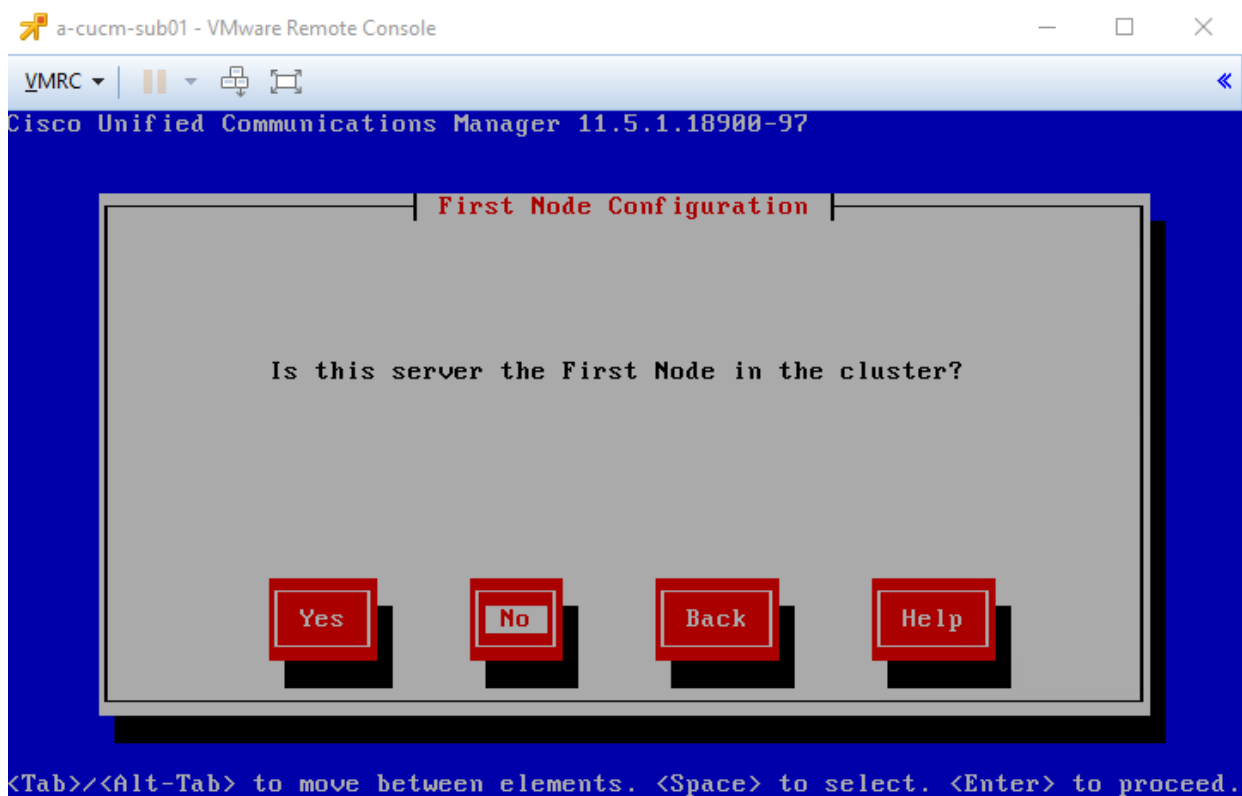




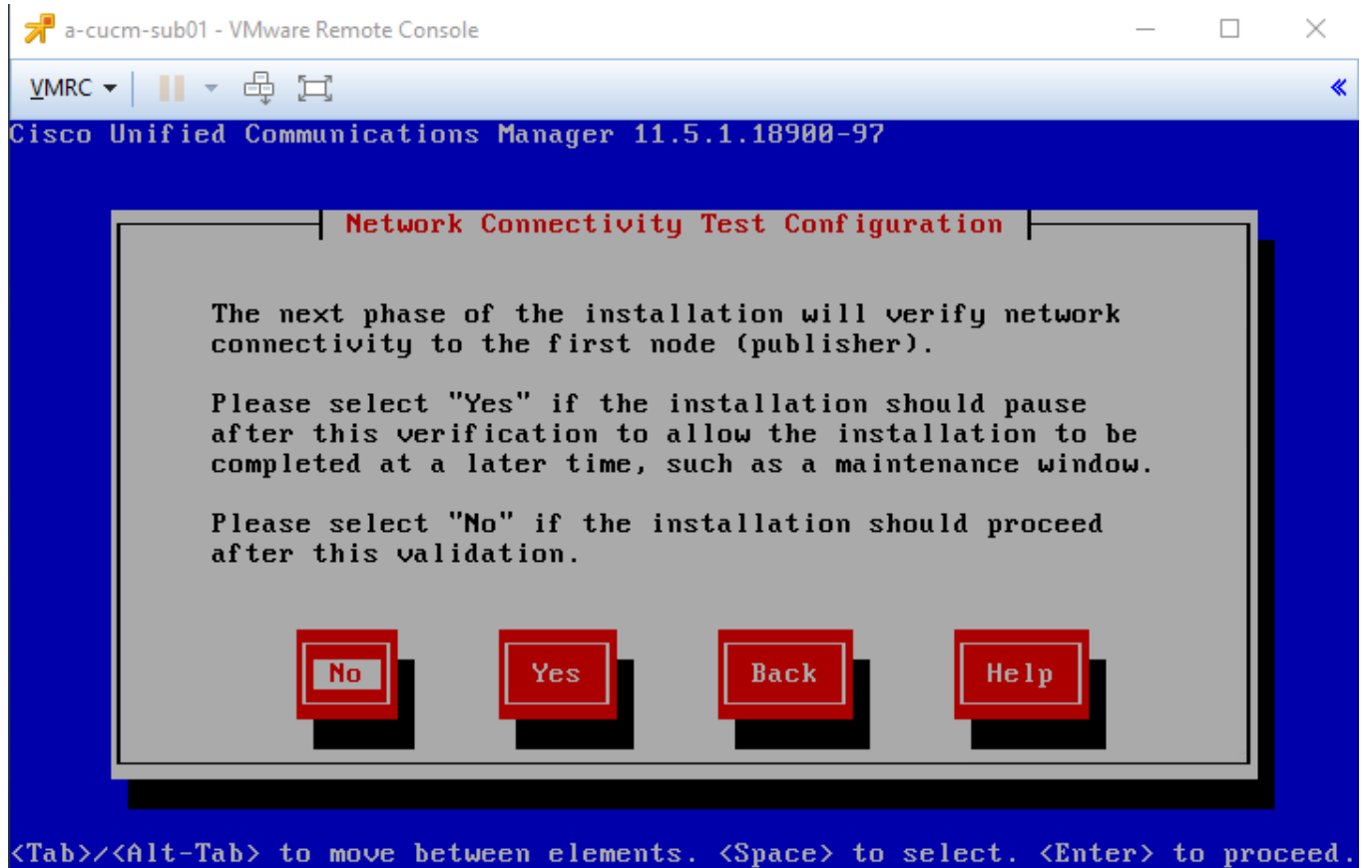
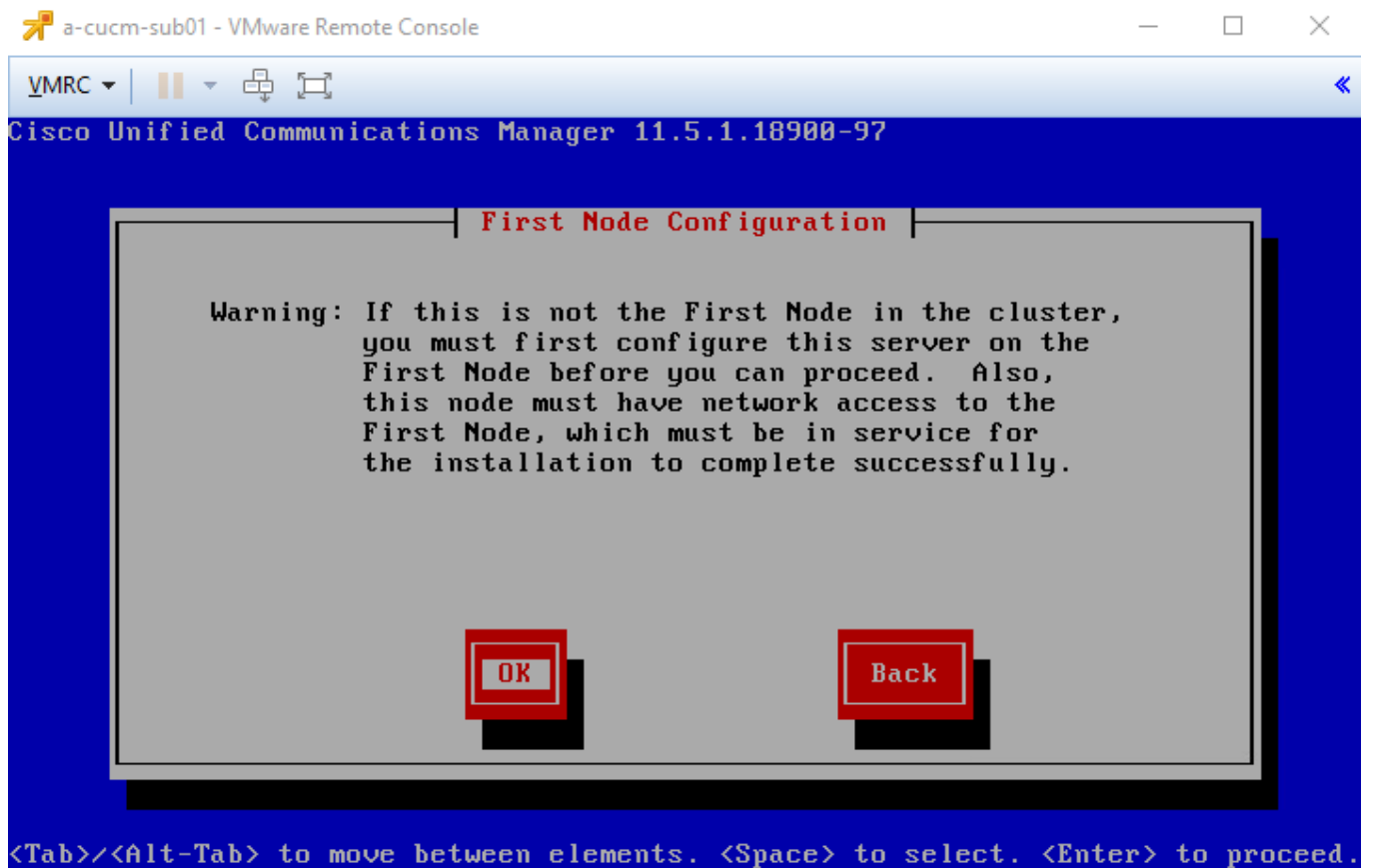
- This is the Linux OS Admin password
- Used to login to CUCM Node CLI while troubleshooting

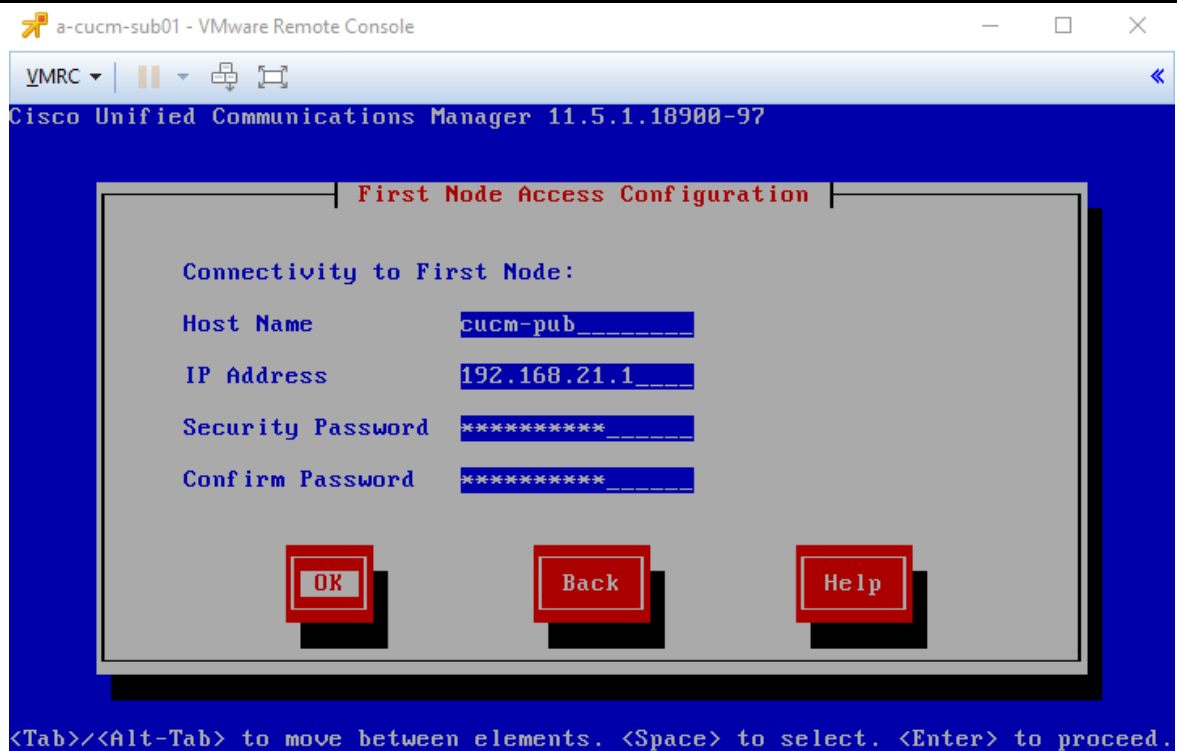


- This is node specific, means we need to enter this while installing CUCM Pub and CUCM Sub

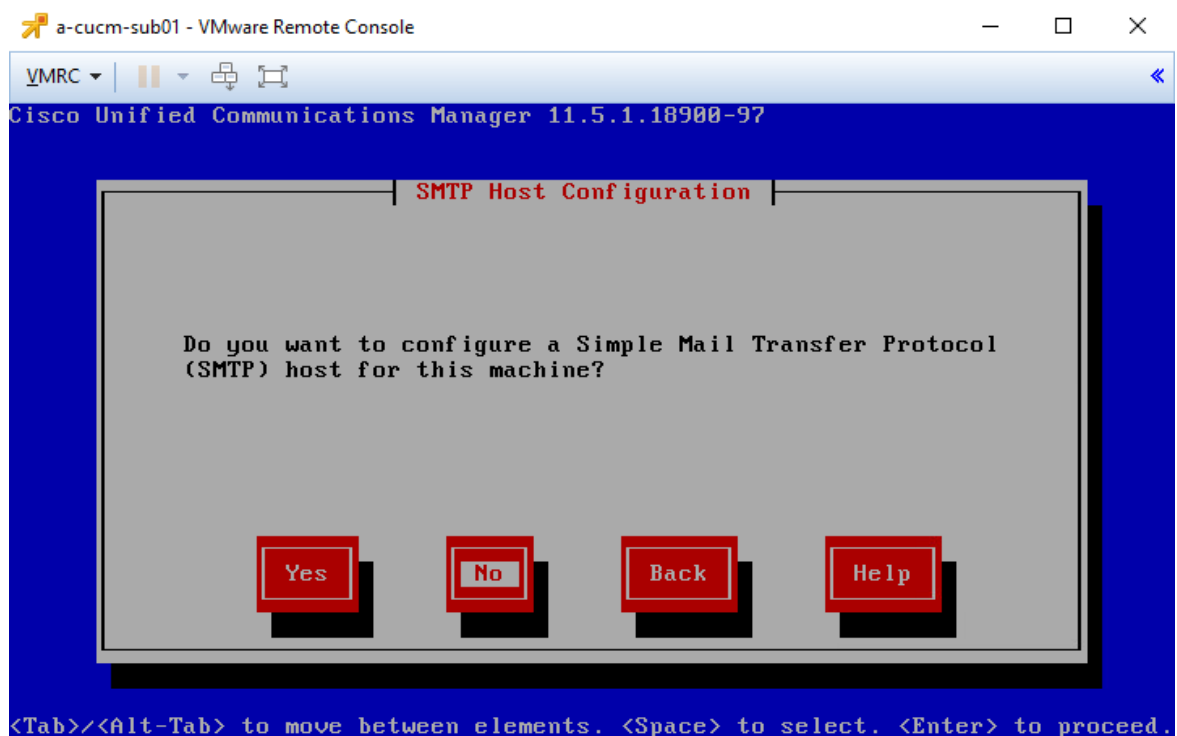


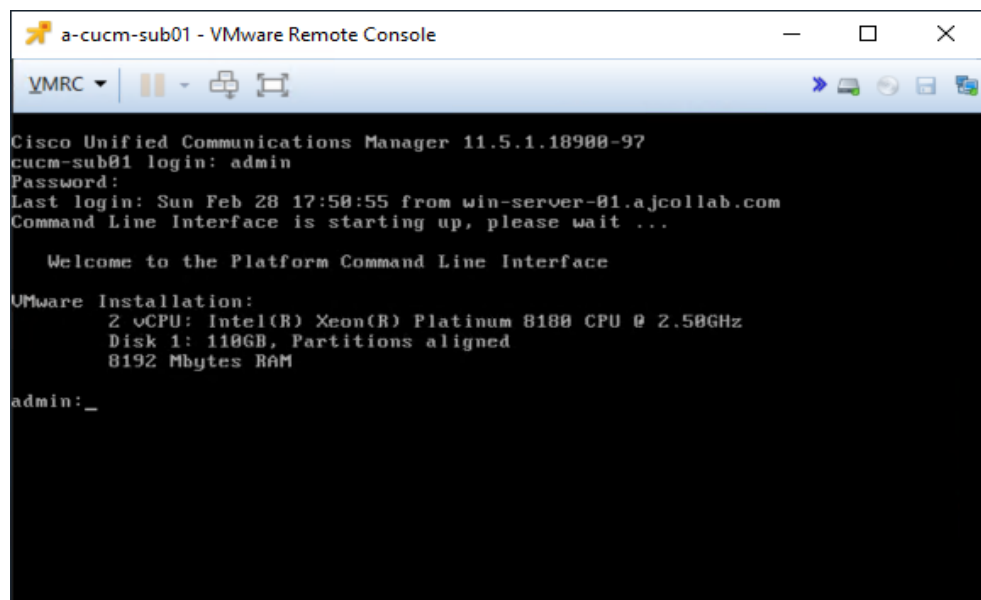
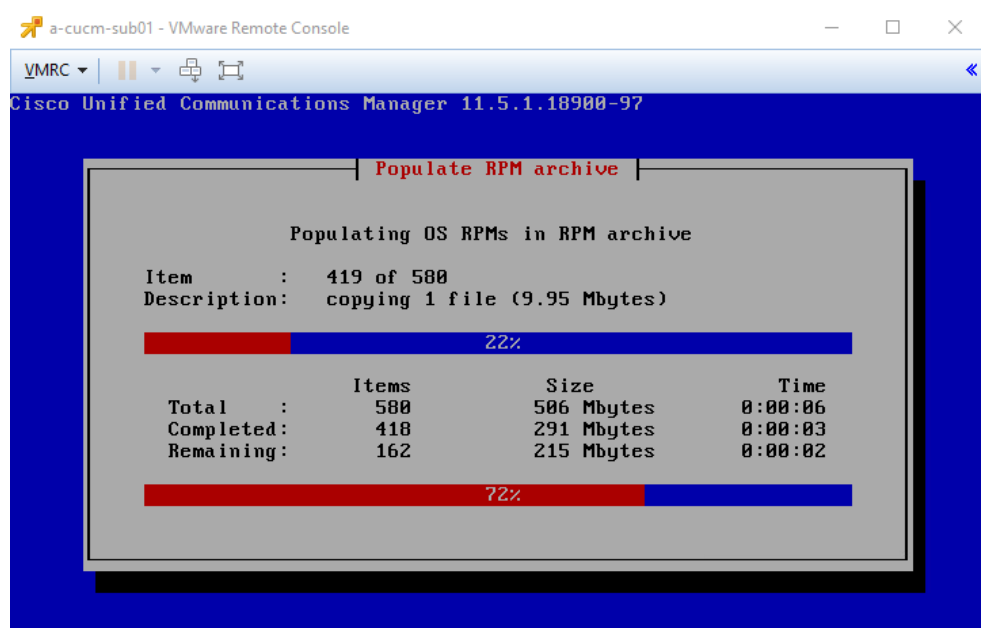
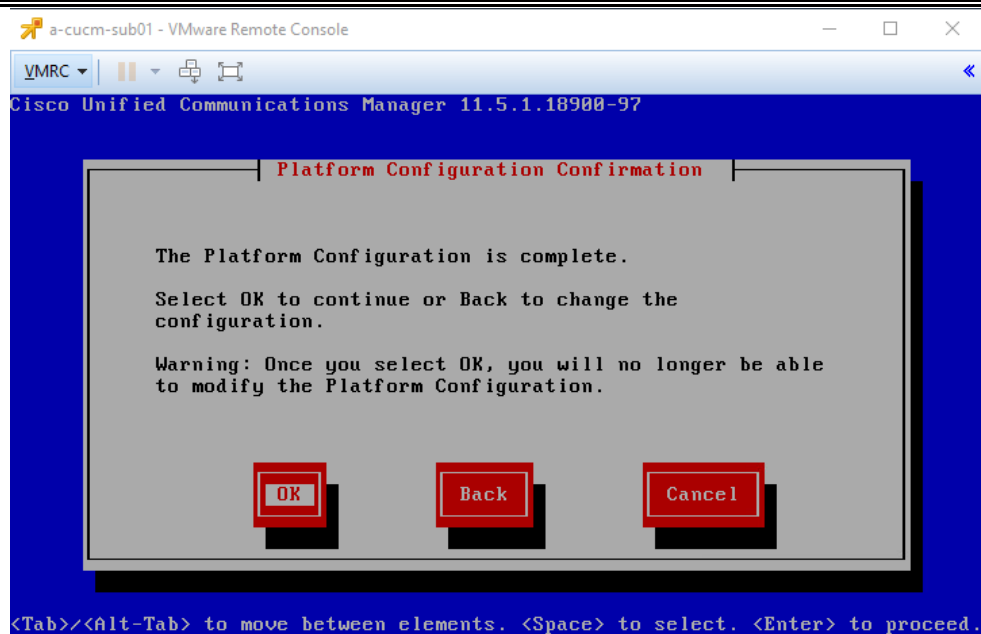
- Till here CUCM PUB and SUB installations are same
- This is the 1st difference in CUCM Sub installation
- We select this is NOT a First node in the cluster





- We must give the CUCM Pub details here
- During the installation, Sub will do network connectivity validation
- CUCM Pub must be ON state
- Make sure you added CUCM-SUB01 in the System >> Server of CUCM-PUB
- We should enter the security password here
- This must match the one we gave while installing CUCM Pub





Virtual Hardware

VM Options

Add hard disk

Add network adapter

Add other device

▶ CPU	2		
▶ Memory	4096	MB	
▶ Hard disk 1	80	GB	
▶ SCSI Controller 0	LSI Logic Parallel		
▶ Network Adapter 1	VM Network	<input checked="" type="checkbox"/> Connect	
▶ Floppy drive 1			
▶ CD/DVD Drive 1	Host device	<input type="checkbox"/> Connect	
▶ Video Card	Specify custom settings		

Save

Cancel

[Lab] Some Useful CLI Commands

CLI Commands	Use
Status Commands	
show status	Get the node status
show myself	Get node details
show network eth0	Get node IP Details
show network cluster	To know other node details
run sql select * from processnode	To know other node details
utils ntp status	Get NTP status, stratum should be <=5
show web-security	To know tomcat certificate information
Config Commands	
set network ip eth0 192.168.21.1 255.255.128.0	Change IP
set network gateway 192.168.0.1	Change Gateway
set network hostname cucm-pub	Change Hostname
set network domain ajcollab.com	Change domain name
set network dns primary 192.168.11.1	Change DNS primary server
set network dns secondary 192.168.11.2	Change DNS secondary server
Troubleshooting Commands	
utils service list	List all service status
utils diagnose test	Node diagnostic information
show process load	To know the process load
show process using-most cpu	To know process consuming more CPU
show process using-most memory	To know process consuming more RAM
Operational Commands	
utils service restart Cisco Tomcat	Restart a Service (e.g. Cisco Tomcat)
utils system restart	Node restart
utils system shutdown	Node shutdown

Troubleshooting vmware Tools on UC Servers [Lab Workaround]

- VMware Tools is a suite of utilities that enhances the performance of the virtual machines guest operating system and improves management of the virtual machine
- vmware Tools provides better display resolution, fetches the host name, IP Address, MAC Address of the guest OS
- Full support for ESXi action buttons (Shutdown Guest OS from ESXi)

The screenshot shows the VMware ESXi web interface for a virtual machine named 'aj_cucm-pub_192.168.121.1'. The interface is divided into several sections:

- Navigator:** A sidebar on the left showing the hierarchy of hosts and virtual machines. The 'aj_cucm-pub_192.168.121.1' VM is selected.
- Actions:** A row of buttons for managing the VM, including 'Power on', 'Power off', 'Suspend', 'Reset', 'Edit', and 'Refresh'.
- General Information:** A table showing the VM's configuration:

aj_cucm-pub_192.168.121.1	
Guest OS	Red Hat Enterprise Linux 6 (64...
Compatibility	ESXi 5.0 virtual machine
VMware Tools	Yes
CPU	2
Memory	4 GB
- VMware Tools:** A section with a red box highlighting the status:

aj_cucm-pub_192.168.121.1	
Installed	Yes
Version	VMware Tools 10.3.21 build 14772444
Running	No
- Performance summary last hour:** A line graph showing 'Consumed host CPU' (green line) and 'Consumed host mem' (blue line) over time. The CPU usage is fluctuating between 60% and 100%, while memory usage is increasing towards 100%.
- Recent tasks:** A table at the bottom showing the status of recent tasks, with columns for Task, Target, Initiator, Queued, Started, Result, and Completion.

```
aj_cucm-pub_192.168.121.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
aj_cucm-pub_192.168.121.1 x
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
  2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
  Disk 1: 80GB, Partitions aligned
  4096 Mbytes RAM

admin:utils os secure permissive
OS security mode changed to Permissive
admin:
admin:
admin:utils syste
admin:utils system shu
admin:utils system shutdown

Do you really want to shutdown ?

Enter (yes/no)? yes

Appliance is being Powered - Off ...
Warning: Shutdown could take up to 5 minutes.
█
```

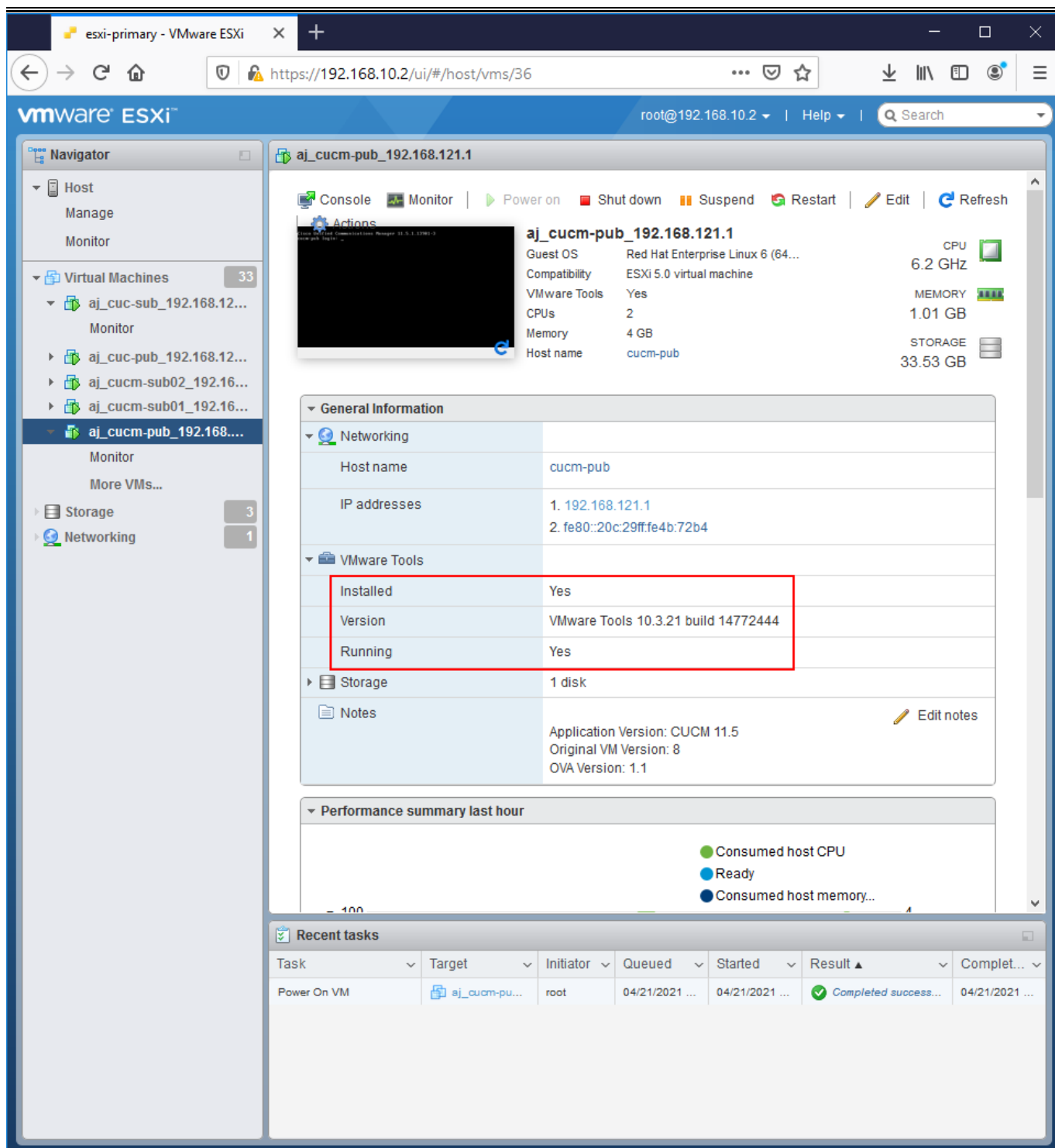
Edit settings - aj_cucm-pub_192.168.121.1 (ESXi 5.0 virtual machine)

Virtual Hardware **VM Options**

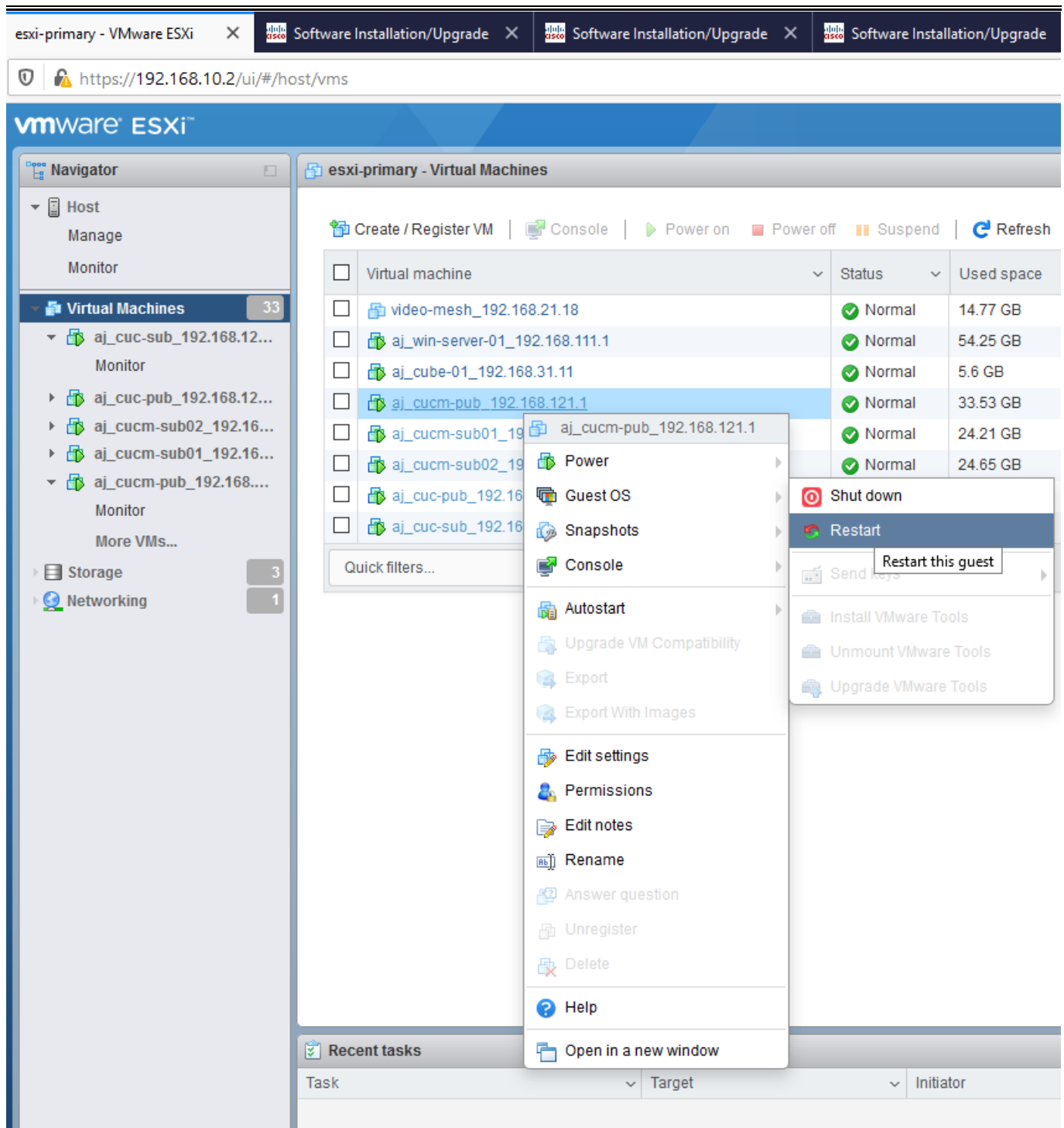
General Options	VM Name: aj_cucm-pub_192.168.121.1
VMware Remote Console Options	<input type="checkbox"/> Lock the guest operating system when the last remote user disconnects
VMware Tools	
Power Operations	<div><div>Shut Down Guest</div><div>Suspend</div><div>Power On / Resume VM</div><div>Restart Guest</div></div>
Run VMware Tools Scripts	<div><input checked="" type="checkbox"/> After powering on</div> <div><input checked="" type="checkbox"/> After resuming</div> <div><input checked="" type="checkbox"/> Before suspending</div> <div><input checked="" type="checkbox"/> Before shutting down guest</div>
Tools Upgrades	<div><input checked="" type="checkbox"/> Check and upgrade VMware Tools before each power on</div>

Save Cancel

- Now power on the virtual machine



- It is not recommended to disable SE Linux in production cluster, hence this can be applied in Lab servers
- There are some known issues (CSCvq17528, CSCvh55176, CSCvm52977, and CSCvb21486) for CUCM 11.5 vmware Tools, hence for production servers, kindly install the COP File 'ciscocm.CSCvq17528_vmtools_initramfs_v1.3.cop'



- This restart is a graceful restart, that means it is equivalent to 'utils system restart' command

Troubleshooting vmware Tools on UC Servers [Production Workaround]

- Download the COP File `ciscocm.CSCvq17528_vmtools_initramfs_v1.3.cop.sgn` and place it in SFTP Server

Cisco Unified Operating System Administration

For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go

admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

Install/Upgrade

TFTP File Management

Install/Upgrade

Device Configuration

Customized Logon Message

WARNING: No backup is required to recover your system in case of failure.

Cisco Unified Operating System Administration

System version: 11.5.1.13901-3

VMware Installation: 2 vCPU Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz, disk 1: 80Gbytes, 4096Mbytes RAM, Partitions aligned

Last Successful Logon: Never

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This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.


A summary of U.S. laws governing Cisco cryptographic products may be found at our [Export Compliance Product Report](#) web site.

For information about Cisco Unified Communications Manager please visit our [Unified Communications System Documentation](#) web site.

For Cisco Technical Support please visit our [Technical Support](#) web site.

Software Installation/Upgrade

https://192.168.121.1/cmplatform/install.do

**Cisco Unified Operating System Administration**
For Cisco Unified Communications Solutions


Navigation Cisco Unified OS Administration Go
admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Cancel Next

Status

 Status: Ready

Software Location

Source* Remote Filesystem

Directory* /upgrades

Server* 192.168.11.1

User Name* sftp.admin


User Password*

Transfer Protocol* SFTP

SMTP Server


Email Destination

Cancel Next

 *- indicates required item.

Software Installation/Upgrade

https://192.168.121.1/cmplatform/installOptions.do

**Cisco Unified Operating System Administration**
For Cisco Unified Communications Solutions


Navigation Cisco Unified OS Administration Go
admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Cancel Next


Status

 Status: Ready

Software Location

Options/Upgrades* ciscocm.CSCvq17528_vmttools_initramfs_v1.3.cop.sgn

Cancel Next

 *- indicates required item.

Software Installation/Upgrade X +

https://192.168.121.1/cmplatform/installConfirm.do

Cisco Unified Operating System Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go
admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Cancel Next

Status

- Warning:** To ensure the integrity of the installation file, please verify the MD5 hash value against the Cisco Systems web site
- Warning:** To ensure the integrity of the installation file, please verify the SHA512 value against the Cisco Systems web site
- Warning:** You may need to stop some services before you install a locale. You may then restart those services after you complete the locale installation. Refer to your product-specific online help for locale installation details.

File Checksum Details

File ciscocm.CSCvq17528_vmttools_initramfs_v1.3.cop.sgn
MD5 Hash Value ba:f7:ff:30:34:95:c6:3c:91:ba:4b:fa:fd:ae:c8:79
SHA512 Value

Cancel Next

*- indicates required item.

Software Installation/Upgrade X +

https://192.168.121.1/cmplatform/installStatus.do

Cisco Unified Operating System Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go
admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Cancel

Installation Status

File ciscocm.CSCvq17528_vmttools_initramfs_v1.3.cop.sgn
Start Time Wed Apr 21 22:49:01 IST 2021
Status **Running**

Installation Log

```
04/21/2021 22:48:31 upgrade_get_file.sh|Create md5 complete|<LVL::Info>
04/21/2021 22:48:31 upgrade_get_file.sh|Authenticate file "/common/download/ciscocm.CSCvq17528_vmttools_initramfs_v1.3.cop.sgn"|<LVL::Info>
04/21/2021 22:48:31 upgrade_get_file.sh|File authentication complete|<LVL::Debug>
04/21/2021 22:48:31 upgrade_get_file.sh|Download of iso file RTMTFinish|<LVL::Notice>
04/21/2021 22:48:31 upgrade_get_file.sh|Process preflight|<LVL::Info>
04/21/2021 22:48:31 upgrade_get_file.sh|Skipping preflight since file type is COP|<LVL::Debug>
04/21/2021 22:48:32 upgrade_get_file.sh|success|<LVL::Info>
04/21/2021 22:48:32 upgrade_get_file.sh|upgrade_get_file.sh complete (rc=0)|<LVL::Info>
04/21/2021 22:48:32 upgrade_get_file.sh|is_upgrade_lock_available: Upgrade lock is not available.|<LVL::Debug>
04/21/2021 22:48:32 upgrade_get_file.sh|is_upgrade_in_progress: Already locked by this process (pid: 7127).|<LVL::Debug>
04/21/2021 22:48:32 upgrade_get_file.sh|release_upgrade_lock: Releasing lock (pid: 7127)|<LVL::Debug>
```

Cancel

*- indicates required item.

Software Installation/Upgrade

https://192.168.121.1/cmplatform/installStatus.do

Cisco Unified Operating System Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go
admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Install Another

Installation Status

File ciscocm.CSCvq17528_vmttools_initramfs_v1.3.cop.sgn
Start Time Wed Apr 21 22:49:01 IST 2021
Status Complete

Installation Log

```
#####  
The installed version is "11.5.1". Proceeding with install.  
#####  
  
The version is 11.5.1  
grep: /etc/cron.hourly/checkinitramfs: No such file or directory  
  
[21/04/21_22:49:40] locale_install.sh: Not running installdb.  
[21/04/21_22:49:40] locale_install.sh: Successful running of copstart for /common/download//ciscocm.CSCvq17528_vmttools_initramfs_v1.3.cop
```

Install Another

*- indicates required item.

aj_cucm-pub_192.168.121.1 - SecureCRT

File Edit View Options Transfer Script Tools Window Help

Enter host <Alt+R>

aj_cucm-pub_192.168.121.1

```
Command Line Interface is starting up, please wait ...  
  
Welcome to the Platform Command Line Interface  
  
VMware Installation:  
  2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz  
  Disk 1: 80GB, Partitions aligned  
  4096 Mbytes RAM  
  
admin:utils syste  
admin:utils system rest  
admin:utils system restart  
*** WARNING ***  
Please make sure database replication setup is complete. Use the command 'utils dbreplication runtimest  
ate' to get the current status.  
If database replication setup is in progress, restarting the server may leave database replication unab  
le to complete.  
  
Do you really want to restart ?  
  
Enter (yes/no)? yes  
  
Appliance is being Restarted ...  
Warning: Restart could take up to 5 minutes.  
Stopping Service Manager...
```

```
aj_cucm-pub_192.168.121.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
aj_cucm-pub_192.168.121.1
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
  2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
  Disk 1: 80GB, Partitions aligned
  4096 Mbytes RAM

admin:show version active
Active Master Version: 11.5.1.13901-3
Active Version Installed Software Options:
ciscocm.CSCvq17528_vmtools_initramfs_v1.3.cop
admin:
admin:
```

esxi-primary - VMware ESXi

https://192.168.10.2/ui/#/host/vms/36

root@192.168.10.2 | Help | Search

aj_cucm-pub_192.168.121.1

Console Monitor Power on Shut down Suspend Restart Edit Refresh

aj_cucm-pub_192.168.121.1

Guest OS	Red Hat Enterprise Linux 6 (64...	CPU	6.2 GHz
Compatibility	ESXi 5.0 virtual machine	MEMORY	1.01 GB
VMware Tools	Yes	STORAGE	33.53 GB
CPUs	2		
Memory	4 GB		
Host name	cucm-pub		

General Information

Networking

Host name	cucm-pub
IP addresses	1. 192.168.121.1 2. fe80::20c:29ff:fe4b:72b4

VMware Tools

Installed	Yes
Version	VMware Tools 10.3.21 build 14772444
Running	Yes

Storage

1 disk

Notes

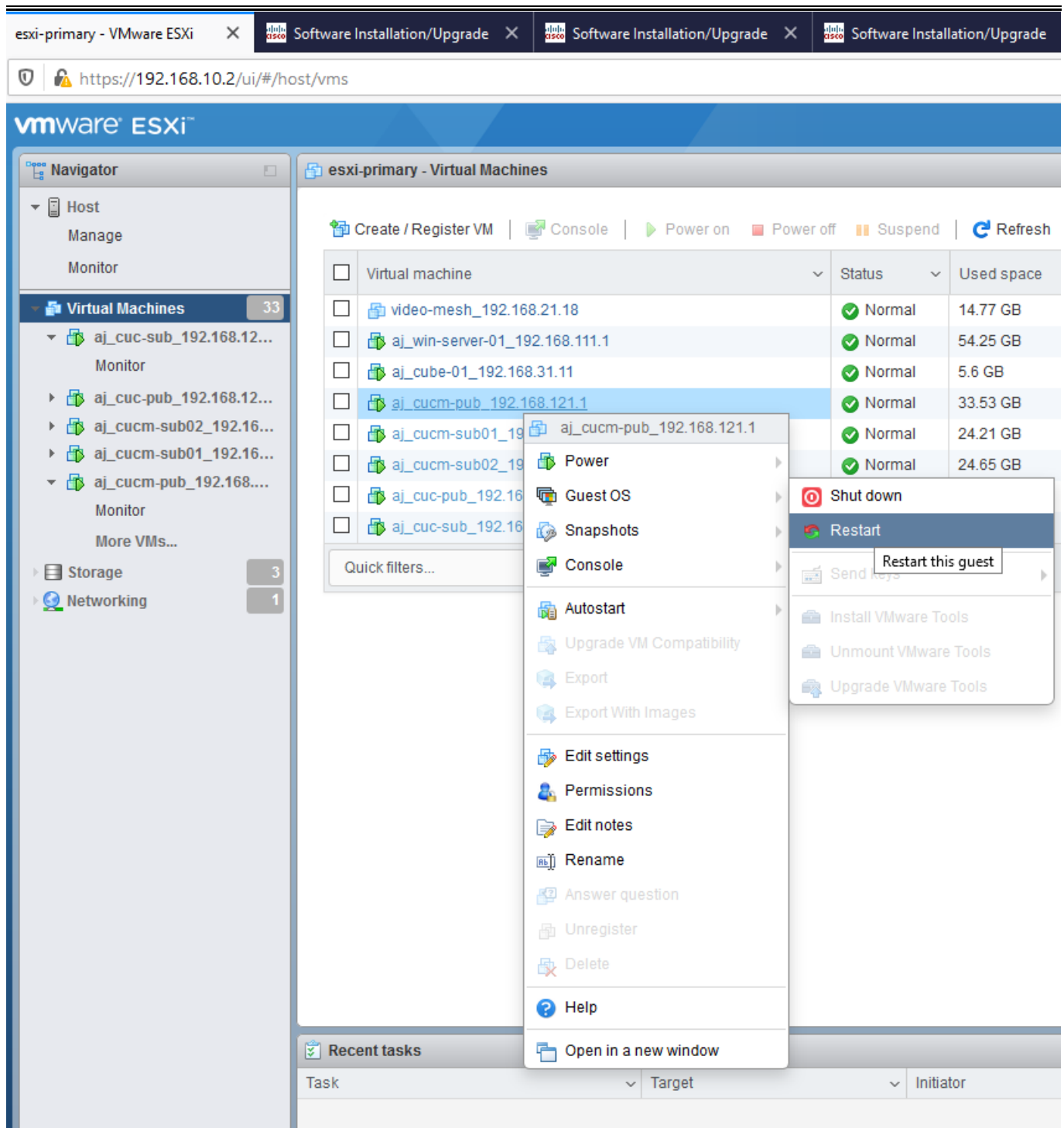
Application Version: CUCM 11.5
Original VM Version: 8
OVA Version: 1.1

Performance summary last hour

Consumed host CPU
Ready
Consumed host memory...

Recent tasks

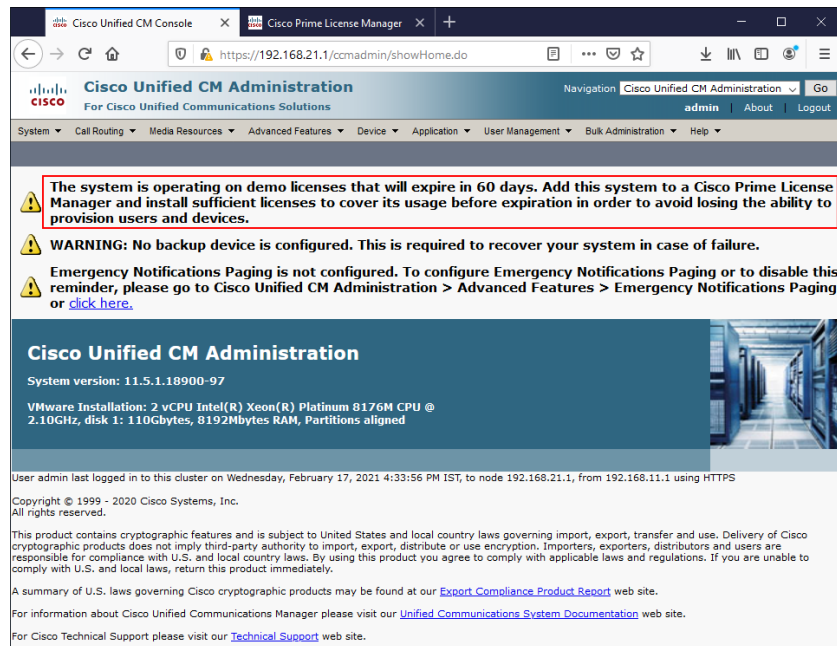
Task	Target	Initiator	Queued	Started	Result	Comple...
Power On VM	aj_cucm-pu...	root	04/21/2021 ...	04/21/2021 ...	Completed success...	04/21/2021 ...



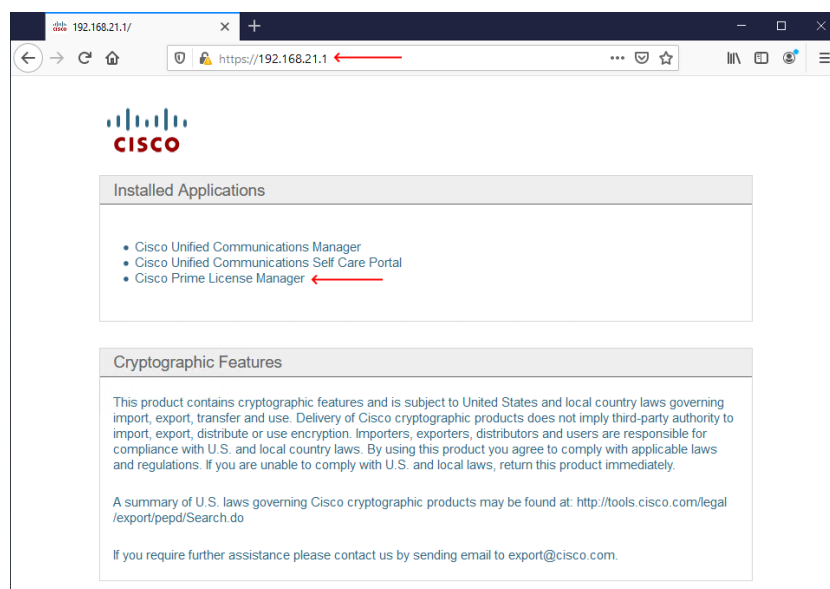
- This restart is a graceful restart, that means it is equivalent to 'utils system restart' command

[Lab] CUCM Licensing

- Right after installing CUCM Cluster, we can see “The system is operating on demo license that will expire in 60 days”



- We must configure the licensing for UC cluster to get rid of from this warning as well as to get licensed features
- The license is managed by Cisco Prime License Manager which is co-installed with CUCM
- You can also maintain separate node for Cisco Prime License Manager
- CUCM Cluster is synchronized with prime Cisco Prime License Manager
- In our scenario, I'm using co-installed Cisco Prime License Manager on CUCM PUB, that means I browse https://cucm-pub/elm to access Cisco Prime License Manager. Platform credentials are used to login to PLM



Cisco Unified CM Console x Cisco Prime License Manager x

https://192.168.21.1/elm-admin/faces/main.xhtml

Cisco Prime License Manager

Dashboard Licenses Product Instances Administration

Dashboard

⚠ Cisco Prime License Manager is operating in demo mode. Install licenses to cover the licensing requirements of your product instances in order to avoid losing functionality in those products.

Overview

Product Instances: 0
Last License Update: -
Last Synchronization: 2021-Feb-17 14:55:36
Previous Successful Login: -

License Alerts

Type	Status
No data available	

License Usage

Type	Required
No data available	

Product Instance Alerts

Name	Status	Last
No data available		

Cisco Unified CM Console x Cisco Prime License Manager x

https://192.168.21.1/elm-admin/faces/main.xhtml

Cisco Prime License Manager

Dashboard Licenses **Product Instances** Administration

Product Instances

Last Synchronized: 2021-Feb-17 14:55:36 Synchronize Now

Product Instances Total 0

+ Add... ←

Name	Hostname/IP Address	Product Type	Version	Status	Last Succ
No data available					

Product Add

*Name: site-a-cucm-cluster
Description: site-a-cucm-cluster
*Product Type: Unified CM
*Hostname/IP Address: cucm-pub ←
*Username: admin
*Password: ••••••••
Test Connection
OK Cancel

Cisco Unified CM Console x Cisco Prime License Manager x

https://192.168.21.1/elm-admin/faces/main.xhtml

admin | Log Out

Dashboard Licenses Product Instances Administration

Product Instances

Last Synchronized: 2021-Feb-17 14:55:36 [Synchronize Now](#)

Product Instances Total 1

[Add...](#)

Name	Hostname/IP Address	Product Type	Version	Status	Last Success
site-a-cucm-cluster	cucm-pub	Unified CM	11.5.1	-	Never

Cisco Unified CM Console x Cisco Prime License Manager x

https://192.168.21.1/elm-admin/faces/main.xhtml

admin | Log Out

Dashboard Licenses Product Instances Administration

Dashboard

Cisco Prime License Manager is operating in demo mode. Install licenses to cover the licensing requirements of your product instances in order to avoid losing functionality in those products.

Overview

Product Instances: 1
 Last License Update: -
 Last Synchronization: 2021-Feb-17 17:18:09
 Previous Successful Login: -

License Usage

Type	Required
No data available	

License Alerts

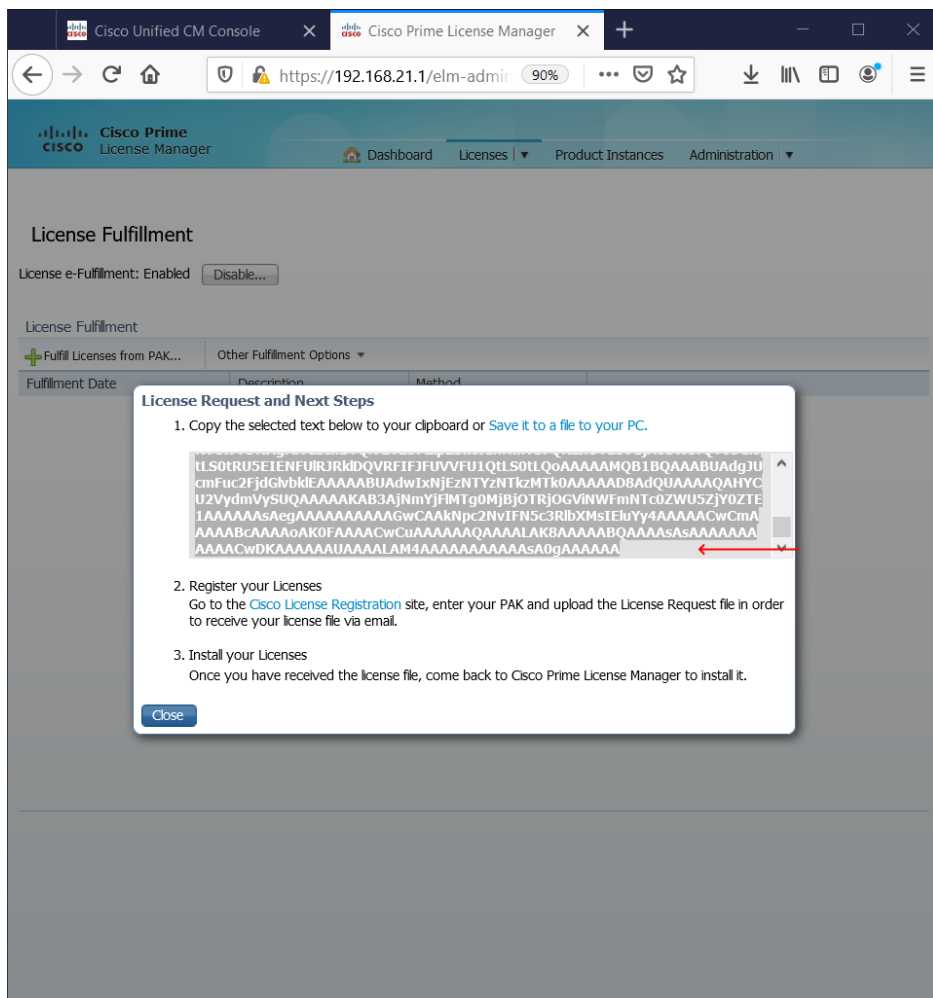
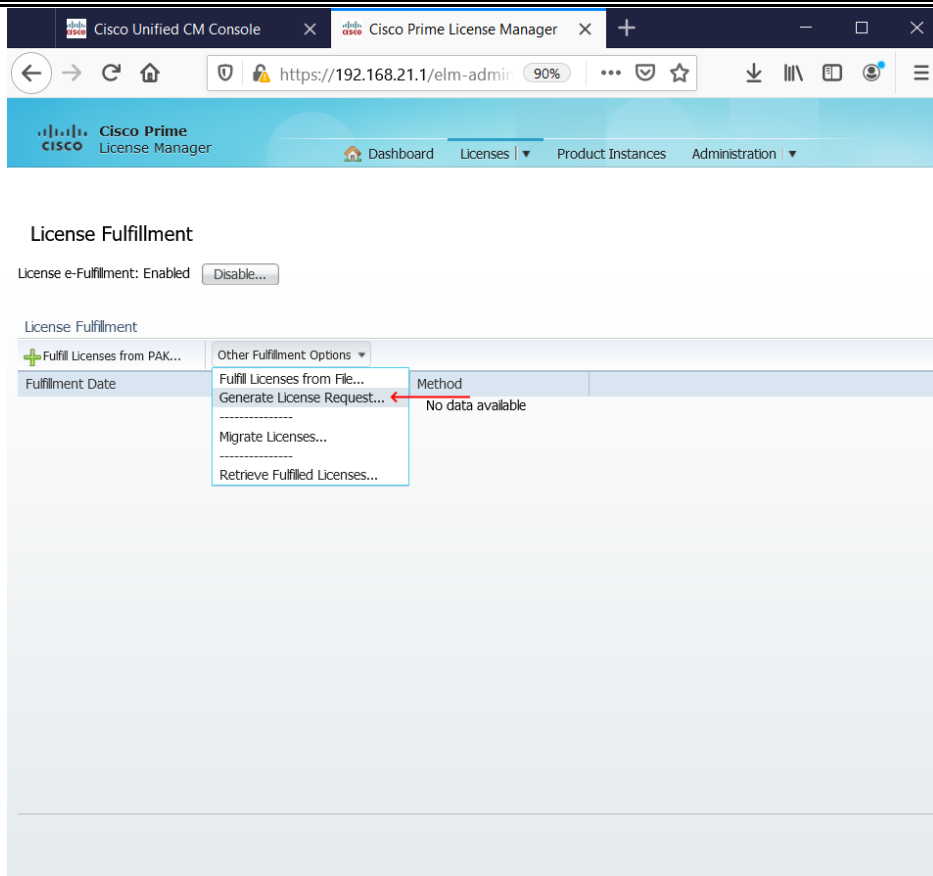
Type
No

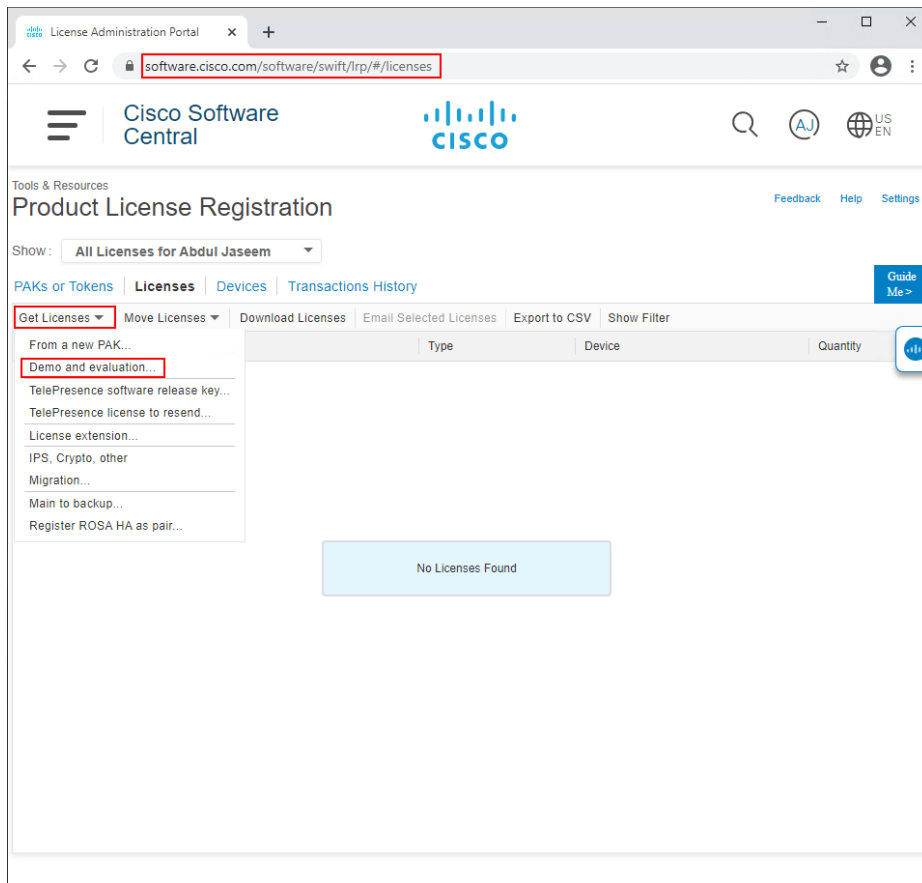
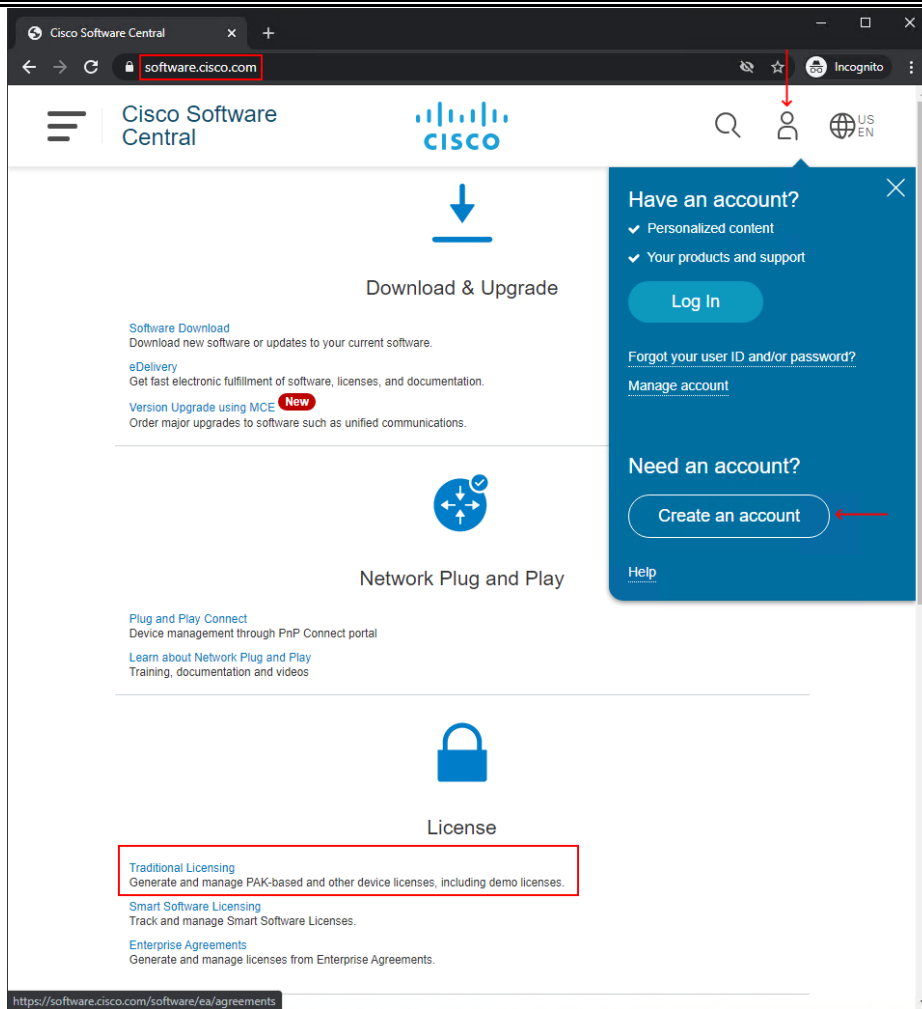
Product Instance Alerts

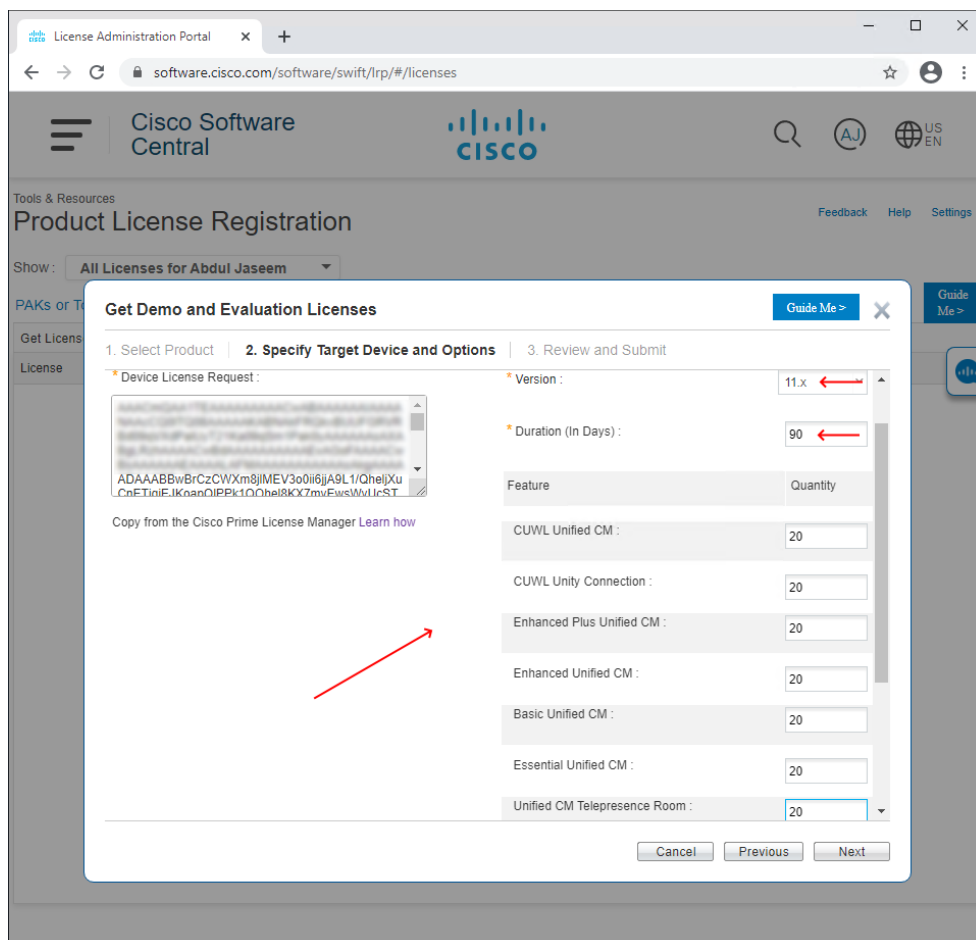
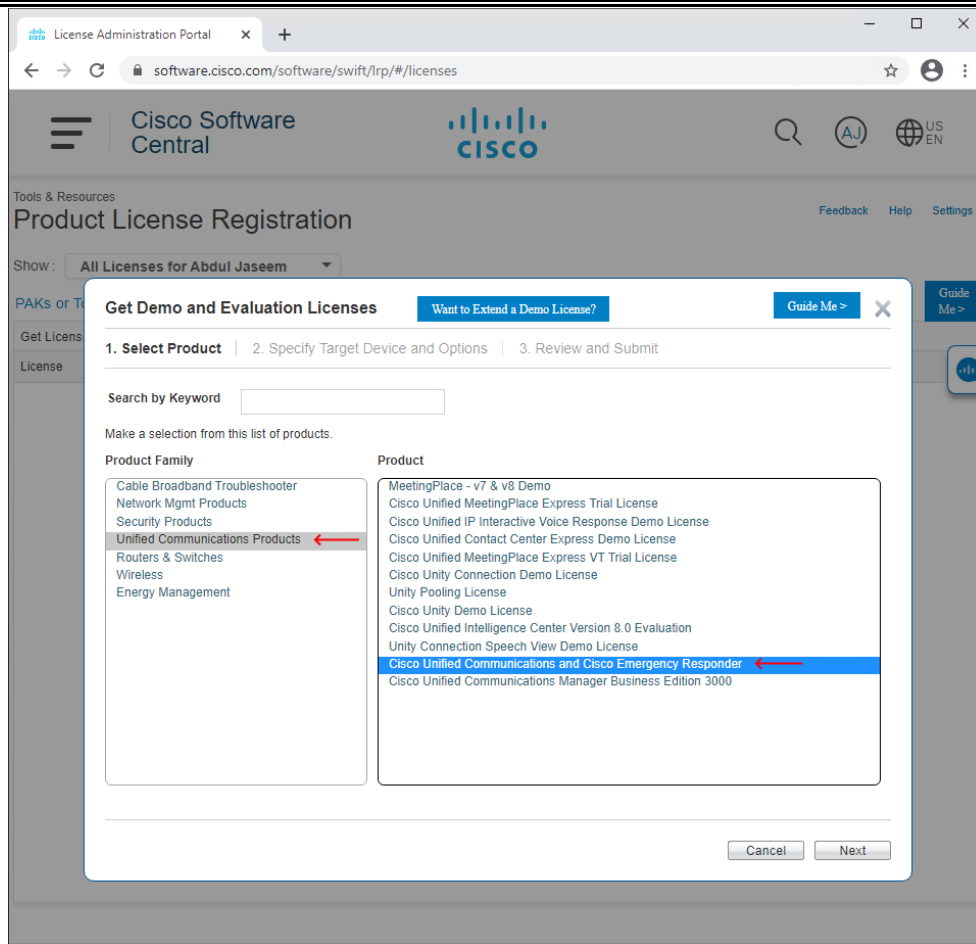
Name	Status
site-a-cucm-cluster	Demo License

Licenses

- Usage
- Planning
- Fulfillment







License Administration Portal

software.cisco.com/software/swift/lrp/#/licenses

Cisco Software Central

US

EN

Tools & Resources

Product License Registration

Feedback Help Settings

Show: All Licenses for Abdul Jaseem

PAKs or T

Get Licens

License

Get Demo and Evaluation Licenses

Guide Me >

1. Select Product2. Specify Target Device and Options3. Review and Submit

Recipient and Owner Information

Enter multiple email addresses separated by commas. Your License Key will be emailed within the hour to the specified email addresses.

* Send To: ajlabs110@gmail.comAdd...

* End User: Jaseem, AbdulEdit...

License Request

Version:	11.x	Feature	Quantity
Duration:	90	CUWL Unity Connection	20
Smart Account:	unassigned	Enhanced Unified CM	20
Virtual Account:	unassigned	Essential Unified CM	20
		CUWL Unified CM	20
		Basic Unified CM	20
		Unified CM Telepresence Room	20
		Enhanced Plus Unified CM	20

By clicking Submit you indicate that you agree with the terms of the [License Agreement](#)

CancelPreviousSubmit

License Administration Portal

software.cisco.com/software/swift/lrp/#/licenses

Cisco Software Central

US

EN

Tools & Resources

Product License Registration

Feedback Help Settings

Show: All Licenses for Abdul Jaseem

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Get Licens

License

Get Demo and Evaluation Licenses

Guide Me >

1. Select Product2. Specify Target Device and Options3. Review and Submit

Recipient and Owner Information

Enter multiple email addresses separated by commas. Your License Key will be emailed within the hour to the specified email addresses.

* Send To: ajlabs110@gmail.comAdd...

* End User: Jaseem, AbdulEdit...

License Request

Version:	11.x	Feature	Quantity
Duration:	90	CUWL Unity Connection	20
Smart Account:	unassigned	Enhanced Unified CM	20
Virtual Account:	unassigned	Essential Unified CM	20
		CUWL Unified CM	20
		Basic Unified CM	20
		Unified CM Telepresence Room	20
		Enhanced Plus Unified CM	20

By clicking Submit you indicate that you agree with the terms of the [License Agreement](#)

CancelPreviousSubmit

License Request Status

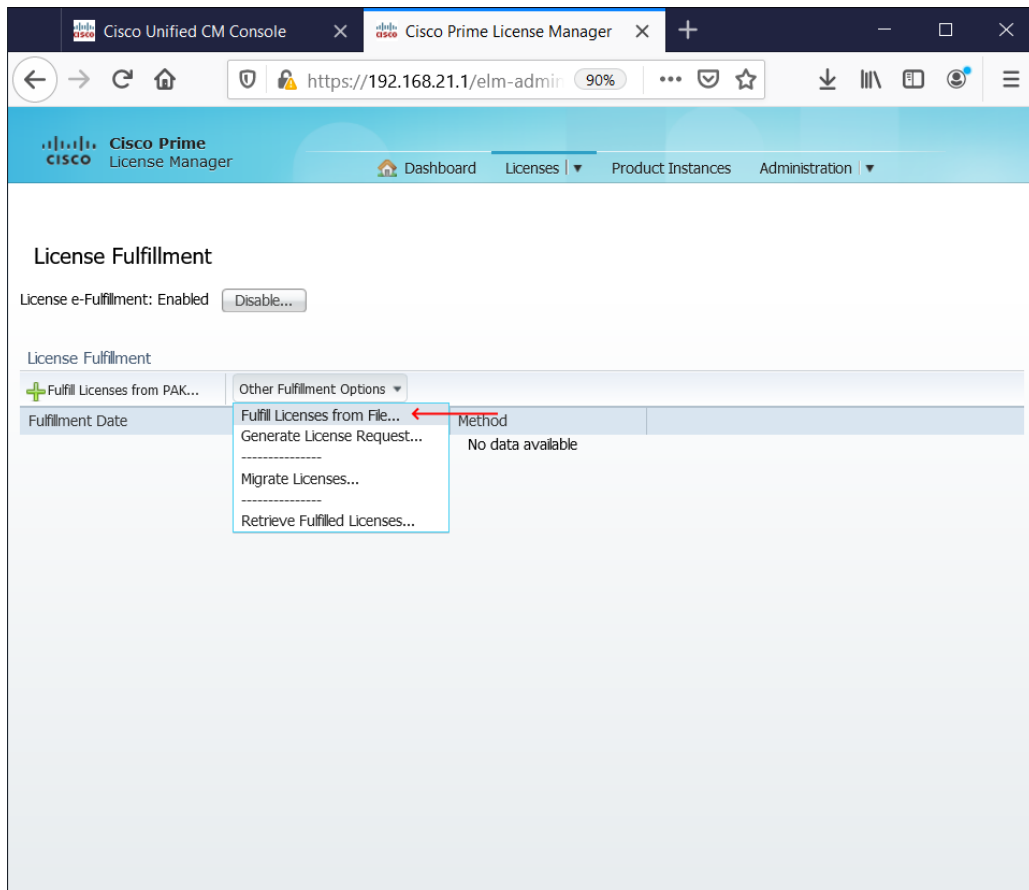
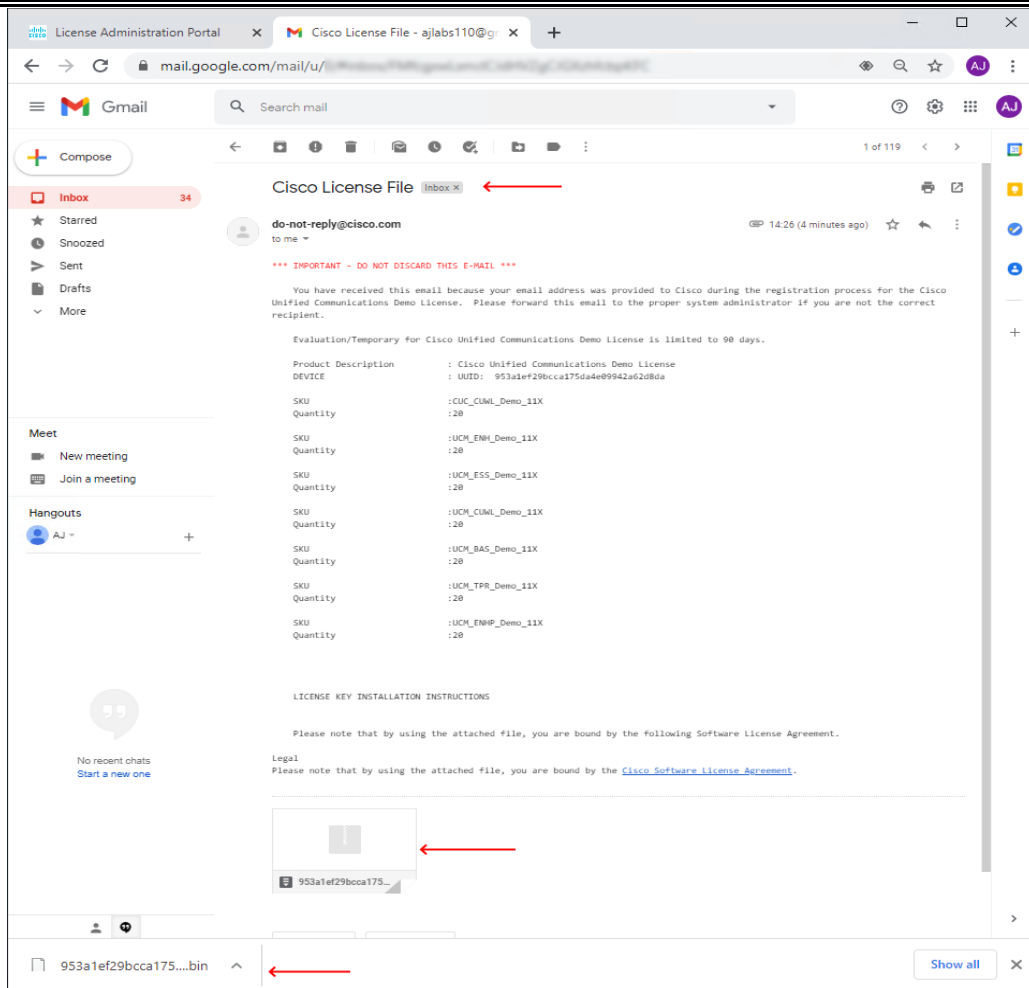
The License has been sent to - ajlabs110@gmail.com

Thank you for registering your product with Cisco System's. If you have not received an email within 1 hour, please open a [Service Request](#) using the [Open a Support Case](#), or contact GLO support. Contact numbers provided in the [Contact Us](#) link. Check that Junk/Spam email folders allow email from 'do-not-reply@cisco.com'.

Use this transaction ID to view status on the [Manage > Transactions History](#)
Transaction Id: TRXREQEPHISOIDZ

Please provide feedback... Let Cisco know how to improve this experience.

CloseDownload



Dashboard

Overview

- Product Instances: 1
- Last License Update: 2021-Feb-17 18:11:04
- Last Synchronization: 2021-Feb-17 21:32:28
- Previous Successful Login: 2021-Feb-17 17:48:39

License Usage

Type	Required
CUWL Professional (11.x) - Unified CM	0
CUWL Standard (11.x) - Unified CM	0
Enhanced Plus (11.x) - Unified CM	0
Enhanced (11.x) - Unified CM	0
Basic (11.x) - Unified CM	0
Essential (11.x) - Unified CM	0
TelePresence Room (11.x) - Unified CM	0

License Alerts

Type	Status
No data available	

Product Instance Alerts

Name	Status	Last Synchronization
No data available		

Cisco Unified CM Administration

Navigation: Cisco Unified CM Administration | Go

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

WARNING: No backup device is configured. This is required to recover your system in case of failure.

Emergency Notifications Paging is not configured. To configure Emergency Notifications Paging or to disable this reminder, please go to Cisco Unified CM Administration > Advanced Features > Emergency Notifications Paging or [click here](#).

Cisco Unified CM Administration

System version: 11.5.1.18900-97

VMware Installation: 2 vCPU Intel(R) Xeon(R) Platinum 8176M CPU @ 2.10GHz, disk 1: 110Gbytes, 8192Mbytes RAM, Partitions aligned

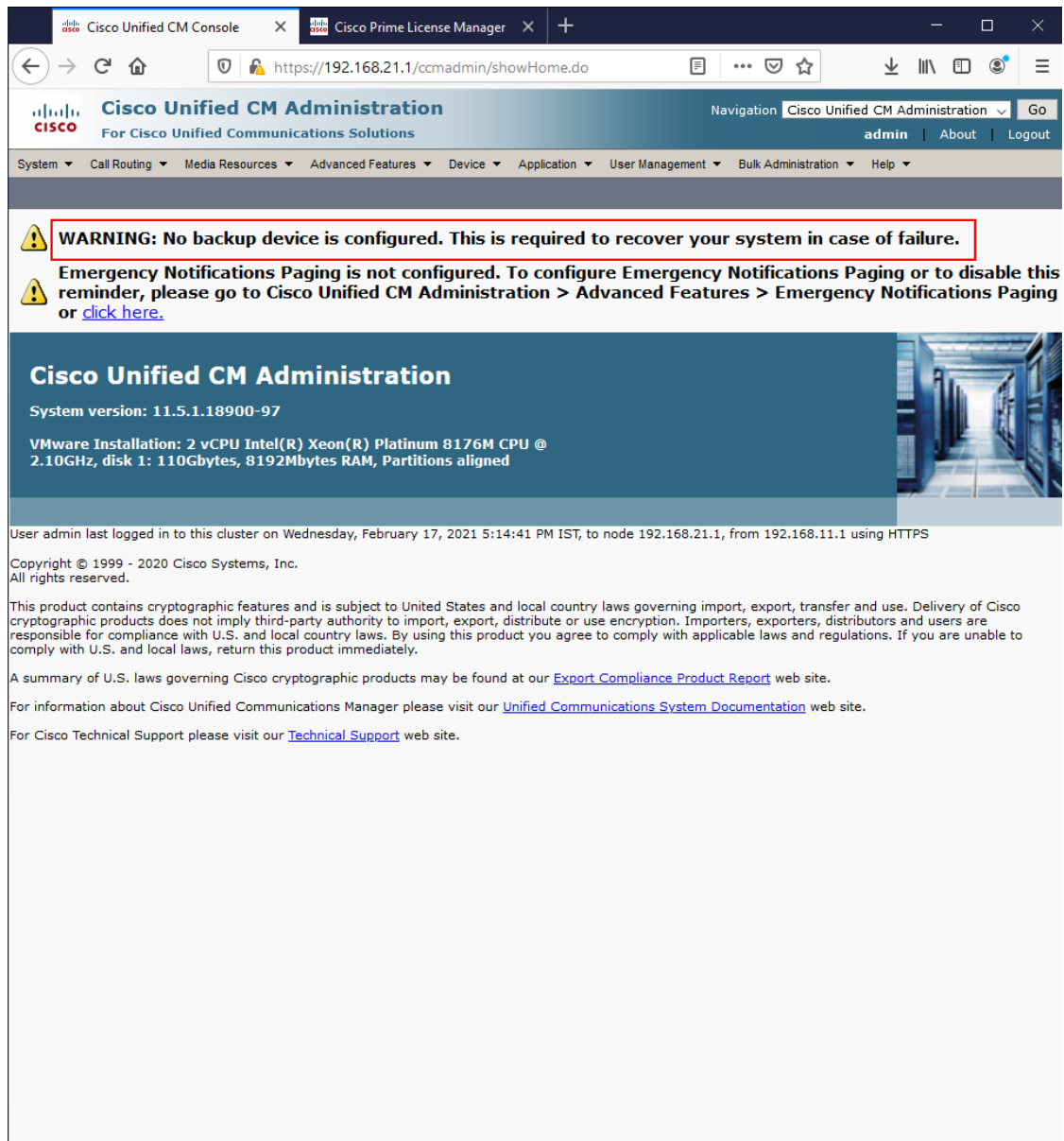
User admin last logged in to this cluster on Wednesday, February 17, 2021 5:14:41 PM IST, to node 192.168.21.1, from 192.168.11.1 using HTTPS

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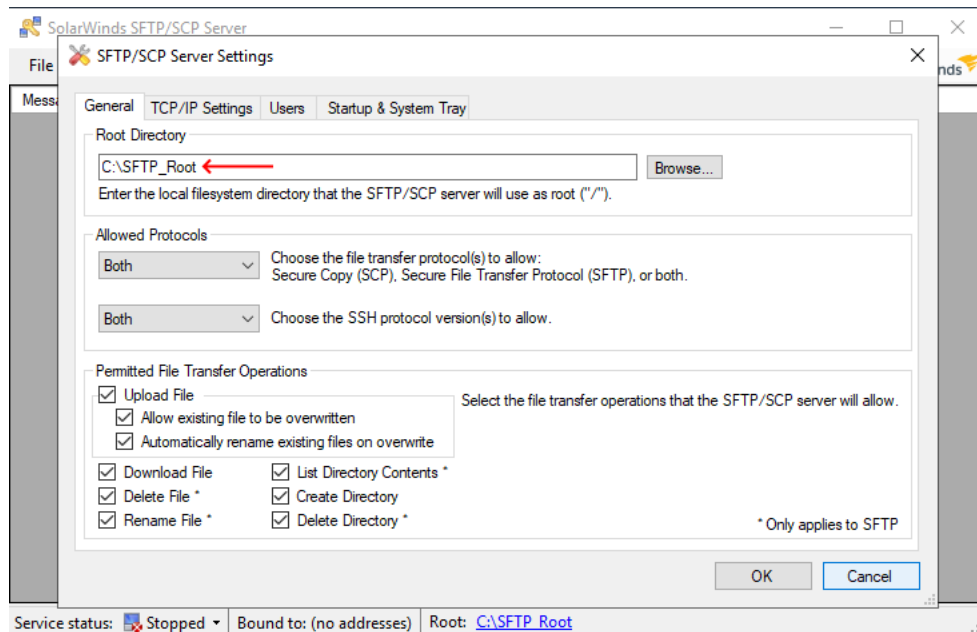
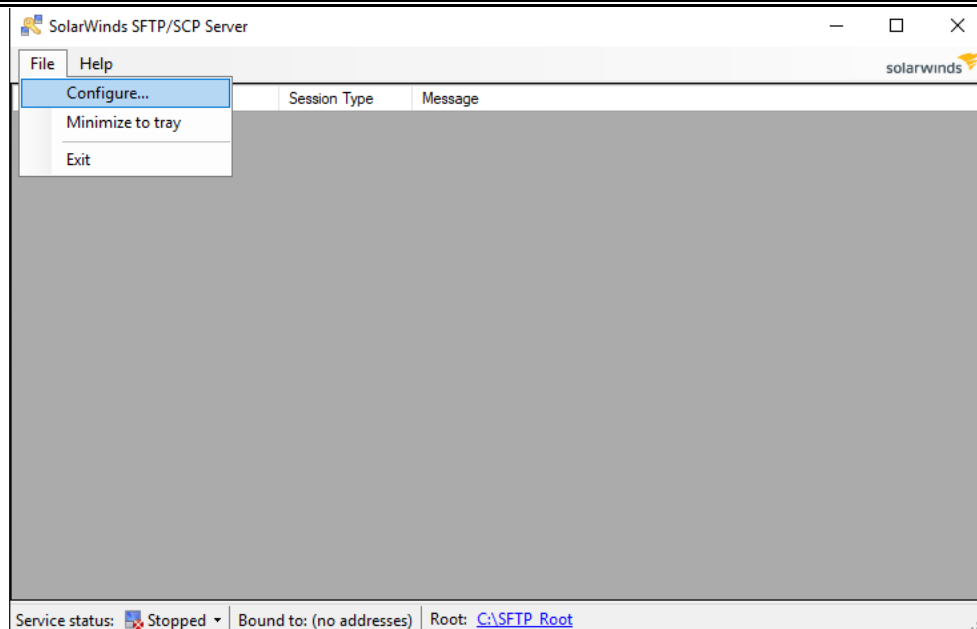
- Details about different license type and license consumption will be covered later in this document (License Consumption section)
- We need some endpoints to be registered to understand the license usage

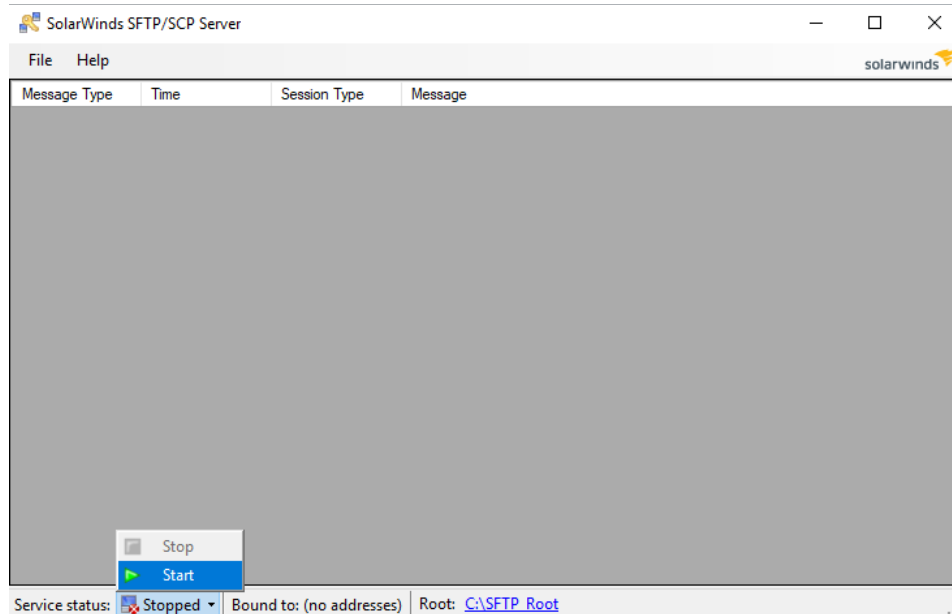
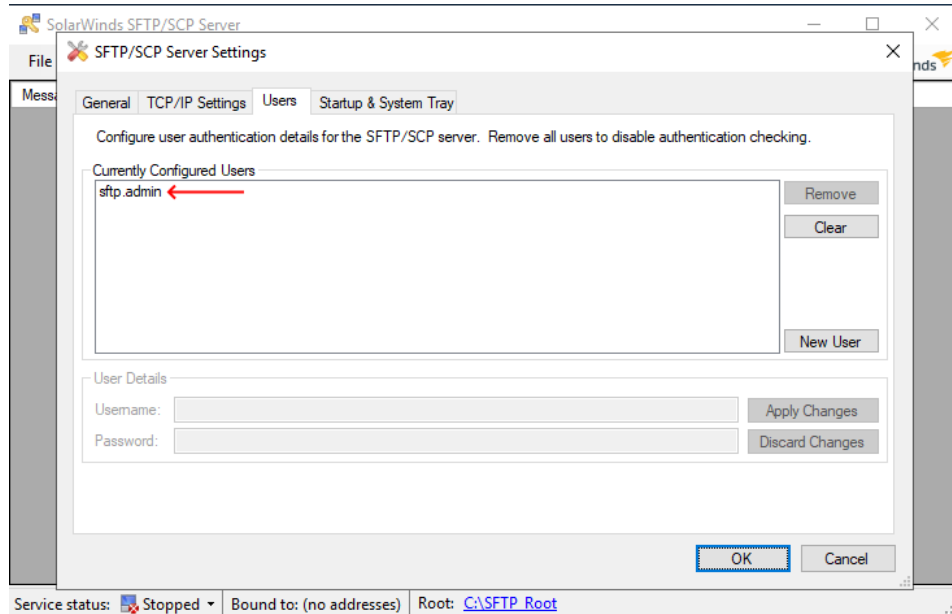
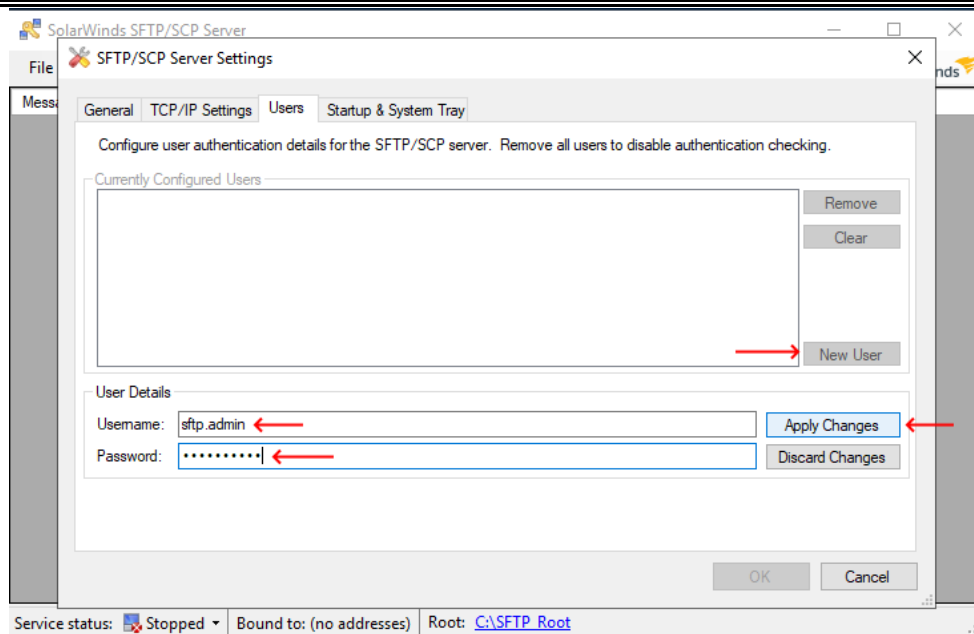
[Lab] Disaster Recovery System (DRS) Backup of CUCM Cluster

- After the installation of CUCM cluster, another warning you have seen is “No Backup device is configured”



- DRS or Disaster Recovery System provides full data backup and restore capabilities for all servers in the cluster
- The DRS allows you to perform regularly scheduled automatic or user-invoked data backups
- The Disaster Recovery System contains two key functions, Master Agent (MA) and Local Agent (LA). The Master Agent coordinates backup and restore activity with Local Agents
- Disaster Recovery Framework (DRF) Master runs on CUCM-PUB and DRF Local runs on all the Subscribers
- Hence CUCM Publisher should be alive to perform backup





SolarWinds SFTP/SCP Server

File Help

Message Type	Time	Session Type	Message
	2/18/2021 5:35 ...	Unknown	Starting...
	2/18/2021 5:35 ...	Unknown	Started

Service status: Running | Bound to: 0.0.0.0, :: | Root: [CASFTP Root](#)

Disaster Recovery System Cisco Prime License Manager

[←](#)
[→](#)
[↺](#)
[↻](#)
[🏠](#)
[🔒](#)
[https://192.168.21.1/drf/showHome.do](#)
...
🔖
📄
🔍
☰

Disaster Recovery System
 For Cisco Unified Communications Solutions

Navigation **Disaster Recovery System** [Go](#)

admin | [About](#) | [Logout](#)

Backup ▾ Restore ▾ Help ▾

Backup Device
 Scheduler
 Manual Backup
 History
 Current Status

VMware Installation: 2 vCPU@ Intel(R) Xeon(R) Platinum 8176M CPU @ 2.10GHz, disk 1: 110Gbytes, 8192Mbytes RAM, Partitions aligned

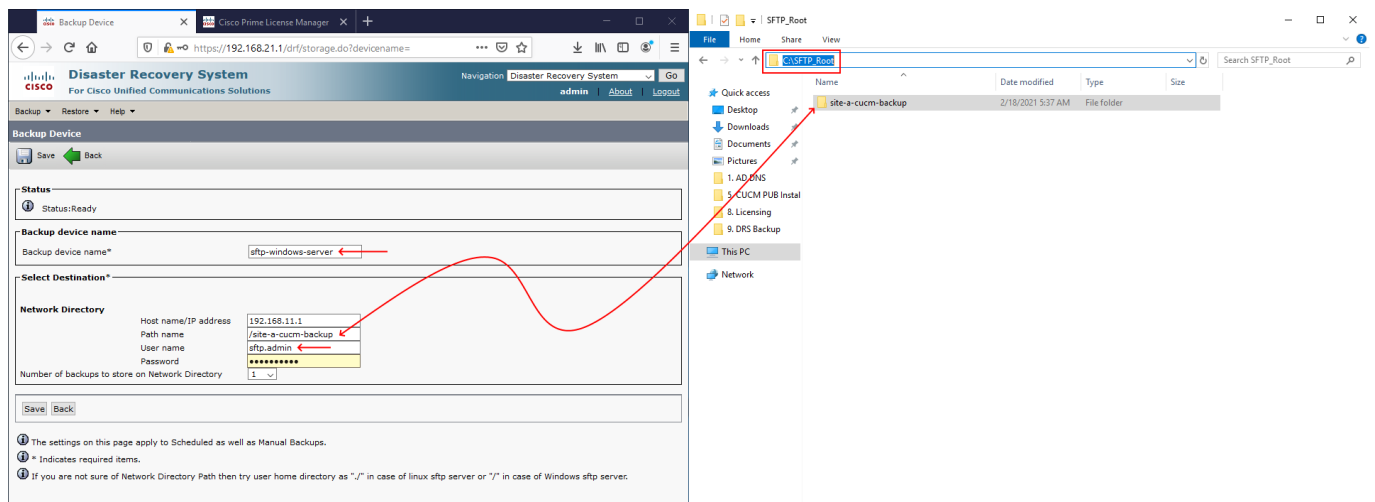
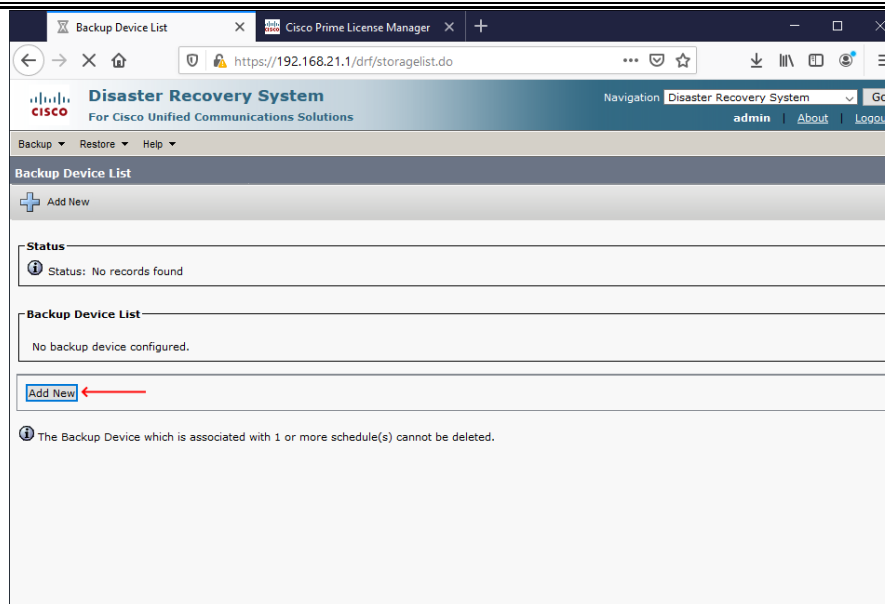
Last Successful Logon: Never

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For Cisco Technical Support please visit our [Technical Support](#) web site.



Backup Device
Cisco Prime License Manager
+

https://192.168.21.1/drf/storageUpdate.do?action=addnew

Cisco
Disaster Recovery System
For Cisco Unified Communications Solutions
Navigation
Disaster Recovery System
Go
admin | About | Logout

Backup Restore Help

Backup Device

Save Back

Status

Update successful

Backup device name

Backup device name* sftp-windows-server

Select Destination*

Network Directory	Host name/IP address	192.168.11.1
	Path name	/site-a-cucm-backup
	User name	sftp.admin
	Password
Number of backups to store on Network Directory		1

Save Back

The settings on this page apply to Scheduled as well as Manual Backups.

* Indicates required items.

If you are not sure of Network Directory Path then try user home directory as "/" in case of linux sftp server or "/" in case of Windows sftp server.

Cisco Unified CM Console
Cisco Prime License Manager
+

https://192.168.21.1/ccmadmin/showHome.do

Cisco
Cisco Unified CM Administration
For Cisco Unified Communications Solutions
Navigation
Cisco Unified CM Administration
Go
admin | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Emergency Notifications Paging is not configured. To configure Emergency Notifications Paging or to disable this reminder, please go to Cisco Unified CM Administration > Advanced Features > Emergency Notifications Paging or [click here](#).

Cisco Unified CM Administration

System version: 11.5.1.18900-97

VMware Installation: 2 vCPU Intel(R) Xeon(R) Platinum 8176M CPU @ 2.10GHz, disk 1: 110Gbytes, 8192Mbytes RAM, Partitions aligned

No backup has been taken after the Install

User admin last logged in to this cluster on Wednesday, February 17, 2021 9:33:16 PM IST, to node 192.168.21.1, from 192.168.11.1 using HTTPS

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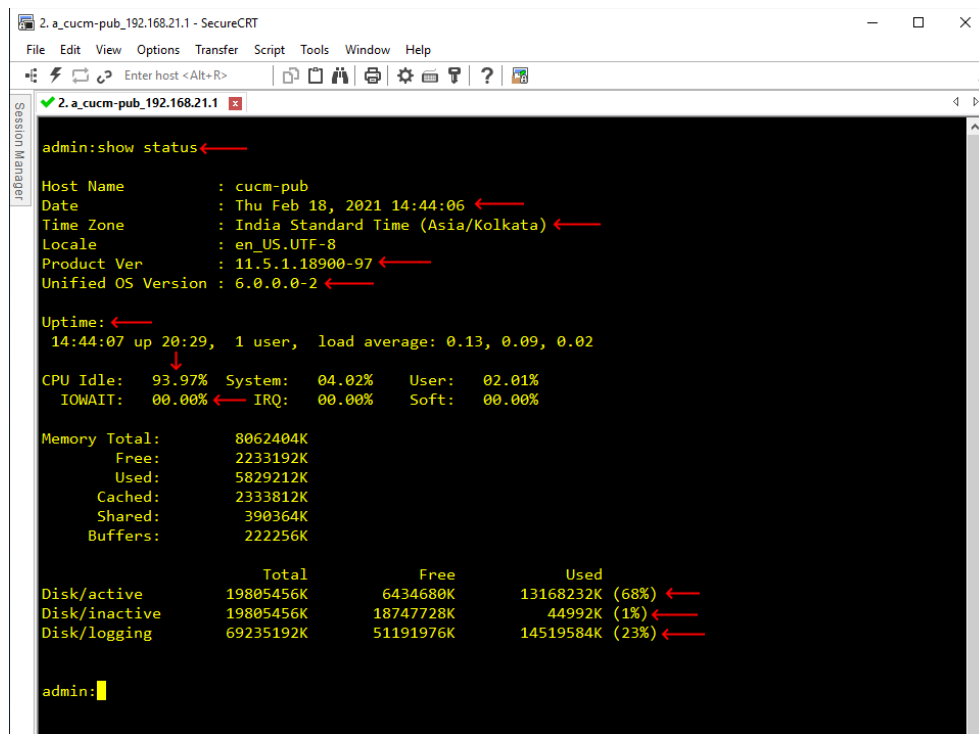
A summary of U.S. laws governing Cisco cryptographic products may be found at our [Export Compliance Product Report](#) web site.

For information about Cisco Unified Communications Manager please visit our [Unified Communications System Documentation](#) web site.

For Cisco Technical Support please visit our [Technical Support](#) web site.

[Lab] Basic Health Check of UC Infrastructure & Understand the Cluster

- When you get started with a new job role, it is important to understand your UC infrastructure. I have given some CLI commands to help knowing the cluster
- As a regular health check, some engineers perform this every day when they start working
- While opening any platform related TAC cases, you should give these command outputs



```
2. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2. a_cucm-pub_192.168.21.1
admin:show status
Host Name      : cucm-pub
Date           : Thu Feb 18, 2021 14:44:06
Time Zone      : India Standard Time (Asia/Kolkata)
Locale         : en_US.UTF-8
Product Ver    : 11.5.1.18900-97
Unified OS Version : 6.0.0.0-2

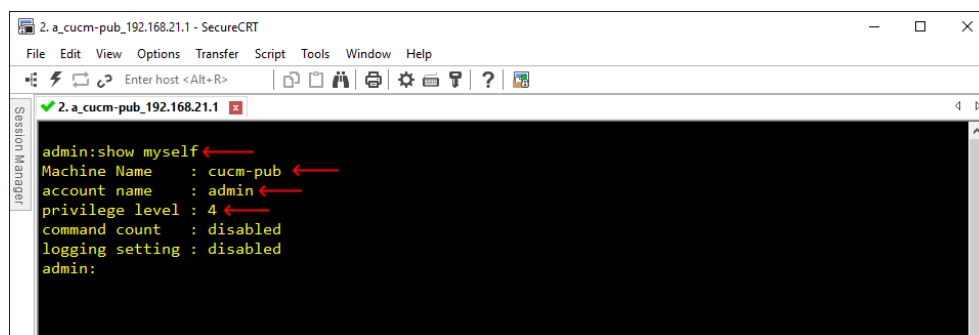
Uptime:
14:44:07 up 20:29, 1 user, load average: 0.13, 0.09, 0.02

CPU Idle: 93.97% System: 04.02% User: 02.01%
IOWAIT: 00.00% IRQ: 00.00% Soft: 00.00%

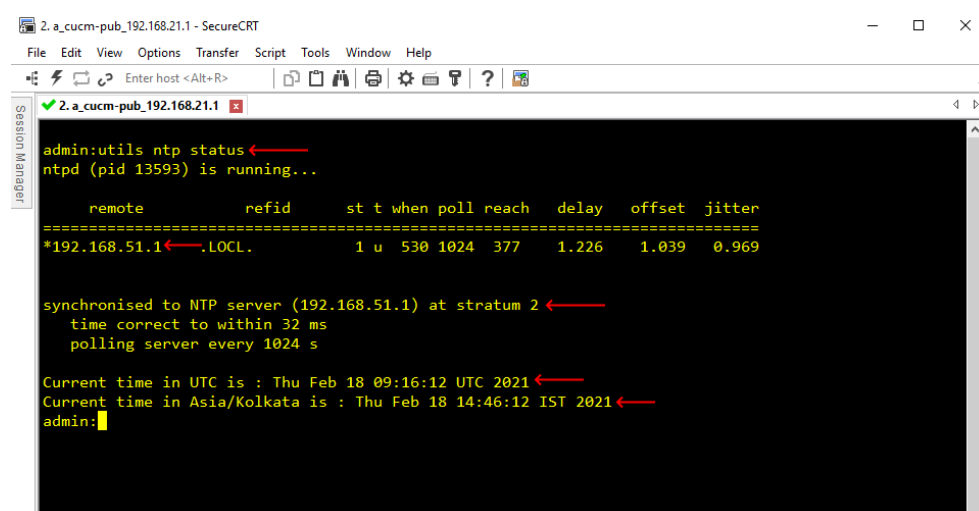
Memory Total: 806240K
Free: 2233192K
Used: 5829212K
Cached: 2333812K
Shared: 390364K
Buffers: 222256K

Disk/active    Total      Free      Used
Disk/active    19805456K  6434680K  13168232K (68%)
Disk/inactive  19805456K  18747728K  44992K (1%)
Disk/logging   69235192K  51191976K  14519584K (23%)

admin:
```



```
2. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2. a_cucm-pub_192.168.21.1
admin:show myself
Machine Name   : cucm-pub
account name   : admin
privilege level : 4
command count  : disabled
logging setting : disabled
admin:
```



```
2. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2. a_cucm-pub_192.168.21.1
admin:utils ntp status
ntpd (pid 13593) is running...

remote      refid      st t when poll reach  delay  offset jitter
=====
*192.168.51.1 .LOCL.      1 u  530 1024 377    1.226    1.039    0.969

synchronised to NTP server (192.168.51.1) at stratum 2
time correct to within 32 ms
polling server every 1024 s

Current time in UTC is : Thu Feb 18 09:16:12 UTC 2021
Current time in Asia/Kolkata is : Thu Feb 18 14:46:12 IST 2021
admin:
```

```
2. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>

2. a_cucm-pub_192.168.21.1 x
admin:show network eth0
Ethernet 0
DHCP      : disabled      Status    : up
IP Address : 192.168.21.1  IP Mask   : 255.255.128.0
Link Detected: yes      Mode      : Auto disabled, Full, 10000 Mbits/s
Duplicate IP : no

DNS
Primary   : 192.168.11.1  Secondary  : Not Configured
Options   : timeout:5 attempts:2
Domain    : ajcollab.com
Gateway   : 192.168.0.1 on Ethernet 0

admin:
```

```
2. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>

2. a_cucm-pub_192.168.21.1 x
admin:
admin:show network cluster
192.168.21.1 cucm-pub.ajcollab.com cucm-pub Publisher callmanager DBSub authenticated
192.168.21.2 cucm-sub01.ajcollab.com cucm-sub01 Subscriber callmanager DBSub authenticated using TCP since Thu Feb 18 14:52:22 2021
192.168.21.3 cucm-sub02.ajcollab.com cucm-sub02 Subscriber callmanager DBSub authenticated using TCP since Thu Feb 18 15:17:43 2021
192.168.21.6 imp-pub.ajcollab.com imp-pub Subscriber cups DBSub authenticated using TCP since Thu Feb 18 20:07:28 2021
192.168.21.7 imp-sub.ajcollab.com imp-sub Subscriber cups DBSub authenticated using TCP since Thu Feb 18 20:46:35 2021

Server Table (processnode) Entries
-----
cucm-pub
cucm-sub01
cucm-sub02
imp-pub
imp-sub
admin:
admin:
admin:
```

```
2. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>

2. a_cucm-pub_192.168.21.1 x
admin:
admin:run sql select * from processnode
pkid          name          mac systemnode description isactive nodeid tknodeusage ipv6name fklbmhubgroup tkprocessnoderole tkssomode
-----
00000000-1111-0000-0000-000000000000 EnterpriseWideData t t 1 1 NULL 1 0
ea5cb40c-2e42-4552-b2f7-d6ef2507d20f cucm-pub f t 2 0 NULL 1 0
b01282ac-f8c1-1603-acfd-68761169d81c cucm-sub01 f cucm-sub01 t 5 1 NULL 1 0
fc5e5630-5508-e633-b665-2a3b5c84e4db cucm-sub02 f cucm-sub02 t 6 1 NULL 1 0
334fb233-b415-d207-8b19-9b2042840632 imp-pub f imp-pub t 7 0 NULL 2 0
51a6a522-1670-81b0-187e-edba2f7bf41b imp-sub f imp-sub t 8 1 NULL 2 0
admin:
admin:
admin:
```

```
2. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>

2. a_cucm-pub_192.168.21.1 x
admin:utils network ping cucm-sub01
PING cucm-sub01.ajcollab.com (192.168.21.2) 56(84) bytes of data.
64 bytes from cucm-sub01.ajcollab.com (192.168.21.2): icmp_seq=1 ttl=64 time=0.184 ms
64 bytes from cucm-sub01.ajcollab.com (192.168.21.2): icmp_seq=2 ttl=64 time=0.303 ms
64 bytes from cucm-sub01.ajcollab.com (192.168.21.2): icmp_seq=3 ttl=64 time=0.390 ms
64 bytes from cucm-sub01.ajcollab.com (192.168.21.2): icmp_seq=4 ttl=64 time=0.301 ms

--- cucm-sub01.ajcollab.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 0.184/0.294/0.390/0.075 ms

admin:
```

2. a_cucm-pub_192.168.21.1 - SecureCRT

File Edit View Options Transfer Script Tools Window Help

Enter host <Alt+R>

2. a_cucm-pub_192.168.21.1

```
admin:utils network traceroute cucm-sub01
traceroute to cucm-sub01 (192.168.21.2), 30 hops max, 60 byte packets
 1 cucm-sub01.ajcollab.com (192.168.21.2)  0.199 ms  0.252 ms  0.297 ms
admin:
```

2. a_cucm-pub_192.168.21.1 - SecureCRT

File Edit View Options Transfer Script Tools Window Help

Enter host <Alt+R>

2. a_cucm-pub_192.168.21.1

```
admin:utils service list

Requesting service status, please wait...
System SSH [STARTED]
Cluster Manager [STARTED]
Name Service Cache [STARTED]
Entropy Monitoring Daemon [STARTED]
Cisco SCSI Watchdog [STARTED]
Service Manager [STARTED]
HTTPS Configuration Download [STARTED]
Service Manager is running
Getting list of all services
>> Return code = 0
A Cisco DB[STARTED]
A Cisco DB Replicator[STARTED]
Cisco AMC Service[STARTED]
Cisco AXL Web Service[STARTED]
Cisco Audit Event Service[STARTED]
Cisco CAR DB[STARTED]
Cisco CAR Scheduler[STARTED]
Cisco CDP[STARTED]
Cisco CDP Agent[STARTED]
Cisco CDR Agent[STARTED]
Cisco CDR Repository Manager[STARTED]
Cisco CallManager Admin[STARTED]
Cisco CallManager Serviceability[STARTED]
Cisco CallManager Serviceability RTMT[STARTED]
Cisco Certificate Change Notification[STARTED]
Cisco Certificate Expiry Monitor[STARTED]
Cisco Change Credential Application[STARTED]
Cisco DRF Local[STARTED]
Cisco DRF Master[STARTED]
Cisco Database Layer Monitor[STARTED]
Cisco E911[STARTED]
Cisco ELM Client Service[STARTED]
Cisco Extension Mobility Application[STARTED]
Cisco License Manager[STARTED]
Cisco Log Partition Monitoring Tool[STARTED]
Cisco Management Agent Service[STARTED]
Cisco Prime LM Admin[STARTED]
Cisco Prime LM DB[STARTED]
Cisco Prime LM Server[STARTED]
Cisco Push Notification Service[STARTED]
Cisco RIS Data Collector[STARTED]
Cisco RTMT Reporter Servlet[STARTED]
Cisco SOAP - CallRecord Service[STARTED]
```

Ready ssh2: AES-256-CTR 47, 7 47 Rows, 100 Cols Xterm CAP NUM


```
2_a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2_a_cucm-pub_192.168.21.1
admin:show web-security
[
  Version: V3
  Serial Number: 511D2EC283C99AEAC43885A88884D4E8
  SignatureAlgorithm: SHA256withRSA (1.2.840.113549.1.1.11)
  Issuer Name: L=Bangalore, ST=Karnataka, CN=cucm-pub.ajcollab.com, OU=Collab, O=AJ Collab, C=IN
  Validity From: Wed Feb 17 14:32:10 IST 2021
  To: Mon Feb 16 14:32:09 IST 2026
  Subject Name: L=Bangalore, ST=Karnataka, CN=cucm-pub.ajcollab.com, OU=Collab, O=AJ Collab, C=IN
  Key: RSA (1.2.840.113549.1.1.1)
  Key value: 3082010a0282010100be940fd50c2bc0dae6e073f8644b9744de049bbea5e9a3d10f8eb9999f70fb5069b
74393ec3362744402937bf26af00347ed89831d565de0cd225cb151ad7f53abba5325076aebcf5e097f80f001c39e6351ba
5f1a9a828821f2033535d547ff1f129abdd700d50ee0f7a672e738e877271c24d4ffd9b480a10cea8f84b6e6f446b6081b19
3b285af7774ecd40386152a047d92ac818117695d68b4fc4ef15870988e580887bcd6eaa40cce826f3a035bcd611cca51a98
a0b7bc6db00fe6f37cc08f0ef9f574cdf54e9ad62ed974752835601e68695603464904fa74f73c184688186b7e90278c0ca8
9e903468b29b7717beefe55141bd6b7733782c6d06efb0203010001
  Extensions: 4 present
  [
    Extension: KeyUsage (OID.2.5.29.15)
    Critical: false
    Usages: digitalSignature, keyEncipherment, dataEncipherment, keyCertSign,
  ]
  [
    Extension: ExtKeyUsageSyntax (OID.2.5.29.37)
    Critical: false
    Usage oids: 1.3.6.1.5.5.7.3.1, 1.3.6.1.5.5.7.3.2,
  ]
  [
    Extension: SubjectKeyIdentifier (OID.2.5.29.14)
    Critical: false
    keyID: 2592e7a6a54770ff7cb00867d5c9a86c67b830cc
  ]
  [
    Extension: BasicConstraints (OID.2.5.29.19)
    Critical: true
    cA: true
    pathLenConstraint: 0
  ]
  Signature:
  0000: 36 e5 49 42 01 ef 37 d3 9f 42 63 8a 95 b4 17 d1 [6..IB..7..Bc.....]
  0010: f5 d6 56 c1 6f 4d 75 1d 6f 6c 7d a3 ab 59 03 f3 [..V.oMu.ol]..Y..]
  0020: b1 b4 3d 2c 8e 8a 9a fb bf 42 8b b8 82 7d 0b 8f [..=,....B...].]
  0030: 9a ee 03 85 06 4c 9b 22 51 dd 06 ca 1d db 0c 9f [.....L."Q.....]
  0040: 1b 9d 77 ab d2 f2 3b 85 6a d3 e1 d7 69 c8 f3 0a [..w...;..j....i...]
  0050: d8 45 ad 45 21 b2 8d be 06 c6 78 44 4f fe d6 f8 [..E..!.....xDO...]
```

```
2_a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2_a_cucm-pub_192.168.21.1
admin:utils network connectivity cucm-sub01
This command can take up to 3 minutes to complete.
Continue (y/n)?y
Running test, please wait ...
.....
Network connectivity test with cucm-sub01 completed successfully.
admin:
admin:
admin:utils network connectivity cucm-sub02
This command can take up to 3 minutes to complete.
Continue (y/n)?y
Running test, please wait ...
.....
Network connectivity test with cucm-sub02 completed successfully.
admin:
admin:
```

```
2_a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2_a_cucm-pub_192.168.21.1
admin:show process load
top - 14:47:07 up 20:32, 1 user, load average: 0.00, 0.05, 0.00
Tasks: 241 total, 1 running, 240 sleeping, 0 stopped, 0 zombie
Cpu(s): 3.7%us, 2.1%sy, 0.0%ni, 94.0%id, 0.1%wa, 0.0%hi, 0.0%si, 0.0%st
Mem: 8062404k total, 5831680k used, 2230724k free, 222480k buffers
Swap: 4095996k total, 0k used, 4095996k free, 2335068k cached
  PID USER      PR  NI  VIRT  RES  SHR  S %CPU  %MEM    TIME+  COMMAND
19849 admin    20   10 15164 1328  904  R  2.0   0.0   0:00.01 top
31668 redis    20    0 136m 5496 1148  S  2.0   0.1   1:17.29 redis-server
1 root      20    0 19600 1928 1320  S  0.0   0.0   0:09.84 init
2 root      20    0      0      0  0  S  0.0   0.0   0:00.00 kthreadd
3 root      RT    0      0      0  0  S  0.0   0.0   0:02.30 migration/0
4 root      20    0      0      0  0  S  0.0   0.0   0:02.14 ksoftirqd/0
5 root      RT    0      0      0  0  S  0.0   0.0   0:00.00 stopper/0
6 root      RT    0      0      0  0  S  0.0   0.0   0:04.18 watchdog/0
7 root      RT    0      0      0  0  S  0.0   0.0   0:02.16 migration/1
8 root      RT    0      0      0  0  S  0.0   0.0   0:00.00 stopper/1
admin:
```

```
2_a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt>R>

admin:show process using-most cpu
PCPU PID CPU NICE STATE CPUTIME ARGS
%CPU PID CPU NI S TIME COMMAND
3.1 8255 0 0 00:38:25 /home/tomcat/tomcat -user tomcat -home /usr/local/
k -pidfile /usr/local/thirdparty/jakarta-tomcat/conf/tomcat.pid -procname /home/tomcat/tomcat -outfi
le /usr/local/thirdparty/jakarta-tomcat/logs/catalina.out -errfile &1 -Djava.library.path=/usr/local
/lib:/usr/local/thirdparty/java/j2sdk/jre/lib/i386:/usr/local/thirdparty/java/j2sdk/jre/lib/i386/ser
ver:/usr/lib/psql:/usr/lib:/usr/local/cm/lib:/usr/local/platform/lib -Djavax.net.ssl.sessionCacheS
ize=10000 -Djavax.net.ssl.trustStore=/usr/local/platform/.security/tomcat/trust-certs/tomcat-trust.k
eystore -Djavax.net.ssl.keyStoreType=PKCS12 -Djavax.net.ssl.trustStorePassword=xxxx -XX:ErrorFile=/u
sr/local/thirdparty/jakarta-tomcat/logs/diagnostic-info JVM crash.Xp.tomcat.txt -Dsun.zip.disableMem
oryMapping=true -XX:OnOutOfMemoryError=/home/tomcat/tomcat_diagnostics.sh -XX:OnError=/home/tomcat/t
omcat_diagnostics.sh -XX:UseSplitVerifier -Djdk.tls.ephemeralDHKeySize=2048 -Djava.util.logging.man
ager=org.apache.juli.ClassLoaderLogManager -Djava.util.logging.config.file=/usr/local/thirdparty/jak
arta-tomcat/conf/logging.properties -Xmx1216m -Xms256m -XX:MaxPermSize=448m -Djava.endorsed.dirs=/u
sr/local/thirdparty/jakarta-tomcat/endorsed -cp /common/download:/usr/local/platform/application_loc
ale/platform-api:/usr/local/platform/application_locale/cmplatform:/usr/local/platform/application_lo
cale:/usr/local/cm/application_locale/cmservices:/usr/local/cm/application_locale/car:/usr/local/cm
/application_locale/cmadmin:/usr/local/cm/application_locale/ucmuser:/usr/local/cm/application_loca
le/etc/opt/cisco/elb/server/resource:/usr/local/thirdparty/jakarta-tomcat/bin/bootstrap.jar:/usr/l
ocal/thirdparty/jakarta-tomcat/bin/tomcat-juli.jar -Djava.security.policy=/usr/local/thirdparty/jak
arta-tomcat/conf/catalina.policy -Dcatalina.base=/usr/local/thirdparty/jakarta-tomcat -Dcatalina.hom
e=/usr/local/thirdparty/jakarta-tomcat -Djava.io.tmpdir=/usr/local/thirdparty/jakarta-tomcat/temp or
g.apache.catalina.startup.Bootstrap start
2.1 20271 0 0 00:00:00 /usr/bin/python /usr/sbin/iotop -Pbot -n 4 -d 15 -qqq
1.1 16915 0 0 00:13:57 /usr/local/cm/bin/RisDC
1.0 11630 0 0 00:00:04 java -DConsoleRows=24 -DConsoleColumns=80 -DCommonFileSystem=disk_ful
l=false,inode_full=false,no_writes=false,internal_error=false -DJvmStartTime=1613639444 -XX:UseSpli
tVerifier -sMain name=admin priv=master
0.9 32275 0 0 00:11:09 /usr/local/cm/bin/cmoninit -w

admin:

Copy all to Notepad++

1 admin:show process using-most cpu
2 PCPU PID CPU NICE STATE CPUTIME ARGS
3 %CPU PID CPU NI S TIME COMMAND
4 3.1 8255 0 0 00:38:25 /home/tomcat/tomcat -user tomcat -home /usr/local/
5 2.1 20271 0 0 00:00:00 /usr/bin/python /usr/sbin/iotop -Pbot -n 4 -d 15 -
6 1.1 16915 0 0 00:13:57 /usr/local/cm/bin/RisDC
7 1.0 11630 0 0 00:00:04 java -DConsoleRows=24 -DConsoleColumns=80 -DCommon
8 0.9 32275 0 0 00:11:09 /usr/local/cm/bin/cmoninit -w
9
10 admin:
```

```
2_a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt>R>

admin:show process using-most memory
MEM(K) PID ARGS
123640 17379 /usr/local/cm/bin/carschr /usr/local/cm/conf/car/carschrCfg.xml
123824 19674 /usr/local/cm/bin/caroninit
124192 16960 /usr/local/cm/bin/amc /usr/local/cm/conf/amc/amcCfg.xml
247912 32275 /usr/local/cm/bin/cmoninit -w
1632456 8255 /home/tomcat/tomcat -user tomcat -home /usr/local/thirdparty/java/j2sdk -pidfile /usr/l
ocal/thirdparty/jakarta-tomcat/conf/tomcat.pid -procname /home/tomcat/tomcat -outfile /usr/local/thi
rdparty/jakarta-tomcat/logs/catalina.out -errfile &1 -Djava.library.path=/usr/local/lib:/usr/local/t
hirdparty/java/j2sdk/jre/lib/i386:/usr/local/thirdparty/java/j2sdk/jre/lib/i386/server:/usr/lib/psq
l:/usr/lib:/usr/local/cm/lib:/usr/local/platform/lib -Djavax.net.ssl.sessionCacheSize=10000 -Djav
ax.net.ssl.trustStore=/usr/local/platform/.security/tomcat/trust-certs/tomcat-trust.keystore -Djav
ax.net.ssl.keyStoreType=PKCS12 -Djavax.net.ssl.trustStorePassword=xxxx -XX:ErrorFile=/usr/local/thirdp
arty/jakarta-tomcat/logs/diagnostic-info JVM crash.Xp.tomcat.txt -Dsun.zip.disableMemoryMapping=true
-XX:OnOutOfMemoryError=/home/tomcat/tomcat_diagnostics.sh -XX:OnError=/home/tomcat/tomcat_diagnostics
.sh -XX:UseSplitVerifier -Djdk.tls.ephemeralDHKeySize=2048 -Djava.util.logging.manager=org.apac
he.juli.ClassLoaderLogManager -Djava.util.logging.config.file=/usr/local/thirdparty/jakarta-tomcat/co
nf/logging.properties -Xmx1216m -Xms256m -XX:MaxPermSize=448m -Djava.endorsed.dirs=/usr/local/thirdp
arty/jakarta-tomcat/endorsed -cp /common/download:/usr/local/platform/application_locale/platform-api
:/usr/local/platform/application_locale/cmplatform:/usr/local/platform/application_locale:/usr/local/
cm/application_locale/cmservices:/usr/local/cm/application_locale/car:/usr/local/cm/application_loca
le/cmadmin:/usr/local/cm/application_locale/ucmuser:/usr/local/cm/application_locale/etc/opt/cisco
/elb/server/resource:/usr/local/thirdparty/jakarta-tomcat/bin/bootstrap.jar:/usr/local/thirdparty/j
akarta-tomcat/bin/tomcat-juli.jar -Djava.security.policy=/usr/local/thirdparty/jakarta-tomcat/co
nf/catalina.policy -Dcatalina.base=/usr/local/thirdparty/jakarta-tomcat -Dcatalina.home=/usr/local/thi
rdparty/jakarta-tomcat -Djava.io.tmpdir=/usr/local/thirdparty/jakarta-tomcat/temp org.apache.catalina
.startup.Bootstrap start

admin:

Copy all to Notepad++

1 admin:show process using-most memory
2 MEM(K) PID ARGS
3 123640 17379 /usr/local/cm/bin/carschr /usr/local/cm/conf/car/carschrCfg.xml
4 123824 19674 /usr/local/cm/bin/caroninit
5 124192 16960 /usr/local/cm/bin/amc /usr/local/cm/conf/amc/amcCfg.xml
6 247912 32275 /usr/local/cm/bin/cmoninit -w
7 1632456 8255 /home/tomcat/tomcat -user tomcat -home /usr/local/thirdparty/java/
8
```

```

2_a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2_a_cucm-pub_192.168.21.1
admin:
admin:utils dbreplication runtimestate
Server Time: Thu Feb 18 21:17:17 IST 2021
Cluster Replication State: Replication status command started at: 2021-02-18-21-12
Replication status command ENDED. Checked 716 tables out of 716
Last Completed Table: devicenumplanmapremdestmap
No Errors or Mismatches found.
Use 'file view activelog cm/trace/dbl/sdi/ReplicationStatus.2021_02_18_21_12_08.out' to see the details
DB Version: ccm11_5_1_18900_97
Repltimeout set to: 300s
PROCESS option set to: 1
Cluster Detailed View from cucm-pub (3 Servers):
SERVER-NAME      IP ADDRESS      PING      DB/RPC/      REPL.      Replication      REPLICATION SETUP
-----      -----      ----      ---      ---      ---      (RTMT) & Details
cucm-sub01      192.168.21.2      0.176      Y/Y/Y      0      (g_5)      (2) Setup Completed
cucm-pub      192.168.21.1      0.017      Y/Y/Y      0      (g_2)      (2) Setup Completed
cucm-sub02      192.168.21.3      0.152      Y/Y/Y      0      (g_6)      (2) Setup Completed

```

```

2_a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2_a_cucm-pub_192.168.21.1
admin:
admin:file view activelog cm/trace/dbl/sdi/ReplicationStatus.2021_02_18_21_12_08.out
Thu Feb 18 21:12:08 2021 main()  DEBUG:  --
Thu Feb 18 21:12:12 2021 main()  DEBUG:  Replication cluster summary:
SERVER      ID STATE      STATUS      QUEUE      CONNECTION CHANGED
-----
g_2_ccm11_5_1_18900_97      2 Active      Local      0
g_5_ccm11_5_1_18900_97      5 Active      Connected      0 Feb 18 13:25:31
g_6_ccm11_5_1_18900_97      6 Active      Connected      0 Feb 18 15:23:23
Thu Feb 18 21:12:23 2021 main()  DEBUG:  <--
No Errors or Mismatches found.
Replication status is good on all available servers.
utils dbreplication status output
To determine if replication is suspect, look for the following:
(1) Number of rows in a table do not match on all nodes.
(2) Non-zero values occur in any of the other output columns for a table
options: q=quit, n=next, p=prev, b=begin, e=end (lines 1 - 20 of 7897) :
Feb 18 2021 21:12:30 ----- Table scan for ccmbdtemplate_g_2_ccm11_5_1_18900_97_1_145_typedberrors start -----
Node      Rows      Extra      Missing      Mismatch      Processed
-----
g_2_ccm11_5_1_18900_97      1665      0      0      0      0
g_5_ccm11_5_1_18900_97      1665      0      0      0      0
g_6_ccm11_5_1_18900_97      1665      0      0      0      0
Feb 18 2021 21:12:31 ----- Table scan for ccmbdtemplate_g_2_ccm11_5_1_18900_97_1_145_typedberrors end -----
Feb 18 2021 21:12:31 ----- Table scan for ccmbdtemplate_g_2_ccm11_5_1_18900_97_1_352_typeroutingdatabasacachetimer start -----
Node      Rows      Extra      Missing      Mismatch      Processed
-----
g_2_ccm11_5_1_18900_97      97      0      0      0      0
g_5_ccm11_5_1_18900_97      97      0      0      0      0
g_6_ccm11_5_1_18900_97      97      0      0      0      0
options: q=quit, n=next, p=prev, b=begin, e=end (lines 21 - 40 of 7897) :

```

Ready ssh2: AES-256-CTR 47, 75 47 Rows, 163 Cols Xterm CAP NUM

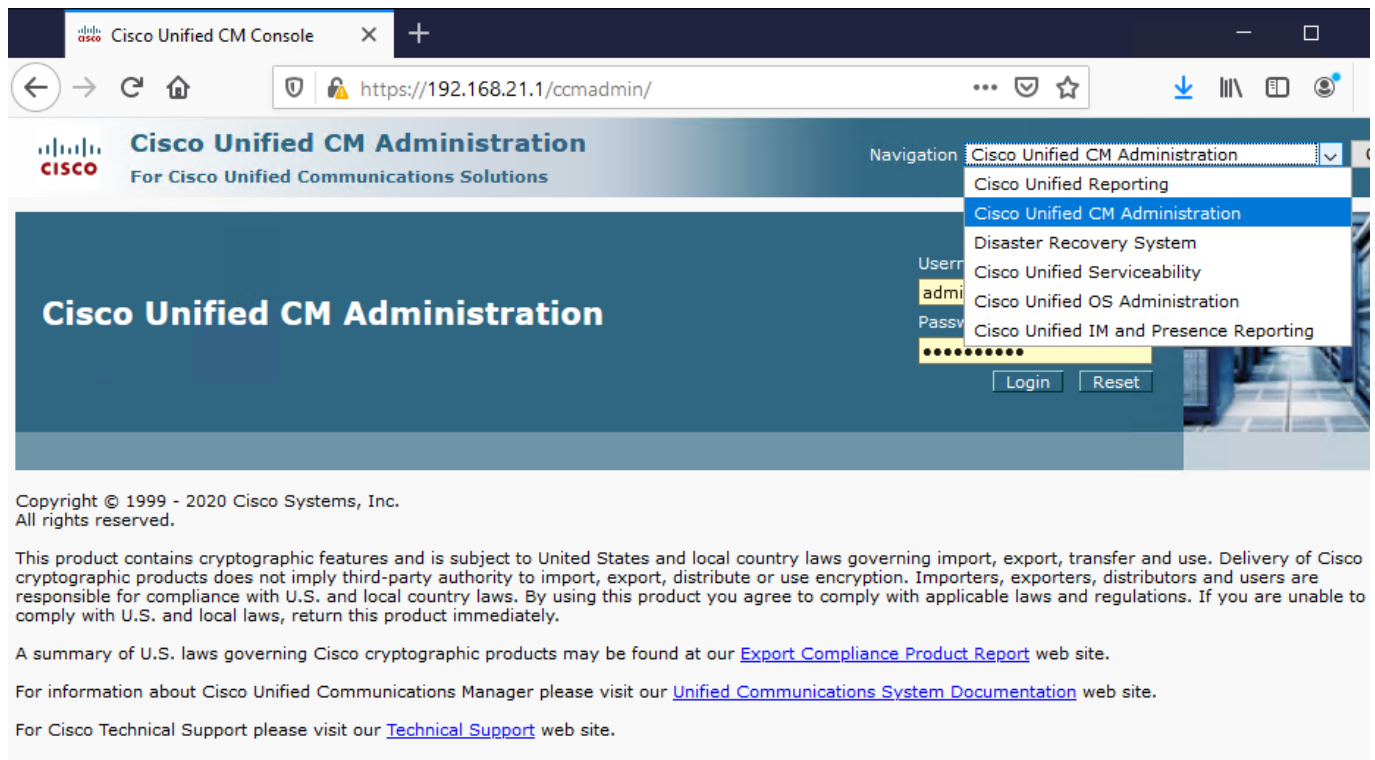
```

2_a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
2_a_cucm-pub_192.168.21.1 2_a_cucm-sub01_192.168.21.2
admin:
admin:
admin:
admin:utils dbreplication status all
Replication status check is now running in background.
Use command 'utils dbreplication runtimestate' to check its progress
The final output will be in file cm/trace/dbl/sdi/ReplicationStatus.2021_02_18_22_27_25.out
Please use "file view activelog cm/trace/dbl/sdi/ReplicationStatus.2021_02_18_22_27_25.out " command to see the output
admin:
admin:file list activelog cm/trace/dbl/sdi/ReplicationStatus* date rev detail
18 Feb,2021 22:27:52      30,220      ReplicationStatus_temp.2021_02_18_22_27_25.out
18 Feb,2021 22:27:40      517      ReplicationStatus.2021_02_18_22_27_25.out
18 Feb,2021 22:27:11      234      ReplicationStatus_temp.2021_02_18_22_27_11.out
18 Feb,2021 22:27:11      45      ReplicationStatus.2021_02_18_22_27_11.out
18 Feb,2021 22:23:03      432,826      ReplicationStatus.2021_02_18_22_21_45.out
18 Feb,2021 22:23:01      607      ReplicationStatus.2021_02_18_22_22_55.out
18 Feb,2021 22:22:55      234      ReplicationStatus_temp.2021_02_18_22_22_55.out
18 Feb,2021 21:13:21      432,826      ReplicationStatus.2021_02_18_21_12_08.out
dir count = 0, file count = 8
admin:
admin:
admin:
Run this command if the 'dbreplication runtimestate' gives some old output, this will re-check 'db runtimestate'
admin:

```

```
01.1. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
01.1. a_cucm-pub_192.168.21.1
admin:utils diagnose test
Log file: platform/log/diag1.log
Starting diagnostic test(s)
=====
test - disk_space      : Passed (available: 6199 MB, used: 12945 MB)
skip - disk_files     : This module must be run directly and off hours
test - service_manager : Passed
test - tomcat          : Passed
test - tomcat_deadlocks : Passed
test - tomcat_keystore : Passed
test - tomcat_connectors : Passed
test - tomcat_threads  : Passed
test - tomcat_memory   : Passed
test - tomcat_sessions : Passed
skip - tomcat_heapdump  : This module must be run directly and off hours
test - validate_network : Passed
test - raid            : Passed
test - system_info     : Passed (Collected system information in diagnostic log)
test - ntp_reachability : Passed
test - ntp_clock_drift : Passed
test - ntp_stratum     : Passed
skip - sdl_fragmentation : This module must be run directly and off hours
skip - sdi_fragmentation : This module must be run directly and off hours
Diagnostics Completed
The final output will be in Log file: platform/log/diag1.log
Please use 'file view activelog platform/log/diag1.log' command to see the output
admin:
```

Web GUI and Six Consoles in CUCM Cluster



- There are 6 different web consoles available in CUCM to administrate
- We usually browse the IP Address or FQDN of CUCM PUB to get access to the web interface
- Cisco Tomcat Service is responsible for delivering the web interface over HTTPS
- All the CUCM nodes will have the web interface but all of them connects to the DB of CUCM PUB if PUB is running
- The only time the CUCM SUB talks to its own DB via HTTPS web GUI, when the CUCM PUB is down
- During such scenario, we will not be able to change any configuration on the cluster, we just can see the things (read only mode) since CUCM PUB is the read write copy of DB

Cisco Unified Reporting

The screenshot displays the Cisco Unified Reporting web interface. The browser address bar shows the URL `https://192.168.21.1/cucreports/generateReport.do?isStand...`. The page header includes the Cisco logo, the title "Cisco Unified Reporting", and the subtitle "For Cisco Unified Communications Solutions". The navigation bar shows "admin" and links for "About" and "Logout".

On the left side, there is a "System Reports" menu with a list of report categories:

- Report Descriptions
- Unified CM Cluster Overview
- Unified CM Data Summary
- Unified CM Database Replication Debug
- Unified CM Database Status
- Unified CM Device Counts Summary
- Unified CM Device Distribution Summary
- Unified CM Directory URI and GDPR Duplicates
- Unified CM Extension Mobility
- Unified CM GeoLocation Policy
- Unified CM GeoLocation Policy with Filter
- Unified CM Lines Without Phones
- Unified CM Multi-Line Devices
- Unified CM Phone Category
- Unified CM Phone Feature List
- Unified CM Phone Locale Installers
- Unified CM Phones With Mismatched Load
- Unified CM Phones Without Lines
- Unified CM Shared Lines
- Unified CM Table Count Summary
- Unified CM User Device Count
- Unified CM Users Sharing Primary Extensions
- Unified CM VG2XX Gateway
- Unified CM Voice Mail
- Unified Confidential Access Level Matrix

The main content area shows a success message: "OK: Report generated successfully." Below this is the "Unified CM Data Summary" report. It provides a summary view of data in the Unified CM database organized according to the Unified CM Administration menu layout. The report was created on Thu Feb 18 23:14:22 IST 2021.

The "Unified CM Cluster Name" section shows the following details:

Cluster Name	Publisher Name/IP
StandAloneCluster	cucm-pub

The "System Summary" section shows counts of items configured under the System menu:

Property	Value
Servers	5
Cisco Unified CM	3
Cisco Unified CM Group	1
NTP Server	0
Date Time Settings	1
Presence Group	1
Region	1
Device Pool	1
Device Mobility Group	0
Device Mobility Info	0
DHCP Server	0
DHCP Subnet	0
Location	3
Physical Location	0
SRST	2

The "Call Routing Summary" section shows counts of items configured under the Call Routing menu:

Property	Value
Application Dial Rules	0
Directory Lookup Dial Rules	0
SIP Dial Rule	0
Route Groups	1
Route List	0
Route Patterns	0
Line Group	0
Hunt List	0

- Gives the details and reports about the cluster like Unified CM Cluster Overview, Database Status, Device Counts Summary and much more
- This interface can be used for auditing purposes
- While troubleshooting, we may consider looking at Reporting interface
- We use **Application Credentials** to login to Cisco Unified Reporting interface

Cisco Unified CM Administration

Cisco Unified CM Administration

System version: 11.5.1.18900-97

VMware Installation: 2 vCPU Intel(R) Xeon(R) Platinum 2.10GHz, disk 1: 110Gbytes, 8192Mbytes RAM, Partition

No backup has been taken after the Install

User admin last logged in to this cluster on Thursday, February 18, 2021 11:00:53 PM IST, to node 192.168.21.1, from 192.168.11.1 using HTTPS

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For information about Cisco Unified Communications Manager please visit our [Unified Communications System Documentation](#) web site.

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- This is the heart of CUCM Administration
- Core day to day configurations like Adding Phone, Deleting Phones, Call Routing Configurations, etc. done from Cisco Unified CM Administration interface
- We will be here most of the time while dealing with CUCM
- We use **Application User Credentials** to login to Cisco Unified CM Administration interface

Cisco Unified Disaster Recovery System

Disaster Recovery System
For Cisco Unified Communications Solutions

Navigation: Disaster Recovery System Go

admin | About | Logout

Backup Restore Help

Backup Device
Scheduler
Manual Backup
History
Current Status

Disaster Recovery System
Version: 11.5.1.18900-97

VMware Installation: 2 vCPU@ Intel(R) Xeon(R) Platinum 8176M CPU @ 2.10GHz, disk 1: 110Gbytes, 8192Mbytes RAM, Partitions aligned

User admin last logged in to this cluster on Thursday, February 18, 2021 9:26:27 PM IST, to node 192.168.21.1, from 192.168.11.1 using HTTPS

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- Used to configure backup-device and perform manual and scheduled auto backup of the CUCM cluster
- Also used to restore the DB in case of major database corruption or failures
- Cluster backup is stored to SFTP server as flat files
- It is not recommended to use the vmware native backup option like vmware Snapshot for CUCM VM as gives bad performance and IO delay
- vmware image backup solutions like Veem is also not recommended to take CUCM backup
- Also, it is not recommended to enable vmware vmotion and HA for CUCM nodes
- The only recommended backup is via SFTP server
- We use **Platform User Credentials** (OS Admin credentials) to login to Cisco Unified Disaster Recovery System interface

Cisco Unified Serviceability

Cisco Unified Serviceability

Navigation: Cisco Unified Serviceability Go

admin | About | Logout

Alarm Trace Tools Snmp CallHome Help

Cisco Unified Serviceability

System version

VMware Install 2.10GHz, disk

(R) Xeon(R) Platinum 8176M CPU @ 2Mbytes RAM, Partitions aligned

User admin last logged in Thursday, February 18, 2021 11:38:47 PM IST, to node 192.168.21.1, from 192.168.11.1 using HTTPS

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For information about Cisco Unified Communications Manager please visit our [Unified Communications System Documentation](#) web site.

For Cisco Technical Support please visit our [Technical Support](#) web site.

- Different services can be activated, started, stopped, and restarted from here
- We can also check the service up-time from this interface
- Trace levels (debugs log level) can be tuned from this interface
- Monitoring alarms are configured here, CUCM can send events to external syslog servers
- We use **Application User Credentials** to login to Cisco Unified Service Ability interface

Cisco Unified OS Administration

Cisco Unified Operating System Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go

admin | About | Logout

Show Settings Security Software Upgrades Services Help

IP
NTP Servers
SMTP
Time
Version

Ethernet
Ethernet IPv6
Publisher

Cisco Unified Operating System Administration

VMware Installation: 2 vCPU Intel(R) Xeon(R) Platinum 8176M CPU @ 2.10GHz, disk 1: 110Gbytes, 8192Mbytes RAM, Partitions aligned

User admin last logged in to this cluster on Thursday, February 18, 2021 11:30:16 PM IST, to node 192.168.21.1, from 192.168.11.1 using HTTPS

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For information about Cisco Unified Communications Manager please visit our [Unified Communications System Documentation](#) web site.

For Cisco Technical Support please visit our [Technical Support](#) web site.

- Here we can interact to the Linux OS of CUCM like configuring IP Address, Changing DNS hostnames, Rebooting the node, Ping and much more
- CUCM Node can be upgraded using this interface
- Some system status can be verified from here
- This is the same interface we access via SSH CLI
- We use **Platform User Credentials** (OS Admin credentials) to login to Cisco Unified OS Administration interface

Cisco Unified IM and Presence Reporting

System Reports

System Reports Help

IM and Presence Database Replication Debug

IM and Presence Database Status

IM and Presence Table Count Summary

Presence Configuration

Presence Limits Warnings

Presence Usage

Report Descriptions

OK: Report generated successfully.

IM and Presence Database Status

Provides a snapshot of the IM and Presence database health. This report can be useful to monitor periodically, and should be used to ensure the database is healthy before an upgrade.

Created on Thu Feb 18 23:52:52 IST 2021

IM and Presence Cluster Name

Cluster Name	Publisher Name/IP
StandAloneCluster334fb	imp-pub

IM and Presence Database Access

Local and publisher databases accessible.

[View Details](#)

IM and Presence Database Status

RTMT Counter Information

- All servers have a replication count of 316.
- All servers have a good replication status.

[View Details](#)

See also Database Summary Screen in RTMT.

Run CLI command (show tech dbstateinfo) for more detail.

Replication Server List (cdr list serv) from every server for debugging purposes only.

[View Details](#)

Replication Server Template (cdr list template) from every server for debugging purposes only.

[View Details](#)

Database Prefs File

[View Details](#)

IM and Presence Hosts

All servers have equivalent host files

[View Details](#)

IM and Presence Rhosts

All servers have equivalent rhosts files.

[View Details](#)

IM and Presence Sqlhosts

All servers have equivalent sqlhosts files.

[View Details](#)

- Though you see this on the CUCM web GUI, it redirects to IMP Server if you have IMP in the cluster
- You can see that the web URL changes the moment you click here, this is like the reporting interface of CUCM for IMP servers
- We use **Application User Credentials** to login to Cisco Unified IM and Presence Reporting interface

Network Services in CUCM

- The services that are running by default are called Network Services.
- These services are responsible for making sure the CUCM cluster operates smoothly (for example DB Services, Tomcat Service, DRS Backup service, etc.)
- All the nodes in the cluster runs these services by default
- We usually deal with these services during troubleshooting purpose only
- Network services can be started or stopped from the Service Ability >> Tools >> Control Center - Network Services page
- We can also see the Up Time of each services here

Control Center - Network Services

Service Activation
Control Center - Feature Services
Control Center - Network Services
Serviceability Reports Archive
Audit Log Configuration

Related Links: Service Activation

Go

Refresh Page

Status: Ready

Select Server: cucm-pub--CUCM Voice/Video Go

Performance and Monitoring

	Service Name	Status:	Start Time	Up Time
<input type="radio"/>	Cisco CallManager Serviceability RTMT	Running	Wed Feb 17 18:26:34 2021	1 days 05:39:32
<input type="radio"/>	Cisco RTMT Reporter Servlet	Running	Wed Feb 17 18:26:34 2021	1 days 05:39:32
<input type="radio"/>	Cisco Log Partition Monitoring Tool	Running	Wed Feb 17 18:16:16 2021	1 days 05:49:50
<input type="radio"/>	Cisco Tomcat Stats Servlet	Running	Wed Feb 17 18:26:38 2021	1 days 05:39:28
<input type="radio"/>	Cisco RIS Data Collector	Running	Wed Feb 17 18:16:33 2021	1 days 05:49:33
<input type="radio"/>	Cisco AMC Service	Running	Wed Feb 17 18:16:34 2021	1 days 05:49:32
<input type="radio"/>	Cisco Audit Event Service	Running	Wed Feb 17 18:16:37 2021	1 days 05:49:29

Platform Services

	Service Name	Status:	Start Time	Up Time
<input type="radio"/>	Platform Administrative Web Service	Running	Wed Feb 17 18:25:44 2021	1 days 05:40:22
<input type="radio"/>	A Cisco DB	Running	Wed Feb 17 18:16:00 2021	1 days 05:50:06
<input type="radio"/>	A Cisco DB Replicator	Running	Wed Feb 17 18:16:01 2021	1 days 05:50:05
<input type="radio"/>	SNMP Master Agent	Running	Wed Feb 17 18:16:06 2021	1 days 05:50:00
<input type="radio"/>	MIB2 Agent	Running	Wed Feb 17 18:16:07 2021	1 days 05:49:59
<input type="radio"/>	Host Resources Agent	Running	Wed Feb 17 18:16:08 2021	1 days 05:49:58
<input type="radio"/>	System Application Agent	Running	Wed Feb 17 18:16:09 2021	1 days 05:49:57
<input type="radio"/>	Cisco CDP Agent	Running	Wed Feb 17 18:16:10 2021	1 days 05:49:56
<input type="radio"/>	Cisco Syslog Agent	Running	Wed Feb 17 18:16:11 2021	1 days 05:49:55
<input type="radio"/>	Cisco Certificate Expiry Monitor	Running	Wed Feb 17 18:16:25 2021	1 days 05:49:41
<input type="radio"/>	Cisco Certificate Change Notification	Running	Wed Feb 17 18:16:26 2021	1 days 05:49:40
<input type="radio"/>	Cisco ELM Client Service	Running	Wed Feb 17 18:26:38 2021	1 days 05:39:28
<input type="radio"/>	Cisco Tomcat	Running	Thu Feb 18 15:44:11 2021	0 days 08:21:55
<input type="radio"/>	Cisco License Manager	Running	Wed Feb 17 18:16:22 2021	1 days 05:49:44

System Services

	Service Name	Status:	Start Time	Up Time
<input type="radio"/>	Cisco CallManager Serviceability	Running	Wed Feb 17 18:26:33 2021	1 days 05:39:33
<input type="radio"/>	Cisco CDP	Running	Wed Feb 17 18:16:17 2021	1 days 05:49:49
<input type="radio"/>	Cisco Trace Collection Servlet	Running	Wed Feb 17 18:26:38 2021	1 days 05:39:28
<input type="radio"/>	Cisco Trace Collection Service	Running	Wed Feb 17 18:16:29 2021	1 days 05:49:37

Feature Services in CUCM

- The services that are not running by default are called Feature Services.
- These services are manually activated for enabling the cluster to perform different features (device registration, TFTP, Extension Mobility, etc.)
- For example, to register a Phone or Telepresence endpoint in CUCM cluster, we need 2 services to be activated. '**Cisco TFTP Service**' (responsible for delivering the configuration files to devices when they request registration) and '**CCM Service**' (responsible for device registration and call processing)
- This configuration file contains necessary information for a device to get register (like which CUCM node to register, soft key template, button template, firmware details, etc.)

The screenshot shows the Cisco Unified IM and Presence Serviceability web interface. The page title is "Cisco Unified IM and Presence Serviceability" and the subtitle is "For Cisco Unified Communications Solutions". The navigation bar includes "admin", "About", and "Logout". The "Service Activation" section is active, showing a dropdown menu with options: "Control Center - Feature Services", "Control Center - Network Services", "Serviceability Reports Archive", and "Audit Log Configuration". The "Control Center - Feature Services" option is selected. Below this, the "Select Server" section shows a dropdown menu with "cucm-pub--CUCM Voice/Video" selected and a "Go" button. The main content area displays a table of "CM Services" with columns for "Service Name" and "Activation Status". The "Cisco Tftp" service is checked and marked as "Activated". Other services like "Cisco CallManager", "Cisco Unified Mobile Voice Access Service", etc., are unchecked and marked as "Deactivated". Below the "CM Services" table, there are sections for "CTI Services" and "CDR Services", each with a table of services and their activation status. The "Database and Admin Services" section is also visible at the bottom.

Service Name	Activation Status
<input type="checkbox"/> Cisco CallManager	Deactivated
<input type="checkbox"/> Cisco Unified Mobile Voice Access Service	Deactivated
<input type="checkbox"/> Cisco IP Voice Media Streaming App	Deactivated
<input type="checkbox"/> Cisco CTIManager	Deactivated
<input type="checkbox"/> Cisco Extension Mobility	Deactivated
<input type="checkbox"/> Cisco Extended Functions	Deactivated
<input type="checkbox"/> Cisco DHCP Monitor Service	Deactivated
<input type="checkbox"/> Cisco Intercluster Lookup Service	Deactivated
<input type="checkbox"/> Cisco Location Bandwidth Manager	Deactivated
<input type="checkbox"/> Cisco Directory Number Alias Sync	Deactivated
<input type="checkbox"/> Cisco Directory Number Alias Lookup	Deactivated
<input type="checkbox"/> Cisco Headset Service	Deactivated
<input type="checkbox"/> Cisco Dialed Number Analyzer Server	Deactivated
<input type="checkbox"/> Cisco Dialed Number Analyzer	Deactivated
<input checked="" type="checkbox"/> Cisco Tftp	Activated

Service Name	Activation Status
<input type="checkbox"/> Cisco IP Manager Assistant	Deactivated
<input type="checkbox"/> Cisco WebDialer Web Service	Deactivated
<input type="checkbox"/> Self Provisioning IVR	Deactivated

Service Name	Activation Status
<input type="checkbox"/> Cisco SOAP - CDRonDemand Service	Deactivated
<input type="checkbox"/> Cisco CAR Web Service	Deactivated

Service Name	Activation Status
--------------	-------------------

- Feature services can be Activated from the Service Ability >> Tools >> Service Activation page

The screenshot displays the Cisco Unified IM and Presence Serviceability interface. The 'Control Center - Feature Services' dropdown menu is open, showing options like 'Service Activation', 'Control Center - Feature Services', 'Control Center - Network Services', 'Serviceability Reports Archive', and 'Audit Log Configuration'. The 'Cisco Tftp' service is highlighted in red in the 'CM Services' table, indicating it is 'Started' and 'Activated'. A red arrow points to the 'Up Time' column header.

Service Name	Status:	Activation Status	Start Time	Up Time
Cisco Serviceability Reporter	Not Running	Deactivated		
Cisco CallManager SNMP Service	Not Running	Deactivated		
Directory Services				
Cisco DirSync	Not Running	Deactivated		
CM Services				
Cisco CallManager	Not Running	Deactivated		
Cisco Unified Mobile Voice Access Service	Not Running	Deactivated		
Cisco IP Voice Media Streaming App	Not Running	Deactivated		
Cisco CTIManager	Not Running	Deactivated		
Cisco Extension Mobility	Not Running	Deactivated		
Cisco DHCP Monitor Service	Not Running	Deactivated		
Cisco Intercluster Lookup Service	Not Running	Deactivated		
Cisco Location Bandwidth Manager	Not Running	Deactivated		
Cisco Directory Number Alias Sync	Not Running	Deactivated		
Cisco Directory Number Alias Lookup	Not Running	Deactivated		
Cisco Headset Service	Not Running	Deactivated		
Cisco Dialed Number Analyzer Server	Not Running	Deactivated		
Cisco Dialed Number Analyzer	Not Running	Deactivated		
Cisco Tftp	Started	Activated	Fri Feb 19 00:00:57 2021	0 days 00:09:50
CTI Services				
Cisco IP Manager Assistant	Not Running	Deactivated		
Cisco WebDialer Web Service	Not Running	Deactivated		
Self Provisioning IVR	Not Running	Deactivated		

- Feature services can be Started, Stopped from the Service Ability >> Tools >> Control Center - Feature Services page
- We can also see the Activation time and Up Time of each services here
- Since CUCM is a distributed cluster of many CUCM nodes, we activate services by considering load lancing in mind
- Hence, I have activated 'Cisco TFTP Service' on the CUCM PUB and 'CCM Service' on CUCM SUB01 and CUCM SUB02
- CUCM SUB01 and CUCM SUB02 can act as a redundant registration server for devices

-
- Here, I haven't activated 'CCM Service' on CUCM PUB because CUCM PUB has primary responsibility to maintain and replicate the database to other nodes.
 - Giving extra load on CUCM PUB by activating 'CCM Service' adversely affect the DB Replication process. Hence it is not recommended activate 'CCM Service' on CUCM PUB

[Lab] Service Activation in CUCM Cluster

- Cisco Unified Service Ability >> Tools >> Service Activation >> Select the CUCM PUB >> Go >> Check Cisco TFTP >> Save

Cisco Unified IM and Presence Serviceability
For Cisco Unified Communications Solutions

Navigation: Cisco Unified IM and Presence Serviceability Go

admin About Logout

Alarm Trace Tools Snmp CallHome Help

Service Activation Related Links: Control Center - Feature Services Go

Save Set to Default Refresh

Status:
Ready

Select Server
Server* cucm-pub--CUCM Voice/Video Go
☐ Check All Services

CM Services

	Service Name	Activation Status
<input type="checkbox"/>	Cisco CallManager	Deactivated
<input type="checkbox"/>	Cisco Unified Mobile Voice Access Service	Deactivated
<input type="checkbox"/>	Cisco IP Voice Media Streaming App	Deactivated
<input type="checkbox"/>	Cisco CTIManager	Deactivated
<input type="checkbox"/>	Cisco Extension Mobility	Deactivated
<input type="checkbox"/>	Cisco Extended Functions	Deactivated
<input type="checkbox"/>	Cisco DHCP Monitor Service	Deactivated
<input type="checkbox"/>	Cisco Intercluster Lookup Service	Deactivated
<input type="checkbox"/>	Cisco Location Bandwidth Manager	Deactivated
<input type="checkbox"/>	Cisco Directory Number Alias Sync	Deactivated
<input type="checkbox"/>	Cisco Directory Number Alias Lookup	Deactivated
<input type="checkbox"/>	Cisco Headset Service	Deactivated
<input type="checkbox"/>	Cisco Dialed Number Analyzer Server	Deactivated
<input type="checkbox"/>	Cisco Dialed Number Analyzer	Deactivated
<input checked="" type="checkbox"/>	Cisco Tftp	Deactivated

CTI Services

	Service Name	Activation Status
<input type="checkbox"/>	Cisco IP Manager Assistant	Deactivated
<input type="checkbox"/>	Cisco WebDialer Web Service	Deactivated
<input type="checkbox"/>	Self Provisioning IVR	Deactivated

CDR Services

	Service Name	Activation Status
<input type="checkbox"/>	Cisco SOAP - CDRonDemand Service	Deactivated
<input type="checkbox"/>	Cisco CAR Web Service	Deactivated

Database and Admin Services

	Service Name	Activation Status
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- Make sure the service is in Activated State

Cisco Unified IM and Presence Serviceability

Navigation: Cisco Unified IM and Presence Serviceability Go

admin About Logout

Alarm Trace Tools Snmp CallHome Help

Service Activation Related Links: Control Center - Feature Services Go

Save Set to Default Refresh

Status: Update Completed

Select Server

Server* cucm-pub--CUCM Voice/Video Go

☐ Check All Services

CM Services

	Service Name	Activation Status
<input type="checkbox"/>	Cisco CallManager	Deactivated
<input type="checkbox"/>	Cisco Unified Mobile Voice Access Service	Deactivated
<input type="checkbox"/>	Cisco IP Voice Media Streaming App	Deactivated
<input type="checkbox"/>	Cisco CTIManager	Deactivated
<input type="checkbox"/>	Cisco Extension Mobility	Deactivated
<input type="checkbox"/>	Cisco Extended Functions	Deactivated
<input type="checkbox"/>	Cisco DHCP Monitor Service	Deactivated
<input type="checkbox"/>	Cisco Intercluster Lookup Service	Deactivated
<input type="checkbox"/>	Cisco Location Bandwidth Manager	Deactivated
<input type="checkbox"/>	Cisco Directory Number Alias Sync	Deactivated
<input type="checkbox"/>	Cisco Directory Number Alias Lookup	Deactivated
<input type="checkbox"/>	Cisco Headset Service	Deactivated
<input type="checkbox"/>	Cisco Dialed Number Analyzer Server	Deactivated
<input type="checkbox"/>	Cisco Dialed Number Analyzer	Deactivated
<input checked="" type="checkbox"/>	Cisco Tftp	Activated ←

CTI Services

	Service Name	Activation Status
<input type="checkbox"/>	Cisco IP Manager Assistant	Deactivated
<input type="checkbox"/>	Cisco WebDialer Web Service	Deactivated
<input type="checkbox"/>	Self Provisioning IVR	Deactivated

CDR Services

	Service Name	Activation Status
<input type="checkbox"/>	Cisco SOAP - CDRonDemand Service	Deactivated
<input type="checkbox"/>	Cisco CAR Web Service	Deactivated

Database and Admin Services

	Service Name	Activation Status
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- We can monitor the status, up time, activation time from the Control Center - Feature Services section

Control Center - Feature Services

- Service Activation
- Control Center - Feature Services
- Control Center - Network Services
- Serviceability Reports Archive
- Audit Log Configuration

Performance and Monitoring Services

Service Name	Status	Activation Status	Start Time	Up Time
Cisco Serviceability Reporter	Not Running	Deactivated		
Cisco CallManager SNMP Service	Not Running	Deactivated		

Directory Services

Service Name	Status	Activation Status	Start Time	Up Time
Cisco DirSync	Not Running	Deactivated		

CM Services

Service Name	Status	Activation Status	Start Time	Up Time
Cisco CallManager	Not Running	Deactivated		
Cisco Unified Mobile Voice Access Service	Not Running	Deactivated		
Cisco IP Voice Media Streaming App	Not Running	Deactivated		
Cisco CTIManager	Not Running	Deactivated		
Cisco Extension Mobility	Not Running	Deactivated		
Cisco DHCP Monitor Service	Not Running	Deactivated		
Cisco Intercluster Lookup Service	Not Running	Deactivated		
Cisco Location Bandwidth Manager	Not Running	Deactivated		
Cisco Directory Number Alias Sync	Not Running	Deactivated		
Cisco Directory Number Alias Lookup	Not Running	Deactivated		
Cisco Headset Service	Not Running	Deactivated		
Cisco Dialed Number Analyzer Server	Not Running	Deactivated		
Cisco Dialed Number Analyzer	Not Running	Deactivated		
Cisco Tftp	Started	Activated	Fri Feb 19 00:00:57 2021	0 days 00:09:50

CTI Services

Service Name	Status	Activation Status	Start Time	Up Time
Cisco IP Manager Assistant	Not Running	Deactivated		
Cisco WebDialer Web Service	Not Running	Deactivated		
Self Provisioning IVR	Not Running	Deactivated		

Service Activation

- Save
- Set to Default
- Refresh

Status:

Ready

Select Server

Server* cucm-sub01--CUCM Voice/Video Go

☐ Check All Services

CM Services

Service Name	Activation Status
Cisco CallManager	Activated
Cisco IP Voice Media Streaming App	Deactivated
Cisco CTIManager	Deactivated
Cisco Extension Mobility	Deactivated
Cisco Extended Functions	Deactivated
Cisco DHCP Monitor Service	Deactivated
Cisco Location Bandwidth Manager	Deactivated
Cisco Directory Number Alias Lookup	Deactivated
Cisco Headset Service	Deactivated
Cisco Dialed Number Analyzer Server	Deactivated
Cisco Dialed Number Analyzer	Deactivated
Cisco Tftp	Deactivated

CTI Services

Service Name	Activation Status
Cisco IP Manager Assistant	Deactivated
Cisco WebDialer Web Service	Deactivated

Cisco Unified IM and Presence Serviceability

Navigation: Cisco Unified IM and Presence Serviceability

admin | About | Logout

Alarm | Trace | Tools | Snmp | CallHome | Help

Service Activation Related Links: Control Center - Feature Services

Save Set to Default Refresh

Status: Ready

Select Server

Server*: cucm-sub02--CUCM Voice/Video Go

☐ Check All Services

CM Services

	Service Name	Activation Status
<input checked="" type="checkbox"/>	Cisco CallManager	Activated
<input type="checkbox"/>	Cisco IP Voice Media Streaming App	Deactivated
<input type="checkbox"/>	Cisco CTIManager	Deactivated
<input type="checkbox"/>	Cisco Extension Mobility	Deactivated
<input type="checkbox"/>	Cisco Extended Functions	Deactivated
<input type="checkbox"/>	Cisco DHCP Monitor Service	Deactivated
<input type="checkbox"/>	Cisco Location Bandwidth Manager	Deactivated
<input type="checkbox"/>	Cisco Directory Number Alias Lookup	Deactivated
<input type="checkbox"/>	Cisco Headset Service	Deactivated
<input type="checkbox"/>	Cisco Dialed Number Analyzer Server	Deactivated
<input type="checkbox"/>	Cisco Dialed Number Analyzer	Deactivated
<input type="checkbox"/>	Cisco Tftp	Deactivated

CTI Services

	Service Name	Activation Status
<input type="checkbox"/>	Cisco IP Manager Assistant	Deactivated
<input type="checkbox"/>	Cisco WebDialer Web Service	Deactivated

Database and Admin Services

	Service Name	Activation Status
<input checked="" type="checkbox"/>	Cisco AXL Web Service	Activated
<input type="checkbox"/>	Cisco UXL Web Service	Deactivated

Performance and Monitoring Services

	Service Name	Activation Status
<input type="checkbox"/>	Cisco Serviceability Reporter	Deactivated
<input type="checkbox"/>	Cisco CallManager SNMP Service	Deactivated

- In CUCM SUB01 and SUB02, activate Cisco CallManager service
- Now our cluster is ready to accept device registration, we will see how to register a Device to CUCM soon















Understanding Cisco IP Phone 8865




- The Cisco IP Phone 8865 is advanced, high-quality, full-featured VoIP communications and affordable entry into HD video (720p) communications
- Flexible deployment options include Cisco on-premises (CUCM), hosted, Mobile Remote Access (MRA) and WebEx Calling
- Read More: [Cisco IP Phone 8865](#)

Cisco IP Phone 8865 Front Panel



1	Handset and Handset light strip	Indicates whether you have an incoming call (flashing red) or a new voice message (steady red).
2	Camera	Use the camera for video calls.
3	Programmable feature buttons and line buttons	 Access your phone lines, features, and call sessions.
4	Softkey buttons	 Access to functions and services.
5	Back , Navigation cluster, and Release	<p>Back  Return to the previous screen or menu.</p> <p>If you press and hold the back button for more than 0.5 secs (long press), you return to the main screen or the call screen. When you are in the settings screens, the long press takes you to the main screen. If you are in one of the call screens, the long press takes you to the call screen.</p> <p>Navigation cluster  Navigation ring and Select button—Scroll through menus, highlight items and select the highlighted item.</p> <p>Release  End a connected call or session.</p>
6	Hold/Resume , Conference , and Transfer	<p>Hold/Resume  Place an active call on hold and resume the held call.</p> <p>Conference  Create a conference call.</p> <p>Transfer  Transfer a call.</p>
7	Speakerphone , Mute , and Headset	<p>Speakerphone  Toggle the speakerphone on or off. When the speakerphone is on, the button is lit.</p> <p>Mute  Toggle the microphone on or off. When the microphone is muted, the button is lit.</p> <p>Headset  Toggle the headset on or off. When the headset is on, the button is lit.</p>
8	Contacts , Applications , and Messages	<p>Contacts  Access personal and corporate directories.</p> <p>Applications  Access call history, user preferences, phone settings, and phone model information.</p> <p>Messages  Autodial your voice messaging system.</p>

9	Volume button	 Adjust the handset, headset, and speakerphone volume (off hook) and the ringer volume (on hook).
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Cisco IP Phone 8865 Back Panel



1	DC adaptor port	48V DC Power (If there is no PoE)
2	AC-to-DC power supply (optional)	AC to 48V DC power adapter
3	AC power wall plug (optional)	Power adapter wall plug
4	Network port (10/100/1000 SW) connection	IEEE 802.3at power enabled, to connect IP Phone to the switch (Network).
5	PC port (10/100/1000 PC) connection	To connect co-located PC (IP Phone acts as a mini switch). We can configure different VLANs for Network and PC ports.
6	Auxiliary port	To connect expansion module
7	Handset connection	To connect receiver handset
8	Analog headset connection (optional)	To connect Cisco Headset (RJ11)
9	USB port	USB devices can be connecte3d, e.g. USB wireless headset

10	Audio In/Out ports	To feed audio in and out
11	USB port	USB devices can be connecte3d, e.g. USB wireless headset

Understanding Cisco Telepresence Endpoint DX70



- The Cisco DX70 desk series 14-inch HD video and audio device
- A multi touch capacitive touch screen that provides an elegant and powerful user interface
- Flexible registration models on-premises, MRA and in the cloud
- Internal 2-port Cisco Ethernet switch allows for a direct connection to a 10/100/1000BASE-T Ethernet network (IEEE802.3i/802.3u/802.3ab) through an RJ-45 interface with single LAN connectivity for both the DX70 and a co-located PC
- Supports wireless network connection
- Firmware is either Cisco CE or Android, default comes with Cisco CE software
- DX70 is bit outdated Telepresence Endpoint, we have Cisco WebEx Desk Series

Cisco DX 70 Front Panel

Integrated collaboration at the desktop

Compact size for limited spaces

Features

- 802.11 a/b/g/n wireless and Gigabit Ethernet connectivity
- Bluetooth and USB (including a high-current side port for charging tablets and smart phones)
- Peripheral support offers many options for personalization
- Android 4.1 and Google Play Store access for third-party applications
- HDMI Input for PC/Mac Display and Content Sharing
- Tilttable Document Camera
- VESA (100 and 75) mount support



Cisco DX 70 Back Panel



Protocols and Services Used by Cisco IP Phones / Telepresence Endpoints

- **NTP (Network Time Protocol):** Used to synchronize time with a central server to enable standard time on all the IP Phones
- **CDP (Cisco Discovery Protocol):** Cisco Switches will identify connected IP Phone via CDP. This will make sure specific power delivery over PoE enabled switches
- **DHCP (Dynamic Host Configuration Protocol):** DHCP is faster, easier, widely accepted method to distribute IP information to the clients, here IP Phones. DHCP can be provided by an existing dedicated DHCP server, Router, L3 Switch, other software or natively from CUCM itself. It provides following information to the IP Phones,
 - IP Address
 - Subnet Mask
 - Default Gateway
 - DNS Server
 - TFTP Server IP
- **TFTP (Trivial File Transfer Protocol):** IP Phones utilize TFTP to download their configuration files, firmware images etc. Normal TFTP server can't fulfill IP Phones requirement, hence we must have CUCM TFTP server. CUCM runs TFTP service at port number 6970
- **PoE (Power Over Ethernet):** Provides DC power over Ethernet cabling. No extra wiring, no external power supply needed. Cisco Switch send FLP (Fast Line Pulse 147KHz), phone receive and send back the FLP to the switch. By this way switch will realize the device need power. Then switch provide required power. From CDP message switch can be able to analyze how much power needed for an IP Phone. 3rd party phone will take full power. Use show power inline command to verify the PoE

192.168.10.254 - PuTTY

```
SWITCH#show power inline
```

Module	Available (Watts)		Used (Watts)	Remaining (Watts)			
2	370.0		46.3	323.7			
Interface	Admin	Oper	Power (Watts)	Device	Class	Max	
Fa2/0/1	auto	off	0.0	n/a	n/a	15.4	
Fa2/0/2	auto	off	0.0	n/a	n/a	15.4	
Fa2/0/3	auto	on	15.4	Ieee PD	3	15.4	
Fa2/0/4	auto	off	0.0	n/a	n/a	15.4	
Fa2/0/5	auto	off	0.0	n/a	n/a	15.4	
Fa2/0/6	auto	off	0.0	n/a	n/a	15.4	
Fa2/0/7	auto	off	0.0	n/a	n/a	15.4	
Fa2/0/8	auto	off	0.0	n/a	n/a	15.4	
Fa2/0/9	auto	on	6.3	IP Phone 7942	2	15.4	
Fa2/0/10	auto	on	6.3	IP Phone 7942	2	15.4	
Fa2/0/11	auto	off	0.0	n/a	n/a	15.4	
Fa2/0/12	auto	off	0.0	n/a	n/a	15.4	

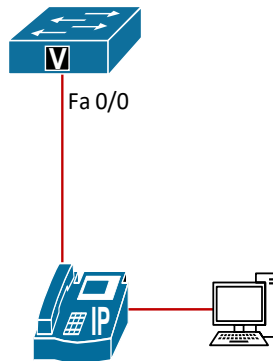
- **DNS (Domain Name System):** DNS provides IP to Domain mapping and vice versa. It is not critical to IP Phones. DNS is not a service that CUCM can offer
- **SIP (Session Initiation Protocol):** Used to register the phone with CUCM and facilitates in call control. Open standard protocols
- **SCCP (Skinny Client Control Protocol):** Used to register the phone with CUCM and enables in call control. Cisco proprietary protocol, almost outdated. New IP phones don't support SCCP

DHCP Configuration for Cisco IP Phones and Telepresence Endpoints

- DHCP can be configured on a L3 switch, Router or dedicated DHCP servers (Windows, Linux, etc.)
- Option 150 is used to mention CUCM TFTP Server IP address
- Option 66 is used to point CUCM TFTP Server DNS name

[LAB] DHCP on L3 Switch

- In the below topology, the phones will get VLAN 11 and the respective IPs and PC will get VLAN 12 and corresponding IPs.



Creating a Logical Interface for Voice VLAN

```
SWITCH(config)# interface Vlan10  
SWITCH(config-if)# ip address 192.168.10.254 255.255.255.0
```

Creating a Logical Interface for Data VLAN

```
SWITCH(config)# interface Vlan11  
SWITCH(config-if)# ip address 192.168.20.254 255.255.255.0
```

Excluding IP Address from the pool

```
SWITCH(config)# ip dhcp excluded-address 192.168.10.1 192.168.10.10  
SWITCH(config)# ip dhcp excluded-address 192.168.10.245 192.168.10.254
```

```
SWITCH(config)# ip dhcp excluded-address 192.168.20.1 192.168.20.10  
SWITCH(config)# ip dhcp excluded-address 192.168.20.245 192.168.20.254
```

Creating DHCP Pool for phones with TFTP Options

```
SWITCH(dhcp-config)# ip dhcp pool HQ_PHONES  
SWITCH(dhcp-config)# network 192.168.10.0 255.255.255.0  
SWITCH(dhcp-config)# default-router 192.168.10.254  
SWITCH(dhcp-config)# dns-server 192.168.10.11  
SWITCH(dhcp-config)# option 150 ip 192.168.10.253 192.168.10.13  
SWITCH(dhcp-config)# option 66 ip cucm-pub.ajcollab.com  
SWITCH(dhcp-config)# domain-name ajcollab.com
```

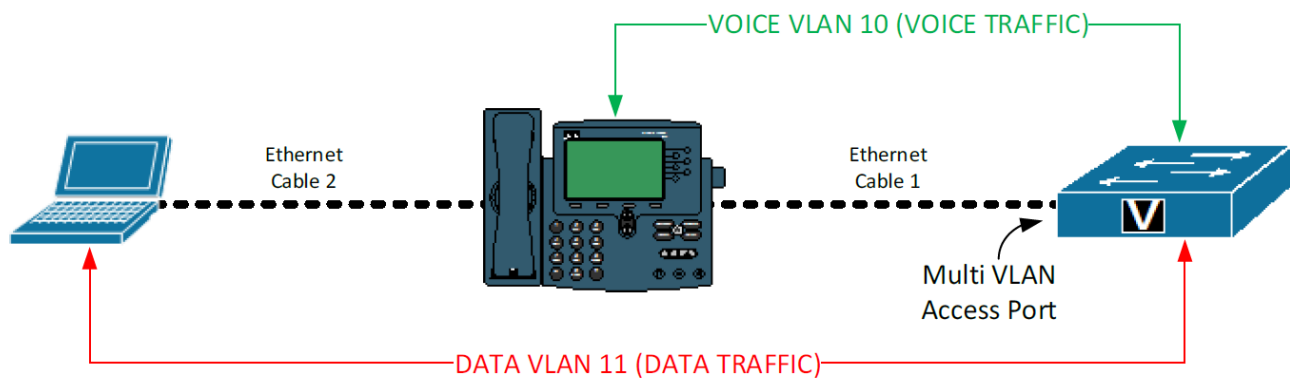
Creating DHCP Pool for PCs

```
SWITCH(dhcp-config)# ip dhcp pool HQ_DATA  
SWITCH(dhcp-config)# network 192.168.20.0 255.255.255.0  
SWITCH(dhcp-config)# default-router 192.168.20.254  
SWITCH(dhcp-config)# dns-server 192.168.20.11
```

Assign Dual VLAN to the Switch Port

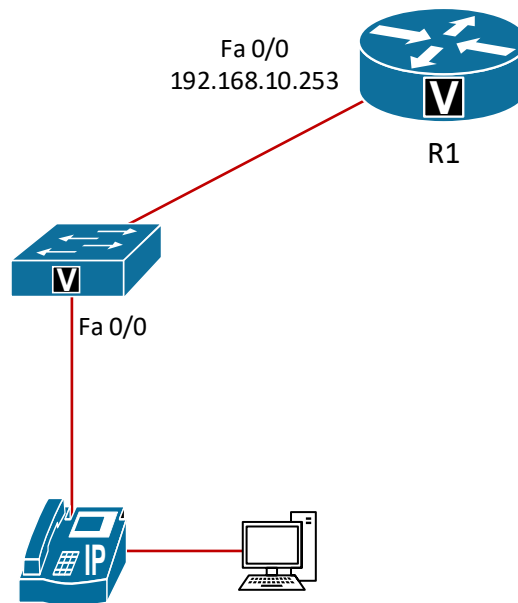
```
SWITCH(dhcp-config)# interface range fastEthernet 0/1-12  
Switch(config-if-range)#switchport mode access  
Switch(config-if-range)#switchport voice vlan 10  
Switch(config-if-range)#switchport access vlan 11
```

In this case the switch port is intelligent enough to assign Data VLAN to the PC port on the IP Phone. Hence, when you connect a PC on the PC Port, that device will be in Data VLAN 11 and IP Phone will be in Voice VLAN 10



[LAB] DHCP on Local Router

- In this situation, make sure there is no interface VLAN configured on the switch for the VLAN where the phones are connected



Assigning IP Address to router interface

```
Router(config)# interface fa 0/0
Router(config-if)# ip address 192.168.10.253 255.255.255.0
Router(config-if)# no shutdown
```

Excluding IP Address from the pool

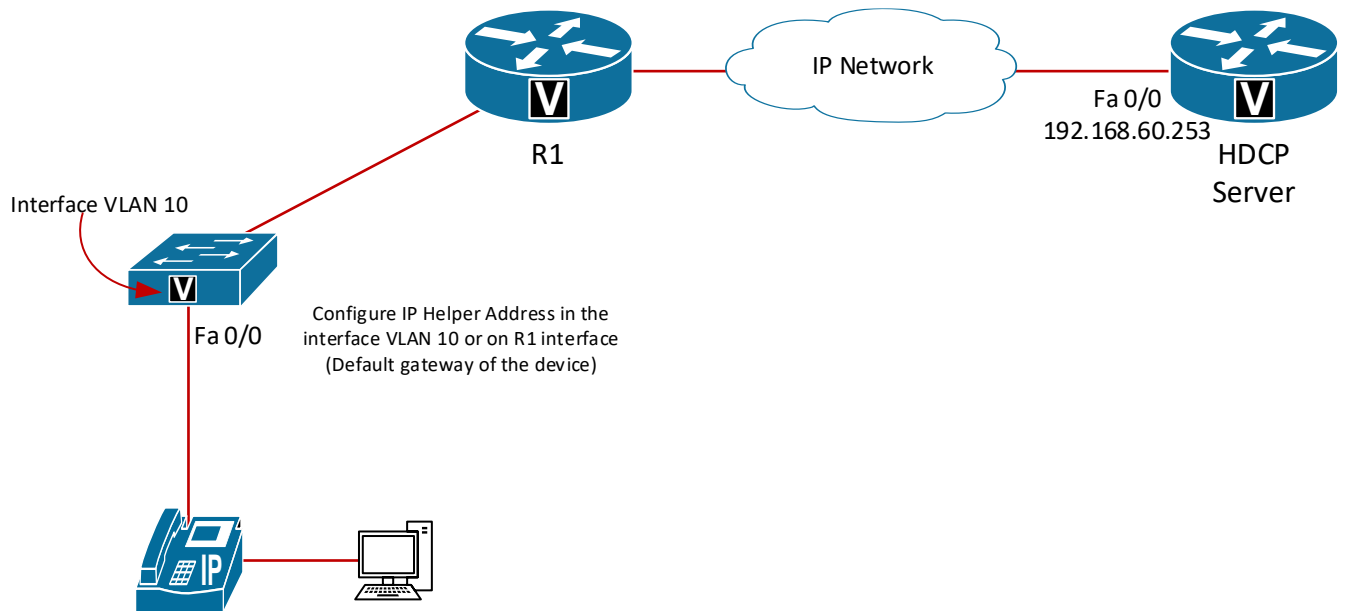
```
Router(config)# ip dhcp excluded-address 192.168.10.1 192.168.20.10
Router(config)# ip dhcp excluded-address 192.168.10.245 192.168.20.254
```

Creating DHCP Pool for phones with TFTP Options

```
Router(dhcp-config)# ip dhcp pool HQ_PHONES
Router(dhcp-config)# network 192.168.10.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.10.253
Router(dhcp-config)# dns-server 192.168.10.11
Router(dhcp-config)# option 150 ip 192.168.10.253 192.168.10.13
Router(dhcp-config)# option 66 ip cucm-pub.ajcollab.com
Router(dhcp-config)# domain-name ajcollab.com
```

[Lab] DHCP Configuration on Remote Router or Device

- If DHCP server is located remotely (not in the LAN), the DHCP broadcast packets will drop at the default gateway of the device
- Hence, we would configure IP Helper address in the default gateway interface to reach a remote DHCP server
- In below figure, the DHCP traffic will drop at the interface VLAN 10. Hence configure IP Helper address at the interface VLAN 10

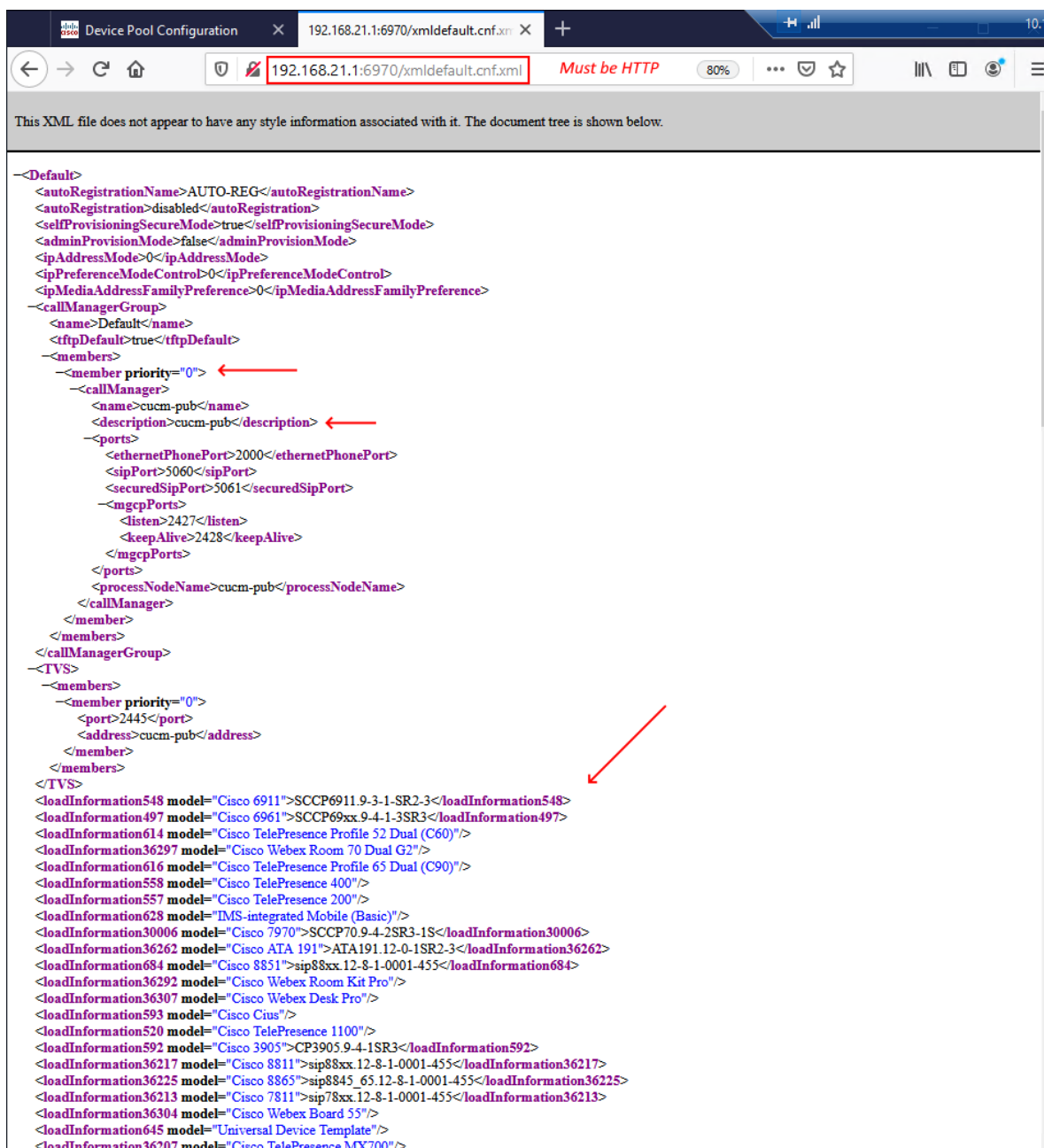


```
SWITCH(config)# interface Vlan11
SWITCH(config-if)# ip address 192.168.10.254 255.255.255.0
SWITCH(config-if)# ip helper-address 192.168.60.253
```

Note: Make sure, the Remote DHCP server should contains a DHCP pool with a network similar to the interface VLAN 10.

Default Phone Configuration File - xmldefault.cnf.xml

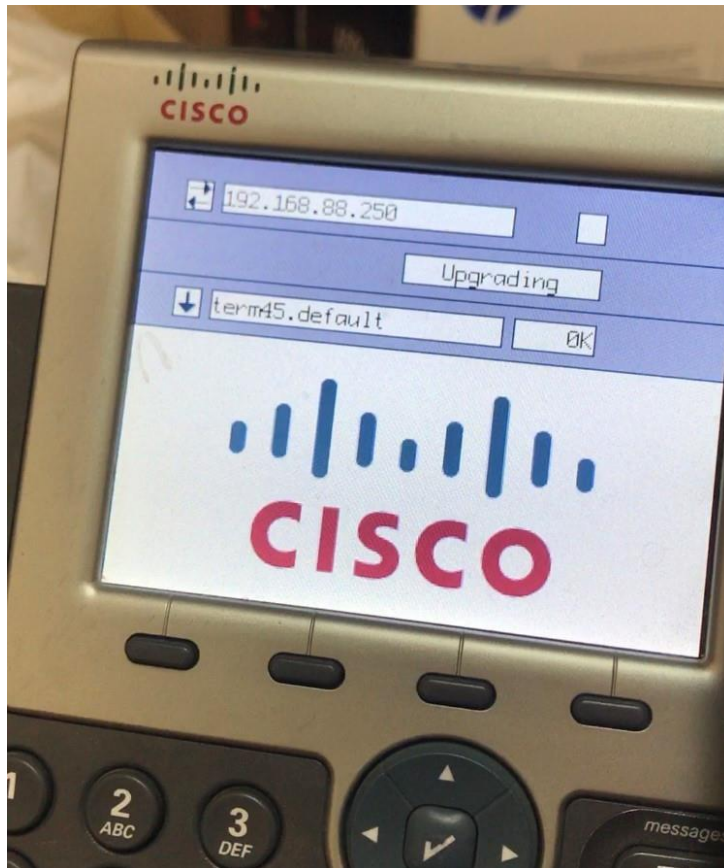
- As part of Phone registration process, the phone requests a configuration file from the CUCM TFTP Server over HTTP port 6970
- Phone will always request **SEPMAC_ADDRESS.cnf.xml** file, if the phone is not present in the CUCM database (not added before), this specific SEPMAC_ADDRESS.cnf.xml won't be available
- During such scenario (phone is not added in CUCM before), the phone requests the default configuration file **xmldefault.cnf.xml** from TFTP server
- To access this file, **http://CUCM_TFTP_SERVER:6970/xmldefault.cnf.xml**
- The file contains whether the Auto registration is Enabled or Disabled, CUCM Group (where we have the CUCM node to register) and all supported Phone models and available firmware



```
<?xml version="1.0" encoding="UTF-8" ?>
<Default>
  <autoRegistrationName>AUTO-REG</autoRegistrationName>
  <autoRegistration>disabled</autoRegistration>
  <selfProvisioningSecureMode>true</selfProvisioningSecureMode>
  <adminProvisionMode>false</adminProvisionMode>
  <ipAddressMode>0</ipAddressMode>
  <ipPreferenceModeControl>0</ipPreferenceModeControl>
  <ipMediaAddressFamilyPreference>0</ipMediaAddressFamilyPreference>
  <callManagerGroup>
    <name>Default</name>
    <tftpDefault>true</tftpDefault>
    <members>
      <member priority="0">
        <callManager>
          <name>cucm-pub</name>
          <description>cucm-pub</description>
          <ports>
            <ethernetPhonePort>2000</ethernetPhonePort>
            <sipPort>5060</sipPort>
            <securedSipPort>5061</securedSipPort>
          </ports>
          <mcpPorts>
            <listen>2427</listen>
            <keepAlive>2428</keepAlive>
          </mcpPorts>
          <processNodeName>cucm-pub</processNodeName>
        </callManager>
      </member>
    </members>
  </callManagerGroup>
  <TVS>
    <members>
      <member priority="0">
        <port>2445</port>
        <address>cucm-pub</address>
      </member>
    </members>
  </TVS>
  <loadInformation548 model="Cisco 6911">SCCP6911.9-3-1-SR2-3</loadInformation548>
  <loadInformation497 model="Cisco 6961">SCCP69xx.9-4-1-3SR3</loadInformation497>
  <loadInformation614 model="Cisco TelePresence Profile 52 Dual (C60)">
  <loadInformation36297 model="Cisco Webex Room 70 Dual G2">
  <loadInformation616 model="Cisco TelePresence Profile 65 Dual (C90)">
  <loadInformation558 model="Cisco TelePresence 400">
  <loadInformation557 model="Cisco TelePresence 200">
  <loadInformation628 model="IMS-integrated Mobile (Basic)">
  <loadInformation30006 model="Cisco 7970">SCCP70.9-4-2SR3-1S</loadInformation30006>
  <loadInformation36262 model="Cisco ATA 191">ATA191.12-0-1SR2-3</loadInformation36262>
  <loadInformation684 model="Cisco 8851">sip88xx.12-8-1-0001-455</loadInformation684>
  <loadInformation36292 model="Cisco Webex Room Kit Pro">
  <loadInformation36307 model="Cisco Webex Desk Pro">
  <loadInformation593 model="Cisco Cius">
  <loadInformation520 model="Cisco TelePresence 1100">
  <loadInformation592 model="Cisco 3905">CP3905.9-4-1SR3</loadInformation592>
  <loadInformation36217 model="Cisco 8811">sip88xx.12-8-1-0001-455</loadInformation36217>
  <loadInformation36225 model="Cisco 8865">sip8845_65.12-8-1-0001-455</loadInformation36225>
  <loadInformation36213 model="Cisco 7811">sip78xx.12-8-1-0001-455</loadInformation36213>
  <loadInformation36304 model="Cisco Webex Board 55">
  <loadInformation645 model="Universal Device Template">
  <loadInformation36707 model="Cisco TelePresence MX 700">
```

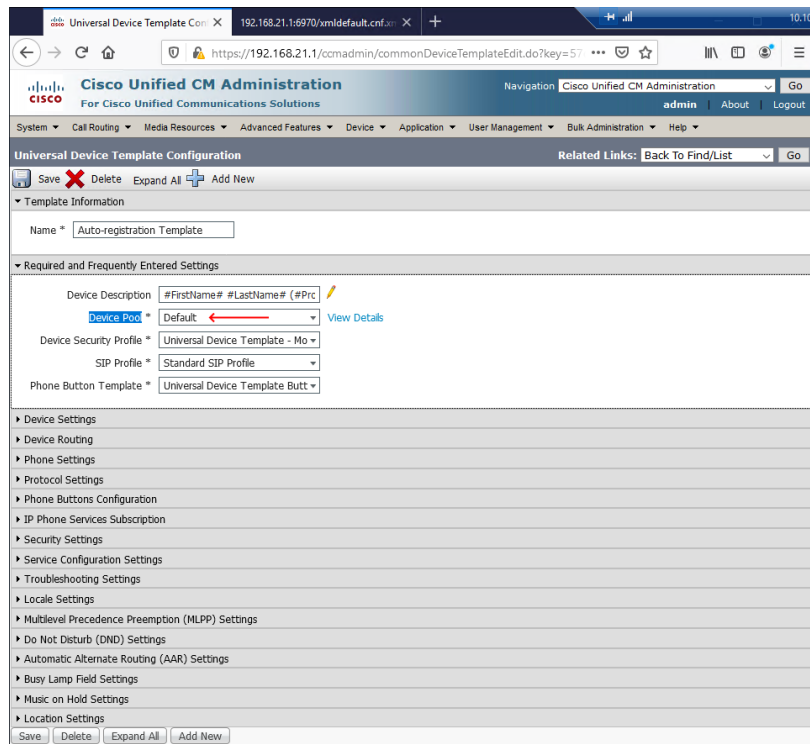
Auto Phone Firmware Upgrade Situations

- A phone will go for a firmware upgrade if its firmware is lower than the one available on xmldefault.cnf.xml file
- If the phone firmware is higher than the one available on xmldefault.cnf.xml, there won't be any firmware upgrade



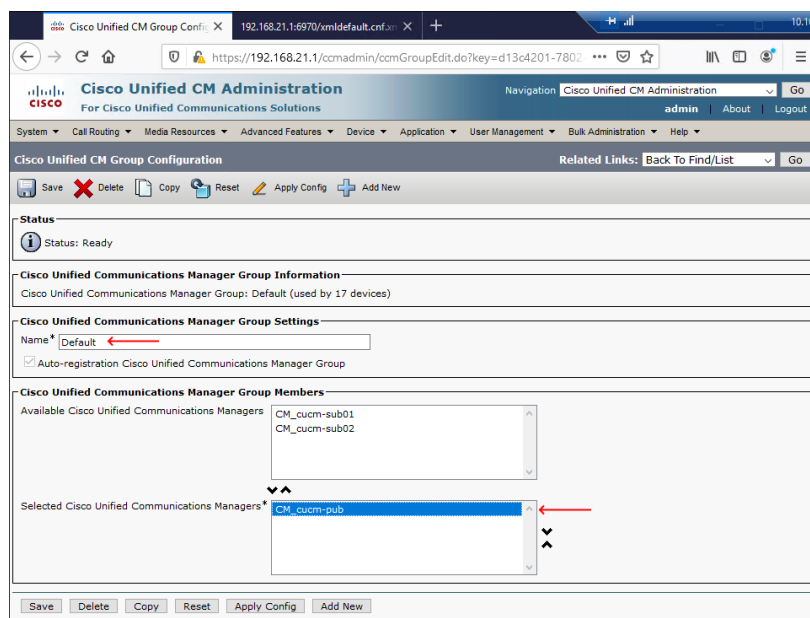
[Lab] Auto Registration of Cisco Endpoint in CUCM

- Go to User Management >> User/Phone Add >> Universal Device Template
- Check the device pool there, phones will be taking this information to get register
- Here the device pool is Default and hence it takes the CUCM Group under the Default device pool



The screenshot shows the 'Universal Device Template Configuration' page in the Cisco Unified CM Administration console. The 'Device Pool' is set to 'Default'. The 'SIP Profile' is 'Standard SIP Profile'. The 'Phone Button Template' is 'Universal Device Template Butt'. The 'Device Description' is '#FirstName# #LastName# (#Prc)'. The 'Device Security Profile' is 'Universal Device Template - Mo'. The 'Phone Button Template' is 'Universal Device Template Butt'. The 'Device Settings' section is expanded, showing various settings like Device Routing, Phone Settings, Protocol Settings, etc.

- Go to System >> Cisco Unified CM Groups and check the Default CUCM Group
- Here we see CUCM PUB in the Selected Cisco Unified Communications Managers list
- We haven't activated Cisco CallManager service on CUCM PUB
- Hence no registration will happen by default



The screenshot shows the 'Cisco Unified CM Group Configuration' page in the Cisco Unified CM Administration console. The 'Name' is 'Default'. The 'Auto-registration Cisco Unified Communications Manager Group' checkbox is checked. The 'Selected Cisco Unified Communications Managers' list shows 'CM_cucm-pub' selected. The 'Available Cisco Unified Communications Managers' list shows 'CM_cucm-sub01' and 'CM_cucm-sub02'.

- If we look at the xmldefault.cnf.xml file, we see that Auto Registration is disabled and primary node is CUCM PUB, this must be changed

Device Pool Configuration x 192.168.21.1:6970/xmldefault.cnf.xml x +

192.168.21.1:6970/xmldefault.cnf.xml Must be HTTP 80%

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```

<Default>
  <autoRegistrationName>AUTO-REG</autoRegistrationName>
  <autoRegistration>disabled</autoRegistration>
  <selfProvisioningSecureMode>true</selfProvisioningSecureMode>
  <adminProvisionMode>false</adminProvisionMode>
  <ipAddressMode>0</ipAddressMode>
  <ipPreferenceModeControl>0</ipPreferenceModeControl>
  <ipMediaAddressFamilyPreference>0</ipMediaAddressFamilyPreference>
  <callManagerGroup>
    <name>Default</name>
    <httpDefault>true</httpDefault>
    <members>
      <member priority="0">
        <callManager>
          <name>cucm-pub</name>
          <description>cucm-pub</description>
          <ports>
            <ethernetPhonePort>2000</ethernetPhonePort>
            <sipPort>5060</sipPort>
            <securedSipPort>5061</securedSipPort>
          </ports>
          <mgcpPorts>
            <listen>2427</listen>
            <keepAlive>2428</keepAlive>
          </mgcpPorts>
          <processNodeName>cucm-pub</processNodeName>
        </callManager>
      </member>
    </members>
  </callManagerGroup>
</TVS>
  <members>
    <member priority="0">
      <port>2445</port>
      <address>cucm-pub</address>
    </member>
  </members>
</TVS>
<loadInformation548 model="Cisco 6911">SCCP6911.9-3-1-SR2-3</loadInformation548>
<loadInformation497 model="Cisco 6961">SCCP69xx.9-4-1-3SR3</loadInformation497>
<loadInformation614 model="Cisco TelePresence Profile 52 Dual (C60)">
<loadInformation36297 model="Cisco Webex Room 70 Dual G2">
<loadInformation616 model="Cisco TelePresence Profile 65 Dual (C90)">
<loadInformation558 model="Cisco TelePresence 400">
<loadInformation557 model="Cisco TelePresence 200">
<loadInformation628 model="IMS-integrated Mobile (Basic)">
<loadInformation30006 model="Cisco 7970">SCCP70.9-4-2SR3-1S</loadInformation30006>
<loadInformation36262 model="Cisco ATA 191">ATA191.12-0-1SR2-3</loadInformation36262>
<loadInformation684 model="Cisco 8851">sip88xx.12-8-1-0001-455</loadInformation684>
<loadInformation36292 model="Cisco Webex Room Kit Pro">
<loadInformation36307 model="Cisco Webex Desk Pro">
<loadInformation593 model="Cisco Cius">
<loadInformation520 model="Cisco TelePresence 1100">
<loadInformation592 model="Cisco 3905">CP3905.9-4-1SR3</loadInformation592>
<loadInformation36217 model="Cisco 8811">sip88xx.12-8-1-0001-455</loadInformation36217>
<loadInformation36225 model="Cisco 8865">sip8845_65.12-8-1-0001-455</loadInformation36225>
<loadInformation36213 model="Cisco 7811">sip78xx.12-8-1-0001-455</loadInformation36213>
<loadInformation36304 model="Cisco Webex Board 55">
<loadInformation645 model="Universal Device Template">
<loadInformation36207 model="Cisco TelePresence MX700">

```

This must be a CUCM Node with Cisco CallManager Service running

- I have moved CUCM SUB01 to the selected list

The screenshot displays the Cisco Unified CM Administration web interface. The browser address bar shows the URL <https://192.168.21.1/ccmadmin/ccmGroupEdit.do?key=d13c4201-7802>. The page title is "Cisco Unified CM Group Configuration". The navigation menu includes System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The main content area shows the configuration for a Cisco Unified Communications Manager Group. The "Status" section indicates "Status: Ready". The "Cisco Unified Communications Manager Group Information" section shows "Cisco Unified Communications Manager Group: Default (used by 17 devices)". The "Cisco Unified Communications Manager Group Settings" section shows "Name: Default" and a checked checkbox for "Auto-registration Cisco Unified Communications Manager Group". The "Cisco Unified Communications Manager Group Members" section shows two lists: "Available Cisco Unified Communications Managers" with "CM_cucm-sub02" and "CM_cucm-pub", and "Selected Cisco Unified Communications Managers*" with "CM_cucm-sub01". A red arrow points to "CM_cucm-sub01" in the selected list. The bottom of the page contains a legend with three items: "i *- indicates required item.", "i **Selected Cisco Unified Communications Managers are ordered by highest priority", and "i ***Only active Cisco Unified Communications Managers are available for adding to Cisco Unified Communications Manager Groups."

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go
admin | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Cisco Unified CM Group Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

Status
Status: Ready

Cisco Unified Communications Manager Group Information
Cisco Unified Communications Manager Group: Default (used by 17 devices)

Cisco Unified Communications Manager Group Settings
Name* Default
☒ Auto-registration Cisco Unified Communications Manager Group

Cisco Unified Communications Manager Group Members
Available Cisco Unified Communications Managers
CM_cucm-sub02
CM_cucm-pub
Selected Cisco Unified Communications Managers*
CM_cucm-sub01

Save Delete Copy Reset Apply Config Add New

i *- indicates required item.
i **Selected Cisco Unified Communications Managers are ordered by highest priority
i ***Only active Cisco Unified Communications Managers are available for adding to Cisco Unified Communications Manager Groups.

- Go to System >> Unified CM >> Select CUCM SUB01
- Set Universal Device and Line Template
- Configure starting DN and Ending DN
- Uncheck Auto-registration Disabled box

Cisco Unified CM Configuration
192.168.21.1:6970/xmldefault.cnf.xml
+

https://192.168.21.1/ccmadmin/ccmEdit.do?key=992e1133-34c6-4b5d-...

Cisco Unified CM Administration
Navigation Cisco Unified CM Administration Go
admin | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Cisco Unified CM Configuration
Related Links: Back To Find/List Go

Save Reset Apply Config

Status

Update successful

Cisco Unified Communications Manager Information

Cisco Unified Communications Manager: CM_cucm-sub01 (used by 17 devices)

Server Information

CTI ID 4

Cisco Unified Communications Manager Server* cucm-sub01

Cisco Unified Communications Manager Name* CM_cucm-sub01

Description cucm-sub01

Location Bandwidth Manager Group < None >

Auto-registration Information

Universal Device Template*	Auto-registration Template
Universal Line Template*	Sample Line Template with TAG usage examples
Starting Directory Number*	11001
Ending Directory Number*	11002

☐ Auto-registration Disabled on this Cisco Unified Communications Manager *Uncheck this box!*

Next Auto-Registration number to be used: 11001

Note: Ensure there are unused Directory Numbers within the configured range.

Cisco Unified Communications Manager TCP Port Settings for this Server

Ethernet Phone Port*	2000
MGCP Listen Port*	2427
MGCP Keep-alive Port*	2428
SIP Phone Port*	5060
SIP Phone Secure Port*	5061

Save Reset Apply Config

*- indicates required item.

- Now the xmldefault.ncf.xml file shows that the auto registration is enabled
- The phone that gets this configuration file, will send a SIP Register Request to CUCM SUB01
- After receiving the Register message from the phone, the CUCM SUB01 will create a database entry and corresponding phone specific configuration file SEPMAC_ADDRESS.cnf.xml on the TFTP server

```

<?xml version="1.0" encoding="UTF-8" ?>
<Default>
  <autoRegistrationName>AUTO-REG</autoRegistrationName>
  <autoRegistration>enabled</autoRegistration>
  <selfProvisioningSecureMode>true</selfProvisioningSecureMode>
  <adminProvisionMode>false</adminProvisionMode>
  <ipAddressMode>0</ipAddressMode>
  <ipPreferenceModeControl>0</ipPreferenceModeControl>
  <ipMediaAddressFamilyPreference>0</ipMediaAddressFamilyPreference>
  <callManagerGroup>
    <name>Default</name>
    <tftpDefault>true</tftpDefault>
    <members>
      <member priority="0">
        <callManager>
          <name>cucm-sub01</name>
          <description>cucm-sub01</description>
          <ports>
            <ethernetPhonePort>2000</ethernetPhonePort>
            <sipPort>5060</sipPort>
            <securedSipPort>5061</securedSipPort>
          </ports>
          <mgcpPorts>
            <listen>2427</listen>
            <keepAlive>2428</keepAlive>
          </mgcpPorts>
          <processNodeName>cucm-sub01</processNodeName>
        </callManager>
      </member>
    </members>
  </callManagerGroup>
  <TVS>
    <members>
      <member priority="0">
        <port>2445</port>
        <address>cucm-sub01</address>
      </member>
    </members>
  </TVS>
  <loadInformation548 model="Cisco 6911">SCCP6911.9-3-1-SR2-3</loadInformation548>
  <loadInformation497 model="Cisco 6961">SCCP69xx.9-4-1-3SR3</loadInformation497>
  <loadInformation614 model="Cisco TelePresence Profile 52 Dual (C60)"></loadInformation614>
  <loadInformation36297 model="Cisco Webex Room 70 Dual G2"></loadInformation36297>
  <loadInformation616 model="Cisco TelePresence Profile 65 Dual (C90)"></loadInformation616>
  <loadInformation558 model="Cisco TelePresence 400"></loadInformation558>
  <loadInformation557 model="Cisco TelePresence 200"></loadInformation557>
  <loadInformation628 model="IMS-integrated Mobile (Basic)"></loadInformation628>
  <loadInformation30006 model="Cisco 7970">SCCP70.9-4-2SR3-1S</loadInformation30006>
  <loadInformation36262 model="Cisco ATA 191">ATA191.12-0-1SR2-3</loadInformation36262>
  <loadInformation684 model="Cisco 8851">sin88xx.12-8-1-0001-455</loadInformation684>

```

- Now the phone will go for a reboot, during next registration attempt, the phone will get its own configuration file SEPMAC_ADDRESS.cnf.xml
- Basically, the Auto reg enabled xmldefault.cnf.xml helps to create SEPMAC_ADDRESS.cnf.xml
- Based on the information available on SEPMAC_ADDRESS.cnf.xml, the phone will get register to the respective node (here CUCM SUB01)

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <device xsi:type="axl:XIPPhone" ctiid="33" uuid="{4a71ea3c-9d61-47c3-a5da-95312aac28b2}">
3 <fullConfig>true</fullConfig>
4 <portalDefaultServer>imp-pub</portalDefaultServer>
5 <deviceProtocol>SIP</deviceProtocol>
6 <sshUserId></sshUserId>
7 <sshPassword></sshPassword>
8 <ipAddressMode>0</ipAddressMode>
9 <allowAutoConfig>true</allowAutoConfig>
10 <dadEnable>true</dadEnable>
11 <redirectEnable>false</redirectEnable>
12 <echoMultiEnable>false</echoMultiEnable>
13 <ipPreferenceModeControl>0</ipPreferenceModeControl>
14 <ipMediaAddressFamilyPreference>0</ipMediaAddressFamilyPreference>
15 <tzdata>
16 <tzolsonversion>2019b-2021</tzolsonversion>
17 <tzupdater>tzupdater.jar</tzupdater>
18 </tzdata>
19 <mlppDomainId>000000</mlppDomainId>
20 <mlppIndicationStatus>Off</mlppIndicationStatus>
21 <preemption>Disabled</preemption>
22 <executiveOverridePreemptable>false</executiveOverridePreemptable>
23 <devicePool uuid="{1b1b9eb6-7803-11d3-bdf0-00108302ead1}">
24 <revertPriority>0</revertPriority>
25 <name>Default</name>
26 <dateTimeSetting uuid="{9ec4850a-7748-11d3-bdf0-00108302ead1}">
27 <name>CMLocal</name>
28 <dateTemplate>M/D/Y</dateTemplate>
29 <timeZone>Greenwich Standard Time</timeZone>
30 <olsonTimeZone>Etc/GMT</olsonTimeZone>
31 </dateTimeSetting>
32 <callManagerGroup>
33 <name>Default</name>
34 <tftpDefault>true</tftpDefault>
35 <members>
36 <member priority="0">
37 <callManager>
38 <name>cucm-sub01</name>
39 <description>cucm-sub01</description>
40 <ports>
41 <ethernetPhonePort>2000</ethernetPhonePort>
42 <sipPort>5060</sipPort>
43 <securedSipPort>5061</securedSipPort>
44 <mgcpPorts>
45 <listen>2427</listen>
46 <keepAlive>2428</keepAlive>
47 </mgcpPorts>
48 </ports>
49 <processNodeName>cucm-sub01</processNodeName>
50 </callManager>
51 </member>
52 </members>
53 </callManagerGroup>
54 <srstInfo uuid="{cd241e11-4a58-4d3d-9661-f06c912a18a3}">
55 <name>Disable</name>
56 <srstOption>Disable</srstOption>
57 <userModifiable>false</userModifiable>
58 <ipAddr1></ipAddr1>
59 <port1>2000</port1>
60 <ipAddr2></ipAddr2>
61 <port2>2000</port2>
62 <ipAddr3></ipAddr3>
63 <port3>2000</port3>

```

- Please note, here the CallManager node name is the host name 'cucm-sub01', phones should be able to resolve this to corresponding IP address to successfully register. So, make sure your phones DHCP pool has proper DNS server configured
- If the phone doesn't have DNS server, then change the CUCM node names to IP Address by going to System >> Server

- Device >> Phones, All the Phones are registered automatically with Default Device Pool
- You can make test calls now

Find and List Phones

Navigation: Cisco Unified CM Administration

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Find Phone where: Device Name | begins with | Find | Clear Filter

Rows per Page: 50

Phone	Device Name(Line)	Description	Device Pool	Device Protocol	Status	IPv4 Address	Copy	Super Copy
<input type="checkbox"/>	SEP08CC68310664	Auto 11001	Default	SIP	Registered with cucm-sub01	192.168.10.57		
<input type="checkbox"/>	SEP08CC6831D463	Auto 11003	Default	SIP	Registered with cucm-sub01	192.168.10.55		
<input type="checkbox"/>	SEP501CB00C71D5	Auto 11006	Default	SIP	Registered with cucm-sub01	192.168.10.60		
<input type="checkbox"/>	SEP503DE57D6C04	Auto 11005	Default	SIP	Registered with cucm-sub01	192.168.10.56		
<input type="checkbox"/>	SEP7426ACF35A8E	Auto 11007	Default	SIP	Registered with cucm-sub01	192.168.10.53		
<input type="checkbox"/>	SEP84B517AF4C43	Auto 11002	Default	SIP	Registered with cucm-sub01	192.168.10.58		
<input type="checkbox"/>	SEPA40CC39441D9	Auto 11004	Default	SIP	Registered with cucm-sub01	192.168.10.59		

Buttons: Add New, Select All, Clear All, Delete Selected, Reset Selected, Apply Config to Selected, Generate PRT for Selected

- After the lab, make sure you disable the Auto registration on CUCM SUB01, verify that on the xmldefault.cnf.xml

Cisco Unified CM Configuration

Navigation: Cisco Unified CM Administration

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Save | Reset | Apply Config

Status: Update successful

Cisco Unified Communications Manager Information

Cisco Unified Communications Manager: CM_cucm-sub01 (used by 24 devices)

Server Information

CTI ID: 4

Cisco Unified Communications Manager Server: cucm-sub01

Cisco Unified Communications Manager Name: CM_cucm-sub01

Description: cucm-sub01

Location Bandwidth Manager Group: < None >

Auto-registration Information

Universal Device Template: Auto-registration Template

Universal Line Template: Sample Line Template with TAG usage examples

Starting Directory Number: 11001

Ending Directory Number: 11010

☒ Auto-registration Disabled on this Cisco Unified Communications Manager

Cisco Unified Communications Manager TCP Port Settings for this Server

Ethernet Phone Port: 2000

MGCP Listen Port: 2427

MGCP Keep-alive Port: 2428

SIP Phone Port: 5060

SIP Phone Secure Port: 5061

Buttons: Save, Reset, Apply Config

* indicates required item.

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```

<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<Default>
  <AutoRegistrationName>AUTO-REG</AutoRegistrationName>
  <AutoRegistration>disabled</AutoRegistration>
  <SelfProvisioningSecureMode>true</SelfProvisioningSecureMode>
  <AdminProvisionMode>false</AdminProvisionMode>
  <IPAddressMode>0</IPAddressMode>
  <SIPPreferenceMode>control</SIPPreferenceMode>
  <IPMediaAddressFamilyPreference>0</IPMediaAddressFamilyPreference>
  <CallManagerGroup>
    <name>Default</name>
    <rfpDefault>true</rfpDefault>
    <members>
      <member priority="0">
        <callManager>
          <name>cucm-sub01</name>
          <description>cucm-sub01</description>
          <ports>
            <ethernetPhonePort>2000</ethernetPhonePort>
            <ipPort>5060</ipPort>
            <securedSipPort>5061</securedSipPort>
            <mgcpPort>
              <listen>2427</listen>
              <keepAlive>2428</keepAlive>
            </mgcpPort>
          </ports>
          <processNodeName>cucm-sub01</processNodeName>
        </callManager>
      </member>
    </members>
  </callManagerGroup>
  <TVS>
    <members>
      <member priority="0">
        <port>2445</port>
        <address>cucm-sub01</address>
      </member>
    </members>
  </TVS>
  <loadInformation548 model="Cisco 6911">SCCP6911.9-3-1-SR2-3</loadInformation548>
  <loadInformation497 model="Cisco 6961">SCCP6961.9-4-1-SR3</loadInformation497>
  <loadInformation614 model="Cisco TelePresence Profile 52 Dual (C60)">
  <loadInformation36297 model="Cisco Webex Room 70 Dual G2">
  <loadInformation616 model="Cisco TelePresence Profile 65 Dual (C90)">
  <loadInformation558 model="Cisco TelePresence 400">
  <loadInformation557 model="Cisco TelePresence 200">
  <loadInformation628 model="IMS-integrated Mobile (Basic)">
  <loadInformation30006 model="Cisco 7970">SCCP70.9-4-2SR3-1S</loadInformation30006>
  <loadInformation36262 model="Cisco ATA 191">ATA191.12-0-1SR2-3</loadInformation36262>
  <loadInformation684 model="Cisco 8851">sr8851.12-8-1-0001-455</loadInformation684>

```

Device Pool in CUCM



- It is a set of common configurations for a group of devices. We usually create Device Pools to group similar devices (e.g. Phones in a specific location have same device pool)
- The device pool contains Registrar Server, Codec Settings, and many more information that is useful for a device
- To configure Device Pool, System >> Device Pool
- Let's evaluate some of the key components of a Device Pool

Device Pool Configuration
192.168.21.1:6970/xmldefault.cnf.xml
+
10.106

https://192.168.21.1/ccmadmin/devicePoolEdit.do?key=1b1b9eb6-7803

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go
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Device Pool Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

Status
i Status: Ready

Device Pool Information
Device Pool: Default (17 members**)

Device Pool Settings

Device Pool Name*	Default
Cisco Unified Communications Manager Group*	Default
Calling Search Space for Auto-registration	< None >
Adjunct CSS	< None >
Reverted Call Focus Priority	Default
Intercompany Media Services Enrolled Group	< None >

Roaming Sensitive Settings

Date/Time Group*	CMLocal
Region*	Default
Media Resource Group List	< None >
Location	< None >
Network Locale	< None >
SRST Reference*	Disable
Connection Monitor Duration***	
Single Button Barge*	Default
Join Across Lines*	Default
Physical Location	< None >
Device Mobility Group	< None >
Wireless LAN Profile Group	< None >

[View Details](#)

Local Route Group Settings

Standard Local Route Group	< None >
----------------------------	----------

Device Mobility Related Information****

Device Mobility Calling Search Space	< None >
AAR Calling Search Space	< None >
AAR Group	< None >
Calling Party Transformation CSS	< None >
Called Party Transformation CSS	< None >

Co-location Configuration

Cisco Unified Communications Manager Group

- It specifies a prioritized list of up to 3 Cisco Unified Communications Managers (CUCM nodes with Cisco CallManager service running)
- The first CUCM node in the list serves as the primary registration server for that group, and the other members of the group serve as backup for redundancy
- When primary CUCM node goes down, devices automatically fall back to secondary CUCM nodes
- This provides redundancy in Phone registration and call routing

Date/time group

- The date/time group specifies the time zone and the display formats for date and time for the devices
- CUCM Node time zone is given during the installation of CUCM server, Date/time group is solely used for setting the proper time zone for devices
- You can have you CUCM node in one geographical location and devices in entirely different location if network connectivity in place (Phones can reach CUCM nodes IP)
- Date/Time Group offsets the correct time learned via NTP to match local time zone where the device is located. Also, we can specify the format of time

Region

- Region is used to specify voice codec (bit rate) per calls within a region and between other regions
- Devices in same Region uses G.711 or G.722 whereas one Region to another Region uses G.729 by default
- These relations can be modified according to our needs

Location

- The location specifies the total bandwidth that is available for calls to and from this location
- Use locations to implement call admission control (CAC) in a centralized call-processing system
- CAC enables you to limit the total amount of bandwidth that is available for audio and video calls between locations
- While Region specified per call bit rate, Location sets the maximum calls bitrate from that location

[Lab] Create a Device Pool

- In production cluster, we do not use the default device pool, instead we create specific device pools based on circumstances
- In our case, we have 2 geographical location (Bangalore and Texas), Bangalore is the headquarters and Texas is the remote branch office

Device Pool Component	BANGALORE-DEVICE-POOL	TEXAS-DEVICE-POOL
1 CUCM Group	BANGALORE-CCM-GROUP Order = SUB01, SUB02	TEXAS-CCM-GROUP Order = SUB02, SUB01
2 Region	BANGALORE-REGION	TEXAS-REGION
3 Date/time Group	IST-DATE-TIME-GROUP (GMT+5:30 offset)	CST-DATE-TIME-GROUP (GMT-6 offset)

- We set the Region relation between these 2 areas to G.729 (8 kbps) and with in the region to G.711 (64kbps)
- System >> Cisco Unified CM Groups >> Add New >>
- Add 2 CUCM groups with node priority, BANGALORE = SUB01 & SUB02; TEXAS = SUB02 & SUB01

The screenshot shows the Cisco Unified CM Administration web interface. The browser address bar displays the URL: <https://192.168.21.1/ccmadmin/ccmGroupEdit.do?key=b9f5cf3b-1>. The page title is "Cisco Unified CM Group Configuration". The navigation bar includes links for System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The main content area shows the configuration for a new CUCM Group named "BANGALORE-CCM-GROUP". The "Name" field is set to "BANGALORE-CCM-GROUP". The "Auto-registration" checkbox is unchecked. The "Selected Cisco Unified Communications Managers" list contains two entries: "CM_cucm-sub01" and "CM_cucm-sub02", both indicated by red arrows. The "Available Cisco Unified Communications Managers" list is empty. The "Status" section shows a message "Add successful". The "Cisco Unified Communications Manager Group Information" section shows the group name and that it is used by 0 devices. The "Cisco Unified Communications Manager Group Settings" section shows the group name and the "Auto-registration" checkbox. The "Cisco Unified Communications Manager Group Members" section shows the "Selected" and "Available" lists. At the bottom, there are buttons for Save, Delete, Copy, Reset, Apply Config, and Add New.

Cisco Unified CM Group Config
+

https://192.168.21.1/ccmadmin/ccmGroupEdit.do?key=333f376e-...

Cisco
Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go
admin | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Cisco Unified CM Group Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

Status
Add successful

Cisco Unified Communications Manager Group Information
Cisco Unified Communications Manager Group: TEXAS-CCM-GROUP (used by 0 devices)

Cisco Unified Communications Manager Group Settings
Name* TEXAS-CCM-GROUP
☐ Auto-registration Cisco Unified Communications Manager Group

Cisco Unified Communications Manager Group Members
Available Cisco Unified Communications Managers
Selected Cisco Unified Communications Managers*
CM_cucm-sub02
CM_cucm-sub01

Save Delete Copy Reset Apply Config Add New

i *- indicates required item.
i **Selected Cisco Unified Communications Managers are ordered by highest priority
i ***Only active Cisco Unified Communications Managers are available for adding to Cisco Unified Communications Manager Groups.

- System >> Region Information >> Region >> Add New >>
- Add 2 regions and set the relation (SAME REGION = G.711; between BANGALORE & TEXAS = G.729)

Region Configuration

https://192.168.21.1/ccmadmin/regionEdit.do?key=fb78bec7-2be2-46d9-3c

Cisco Unified CM Administration

Navigation Cisco Unified CM Administration Go

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Region Configuration Related Links: Back To Find/List Go

Save Delete Reset Apply Config Add New

Status

Update successful

Click on the Reset button to have the changes take effect.

Region Information

Name* BANGALORE-REGION

Region Relationships

Region	Audio Codec Preference List	Maximum Audio Bit Rate	Maximum Session Bit Rate for Video Calls	Maximum Session Bit Rate for Immersive Video Calls
BANGALORE-REGION	Use System Default (Factory Default low loss)	64 kbps (G.722, G.711)	Use System Default (384 kbps)	Use System Default (2000000000 kbps)
TEXAS-REGION	Use System Default (Factory Default low loss)	8 kbps (G.729)	Use System Default (384 kbps)	Use System Default (2000000000 kbps)

NOTE: Regions not displayed Use System Default Use System Default Use System Default Use System Default

Modify Relationship to other Regions

Regions	Audio Codec Preference List	Maximum Audio Bit Rate	Maximum Session Bit Rate for Video Calls	Maximum Session Bit Rate for Immersive Video Calls
BANGALORE-REGION				
Default				
TEXAS-REGION				

Keep Current Setting 8 kbps (G.729) Keep Current Setting Keep Current Setting

Use System Default Use System Default Use System Default

None None None

kbps kbps kbps

Save Delete Reset Apply Config Add New

*- indicates required item.

Region Configuration

https://192.168.21.1/ccmadmin/regionEdit.do?key=374398a8-55da-165d-5

Cisco Unified CM Administration

Navigation Cisco Unified CM Administration Go

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System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Region Configuration Related Links: Back To Find/List Go

Save Delete Reset Apply Config Add New

Status

Update successful

Click on the Reset button to have the changes take effect.

Region Information

Name* TEXAS-REGION

Region Relationships

Region	Audio Codec Preference List	Maximum Audio Bit Rate	Maximum Session Bit Rate for Video Calls	Maximum Session Bit Rate for Immersive Video Calls
BANGALORE-REGION	Use System Default (Factory Default low loss)	8 kbps (G.729)	Use System Default (384 kbps)	Use System Default (2000000000 kbps)
TEXAS-REGION	Use System Default (Factory Default low loss)	64 kbps (G.722, G.711)	Use System Default (384 kbps)	Use System Default (2000000000 kbps)

NOTE: Regions not displayed Use System Default Use System Default Use System Default Use System Default

Modify Relationship to other Regions

Regions	Audio Codec Preference List	Maximum Audio Bit Rate	Maximum Session Bit Rate for Video Calls	Maximum Session Bit Rate for Immersive Video Calls
BANGALORE-REGION				
Default				
TEXAS-REGION				

Keep Current Setting 64 kbps (G.722, G.711) Keep Current Setting Keep Current Setting

Use System Default Use System Default Use System Default

None None None

kbps kbps kbps

Save Delete Reset Apply Config Add New

*- indicates required item.

- System >> Phone NTP References >> Add New
- SIP Phones take the reference time from NTP Reference configuration
- SCCP Phones will ignore this

The screenshot shows the 'Phone NTP Reference Configuration' page in the Cisco Unified CM Administration interface. The browser address bar shows the URL: `https://192.168.21.1/ccmadmin/ntpServerEdit.do`. The page has a navigation bar with links like 'System', 'Call Routing', 'Media Resources', etc. The main content area includes a 'Save' button, a 'Status' section showing 'Status: Ready', and a 'Phone NTP Reference Information' section with the following fields:

- IP Address*: 192.168.51.1
- Description: CUBE-NTP-SERVER
- Mode*: Multicast (dropdown menu)

At the bottom, there is a 'Save' button and a note: '*- indicates required item.'

- System >> Date/Time Group >> Add New
- IST-DATE-TIME-GROUP with GMT+5:30 and CST-DATE-TIME-GROUP with GMT-6

The screenshot shows the 'Date/Time Group Configuration' page in the Cisco Unified CM Administration interface. The browser address bar shows the URL: `https://192.168.21.1/ccmadmin/datetimeGroupEdit.do?key=46c43`. The page has a navigation bar and a toolbar with buttons like 'Save', 'Delete', 'Copy', 'Reset', 'Apply Config', and 'Add New'. The main content area includes a 'Status' section showing 'Add successful' and a 'Date/Time Group Information' section with the following fields:

- Date/Time Group: IST-DATE-TIME-GROUP (used by 0 devices)
- Group Name*: IST-DATE-TIME-GROUP
- Time Zone*: (GMT+5:30) Asia/Kolkata+ (dropdown menu)
- Separator*: - (dash) (dropdown menu)
- Date Format*: D-M-Y (dropdown menu)
- Time Format*: 12-hour (dropdown menu)

Below the 'Date/Time Group Information' section is a 'Phone NTP References for this Date/Time Group' section. It contains a list of 'Selected Phone NTP References**' with the value 192.168.51.1. There are 'Add Phone NTP References' and 'Remove Phone NTP References' buttons. At the bottom, there is a 'Save' button and a note: '*- indicates required item. **Selected Phone NTP References are ordered by highest priority'.

Date/Time Group Configuration

https://192.168.21.1/ccmadmin/datetimeGroupEdit.do?key=ab357

Cisco Unified CM Administration

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System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Date/Time Group Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

Add successful

Click on the Reset button to have the changes take effect.

Date/Time Group Information

Date/Time Group: CST-DATE-TIME-GROUP (used by 0 devices)

Group Name* CST-DATE-TIME-GROUP

Time Zone* (GMT-6:00) CST6CDT Entries with # are compatible with [legacy phone loads](#)

Separator* - (dash) (applies to Date Format only)

Date Format* M-D-Y

Time Format* 12-hour

Phone NTP References for this Date/Time Group

Selected Phone NTP References** 192.168.51.1

Add Phone NTP References Remove Phone NTP References

Save Delete Copy Reset Apply Config Add New

*- indicates required item.

**Selected Phone NTP References are ordered by highest priority

168

- System >> Device Pool >> Add New
- Associate corresponding CUCM Group, Date/Time Group and Region to BAGALORE-DEVICE-POOL and TEXAS-DEVICE-POOL respectively

Device Pool Configuration

Navigation: Cisco Unified CM Administration

admin | About | Logout

System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help

Device Pool Configuration Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

Status

Add successful

Click on the Reset button to have the changes take effect.

Device Pool Information

Device Pool: BAGALORE-DEVICE-POOL (0 members**)

Device Pool Settings

Device Pool Name* BAGALORE-DEVICE-POOL

Cisco Unified Communications Manager Group* BAGALORE-CCM-GROUP

Calling Search Space for Auto-registration < None >

Adjunct CSS < None >

Reverted Call Focus Priority Default

Intercompany Media Services Enrolled Group < None >

Roaming Sensitive Settings

Date/Time Group* IST-DATE-TIME-GROUP

Region* BANGALORE-REGION

Media Resource Group List < None >

Location < None >

Network Locale < None >

SRST Reference* Disable

Connection Monitor Duration***

Single Button Barge* Default

Join Across Lines* Default

Physical Location < None >

Device Mobility Group < None >

Wireless LAN Profile Group < None > [View Details](#)

Local Route Group Settings

Standard Local Route Group < None >

Device Mobility Related Information****

Device Mobility Calling Search Space < None >

AAR Calling Search Space < None >

AAR Group < None >

Calling Party Transformation CSS < None >

Called Party Transformation CSS < None >

Device Pool Configuration
+

https://192.168.21.1/ccmadmin/devicePoolEdit.do?key=fac99d08-5...

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration
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Device Pool Configuration
Related Links: Back To Find/List
Go

Save Delete Copy Reset Apply Config Add New

Status
Add successful
Click on the Reset button to have the changes take effect.

Device Pool Information
Device Pool: TEXAS-DEVICE-POOL (0 members**)

Device Pool Settings
Device Pool Name* TEXAS-DEVICE-POOL
Cisco Unified Communications Manager Group* TEXAS-CCM-GROUP
Calling Search Space for Auto-registration < None >
Adjunct CSS < None >
Reverted Call Focus Priority Default
Intercompany Media Services Enrolled Group < None >

Roaming Sensitive Settings
Date/Time Group* CST-DATE-TIME-GROUP
Region* TEXAS-REGION
Media Resource Group List < None >
Location < None >
Network Locale < None >
SRST Reference* Disable
Connection Monitor Duration***
Single Button Barge* Default
Join Across Lines* Default
Physical Location < None >
Device Mobility Group < None >
Wireless LAN Profile Group < None > [View Details](#)

Local Route Group Settings
Standard Local Route Group < None >

Device Mobility Related Information****
Device Mobility Calling Search Space < None >
AAR Calling Search Space < None >
AAR Group < None >
Calling Party Transformation CSS < None >
Called Party Transformation CSS < None >

[Lab] Manual Registration of Cisco Endpoint in CUCM

- As we know that any Phones will initially look for SEPMAC_ADDRESS.cnf.xml, if they are unable to find it, then go for xmldefault.cnf.xml
- Based on the auto registration information present in the xmldefault.cnf.xml file, the phone may register or stay without registering
- Auto registration is disabled in in most of the enterprise companies since we can't control the Extension number and other parameters for the phones via auto registration
- Manually adding the Phone MAC details and tuning other parameters in CUCM Database is called manual registration

Device >> Phones >> Add New >> Phone Type: Cisco 8865 >>

The screenshot displays the Cisco Unified CM Administration web interface. The browser address bar shows `https://192.168.21.1/ccmadmin/phoneEdit.do`. The page title is "Cisco Unified CM Administration" with the tagline "For Cisco Unified Communications Solutions". The navigation menu includes System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The "Phone Configuration" section is active, showing a "Save" button and "Related Links: Back To Find/List".

The configuration form is divided into several sections:

- Status:** Status: Ready
- Phone Type:** Product Type: Cisco 8865, Device Protocol: SIP
- Device Information:**
 - ☒ Device is trusted
 - MAC Address*: 501CB00C71D5 (MAC Address of the Phone)
 - Description: 11001 - Deepika Padukone (Description)
 - Device Pool*: BANGALORE-DEVICE-POOL (Device Pool) [View Details]
 - Common Device Configuration: < None > [View Details]
 - Phone Button Template*: Standard 8865 SIP (Button Template)
 - Softkey Template: < None >
 - Common Phone Profile*: Standard Common Phone Profile [View Details]
 - Calling Search Space: < None >
 - AAR Calling Search Space: < None >
 - Media Resource Group List: < None >
 - User Hold MOH Audio Source: < None >
 - Network Hold MOH Audio Source: < None >
 - Location*: Hub_None
 - AAR Group: < None >
 - User Locale: < None >
 - Network Locale: < None >
 - Built In Bridge*: Default
 - Privacy*: Default
 - Device Mobility Mode*: Default
 - Wireless LAN Profile Group: < None > [View Details]
 - Owner: ☐ User ☒ Anonymous (Public/Shared Space)
 - Owner User ID: [Empty field]
 - Mobility User ID: < None >
 - Phone Personalization*: Default
 - Services Provisioning*: Default

Phone Configuration | 192.168.21.1:6970/xmldefault.cnf.x... | https://192.168.21.1/ccmadmin/phoneEdit.do

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | admin | About | Logon

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Phone Configuration | Related Links: Back To Find/List | Go

Save

☒ Use Device Pool Calling Party Transformation CSS (Caller ID For Calls From This Phone)

Remote Number

Calling Party Transformation CSS: < None >

☒ Use Device Pool Calling Party Transformation CSS (Device Mobility Related Information)

Protocol Specific Information

Packet Capture Mode*: None

Packet Capture Duration: 0

BLF Presence Group*: Standard Presence group

SIP Dial Rules: < None >

MTP Preferred Originating Codec*: 711ulaw

Device Security Profile*: Cisco 8865 - Standard SIP Non-Secure Profile

Rerouting Calling Search Space: < None >

SUBSCRIBE Calling Search Space: < None >

SIP Profile*: Standard SIP Profile [View Details](#)

Digest User: < None >

☐ Media Termination Point Required

☐ Unattended Port

☐ Require DTMF Reception

Certification Authority Proxy Function (CAPF) Information

Certificate Operation*: No Pending Operation

Authentication Mode*: By Null String

Authentication String:

[Generate String](#)

Key Order*: RSA Only

RSA Key Size (Bits)*: 2048

EC Key Size (Bits):

Operation Completes By: 2021 02 12 (YYYY:MM:DD:HH)

Certificate Operation Status: None

Note: Security Profile Contains Addition CAPF Settings.

Extension Module Information

- Video Capabilities must be enabled if we need video calls feature

Phone Configuration | 192.168.21.1:6970/xmldefault.cnf.x... | https://192.168.21.1/ccmadmin/phoneEdit.do

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | admin | About | Logon

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Phone Configuration | Related Links: Back To Find/List | Go

Save

Secure Shell Password:

Product Specific Configuration Layout

	Parameter Value	Override Enterprise/Common Phone Profile Settings
<input type="checkbox"/> Disable Speakerphone		<input type="checkbox"/>
<input type="checkbox"/> Disable Speakerphone and Headset		<input type="checkbox"/>
<input type="checkbox"/> Disable Handset		<input type="checkbox"/>
PC Port *	Enabled	<input type="checkbox"/>
Settings Access*	Enabled	<input type="checkbox"/>
PC Voice VLAN Access*	Enabled	<input type="checkbox"/>
Video Capabilities*	Enabled	<input type="checkbox"/>
Web Access*	Disabled	<input type="checkbox"/>
Disable TLS 1.0 and TLS 1.1 for Web Access*	Disabled	<input type="checkbox"/>
Enbloc Dialing*	Disabled	<input type="checkbox"/>
Days Display Not Active	Sunday	<input type="checkbox"/>
	Monday	
	Tuesday	
Display On Time	07:30	<input type="checkbox"/>
Display On Duration	10:30	<input type="checkbox"/>
Display Idle Timeout	01:00	<input type="checkbox"/>
Display On When Incoming Call*	Enabled	<input type="checkbox"/>
Enable Power Save Plus	Sunday	<input type="checkbox"/>
	Monday	
	Tuesday	
Phone On Time	00:00	<input type="checkbox"/>
Phone Off Time	24:00	<input type="checkbox"/>
Phone Off Idle Timeout*	60	<input type="checkbox"/>
<input type="checkbox"/> Enable Audible Alert		<input type="checkbox"/>
EnergyWise Domain		<input type="checkbox"/>
EnergyWise Secret		<input type="checkbox"/>
<input type="checkbox"/> Allow EnergyWise Overrides		<input type="checkbox"/>
Join And Direct Transfer Policy*	Same line, across line enable	<input type="checkbox"/>
Span to PC Port*	Disabled	<input type="checkbox"/>
Recording Tone*	Disabled	<input type="checkbox"/>
Recording Tone Local Volume*	100	<input type="checkbox"/>
Recording Tone Remote Volume*	50	<input type="checkbox"/>
Recording Tone Duration		<input type="checkbox"/>

Phone Configuration

<https://192.168.21.1/ccadmin/phoneEdit.do?key=3b7e294b-ffa>

Cisco Unified CM Administration

Navigation Cisco Unified CM Administration

admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Phone Configuration

Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

Status

Add successful

Association

Modify Button Items

1 Line [1] - Add a new DN 1st Extension Number

2 Line [2] - Add a new DN 2nd Extension Number

3 Add a new SD

4 Add a new SD

5 Add a new SD

6 Add a new SD

7 Add a new SD

8 Add a new SD

9 Add a new SD

10 Add a new SD

----- Unassigned Associated Items -----

11 Add a new SD

12 Alerting Calls

13 All Calls

14 Answer Oldest

15 Add a new BLF Directed Call Park

16 Call Park

17 Call Pickup

18 CallBack

19 Do Not Disturb

20 Group Call Pickup

21 Hunt Group Logout

22 Intercom [1] - Add a new Intercom

23 Malicious Call Identification

24 Meet Me Conference

25 Mobility

26 Other Pickup

27 Double Ringing Test

Phone Type

Product Type: Cisco 8865

Device Protocol: SIP

Real-time Device Status

Registration: Unregistered

IPv4 Address: 192.168.10.60

Active Load ID: sip8845_65.12-8-1-0001-455

Inactive Load ID: sip8845_65.12-5-1SR2-2

Download Status: None

Device Information

Device is Active

Device is trusted

MAC Address* 501CB00C71D5

Description 11001 - Deepika Padukone

Device Pool* BANGALORE-DEVICE-POOL View Details

Common Device Configuration < None > View Details

Phone Button Template* Standard 8865 SIP

Softkey Template < None >

Common Phone Profile* Standard Common Phone Profile View Details

Calling Search Space < None >

AAR Calling Search Space < None >

Media Resource Group List < None >

User Hold MOH Audio Source < None >

Network Hold MOH Audio Source < None >

Location* Hub_None

AAR Group < None >

User Locale < None >

Network Locale < None >

Built In Bridge* Default

Privacy* Default

Device Mobility Mode* Default View Current

Wireless LAN Profile Group < None > View Details

Directory Number Configuration

<https://192.168.21.1/ccadmin/directoryNumberEdit.do?key=950>

Cisco Unified CM Administration

Navigation Cisco Unified CM Administration

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System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Directory Number Configuration

Related Links: Configure Device (SEP501CB00C71D5)

Save Delete Reset Apply Config Add New

Status

Update successful

Directory Number Information

Directory Number* 11001

Route Partition < None >

Description 11001 - Deepika Padukone

Alerting Name 11001 - Deepika Padukone

ASCII Alerting Name 11001 - Deepika Padukone

External Call Control Profile < None >

Allow Control of Device from CTI

Associated Devices SEP501CB00C71D5

Edit Device

Edit Line Appearance

Dissociate Devices

Directory Number Settings

Voice Mail Profile < None > (Choose <None> to use system default)

Calling Search Space < None >

BLF Presence Group* Standard Presence group

User Hold MOH Audio Source < None >

Network Hold MOH Audio Source < None >

Auto Answer* Auto Answer Off

Reject Anonymous Calls

Enterprise Alternate Number

Add Enterprise Alternate Number

+E.164 Alternate Number

Add +E.164 Alternate Number

Directory URIs

Primary URI Partition Advertise Globally via TLS Rem

Phone Configuration

[←](#)
[→](#)
[↺](#)
[🏠](#)

[🔒](#)
[🔒](#)
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[🔒](#)
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[🔒](#)
[🔒](#)
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[https://192.168.21.1/cmadmin/phoneEdit.do?key=3b7e294b-ffc...](#)

[🔍](#)
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Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation
Cisco Unified CM Administration

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Related Links: Back To Find/List

Save
Delete
Copy
Reset
Apply Config
Add New

Status
Status: Ready

Association

Modify Button Items

Line [1] - 11001 (no partition)

Line [2] - Add a new DN

Add a new SD

Add a new SD

Add a new SD

Add a new SD

Add a new SD

Add a new SD

Add a new SD

----- Unassigned Associated Items -----

Add a new SD

Alerting Calls

All Calls

Answer Oldest

Add a new BLF Directed Call Park

Call Park

Call Pickup

CallBack

Do Not Disturb

Group Call Pickup

Hunt Group Logout

Add a new Intercom

Malicious Call Identification

Meet Me Conference

Mobility

Other Pickup

Phone Type

Product Type: Cisco 8865
Device Protocol: SIP

Real-time Device Status

Registered: Registered with Cisco Unified Communications Manager cucm-sub01
IPv4 Address: 192.168.10.60
Active Load ID: sip8845_65.12-8-1-0001-455
Inactive Load ID: sip8845_65.12-5-1SR2-2
Download Status: None

Device Information

☒ Device is Active
☒ Device is trusted
MAC Address* 501C80C71D5

Description 11001 - Deepika Padukone
Device Pool* BANGALORE-DEVICE-POOL [View Details](#)
Common Device Configuration < None > [View Details](#)
Phone Button Template* Standard 8865 SIP
Softkey Template < None >
Common Phone Profile* Standard Common Phone Profile [View Details](#)
Calling Search Space < None >
AAR Calling Search Space < None >
Media Resource Group List < None >
User Hold MOH Audio Source < None >
Network Hold MOH Audio Source < None >
Location* Hub_None
AAR Group < None >
User Locale < None >
Network Locale < None >
Built In Bridge* Default
Privacy* Default
Device Mobility Mode* Default [View Current](#)
[Device Mobility Settings](#)

- Telepresence endpoints do not register even if they added to CUCM manually, we must perform additional step on the DX70 web interface to get that registered to CUCM
- Access the DX70 web interface by browsing the device IP Address
- Setup >> Configuration >> Provisioning >> Mode: CUCM >> Save
- Then only DX70 will auto register to CUCM, This step is not required for IP Phones

The screenshot displays the Cisco DX70 web interface for configuration. The browser window shows the URL `https://192.168.10.53/web/config/Provisioning`. The top navigation bar includes tabs for Home, Call Control, Setup, Security, Maintenance, and Integration. The 'Setup' tab is active. On the left, a sidebar lists various configuration categories, with 'Provisioning' selected. The main content area is titled 'Configuration' and contains a 'Provisioning' section. Within this section, the 'Mode' dropdown menu is set to 'CUCM'. Other fields include 'Connectivity' (Auto), 'LoginName' (0 to 80 characters), 'Password' (0 to 64 characters), and an 'Undo' button. Below the 'Provisioning' section is an 'ExternalManager' section with fields for Address, AlternateAddress, Domain, Path, and Protocol (HTTP). A red arrow points to the 'Save' button in the top right corner of the configuration area.

- If we look at the SEP501CB00C71D5.cnf.xml file, we would be able to see the Device Pool, CUCM Group, Date/Time Group, etc.

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <device xsi:type="axl:XIPPhone" ctiid="36" uuid="{3b7e294b-ffac-f79f-6aab-c2d4e55cbcb9}">
3 <fullConfig>true</fullConfig>
4 <portalDefaultServer>imp-pub</portalDefaultServer>
5 <deviceProtocol>SIP</deviceProtocol>
6 <sshUserId></sshUserId>
7 <sshPassword></sshPassword>
8 <ipAddressMode>0</ipAddressMode>
9 <allowAutoConfig>true</allowAutoConfig>
10 <dadEnable>true</dadEnable>
11 <redirectEnable>false</redirectEnable>
12 <echoMultiEnable>false</echoMultiEnable>
13 <ipPreferenceModeControl>0</ipPreferenceModeControl>
14 <ipMediaAddressFamilyPreference>0</ipMediaAddressFamilyPreference>
15 <tzdata>
16 <tzolsonversion>2019b-2021</tzolsonversion>
17 <tzupdater>tzupdater.jar</tzupdater>
18 </tzdata>
19 <mlppDomainId>000000</mlppDomainId>
20 <mlppIndicationStatus>Off</mlppIndicationStatus>
21 <preemption>Disabled</preemption>
22 <executiveOverridePreemptable>false</executiveOverridePreemptable>
23 <devicePool uuid="{47633417-cf7b-8051-fb1f-160c1ede334c}">
24 <revertPriority>0</revertPriority>
25 <name>BANGALORE-DEVICE-POOL</name>
26 <dateTimeSetting uuid="{46c435f6-8008-1e68-9eb8-7537b1888273}">
27 <name>IST-DATE-TIME-GROUP</name>
28 <dateTemplate>D-M-YA</dateTemplate>
29 <timeZone>India Standard Time</timeZone>
30 <olsonTimeZone>Asia/Kolkata</olsonTimeZone>
31 <ntp>
32 <ntp>
33 <name>192.168.51.1</name>
34 <ntpMode>Multicast</ntpMode>
35 </ntp>
36 </ntp>
37 </dateTimeSetting>
38 <callManagerGroup>
39 <name>BANGALORE-CCM-GROUP</name>
40 <tftpDefault>false</tftpDefault>
41 <members>
42 <member priority="0">
43 <callManager>
44 <name>cucm-sub01</name>
45 <description>cucm-sub01</description>
46 <ports>
47 <ethernetPhonePort>2000</ethernetPhonePort>
48 <sipPort>5060</sipPort>
49 <securedSipPort>5061</securedSipPort>
50 <mgcpPorts>
51 <listen>2427</listen>
52 <keepAlive>2428</keepAlive>
53 </mgcpPorts>
54 </ports>
55 <processNodeName>cucm-sub01</processNodeName>
56 </callManager>
57 </member>
58 <member priority="1">
59 <callManager>
60 <name>cucm-sub02</name>
61 <description>cucm-sub02</description>
62 <ports>
63 <ethernetPhonePort>2000</ethernetPhonePort>

```


[Lab] Telepresence Endpoint Registration

- Connect network cable to DX70 and Perform factory reset of the unit
- Make sure you have added the unit in CUCM

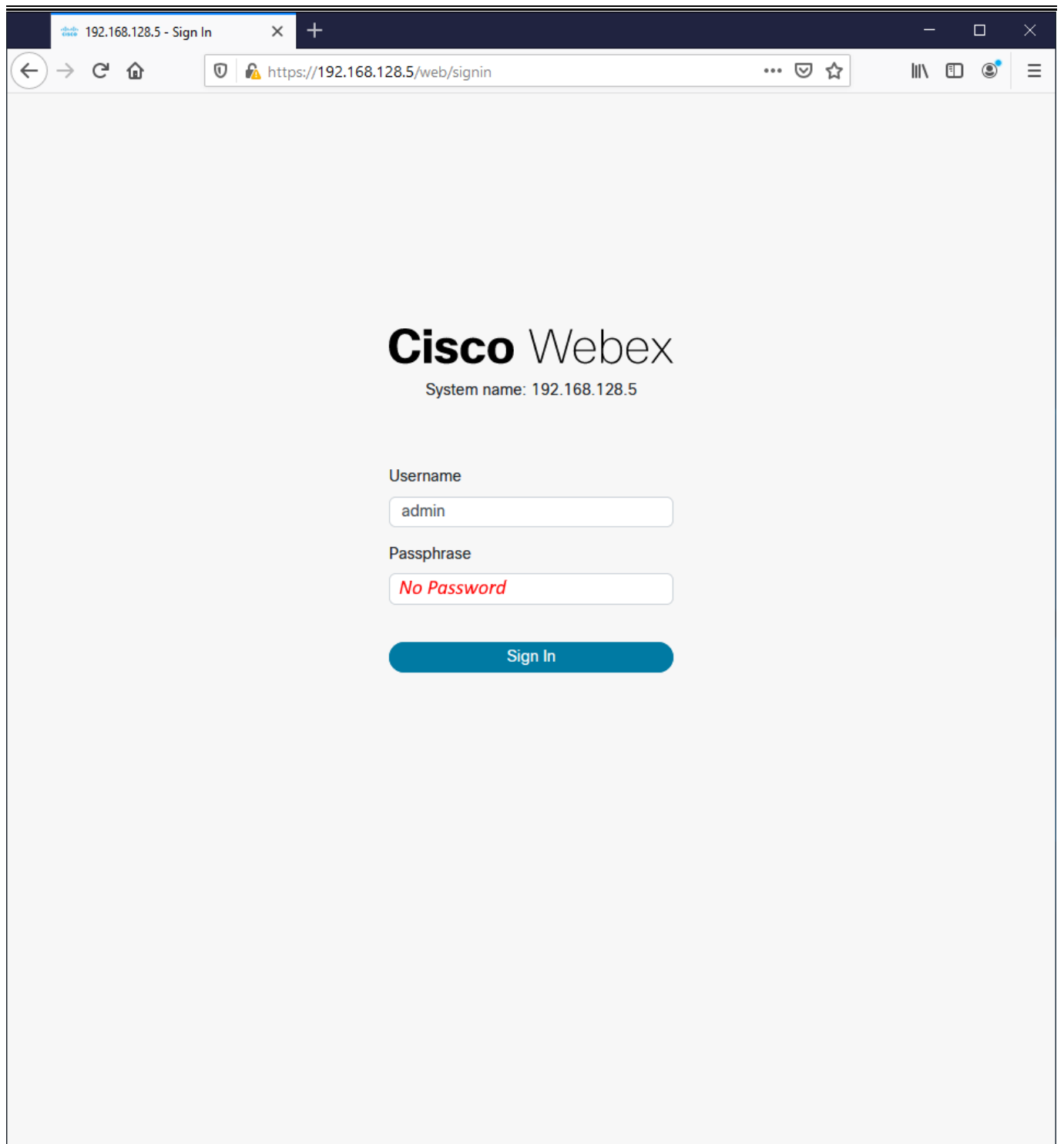
The screenshot displays the Cisco Unified CM Administration web interface. The browser address bar shows the URL: `https://192.168.21.1/ccmadmin/phoneEdit.do?key=24208ac6-0de8-...`. The page title is "Cisco Unified CM Administration" with the tagline "For Cisco Unified Communications Solutions". The navigation menu includes "System", "Call Routing", "Media Resources", "Advanced Features", "Device", "Application", "User Management", "Bulk Administration", and "Help". The "Phone Configuration" section is active, showing a "Related Links" dropdown set to "Back To Find/List".

The configuration form includes the following fields and options:

- ☒ Device is Active
- ☒ Device is trusted
- MAC Address*: 7426ACF35A8E
- Description: 11003 - Hrithik Roshan
- Device Pool*: BANGALORE-PHONES-DEVICE-POOL [View Details](#)
- Common Device Configuration: < None > [View Details](#)
- Phone Button Template: Standard Cisco TelePresence DX70
- Common Phone Profile: Standard Common Phone Profile [View Details](#)
- Calling Search Space: BANGALORE-PHONE-CSS
- AAR Calling Search Space: < None >
- Media Resource Group List: < None >
- User Hold MOH Audio Source: < None >
- Network Hold MOH Audio Source: < None >
- Location*: Hub_None
- AAR Group: < None >
- User Locale: < None >
- Network Locale: < None >
- Privacy*: Default
- Device Mobility Mode*: Default [View Current](#)
[Device Mobility Settings](#)
- Owner: ☒ User ☐ Anonymous (Public/Shared Space)
- Owner User ID*: hrithik.roshan
- Mobility User ID: < None >
- Phone Load Name:
- Use Trusted Relay Point: Default
- Always Use Prime Line*: Default
- Always Use Prime Line for Voice Message*: Default
- Geolocation: < None >
- ☒ Retry Video Call as Audio
- ☐ Ignore Presentation Indicators (internal calls only)
- ☒ Allow Control of Device from CTI
- ☒ Logged Into Hunt Group
- ☐ Remote Device


At the bottom, there is a section for "Number Presentation Transformation" which is currently collapsed.

- Browse the device IP Address to access the web interface



Serial number: FOC1846N3S3
IPv4: 192.168.128.5
IPv6: ...

Welcome

 Change language

Start



Network connection

● Connected



Connection

Ethernet

Connected >

Unplug the network cable to enable Wi-Fi

Status

IP stack	IPv4 and IPv6
IPv4 address (DHCP)	192.168.128.5
IPv6 address	
VLAN	Off
DNS	192.168.11.1
CDP	On & 192.168.128.254

Advanced network settings >



Choose a call service



Cisco Webex

Cisco's cloud service



Other services

Cisco UCM, VCS,
Cisco UCM via Expressway



A Cisco UCM service at 192.168.21.1 192.168.21.2 is available in your network. Continuing will activate this device to that service. Alternatively, choose another service.

[Change service](#)



Other services



Cisco UCM



Cisco UCM
via Expressway



VCS



Advanced setup



Setup done!

11003 - Hrithik Roshan is now ready for use.

192.168.128.5 - Configuration / Phone Configuration

https://192.168.128.5/web/configurations/config/SIP

Cisco Webex Local Device Controls

192.168.128.5 DX70

Home Call

SETUP

Settings

Users Security

CUSTOMIZATION

Personalization UI Extensions Editor Macro Editor Developer API

SYSTEM MAINTENANCE

Software Issues and Diagnostics Backup and Recovery

Audio Bluetooth CallHistory Cameras Conference FacilityService H323 HttpClient HttpFeedback Logging Macros Network NetworkPort NetworkServices Peripherals Phonebook Provisioning Proximity RoomCleanup RoomReset RoomScheduler RTP Security SerialPort SIP Standby

ANAT On (0 to 550 characters)

DefaultTransport TCP (0 to 255 characters)

DisplayName 11003 - Hrithik Roshan (0 to 255 characters)

Line Shared (0 to 255 characters)

ListenPort Off (0 to 255 characters)

Mailbox 10001 (0 to 255 characters)

MinimumTLSVersion TLSv1.0 (0 to 255 characters)

PreferredIPSignaling IPv4 (0 to 255 characters)

Proxy 1 Address cucm-sub01.ajcollab.com (0 to 255 characters)

Proxy 2 Address cucm-sub02.ajcollab.com (0 to 255 characters)

Proxy 3 Address (0 to 255 characters)

Proxy 4 Address (0 to 255 characters)

TlsVerify On (0 to 255 characters)

Type Cisco (0 to 255 characters)

URI 11003@cucm-sub01.ajcollab.com (0 to 255 characters)

Authentication

Password (0 to 128 characters)

UserName (0 to 128 characters)

Ice

DefaultCandidate Host (0 to 128 characters)

Mode Auto (0 to 128 characters)

Turn

DiscoverMode On (0 to 128 characters)

DropRflx Off (0 to 128 characters)

Password (0 to 128 characters)

Server (0 to 255 characters)

- If you do not have a physical access to the device, then you can configure the provisioning server as the TFTP Server in the DX70 web portal

The screenshot displays the Cisco Webex Local Device Controls interface for a DX70 device. The browser window shows the URL `https://192.168.128.5/web/configurations/config/Provisioning`. The left sidebar contains a navigation menu with the following sections:

- Home**
- Call**
- SETUP**
 - Settings** (highlighted)
 - Users
 - Security
- CUSTOMIZATION**
 - Personalization
 - UI Extensions Editor
 - Macro Editor
 - Developer API
- SYSTEM MAINTENANCE**
 - Software
 - Issues and Diagnostics
 - Backup and Recovery

The main content area is titled **Settings** and **Configuration / Provisioning**. It includes a search bar and a list of settings categories on the left:

- Audio
- Bluetooth
- CallHistory
- Cameras
- Conference
- FacilityService
- H323
- HttpClient
- HttpFeedback
- Logging
- Macros
- Network
- NetworkPort
- NetworkServices
- Peripherals
- Phonebook
- Provisioning** (highlighted with a red arrow)
- Proximity
- RoomCleanup
- RoomReset
- RoomScheduler
- RTP
- Security

The **Configuration / Provisioning** section contains two main configuration panels:

- Connectivity**
 - Connectivity: Auto
 - CUCM CallManagementRecords: Enabled
 - CallDiagnostics
 - LoginName: (0 to 80 characters)
 - Mode: CUCM** (highlighted with a red box)
 - Password: (0 to 64 characters)
 - TlsVerify: On
 - WebexEdge: Off
- ExternalManager**
 - Address: 192.168.21.1** (highlighted with a red box)
 - AlternateAddress: (0 to 64 characters)
 - Domain: (0 to 64 characters)
 - Path: (0 to 255 characters)
 - Protocol: HTTP

[Lab] Softkey Template

- Softkey are used to perform different tasks from the phone (e.g. Redial, New Call, CFwdAll, etc.)
- Softkeys will change based on the state of the phone (on-hook, off-hook, connected states, etc.)



- Standard keys will be available in the default Softkey template, but we can customize it
- Device >> Device Settings >> Softkey Template >> Copy the Standard User template

Softkey Template Configuration

Navigation: Cisco Unified CM Administration

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Related Links: [Configure Softkey Layout](#) Go

Save Delete Copy Add New Reset Apply Config

Status

Add successful

Softkey Template Information

Name* CIPC Standard User

Description CIPC Standard User

Applications* Cisco CallManager

Add Application Remove Application

☐ Default Softkey Template

Save Delete Copy Add New Reset Apply Config

- Now, based on the specific state, select the softkeys and save it

Softkey Template Configuration

Navigation: Cisco Unified CM Administration

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Related Links: [Softkey Template Configuration](#) Go

Save Reset Apply Config

Status

Status: Ready

Notes

Use this window to specify the Softkeys and their relative order for any phone models that support downloadable Softkey templates. This window lists all the Softkeys in the system even though not all phones support all Softkeys. For information about the supported Softkeys for a particular phone, refer to the administration guide for the phone. If you choose a Softkey that is not supported by the phone, the Softkey will not display on the phone even if you configured it in this list.

Softkey Layout Configuration

Softkey Template: CIPC Standard User

Select a call state to configure On Hook

Unselected Softkeys

- Call Back (CallBack)
- Conference List (ConfList)
- Direct Transfer (DirTrfr)
- Group Pick Up (GPickUp)
- HLog (HLog)
- Immediate Divert (iDivert)
- Join (Join)
- Meet Me (MeetMe)
- Mobility (Mobility)
- Other Pickup (oPickup)
- Quality Report Tool (QRT)
- Remove Last Conference Party (RmLstC)
- Select (Select)
- Toggle Do Not Disturb (DND)
- Undefined (Undefined)
- Video Mode Command (VidMode)

Selected Softkeys (ordered by position)**

- Redial (Redial)
- **NewCall (NewCall)
- Forward All (CfwdAll)
- Pick Up (PickUp)

Save Reset Apply Config

- Apply this softkey in Device >> Phone >> Softkey Template >> Save >> Apply Config

The screenshot displays the Cisco Unified CM Administration web interface. On the left, the 'Association' list shows various softkey options. On the right, the 'Real-time Device Status' and 'Device Information' sections are visible. A red box highlights the 'Softkey Template' dropdown menu, which is currently set to 'CIPC Standard User'. A red arrow points from this dropdown to the 'On-hook state' softkey on a physical Cisco IP phone. The phone's screen shows the time '12 24p 21-02-21' and the extension '11002'.

- Latest phones like Cisco 88XX, Cisco 99XX have dedicated hard keys for special functions like Hold, Conference, Transfer. Hence, adding those options in softkeys will not reflect on the phone



[Lab] Phone Button (Line & Feature) Template

- Defines the behavior of Phone Buttons. First buttons dedicated for Directory Number (DN), we can customize rest of the buttons
- Special features (option that we have seen in softkeys) can also be added to these buttons
- Device >> Device Settings >> Phone Button Template >> Copy Standard CIPC SCCP >>

The screenshot shows the 'Phone Button Template Configuration' page in Cisco Unified CM Administration. The page title is 'Phone Button Template Configuration' and the URL is 'https://192.168.21.1/ccmadmin/phoneTemplateEdit.do?key=a0b8...'. The page has a navigation bar with 'System', 'Call Routing', 'Media Resources', 'Advanced Features', 'Device', 'Application', 'User Management', 'Bulk Administration', and 'Help'. The 'Phone Button Template Configuration' section includes a 'Status' field (Ready), a 'Phone Button Template Information' section with 'Button Template Name' set to 'BANGALORE Standard CIPC SCCP', and a 'Button Information' table. The table has columns for 'Button', 'Feature', and 'Label'. The buttons are numbered 1 to 8. Buttons 2 through 8 are highlighted with a red box. The features for these buttons are: Line, Speed Dial, Speed Dial, Speed Dial, Conference, Do Not Disturb, and Hunt Group Logout. The labels are: Line 1, Line 2, Speed Dial 1, Speed Dial, Speed Dial 3, Conference, Do Not Disturb, and Hunt Group Logout. Below the table are buttons for 'Save', 'Delete', 'Copy', 'Reset', 'Apply Config', and 'Add New'. A note at the bottom states: '*- indicates required item. **- indicates that this button's feature is not configurable'.

Button	Feature	Label
1	Line **	Line 1
2	Line	Line 2
3	Speed Dial	Speed Dial 1
4	Speed Dial	Speed Dial
5	Speed Dial	Speed Dial 3
6	Conference	Conference
7	Do Not Disturb	Do Not Disturb
8	Hunt Group Logout	Hunt Group Logout

The screenshot shows the 'Phone Configuration' page in Cisco Unified CM Administration. The page title is 'Phone Configuration' and the URL is 'https://192.168.21.1/ccmadmin/phoneEdit.do?key=f8f18d63-b4e...'. The page has a navigation bar with 'System', 'Call Routing', 'Media Resources', 'Advanced Features', 'Device', 'Application', 'User Management', 'Bulk Administration', and 'Help'. The 'Phone Configuration' section includes a 'Status' field (Ready), an 'Association' section with a list of buttons (1 to 28) and a 'Modify Button Items' button, and a 'Phone Type' section with 'Product Type' set to 'Cisco IP Communicator' and 'Device Protocol' set to 'SCCP'. The 'Real-time Device Status' section shows 'Registration' status as 'Registered with Cisco Unified Communications Manager' and 'IPv4 Address' as '192.168.11.1'. The 'Device Information' section shows 'Device is Active' and 'Device is trusted'. The 'Device Name' is 'CIPC-ABDUL'. The 'Description' is '11002 - Abdul Jaseem'. The 'Device Pool' is 'BANGALORE-DEVICE-POOL'. The 'Common Device Configuration' is '< None >'. The 'Phone Button Template' is 'BANGALORE Standard CIPC SCCP'. The 'Softkey Template' is 'CIPC Standard User'. The 'Common Phone Profile' is 'Standard Common Phone Profile'. The 'Calling Search Space' is '< None >'. The 'AAR Calling Search Space' is '< None >'. The 'Media Resource Group List' is '< None >'. The 'User Hold MOH Audio Source' is '< None >'. The 'Network Hold MOH Audio Source' is '< None >'. The 'Location' is 'Hub_None'. The 'AAR Group' is '< None >'. The 'User Locale' is '< None >'. The 'Network Locale' is '< None >'. The 'Built In Bridge' is 'Default'. The 'Privacy' is 'Default'. The 'Device Mobility Mode' is 'Default'. To the right of the screenshot is a Cisco IP Phone. The phone's screen displays '1100p 21-02-21' and '11002'. The phone has a red box around the top right corner, which contains the 'Conference', 'Do Not Disturb', and 'Hunt Group' buttons. Red arrows point from the 'Speed Dial' button in the 'Association' section of the screenshot to the 'Speed Dial' button on the phone's screen.

User Management in CUCM



- Creating additional users in CUCM database extends the capabilities of Unified Communications network
- There are 2 types of users available in CUCM End Users and Application Users
- The Administrator user that we created at the time of installation was an Application user, that is used to login to CUCM Administration page after installing
- We have created this user only during CUCM PUB installation
- After the CUCM evolved, there are not much difference in End users and application users

End Users

- Most of the time we deal with End users
- Third party SIP phones require end user to authenticate the registration
- Jabber IM Presence requires End Users
- End user plays a critical role in Licensing since we use user-based license these days
- End users can control phones after you associate a phone in the End User Configuration window
- Self-Care portal is designed for end users to login and manage their phone and telephony features
- We can have end users created locally on the CUCM or integrate via LDAP

[Lab] Configure Local End User

- User Management >> End User >> Add New

The screenshot displays the 'End User Configuration' page in the Cisco Unified CM Administration interface. The page is titled 'End User Configuration' and includes a navigation bar with links to 'System', 'Call Routing', 'Media Resources', 'Advanced Features', 'Device', 'Application', 'User Management', 'Bulk Administration', and 'Help'. The 'User Information' section is the primary focus, containing various fields for user details. The 'User Status' is 'Enabled Local User'. The 'User ID' is 'deepika.padukone'. The 'Password' field is masked with dots and has a red note 'Used for self-care portal login'. The 'Confirm Password' field is also masked. The 'Self-Service User ID' is '11001'. The 'PIN' field is masked with dots and has a red note 'Used for EM Login'. The 'Last name' is 'Padukone'. The 'Middle name' is empty. The 'First name' is 'Deepika'. The 'Display name' is 'Deepika Padukone'. The 'Title' is empty. The 'Directory URI' is 'deepika.padukone@ajcollab.com' with a red note 'Used for URI dialing'. The 'Telephone Number' is '11001'. The 'Home Number', 'Mobile Number', and 'Pager Number' fields are empty. The 'Mail ID' is 'deepika.padukone@ajcollab.com'. The 'Manager User ID', 'Department', 'User Locale', 'Associated PC/Site Code', 'Digest Credentials', and 'Confirm Digest Credentials' fields are empty. The 'User Profile' is 'Use System Default("Standard (Factory Default) Us' with a 'View Details' link. The 'User Rank' is '1-Default User Rank'. The 'Service Settings' section includes a checked 'Home Cluster' checkbox, an unchecked 'Enable User for Unified CM IM and Presence' checkbox, and an unchecked 'Include meeting information in presence' checkbox. The 'UC Service Profile' is 'Use System Default' with a 'View Details' link.

User Information	
User Status	Enabled Local User
User ID*	deepika.padukone
Password Used for self-care portal login
Confirm Password
Self-Service User ID	11001
PIN Used for EM Login
Confirm PIN
Last name*	Padukone
Middle name	
First name	Deepika
Display name	Deepika Padukone
Title	
Directory URI	deepika.padukone@ajcollab.com Used for URI dialing
Telephone Number	11001
Home Number	
Mobile Number	
Pager Number	
Mail ID	deepika.padukone@ajcollab.com
Manager User ID	
Department	
User Locale	< None >
Associated PC/Site Code	
Digest Credentials	
Confirm Digest Credentials	
User Profile	Use System Default("Standard (Factory Default) Us View Details
User Rank*	1-Default User Rank

Service Settings	
<input checked="" type="checkbox"/> Home Cluster	
<input type="checkbox"/> Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)	
<input type="checkbox"/> Include meeting information in presence(Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)	
UC Service Profile	Use System Default View Details

End User Configuration

Save Delete Add New

Service Settings

☒ Home Cluster

☐ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)

☐ Include meeting information in presence (Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)

UC Service Profile: Use System Default [View Details](#)

Device Information

Controlled Devices: SEP501CB00C71D5

Available Profiles:

CTI Controlled Device Profiles:

Extension Mobility

Available Profiles:

Controlled Profiles:

Default Profile: -- Not Selected --

BLF Presence Group*: Standard Presence group

SUBSCRIBE Calling Search Space: < None >

☒ Allow Control of Device from CTI

☐ Enable Extension Mobility Cross Cluster

Directory Number Associations

Primary Extension: < None >

Mobility Information

- User Group contains one or more User Roles, each User Roles will have set of privileges
- With Standard CCM End Users Group, the user can get access to Self-care portal (https://CUCM_IP/ucmuser/)

End User Configuration

Save Delete Add New

Remote Destination Profiles:

Multilevel Precedence and Preemption Authorization

MLPP User Identification Number:

MLPP Password:

Confirm MLPP Password:

MLPP Precedence Authorization Level: Default

CAPF Information

Associated CAPF Profiles:

Permissions Information

Groups: Standard CCM End Users

Roles: Standard CCM End Users, Standard CCMUSER Administration

Conference Now Information

☐ Enable End User to Host Conference Now

Meeting Number: 11001

Attendees Access Code:

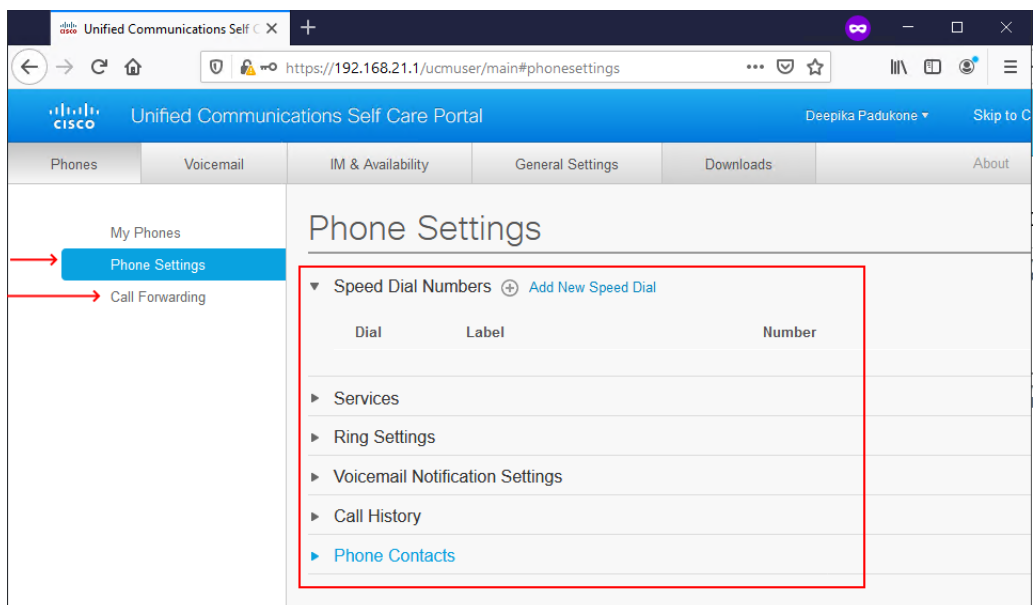
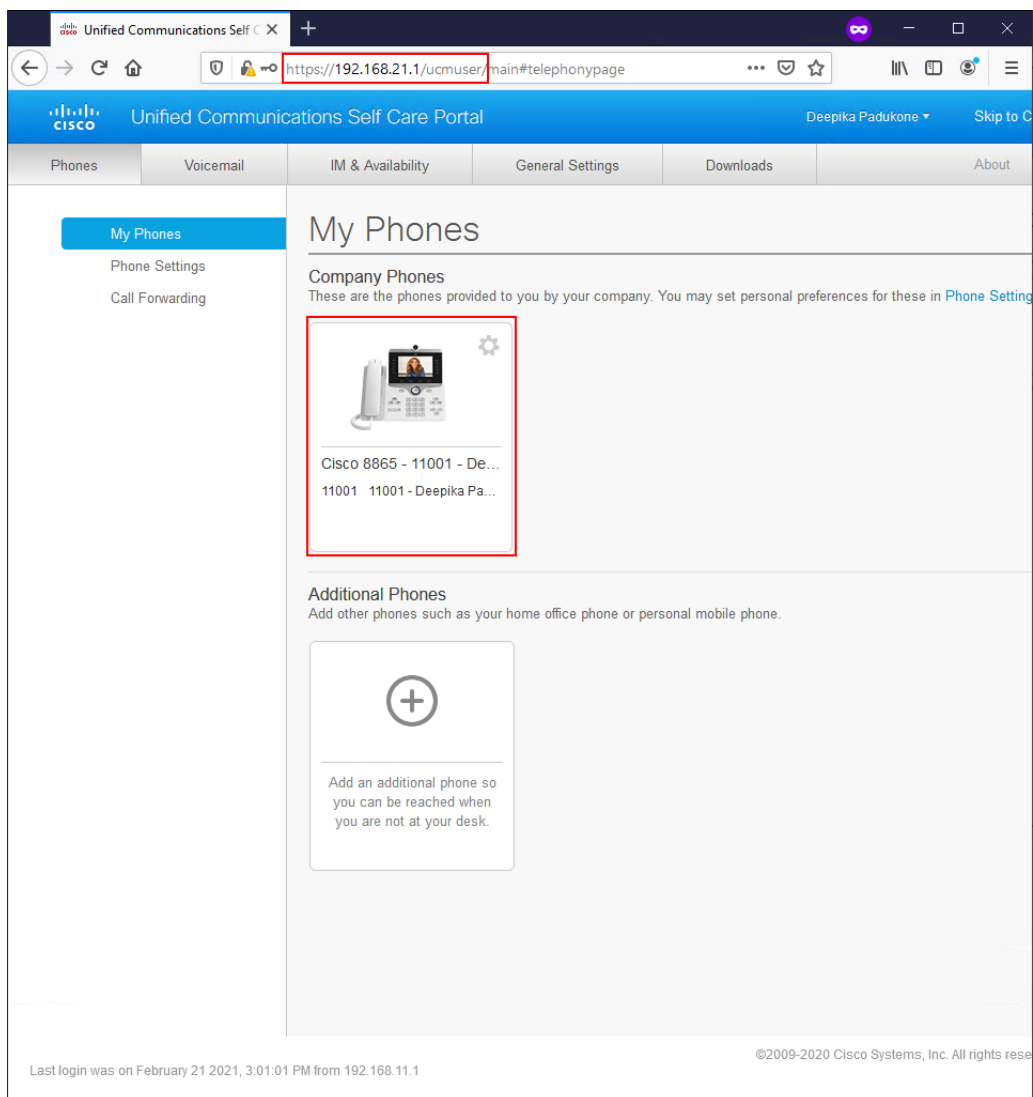
Associated Headsets

Headset Serial Number:

Save Delete Add New

Indicates required item.

- End user can perform basic telephony features like Call Forward, Speed Dials, etc.
- Once we have the end user, it is recommended to associate the end user in the Device Level and Line Level



Phone Configuration

https://192.168.21.1/ccmadmin/phoneEdit.do?key=3b7e294b-ffa...

Cisco Unified CM Administration

Navigation: Cisco Unified CM Administration

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Phone Configuration

Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

1 Line [1] - 11001 (no partition)
2 Line [2] - Add a new DN
3 Add a new SD
4 Add a new SD
5 Add a new SD
6 Add a new SD
7 Add a new SD
8 Add a new SD
9 Add a new SD
10 Add a new SD
----- Unassigned Associated Items -----
11 Add a new SD
12 Alerting Calls
13 All Calls
14 Answer Oldest
15 Add a new BLF Directed Call Park
16 Call Park
17 Call Pickup
18 CallBack
19 Do Not Disturb
20 Group Call Pickup
21 Hunt Group Logout
22 Intercom [1] - Add a new Intercom
23 Malicious Call Identification
24 Meet Me Conference
25 Mobility
26 Other Pickup
27 Quality Reporting Tool
28 Queue Status
29 Redial
30 Add a new SURL
31 Services
32 Add a new BLF SD

Device Protocol: SIP

Real-time Device Status

Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcollab.co
IPv4 Address: 192.168.10.57
Active Load ID: sip8845_65.12-8-1-0001-455
Inactive Load ID: sip8845_65.12-5-1SR2-2
Download Status: None

Device Information

Device is Active
Device is trusted
MAC Address*: 501CB00C71D5
Description: 11001 - Deepika Padukone
Device Pool*: BANGALORE-DEVICE-POOL View Details
Common Device Configuration: < None > View Details
Phone Button Template*: Standard 8865 SIP
Softkey Template: < None >
Common Phone Profile*: Standard Common Phone Profile View Details
Calling Search Space: < None >
AAR Calling Search Space: < None >
Media Resource Group List: < None >
User Hold MOH Audio Source: < None >
Network Hold MOH Audio Source: < None >
Location*: Hub_None
AAR Group: < None >
User Locale: < None >
Network Locale: < None >
Built In Bridge*: Default
Privacy*: Default
Device Mobility Mode*: Default View Current Device Mobility Settings
Wireless LAN Profile Group: < None > View Details
Owner: ☒ User ☐ Anonymous (Public/Shared Space)
Owner User ID*: deepika.padukone
Mobility User ID: < None >
Phone Personalization*: Default
Services Provisioning*: Default

Directory Number Configuration

https://192.168.21.1/ccmadmin/directoryNumberEdit.do?key=950...

Cisco Unified CM Administration

Navigation: Cisco Unified CM Administration

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System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Directory Number Configuration

Related Links: Configure Device (SEP501CB00C71D5) Go

Save Delete Reset Apply Config Add New

Ring Setting (Phone Idle): Use System Default
Ring Setting (Phone Active): Use System Default Applies to this line when any line on the phone has a call in progress.
Call Pickup Group Audio Alert Setting(Phone Idle): Use System Default
Call Pickup Group Audio Alert Setting(Phone Active): Use System Default
Recording Option*: Call Recording Disabled
Recording Profile: < None >
Recording Media Source: Gateway Preferred
Monitoring Calling Search Space: < None >
☒ Log Missed Calls

Multiple Call/Call Waiting Settings on Device SEP501CB00C71D5

Note:The range to select the Max Number of calls is: 1-200
Maximum Number of Calls*: 6
Busy Trigger*: 2 (Less than or equal to Max. Calls)

Forwarded Call Information Display on Device SEP501CB00C71D5

☐ Caller Name
☐ Caller Number
☐ Redirected Number
☐ Dialed Number

Users Associated with Line

	Full Name	User ID	Permission
<input checked="" type="checkbox"/>	Padukone,Deepika	deepika.padukone	1

Associate End Users Select All Clear All Delete Selected

Save Delete Reset Apply Config Add New

*- indicates required item.
**- Changes to Line or Directory Number settings require restart.

[Lab] Configure CUCM Read Only Administrator

End User Configuration

Save

Status: Ready

User Information

User Status: Enabled Local User
User ID*: admin.readonly
Password: *****
Confirm Password: *****
Self-Service User ID: *****
PIN: *****
Confirm PIN: *****
Last name*: admin.readonly
Middle name:
First name:
Display name:
Title:
Directory URI:
Telephone Number:
Home Number:
Mobile Number:
Pager Number:
Mail ID:
Manager User ID:
Department:
User Locale: < None >
Associated PC/Site Code:
Digest Credentials:
Confirm Digest Credentials:
User Profile: Use System Default ("Standard (Factory Default) User Profile")
User Rank*: 1-Default User Rank

Service Settings

☒ Home Cluster
☐ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)
☐ Include meeting information in presence (Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)
UC Service Profile: Use System Default

End User Configuration

Save Delete Add New

Remote Destination Profiles:
View Details

Multilevel Precedence and Preemption Authorization

MLPP User Identification Number:
MLPP Password:
Confirm MLPP Password:
MLPP Precedence Authorization Level: Default

CAPF Information

Associated CAPF Profiles:
View Details

Permissions Information

Groups: Standard CCM Read Only
Roles: Standard CCM Admin Users, Standard CCMADMIN Read Only, Standard SERVICEABILITY Read Only
Add to Access Control Group
Remove from Access Control Group

Conference Now Information

☐ Enable End User to Host Conference Now
Meeting Number:
Attendees Access Code:
View Details

Associated Headsets

Headset Serial Number:
View Details

Save Delete Add New

* - indicates required item.

Find and List Phones

https://192.168.21.1/ccmadmin/phoneFindList.do?lookup=false&m...

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration **admin.readonly** About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Find and List Phones Related Links: **Actively Logged In Device Report** ▾ Go

Status
8 records found

read.only administrator doesn't have Add, Delete, Reset option

Phone (1 - 8 of 8) Rows per Page: 50 ▾

Find Phone where Device Name ▾ begins with ▾ Find Clear Filter + -
Select item or enter search text ▾

<input type="checkbox"/>	Device Name(Line)	Description	Device Pool	Device Protocol	Status	IPv4 Address	Copy	Super Copy
<input type="checkbox"/>	CIPC-ABDUL	11002 - Abdul Jaseem	BANGALORE-DEVICE-POOL	SCCP	Registered with cucm-sub01.ajcollab.com	192.168.11.1		
<input type="checkbox"/>	SEP08CC68310664	Auto 11001	Default	SIP	Unregistered	192.168.10.57		
<input type="checkbox"/>	SEP08CC6831D463	Auto 11003	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.55		
<input type="checkbox"/>	SEP501CB00C71D5	11001 - Deepika Padukone	BANGALORE-DEVICE-POOL	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.57		
<input type="checkbox"/>	SEP503DE57D6C04	Auto 11005	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.52		
<input type="checkbox"/>	SEP7426ACF35A8E	21001 - Jennifer Garner	TEXAS-DEVICE-POOL	SIP	Registered with cucm-sub02.ajcollab.com	192.168.10.62		
<input type="checkbox"/>	SEP84B517AF4C43	Auto 11002	Default	SIP	Unregistered	192.168.10.58		
<input type="checkbox"/>	SEPA40CC39441D9	Auto 11004	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.54		

Find and List Phones

https://192.168.21.1/ccmadmin/phoneFindList.do?lookup=false&m...

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

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Find and List Phones Related Links: **Actively Logged In Device Report** ▾ Go

+ Add New Select All Clear All Delete Selected Reset Selected Apply Config to Selected Generate PRT for Selected

Status
8 records found

Main Administrator can see Add, Delete, Reset, etc buttons

Phone (1 - 8 of 8) Rows per Page: 50 ▾

Find Phone where Device Name ▾ begins with ▾ Find Clear Filter + -
Select item or enter search text ▾

<input type="checkbox"/>	Device Name(Line)	Description	Device Pool	Device Protocol	Status	IPv4 Address	Copy	Super Copy
<input type="checkbox"/>	CIPC-ABDUL	11002 - Abdul Jaseem	BANGALORE-DEVICE-POOL	SCCP	Registered with cucm-sub01.ajcollab.com	192.168.11.1		
<input type="checkbox"/>	SEP08CC68310664	Auto 11001	Default	SIP	Unregistered	192.168.10.57		
<input type="checkbox"/>	SEP08CC6831D463	Auto 11003	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.55		
<input type="checkbox"/>	SEP501CB00C71D5	11001 - Deepika Padukone	BANGALORE-DEVICE-POOL	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.57		
<input type="checkbox"/>	SEP503DE57D6C04	Auto 11005	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.52		
<input type="checkbox"/>	SEP7426ACF35A8E	21001 - Jennifer Garner	TEXAS-DEVICE-POOL	SIP	Registered with cucm-sub02.ajcollab.com	192.168.10.62		
<input type="checkbox"/>	SEP84B517AF4C43	Auto 11002	Default	SIP	Unregistered	192.168.10.58		
<input type="checkbox"/>	SEPA40CC39441D9	Auto 11004	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.54		

Add New Select All Clear All Delete Selected Reset Selected Apply Config to Selected Generate PRT for Selected

[Lab] Configure CUCM MACD Administrator

- When you start working with a company's UC infrastructure, based on your job role, you may get different access control to CUCM cluster
- If you are an L1 or MACD Engineer, you can only perform Move, Add, Change, Delete (MACD) roles
- This can be done via custom Access Control Group and Roles
- User Management >> User Settings >> Role >> Add New >> Application: Cisco Call Manager Administration >> Name: MACD-ADMINISTRATOR-ROLE

Add below roles with read and update,

- BLF Speeddial
- Bulk Export Phones
- Bulk Insert UDP
- CTI Route Point web pages
- Default Device Profile web pages
- Device Profile web pages
- Directory Number web pages
- Firmware Load web pages
- Line Appearance web pages
- Phone Button Template web pages
- Phone web pages
- Reorder Info
- Softkey Template web pages

- User Management >> User Settings >> Access Control Group >> Add New

Role Configuration
+

https://192.168.21.1/ccmadmin/roleEdit.do?key=177f10e7-a947-2

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration

admin | About | Logout

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Role Configuration
Related Links: Back To Find/List

Save Delete Copy Add New

Status
Status: Ready

Role Information
Application* Cisco Call Manager Administration
Name* MACD-ADMINISTRATOR-ROLE
Description MACD-ADMINISTRATOR-ROLE

Resource Access Information

Resource	Description	Privilege
AAR Group web pages		<input type="checkbox"/> read <input type="checkbox"/> update
ALL License Device Usage Report		<input type="checkbox"/> read <input type="checkbox"/> update
Access Control Group web pages		<input type="checkbox"/> read <input type="checkbox"/> update
Access List		<input type="checkbox"/> read <input type="checkbox"/> update
Add Unity User		<input type="checkbox"/> read <input type="checkbox"/> update
Advanced License Device Usage Report		<input type="checkbox"/> read <input type="checkbox"/> update
Advanced License User Usage Report		<input type="checkbox"/> read <input type="checkbox"/> update
Advertised Route Pattern		<input type="checkbox"/> read <input type="checkbox"/> update
All License User Usage Report		<input type="checkbox"/> read <input type="checkbox"/> update
Announcement		<input type="checkbox"/> read <input type="checkbox"/> update
Annunciator web pages		<input type="checkbox"/> read <input type="checkbox"/> update
Application Dial Rules web pages		<input type="checkbox"/> read <input type="checkbox"/> update
Application Server		<input type="checkbox"/> read <input type="checkbox"/> update
Application User CAPF		<input type="checkbox"/> read <input type="checkbox"/> update
Application User Web Pages		<input type="checkbox"/> read <input type="checkbox"/> update
Audio Codec Preference List		<input type="checkbox"/> read <input type="checkbox"/> update
BLF Directed Call Park		<input type="checkbox"/> read <input type="checkbox"/> update
BLF Speeddial		<input checked="" type="checkbox"/> read <input checked="" type="checkbox"/> update
Basic License Device Usage Report		<input type="checkbox"/> read <input type="checkbox"/> update
Basic License User Usage Report		<input type="checkbox"/> read <input type="checkbox"/> update
Blocked Learned Pattern		<input type="checkbox"/> read <input type="checkbox"/> update
Blocked Learned Patterns		<input type="checkbox"/> read <input type="checkbox"/> update
Blocked Patterns		<input type="checkbox"/> read <input type="checkbox"/> update
Bulk Add/Update Lines		<input type="checkbox"/> read <input type="checkbox"/> update
Bulk Add/Update Phones		<input type="checkbox"/> read <input type="checkbox"/> update
Bulk CUPS User Page		<input type="checkbox"/> read <input type="checkbox"/> update

Access Control Group Configuration

Navigation: Cisco Unified CM Administration

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Access Control Group Configuration

Related Links: Assign Role to Access Control Group

Save Delete Copy Add New

Status

Add successful

Access Control Group Information

Name* MACD-ADMINISTRATOR-GROUP

Available for Users with User Rank as * 1 - Default User Rank

User

Rows per Page 50

Find User where User ID begins with Find Clear Filter

No active query. Please enter your search criteria using the options above.

Add End Users to Group Add App Users to Group Select All Clear All Delete Selected

Save Delete Copy Add New

*- indicates required item.

Access Control Group Configuration

Navigation: Cisco Unified CM Administration

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Access Control Group Configuration

Related Links: Back To Find/List

Save

Status

Status: Ready

Access Control Group Information

Name* MACD-ADMINISTRATOR-GROUP

Role Assignment

Role

Assign Role to Group

Delete Role Assignment

Save

*- indicates required item.

**The role Standard CCM Admin Users must be assigned to an access control group to enable its members to logon to CCMAAdmin web site

***The role Standard CCM End Users must be assigned to an access control group to enable its members to logon to CCMUser web site

- Select MACD-ADMINISTRATOR-ROLE and Standard CCM Admin Users (system role provides access to CCM web site)

Find and List Roles

Status: 49 records found

Role (1 - 49 of 49) Rows per Page 50

Name	Application	Description	Copy
<input checked="" type="checkbox"/> MACD-ADMINISTRATOR-ROLE	Cisco Call Manager Administration	MACD-ADMINISTRATOR-ROLE	
<input type="checkbox"/> Standard AXL API Access	Cisco Call Manager AXL Database	Access the AXL APIs	
<input type="checkbox"/> Standard AXL API Users		All users with access to AXL APIs	
<input type="checkbox"/> Standard AXL Read Only API Access	Cisco Call Manager AXL Database Read Only	Access the AXL Read Only APIs	
<input type="checkbox"/> Standard Admin Rep Tool Admin		Administer CAR	
<input type="checkbox"/> Standard Audit Log Administration	Cisco Call Manager Serviceability	Serviceability Audit Log Administration	
<input checked="" type="checkbox"/> Standard CCM Admin Users		All users with access to CCM web site	
<input type="checkbox"/> Standard CCM End Users		Access to CCM User Option Pages	
<input type="checkbox"/> Standard CCM Feature Management	Cisco Call Manager Administration	Standard CCM Feature Management	

Find and List Access Control Groups

Status: 29 records found

Access Control Group (1 - 29 of 29) Rows per Page 50

Name	Roles	Copy	Rank
Admin-3rd Party API			1
Application Client Users			1
<input checked="" type="checkbox"/> MACD-ADMINISTRATOR-GROUP			1
Standard Audit Users			1
Standard CAR Admin Users			1
Standard CCM Admin Users			1
Standard CCM End Users			1
Standard CCM Gateway Administration			1
Standard CCM Phone Administration			1
Standard CCM Read Only			1
Standard CCM Server Maintenance			1
Standard CCM Server Monitoring			1
Standard CCM Super Users			1
Standard CTI Allow Call Monitoring			1
Standard CTI Allow Call Park Monitoring			1
Standard CTI Allow Call Recording			1
Standard CTI Allow Calling Number Modification			1
Standard CTI Allow Control of All Devices			1
Standard CTI Allow Control of Phones supporting Connected Xfer and conf			1
Standard CTI Allow Control of Phones supporting Rollover Mode			1
Standard CTI Allow Reception of SRTP Key Material			1
Standard CTI Enabled			1
Standard CTI Secure Connection			1
Standard Confidential Access Level Users			1
Standard EM Authentication Proxy Rights			1
Standard Packet Sniffer Users			1
Standard RealtimeAndTraceCollection			1
Standard TabSvnc User			1
Third Party Application Users			1

Access Control Group Configuration

https://192.168.21.1/ccmadmin/userGroupRoleEdit.do?key=80752

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For Cisco Unified Communications Solutions

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Access Control Group Configuration Related Links: Back To Find/List

Save

Status
Status: Ready

Access Control Group Information
Name * MACD-ADMINISTRATOR-GROUP

Role Assignment

Role	MACD-ADMINISTRATOR-ROLE Standard CCM Admin Users
------	---

Assign Role to Group
Delete Role Assignment

Save

End User Configuration

https://192.168.21.1/ccmadmin/userEdit.do?key=13ac7b50-0cd

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

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End User Configuration Related Links: Back to Find List Users

Save ✖ Delete + Add New

Status
Add successful

User Information

User Status	Enabled Local User
User ID *	macd.admin
Password
Confirm Password
Self-Service User ID	
PIN
Confirm PIN
Last name *	macd.admin
Middle name	
First name	
Display name	
Title	
Directory URI	
Telephone Number	
Home Number	
Mobile Number	
Pager Number	
Mail ID	
Manager User ID	
Department	
User Locale	< None >
Associated PC/Site Code	
Digest Credentials	
Confirm Digest Credentials	
User Profile	Use System Default("Standard (Factory Default) U: View Details
User Rank *	1-Default User Rank

Edit Credential

Edit Credential

Service Settings

☒ Home Cluster

☐ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)

☐ Include meeting information in presence(Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)

UC Service Profile Use System Default View Details

End User Configuration

[←](#)
[→](#)
[↺](#)
[🏠](#)

<https://192.168.21.1/ccmadmin/userEdit.do?key=13ac7b50-0c0e-c>

Cisco Unified CM Administration
 For Cisco Unified Communications Solutions

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End User Configuration

Related Links: [Back to Find List Users](#) Go

Save

Delete

Add New

Remote Destination Profiles

View Details

Multilevel Precedence and Preemption Authorization

MLPP User Identification Number

MLPP Password

Confirm MLPP Password

MLPP Precedence Authorization Level

Default

CAPF Information

Associated CAPF Profiles

View Details

Permissions Information

Groups

MACD-ADMINISTRATOR-GROUP *Group that we created*

Add to Access Control Group

Remove from Access Control Group

View Details

Roles

MACD-ADMINISTRATOR-ROLE *Role that we created*
 Standard CCM Admin Users *System Role*

View Details

Conference Now Information

☐ Enable End User to Host Conference Now

Meeting Number

Attendees Access Code

Associated Headsets

Headset Serial Number

Save Delete Add New

*- indicates required item.

Find and List Phones

<https://192.168.21.1/ccmadmin/phoneFindList.do?lookup=false&m...>

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go
macd.admin About Logout

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Find and List Phones
Related Links: [Actively Logged In Device Report](#) Go

+ Add New
Select All
Clear All
Delete Selected
Reset Selected
Apply Config to Selected
Generate PRT for Selected

Status
8 records found

Phone (1 - 8 of 8) Rows per Page 50

Find Phone where Device Name begins with Find Clear Filter

	Device Name(Line)	Description	Device Pool	Device Protocol	Status	IPv4 Address	Copy	Super Copy
	CIPC-ABDUL	11002 - Abdul Jaseem	BANGALORE-DEVICE-POOL	SCCP	Registered with cucm-sub01.ajcollab.com	192.168.11.1		
	SEP08CC68310664	Auto 11001	Default	SIP	Unregistered	192.168.10.57		
	SEP08CC6831D463	Auto 11003	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.55		
	SEP501CB00C71D5	11001 - Deepika Padukone	BANGALORE-DEVICE-POOL	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.57		
	SEP503DE57D6C04	Auto 11005	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.52		
	SEP7426ACF35A8E	21001 - Jennifer Garner	TEXAS-DEVICE-POOL	SIP	Registered with cucm-sub02.ajcollab.com	192.168.10.62		
	SEP84B517AF4C43	Auto 11002	Default	SIP	Unregistered	192.168.10.58		
	SEPA40CC39441D9	Auto 11004	Default	SIP	Registered with cucm-sub01.ajcollab.com	192.168.10.54		

Add New Select All Clear All Delete Selected Reset Selected Apply Config to Selected Generate PRT for Selected

Cisco Unified CM Console

<https://192.168.21.1/ccmadmin/noAuthorizationError.do>

Cisco Unified CM Console

User is not authorized to access this page

No access to other pages like Trunk, Gateway pages, etc.

- The end user macd.admin can only access Phone configurations but not any other options in CUCM

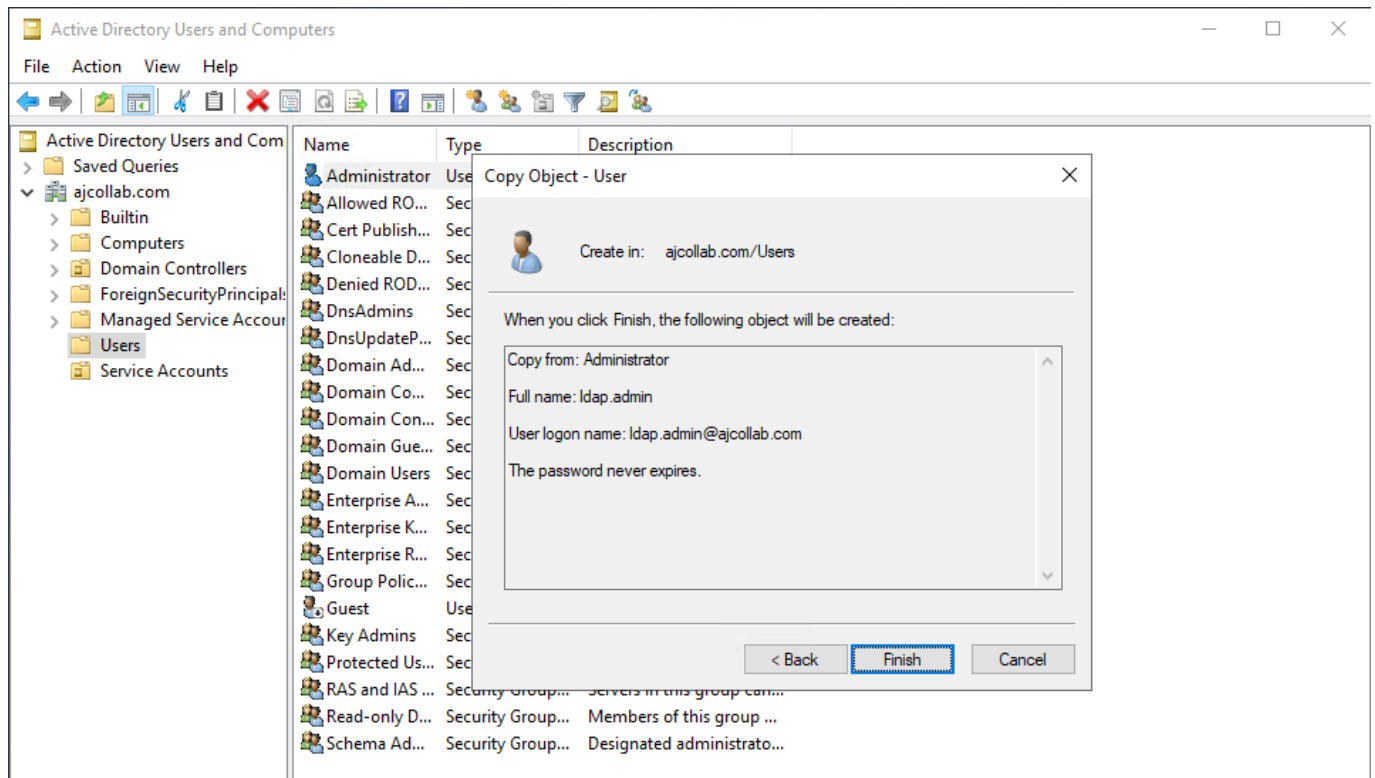
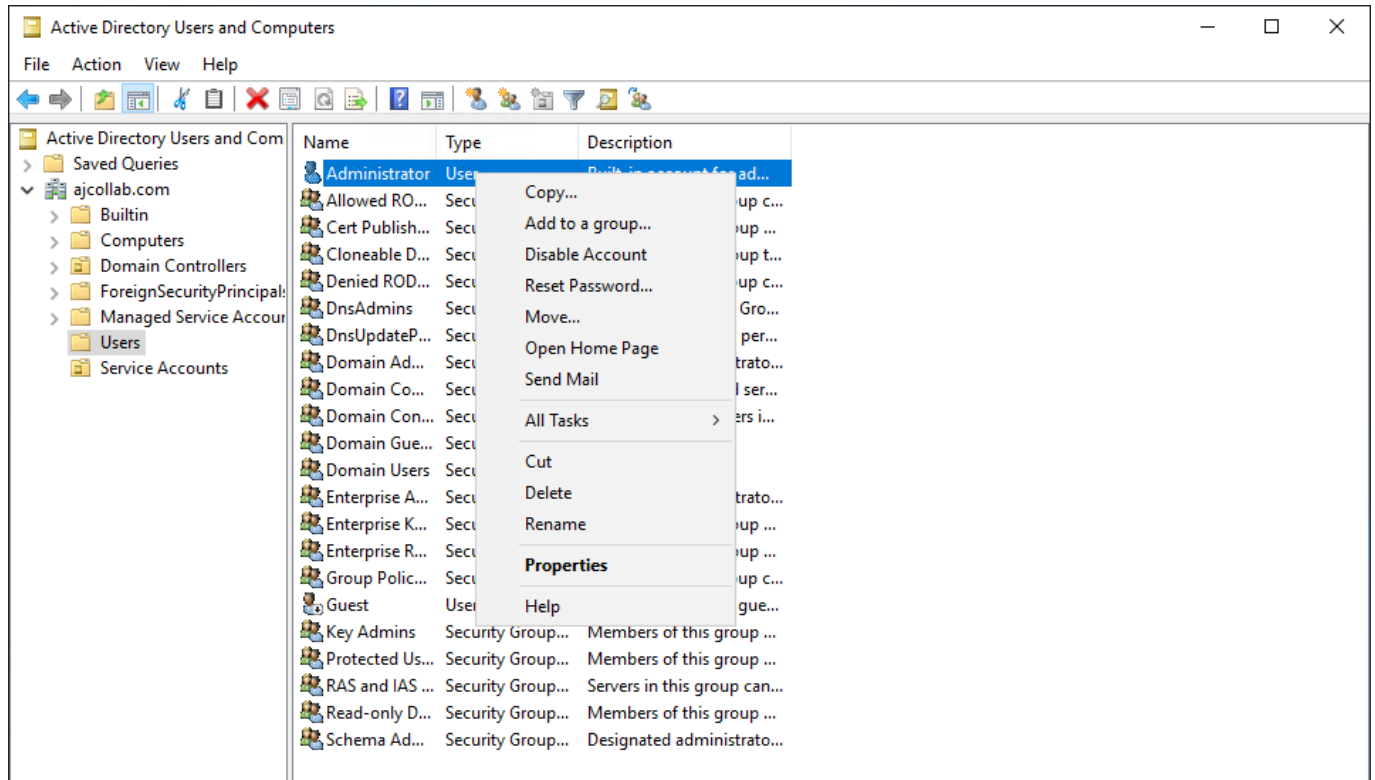
LDAP (Light Weight Directory Access Protocol)

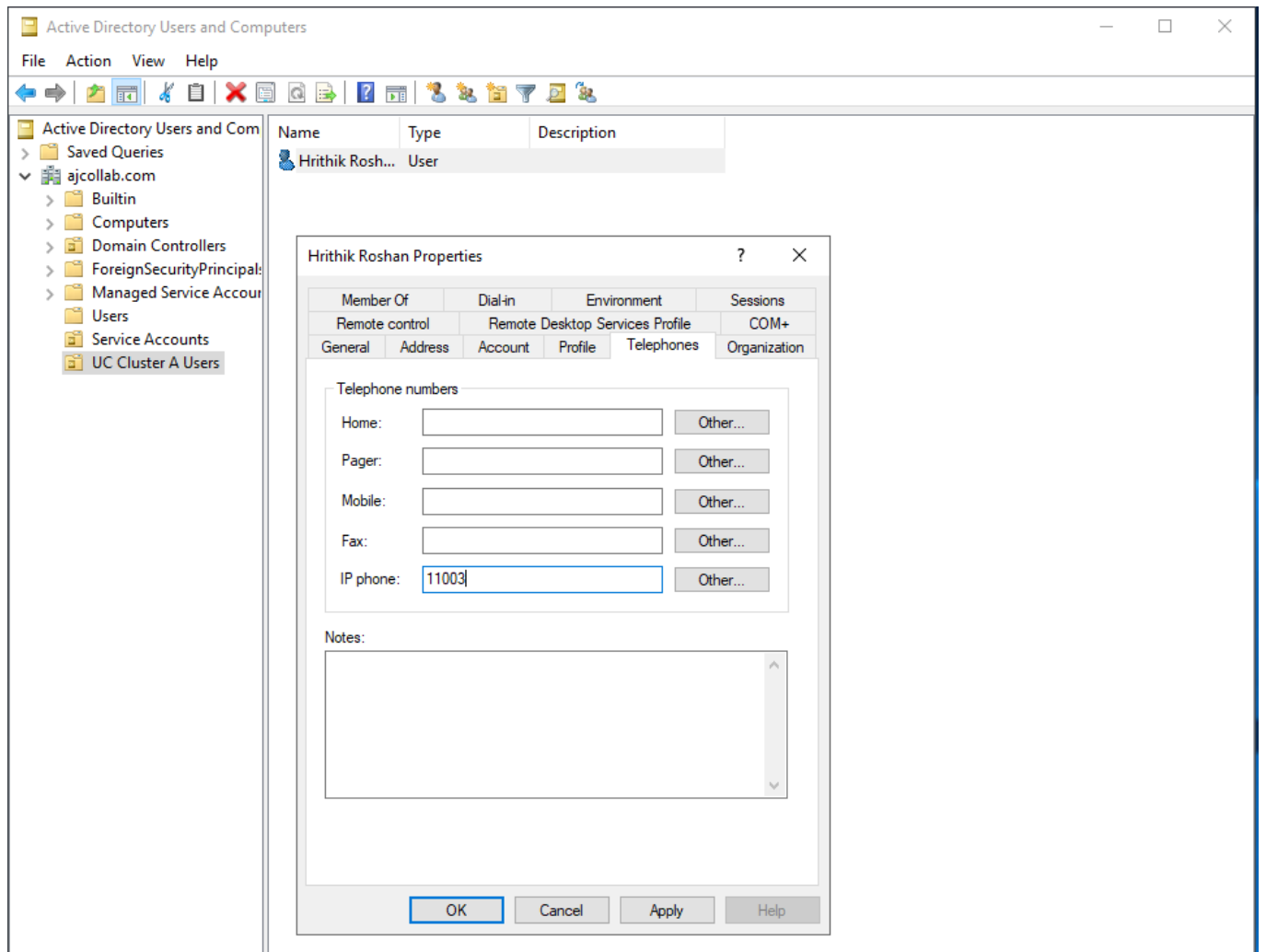
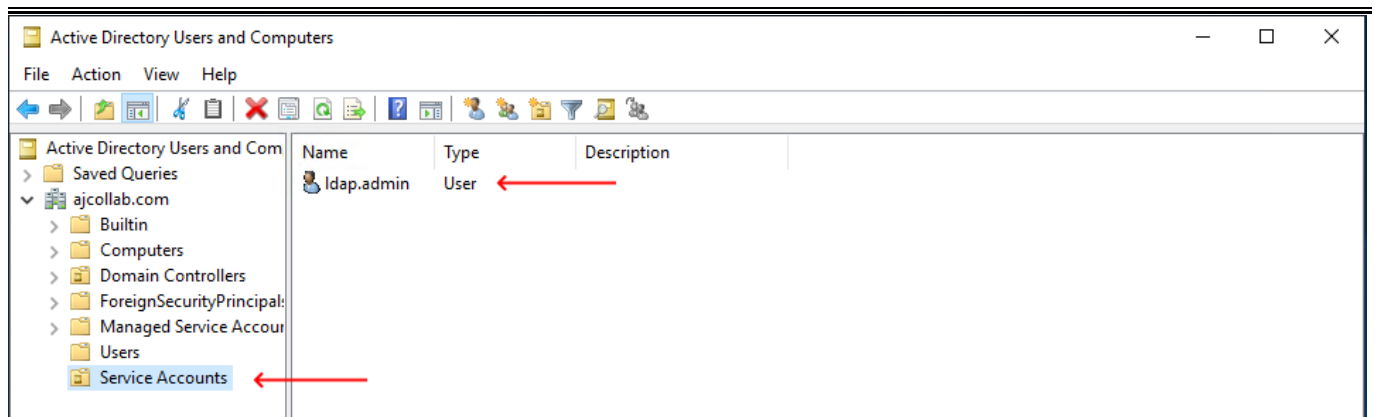


- End users can be synchronized to CUCM database from LDAP server
- Microsoft Active Directory Domain Services (ADDS) provides standard LDAP services to CUCM
- Application users cannot be synced using LDAP, it is always local to the CUCM DB
- We can enable LDAP Authentication so that the user authentication is handled by LDAP server
- Authorization is always provided from CUCM (using Group and Roles)

[LAB] Configuring LDAP

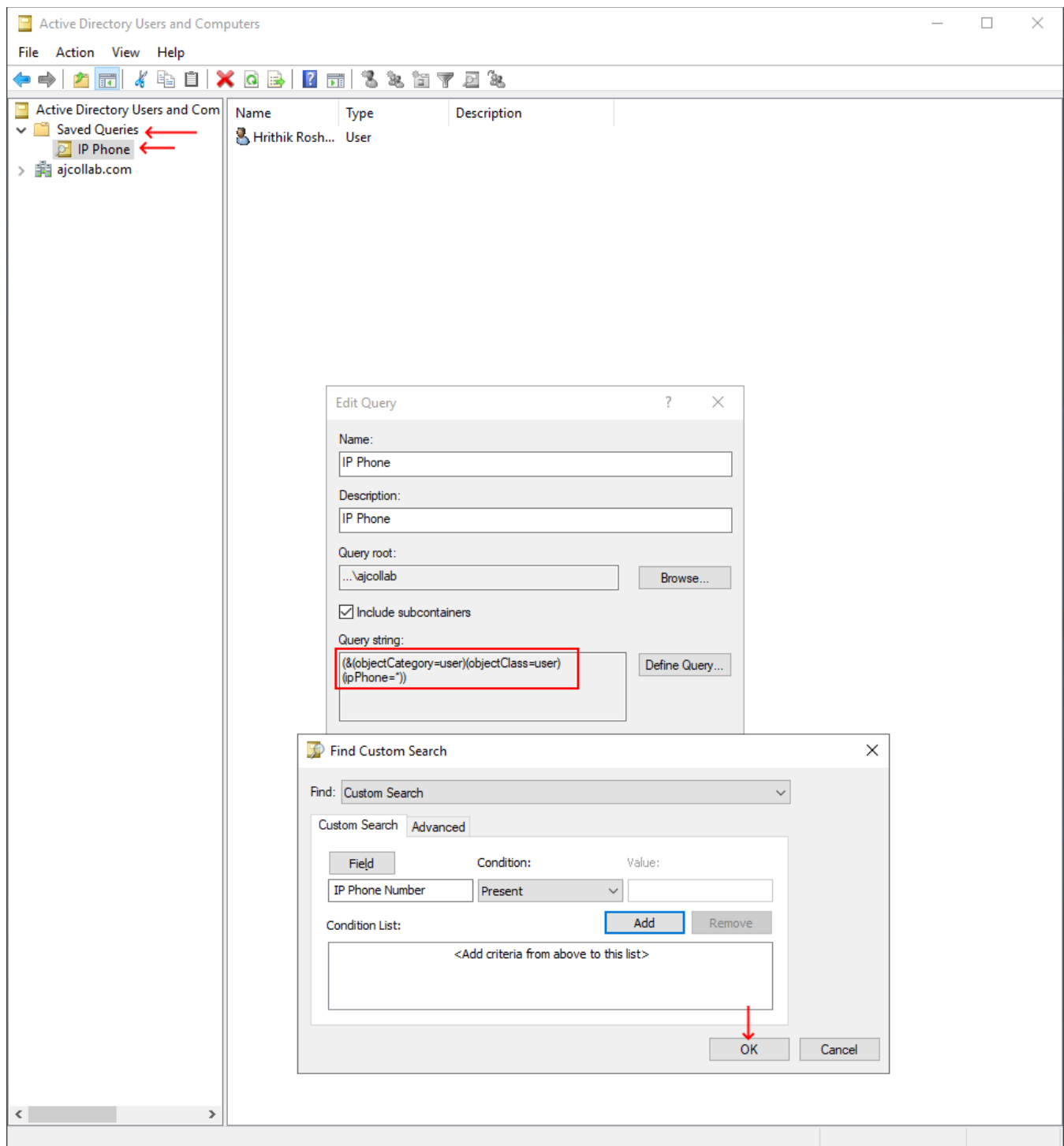
- In the Active Directory, create an OU called 'Service Accounts' and create a user inside it
- We can copy the built-in Administrator account and create 'ldap.admin' and drag to the Service Accounts OU (there is no defined rule like this but this is a best practice)





- I have created another OU UC Cluster A Users and added a user 'hrithik.roshan' there
- In the Telephone tab, I have added IP Phone field = 11003
- When I sync CUCM with LDAP, there is a chance that every user in AD will get synchronized. To avoid this, we create an LDAP Custom Filter with IP Phone field

- Custom filter for listing only users with IP Phone field is below,
((&(objectCategory=user)(objectClass=user)(ipPhone=*))



- Serviceability >> Tools >> Service Activation >> Select CUCM PUB >> Cisco DirSync
- Cisco DirSync only available in CUCM PUB
- This service is responsible for LDAP sync

The screenshot shows the Cisco Unified Serviceability web interface. The browser address bar displays <https://192.168.21.1/ccmservice/MainServlet.class>. The page title is "Cisco Unified Serviceability-Service Activation".

At the top, there is a list of services with checkboxes:

- ☒ Cisco Tftp (Activated)

The services are organized into several categories, each with a table of service names and their activation status:

- CTI Services**

Service Name	Activation Status
<input type="checkbox"/> Cisco IP Manager Assistant	Deactivated
<input type="checkbox"/> Cisco WebDialer Web Service	Deactivated
<input type="checkbox"/> Self Provisioning IVR	Deactivated
- CDR Services**

Service Name	Activation Status
<input type="checkbox"/> Cisco SOAP - CDRonDemand Service	Deactivated
<input type="checkbox"/> Cisco CAR Web Service	Deactivated
- Database and Admin Services**

Service Name	Activation Status
<input type="checkbox"/> Cisco Bulk Provisioning Service	Deactivated
<input checked="" type="checkbox"/> Cisco AXL Web Service	Activated
<input type="checkbox"/> Cisco UXL Web Service	Deactivated
<input type="checkbox"/> Cisco TAPS Service	Deactivated
- Performance and Monitoring Services**

Service Name	Activation Status
<input type="checkbox"/> Cisco Serviceability Reporter	Deactivated
<input type="checkbox"/> Cisco CallManager SNMP Service	Deactivated
- Security Services**

Service Name	Activation Status
<input type="checkbox"/> Cisco CTL Provider	Deactivated
<input type="checkbox"/> Cisco Certificate Authority Proxy Function	Deactivated
- Directory Services**

Service Name	Activation Status
<input checked="" type="checkbox"/> Cisco DirSync	Activated
- Location based Tracking Services**

Service Name	Activation Status
<input type="checkbox"/> Cisco Wireless Controller Synchronization Service	Deactivated
- Cloud based Management Services**

Service Name	Activation Status
--------------	-------------------

At the bottom of the page, there are buttons: "Save", "Set to Default", and "Refresh". Below these buttons is a note: "i *- indicates required item."

- System >> LDAP >> LDAP Custom Filter >> Add New

The screenshot shows the Cisco Unified CM Administration web interface. The browser address bar displays <https://192.168.21.1/ccmadmin/ldapCustomFilterEdit.do>. The page title is "LDAP Filter Configuration".

The page includes a navigation bar with the following links: System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The user is logged in as "admin".

The main content area shows the "LDAP Filter Configuration" page. It includes a "Save" button and a "Status" section indicating "Status: Ready".

The "LDAP Custom Filter Information" section contains the following fields:

- Filter Name***: LDAP-CUSTOM-FILTER-IP-PHONE
- Filter***: (&(objectCategory=user)(objectClass=user)(ipPhone=*))

At the bottom of the page, there is a "Save" button and a note: "i *- indicates required item."

- System >> LDAP >> LDAP System >> Enable Synchronizing from LDAP Server >> Save

LDAP System Configuration

Status: Ready

LDAP System Information

☒ Enable Synchronizing from LDAP Server

LDAP Server Type: Microsoft Active Directory

LDAP Attribute for User ID: sAMAccountName

Save

*- indicates required item.

- System >> LDAP >> LDAP System >> LDAP Directory >> Add New
- Configure given details and add AD Server IP

LDAP Directory

Status: Ready

LDAP Directory Information

LDAP Configuration Name*: AJCOLLAB-AD

LDAP Manager Distinguished Name*: ldap.admin@ajcollab.com

LDAP Password*:

Confirm Password*:

LDAP User Search Base*: dc=ajcollab, dc=com

LDAP Custom Filter for Users: LDAP-CUSTOM-FILTER-IP-PHONE

Synchronize*: ☒ Users Only ☐ Users and Groups

LDAP Custom Filter for Groups: < None >

LDAP Directory Synchronization Schedule

Perform Sync Just Once: ☐

Perform a Re-sync Every*: 1 DAY

Next Re-sync Time (YYYY-MM-DD hh:mm)*: 2021-03-01 00:00

Standard User Fields To Be Synchronized

Cisco Unified Communications Manager User Fields	LDAP Attribute	Cisco Unified Communications Manager User Fields	LDAP Attribute
User ID	sAMAccountName	First Name	givenName
Middle Name	middleName	Last Name	sn
Manager ID	manager	Department	department
Phone Number	ipPhone	Mail ID	mail
Title	title	Home Number	homephone
Mobile Number	mobile	Pager Number	pager
Directory URI	mail	Display Name	displayName

Custom User Fields To Be Synchronized

Note: Custom User Field Names must be same across all synchronization agreements.

Custom User Field Name: _____ LDAP Attribute: _____

Group Information

User Rank*: 1-Default User Rank

Access Control Groups: Standard CCM End Users

Add to Access Control Group

Remove from Access Control Group

LDAP Directory

Navigation: Cisco Unified CM Administration

admin | About | Logout

System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help

LDAP Directory

Related Links: Back to LDAP Directory Find/List

Save

Cisco Unified Communications Manager User Fields	LDAP Attribute	Cisco Unified Communications Manager User Fields	LDAP Attribute
User ID	sAMAccountName	First Name	givenName
Middle Name	middleName	Last Name	sn
Manager ID	manager	Department	department
Phone Number	ipPhone	Mail ID	mail
Title	title	Home Number	homephone
Mobile Number	mobile	Pager Number	pager
Directory URI	mail	Display Name	displayName

Custom User Fields To Be Synchronized

Note: Custom User Field Names must be same across all synchronization agreements.

Custom User Field Name	LDAP Attribute

Group Information

User Rank*: 1-Default User Rank

Access Control Groups: Standard CCM End Users

Add to Access Control Group

Remove from Access Control Group

Feature Group Template: < None >

Warning: If no template is selected, the new line features below will not be active.

☐ Apply mask to synced telephone numbers to create a new line for inserted users

Mask:

☐ Assign new line from the pool list if one was not created based on a synced LDAP telephone number

Order DN Pool Start DN Pool End

Add DN Pool

LDAP Server Information

Host Name or IP Address for Server*: 192.168.11.1

LDAP Port*: 389

Use TLS: ☐

Add Another Redundant LDAP Server

Save

*- indicates required item.

- System >> LDAP >> LDAP Authentication >> Check the box and provide given details

LDAP Authentication

Navigation: Cisco Unified CM Administration

admin | About | Logout

System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help

LDAP Authentication

Save

Status

Update successful

LDAP Authentication for End Users

☒ Use LDAP Authentication for End Users

LDAP Manager Distinguished Name*: ldap.admin@ajcollab.com

LDAP Password*:

Confirm Password*:

LDAP User Search Base*: dc=ajcollab, dc=com

LDAP Server Information

Host Name or IP Address for Server*: 192.168.11.1

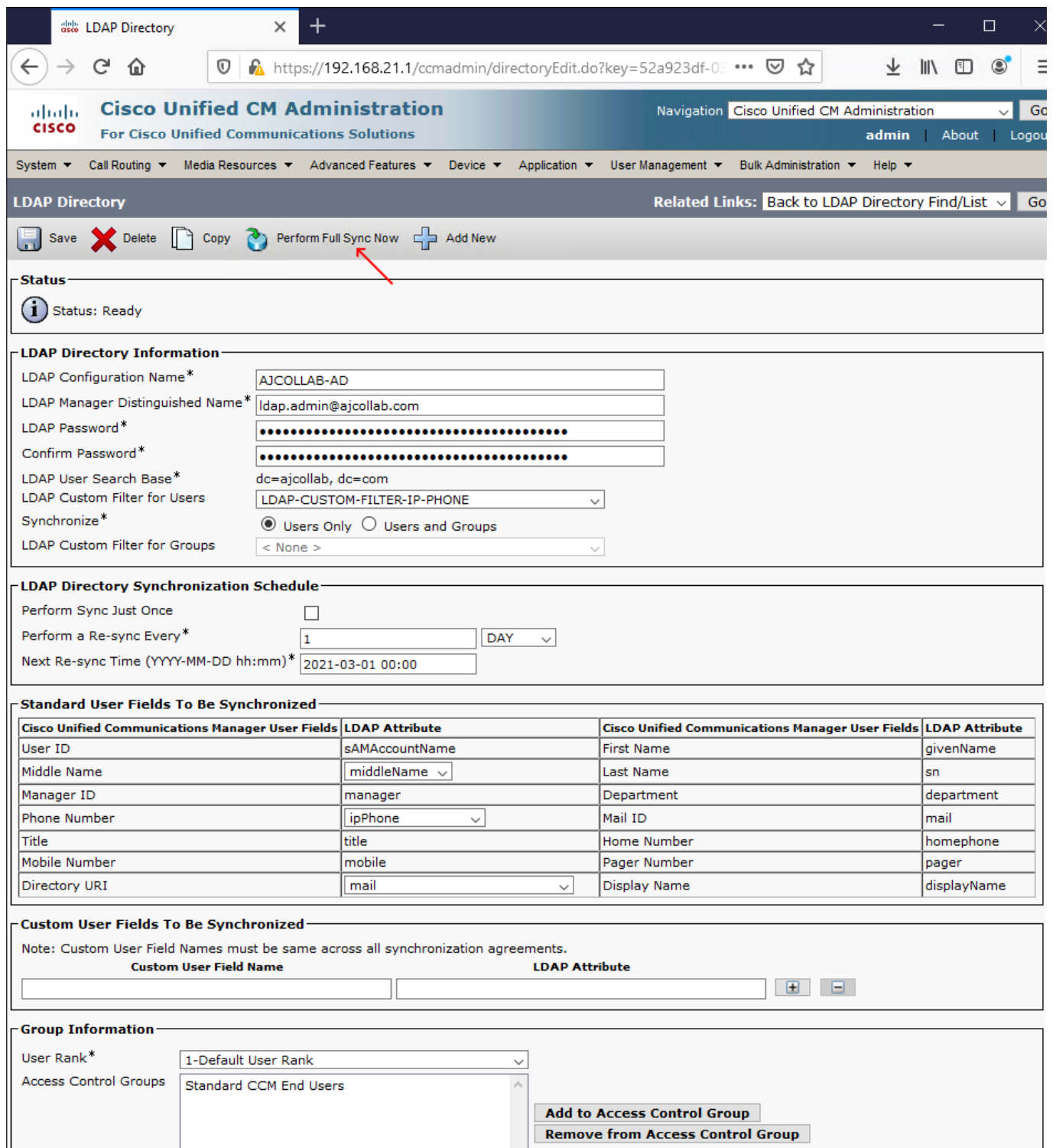
LDAP Port*: 389

Use TLS: ☐

Add Another Redundant LDAP Server

Save

- System >> LDAP >> LDAP System >> LDAP Directory >> Select AJCOLLAB-AD >> Perform Full Sync Now



Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | admin | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

LDAP Directory Related Links: Back to LDAP Directory Find/List ▾ Go

Save ✕ Delete Copy Perform Full Sync Now + Add New

Status
Status: Ready

LDAP Directory Information

LDAP Configuration Name* AJCOLLAB-AD

LDAP Manager Distinguished Name* ldap.admin@ajcollab.com

LDAP Password*

Confirm Password*

LDAP User Search Base* dc=ajcollab, dc=com

LDAP Custom Filter for Users LDAP-CUSTOM-FILTER-IP-PHONE ▾

Synchronize* ☒ Users Only ☐ Users and Groups

LDAP Custom Filter for Groups < None > ▾

LDAP Directory Synchronization Schedule

Perform Sync Just Once ☐

Perform a Re-sync Every* 1 DAY ▾

Next Re-sync Time (YYYY-MM-DD hh:mm)* 2021-03-01 00:00

Standard User Fields To Be Synchronized

Cisco Unified Communications Manager User Fields	LDAP Attribute	Cisco Unified Communications Manager User Fields	LDAP Attribute
User ID	sAMAccountName	First Name	givenName
Middle Name	middleName ▾	Last Name	sn
Manager ID	manager	Department	department
Phone Number	ipPhone ▾	Mail ID	mail
Title	title	Home Number	homephone
Mobile Number	mobile	Pager Number	pager
Directory URI	mail ▾	Display Name	displayName

Custom User Fields To Be Synchronized

Note: Custom User Field Names must be same across all synchronization agreements.

Custom User Field Name	LDAP Attribute

+ -

Group Information

User Rank* 1-Default User Rank ▾

Access Control Groups Standard CCM End Users

Add to Access Control Group

Remove from Access Control Group

- User Management >> End User >> Find
- You can see new user has been synced from LDAP server

The screenshot shows the Cisco Unified CM Administration web interface. The browser address bar displays the URL: `https://192.168.21.1/ccmadmin/userEdit.do?key=9df03709-a24f-c...`. The page title is "End User Configuration". The navigation menu includes: System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The "End User Configuration" section is active, showing a "Related Links" button: "Back to Find List Users".

The "Status" section shows: Status: Ready.

The "User Information" section contains the following fields:

- User Status: Active Enabled LDAP Synchronized User (indicated by a red arrow)
- User ID*: hrithik.roshan
- Self-Service User ID: [Empty field]
- PIN: [Masked field] [Edit Credential]
- Confirm PIN: [Masked field]
- Last name*: Roshan
- Middle name: [Empty field]
- First name: Hrithik
- Display name: Hrithik Roshan
- Title: [Empty field]
- Directory URI: hrithik.roshan@ajcollab.com
- Telephone Number: 11003
- Home Number: [Empty field]
- Mobile Number: [Empty field]
- Pager Number: [Empty field]
- Mail ID: hrithik.roshan@ajcollab.com
- Manager User ID: [Empty field]
- Department: [Empty field]
- User Locale: < None >
- Associated PC/Site Code: [Empty field]
- Digest Credentials: [Masked field]
- Confirm Digest Credentials: [Masked field]
- User Profile: Use System Default("Standard (Factory Default) U: [Empty field] View Details
- User Rank*: 1-Default User Rank

The "Convert User Account" section contains the following fields:

- ☐ Convert LDAP Synchronized User to Local User

The "Service Settings" section contains the following fields:

- ☐ Home Cluster
- ☐ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)
- ☐ Include meeting information in presence(Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)
- UC Service Profile: Use System Default View Details

The "Device Information" section contains the following fields:

- Controlled Devices: [Empty field]

License Consumption

- After the installation of CUCM, we integrated it to Cisco Prime License Manager in previous class
- Now let's see how the licenses are consumed
- When you add a Cisco 8865 Phone to CUCM, it picks 'Enhanced' license
- It provides rights to: One device, including all Basic features, plus advanced (voice and video) call control features including desktop and mobile clients.
- Examples include Cisco 3911, Cisco 3951, Cisco 6941, Cisco 6945, Cisco 6961, Cisco 79xx, Cisco 89xx, Cisco 99xx, Cisco E20, Cisco TelePresence EX60, Cisco TelePresence EX90 and third-party SIP

The screenshot displays two web interfaces side-by-side. The left interface is 'Cisco Unified CM Administration' showing a list of phones. A red circle highlights the 'Device Name' column, and a red arrow points from the 'Enhanced (11.x) - Unified CM' license entry in the right interface to the 'Enhanced' license entry in the left interface's 'Device Name' column. The right interface is the 'Cisco Prime License Manager' dashboard, showing 'License Usage' and 'License Alerts'.

Type	Required
CUWL Professional (11.x) - Unified CM	0
CUWL Standard (11.x) - Unified CM	0
Enhanced Plus (11.x) - Unified CM	0
Enhanced (11.x) - Unified CM	8
Basic (11.x) - Unified CM	0
Essential (11.x) - Unified CM	0
TelePresence Room (11.x) - Unified CM	0

Type	Status
No data available	No data available

Name	Status	Last
No data available	No data available	No data available

- Licenses are categorized in two Cisco User Connect Licensing (UCL) and Cisco Unified Workspace Licensing (UWL)
- Detailed description of these two are given in below table
- When you create a new end user and associate the phone to the user, then the Enhanced license will be free and one

Cisco User Connect Licensing (UCL)	Essential	<ul style="list-style-type: none"> One device providing basic voice via analog device (phone or fax). Examples include analog phones, ATA 186, ATA 187, Cisco 3905 and Cisco 6901
	Basic	<ul style="list-style-type: none"> One device, including all Essential features, plus basic (voice and video) call control features. Examples include Cisco 6911 and Cisco 6921
	Enhanced	<ul style="list-style-type: none"> One device, including all Basic features, plus advanced (voice and video) call control features including desktop and mobile clients. Examples include Cisco 3911, Cisco 3951, Cisco 6941, Cisco 6945, Cisco 6961, Cisco 79xx, Cisco 89xx, Cisco 99xx, Cisco E20, Cisco TelePresence EX60, Cisco TelePresence EX90 and third-party SIP
	Enhanced Plus	<ul style="list-style-type: none"> Advanced voice, video call control Up to 2 devices and including all Enhanced features (e.g. Desk Phone, Jabber Soft Phone) This is based on End user phone association
	Cisco Unified Workspace (CUWL) Standard	<ul style="list-style-type: none"> Advanced voice, video call control Up to 10 devices per user (e.g. Desk Phone, Jabber Soft Phone, Jabber iPhone, Jabber Android, etc.)
Cisco Unified Workspace Licensing (UWL)	Cisco Unified Workspace (CUWL) Professional	<ul style="list-style-type: none"> Advanced voice, video call control Up to 10 devices per user (e.g. Desk Phone, Jabber Soft Phone, Jabber iPhone, Jabber Android, etc.) Professional collaboration workspace application features

[Lab] Third Party SIP Phone Registration

- Device >> Phone >> Add New >> Phone Type: Third-party SIP Device (Basic)

The screenshot shows the 'Phone Configuration' page in Cisco Unified CM Administration. The browser address bar shows <https://192.168.21.1/ccmadmin/phoneEdit.do>. The page title is 'Cisco Unified CM Administration For Cisco Unified Communications Solutions'. The navigation menu includes System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The 'Phone Configuration' section is active, showing 'Status: Ready'. The 'Phone Type' section is set to 'Third-party SIP Device (Basic)' with 'Device Protocol: SIP'. The 'Device Information' section contains the following fields:

- Device is not trusted
- MAC Address*: AAAAAAAAAA1 Dummy MAC
- Description: 11003 - Hrithik Roshan
- Device Pool*: BANGALORE-DEVICE-POOL (View Details)
- Common Device Configuration: < None > (View Details)
- Phone Button Template*: Third-party SIP Device (Basic) (View Details)
- Common Phone Profile*: Standard Common Phone Profile (View Details)
- Calling Search Space: < None >
- AAR Calling Search Space: < None >
- Media Resource Group List: < None >
- Location*: Hub_None
- AAR Group: < None >
- Device Mobility Mode*: Default
- Owner: ☒ User ☐ Anonymous (Public/Shared Space)
- Owner User ID*: hrithik.roshan
- Mobility User ID: < None >
- Use Trusted Relay Point*: Default
- Always Use Prime Line*: Default
- Always Use Prime Line for Voice Message*: Default
- Geolocation: < None >
- ☐ Ignore Presentation Indicators (internal calls only)
- ☒ Logged Into Hunt Group
- ☐ Remote Device

The 'Number Presentation Transformation' section contains:

- Caller ID For Calls From This Phone: Calling Party Transformation CSS: < None >
- ☒ Use Device Pool Calling Party Transformation CSS (Caller ID For Calls From This Phone)

The 'Remote Number' section contains:

- Calling Party Transformation CSS: < None >
- ☒ Use Device Pool Calling Party Transformation CSS (Device Mobility Related Information)

The screenshot shows the 'Phone Configuration' page in Cisco Unified CM Administration, continuing from the previous page. The 'Number Presentation Transformation' and 'Remote Number' sections are visible. The 'Protocol Specific Information' section contains the following fields:

- BLF Presence Group*: Standard Presence group
- MTP Preferred Originating Codec*: 711ulaw
- Device Security Profile*: Third-party SIP Device Basic - Standard SIP Non-S (highlighted with a red box)
- Rerouting Calling Search Space: < None >
- SUBSCRIBE Calling Search Space: < None >
- SIP Profile*: Standard SIP Profile (View Details)
- Digest User: hrithik.roshan (highlighted with a red box)
- ☐ Media Termination Point Required
- ☐ Unattended Port
- ☐ Require DTMF Reception

The 'MLPP and Confidential Access Level Information' section contains:

- MLPP Domain: < None >
- Confidential Access Mode: < None >
- Confidential Access Level: < None >

A 'Save' button is located at the bottom of the page.

Directory Number Configurati...
https://192.168.21.1/cmadmin/directoryNumberEdit.do?key=337
Cisco Unified CM Administration
Navigation Cisco Unified CM Administration
admin About Logout
System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help
Directory Number Configuration
Related Links: Configure Device (SEPAAAAAAAAAAAA1) Go
Save Delete Reset Apply Config Add New
Status
Update successful
Directory Number Information
Directory Number* 11003
Route Partition < None >
Description 11003 - Hrithik Roshan
Alerting Name 11003 - Hrithik Roshan
ASCII Alerting Name 11003 - Hrithik Roshan
External Call Control Profile < None >
Associated Devices SEPAAAAAAAAAAAA1
Edit Device
Edit Line Appearance
Dissociate Devices
Directory Number Settings
Voice Mail Profile < None > (Choose <None> to use system default)
Calling Search Space < None >
BLF Presence Group* Standard Presence group
User Hold MOH Audio Source < None >
Network Hold MOH Audio Source < None >
Reject Anonymous Calls
Enterprise Alternate Number
Add Enterprise Alternate Number
+E.164 Alternate Number
Add +E.164 Alternate Number
Directory URIs
Primary URI Partition Advertise Globally via ILS Rem

Directory Number Configurati...
https://192.168.21.1/cmadmin/directoryNumberEdit.do?key=337
Cisco Unified CM Administration
Navigation Cisco Unified CM Administration
admin About Logout
System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help
Directory Number Configuration
Related Links: Configure Device (SEPAAAAAAAAAAAA1) Go
Save Delete Reset Apply Config Add New
Line Settings for All Devices
Hold Reversion Ring Duration (seconds) Setting the Hold Reversion Ring Duration to zero will
disable the feature
Hold Reversion Notification Interval (seconds) Setting the Hold Reversion Notification Interval to zero
will disable the feature
Party Entrance Tone* Default
Line 1 on Device SEPAAAAAAAAAAAA1
Display (Caller ID) 11003 - Hrithik Roshan Display text for a line appearance is intended for displaying text such
as a name instead of a directory number for calls. If you specify a number, the person receiving a call may not see the proper identity
of the caller.
ASCII Display (Caller ID) 11003 - Hrithik Roshan
External Phone Number Mask
Monitoring Calling Search Space < None >
Multiple Call/Call Waiting Settings on Device SEPAAAAAAAAAAAA1
Note:The range to select the Max Number of calls is: 1-2
Maximum Number of Calls* 2
Busy Trigger* 2 (Less than or equal to Max. Calls)
Forwarded Call Information Display on Device SEPAAAAAAAAAAAA1
Caller Name
Caller Number
Redirected Number
Dialed Number
Users Associated with Line
Associate End Users
Save Delete Reset Apply Config Add New
* - indicates required item.
** - Changes to Line or Directory Number settings require restart.

Directory Number Configuration

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Directory Number Configuration
Related Links:
Configure Device (SEPAAAAAAAAA1)
Go

Save
Delete
Reset
Apply Config
Add New

Hold Reversion Ring Duration (seconds)
disable the feature
Setting the Hold Reversion Ring Duration to zero will disable the feature

Hold Reversion Notification Interval (seconds)
will disable the feature
Setting the Hold Reversion Notification Interval to zero will disable the feature

Party Entrance Tone*
Default

Line 1 on Device SEPAAAAAAAAA1

Display (Caller ID)
11003 - Hrithik Roshan
Display text for a line appearance is intended for displaying text such as a name instead of a directory number for calls. If you specify a number, the person receiving a call may not see the proper identity of the caller.

ASCII Display (Caller ID)
11003 - Hrithik Roshan

External Phone Number Mask

Monitoring
< None >

Calling Search Space

Multiple Call/Call Waiting Settings on Device SEPAAAAAAAAA1

Note: The range to select the Max Number of calls is: 1-2

Maximum Number of Calls*
2

Busy Trigger*
2
(Less than or equal to Max. Calls)

Forwarded Call Information Display on Device SEPAAAAAAAAA1

☐ Caller Name
☐ Caller Number
☐ Redirected Number
☐ Dialed Number

Users Associated with Line

	Full Name	User ID	Permission
<input checked="" type="checkbox"/>	Roshan, Hrithik	hrithik.roshan	

Associate End Users
Select All
Clear All
Delete Selected

Save
Delete
Reset
Apply Config
Add New

* - indicates required item.

** - Changes to Line or Directory Number settings require restart.

End User Configuration

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Related Links:
Back to Find List Users
Go

Save
Delete
Add New

Status
Update successful

User Information

User Status
Active Enabled LDAP Synchronized User

User ID*
hrithik.roshan

Self-Service User ID

PIN
Edit Credential

Confirm PIN

Last name*
Roshan

Middle name

First name
Hrithik

Display name
Hrithik Roshan

Title

Directory URI
hrithik.roshan@ajcollab.com

Telephone Number
11003

Home Number

Mobile Number

Pager Number

Mail ID
hrithik.roshan@ajcollab.com

Manager User ID

Department

User Locale
< None >

Associated PC/ Site Code

Digest Credentials

Confirm Digest Credentials

User Profile
Use System Default ("Standard (Factory Default) User Profile")
View Details

User Rank*
1-Default User Rank

Convert User Account

☐ Convert LDAP Synchronized User to Local User

Service Settings

☒ Home Cluster

☐ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)

☐ Include meeting information in presence (Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)

UC Service Profile
Use System Default
View Details

Device Information

Controlled Devices
SEPAAAAAAAAA1
Associate the device with user

Account settings

Account name:

Caller ID:

Credentials

Enter your SIP account credentials

Extension:

ID:

Password:

My location

Specify the IP of your PBX/SIP server

☒ I am in the office - local IP of PBX

☐ I am out of the office - external IP of PBX

☐ Use 3CX Tunnel

Eliminates firewall configuration. Requires 3CX Phone System for Windows

Local IP of remote PBX:

Tunnel password: Port:

☐ Use Outbound Proxy server

Required by some VoIP Providers. Specify IP or name.

☐ Perform provisioning from following URL:

Advanced settings OK Cancel

Phone Configuration

https://192.168.21.1/cmadmin/phoneEdit.do?key=855c531b-0e5...

Cisco Unified CM Administration

Navigation Cisco Unified CM Administration

admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Phone Configuration Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

Status

Status: Ready

Association

Modify Button Items

1 Line [1] - 11003 (no partition)

2 Line [2] - Add a new DN

Phone Type

Product Type: Third-party SIP Device (Basic)

Device Protocol: SIP

Real-time Device Status

Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcollab.com

IPv4 Address: 192.168.11.1

Active Load ID: None

Download Status: None

Device Information

Device is Active

Device is not trusted

MAC Address*: AAAAAAAAAA1

Description: 11003 - Hrithik Roshan

Device Pool*: BANGALORE-DEVICE-POOL View Details

Common Device Configuration: < None > View Details

Phone Button Template*: Third-party SIP Device (Basic)

Common Phone Profile: Standard Common Phone Profile View Details

Calling Search Space: < None >

AAR Calling Search Space: < None >

Media Resource Group List: < None >

Location*: Hub_None

AAR Group: < None >

Device Mobility Mode*: Default Device Mobility Settings View Current

Owner: User Anonymous (Public/Shared Space)

Owner User ID*: hrithik.roshan

Mobility User ID: < None >

Use Trusted Relay Point*: Default

Always Use Prime Line*: Default

Always Use Prime Line*: Default

3CXPhone

23:13:56 Hrithik Roshan

On Hook Available

Line 1 Line 2 Line 3 Line 4 Line 5

1 2 3

4 5 6

7 8 9

0 + #

Hold Transfer

IP Phone Packet Capture Procedure

- We can take PCAPs either from Phone PC Port locally or from CUCM Node remotely
- If we want to take PCAPs from Phone directly, connect a Laptop or PC (With Wireshark installed) on the PC Port of the Phone
- Enable 'Span to PC Port' option in the Phone configuration page and then start capturing the NIC of Laptop/PC using Wireshark

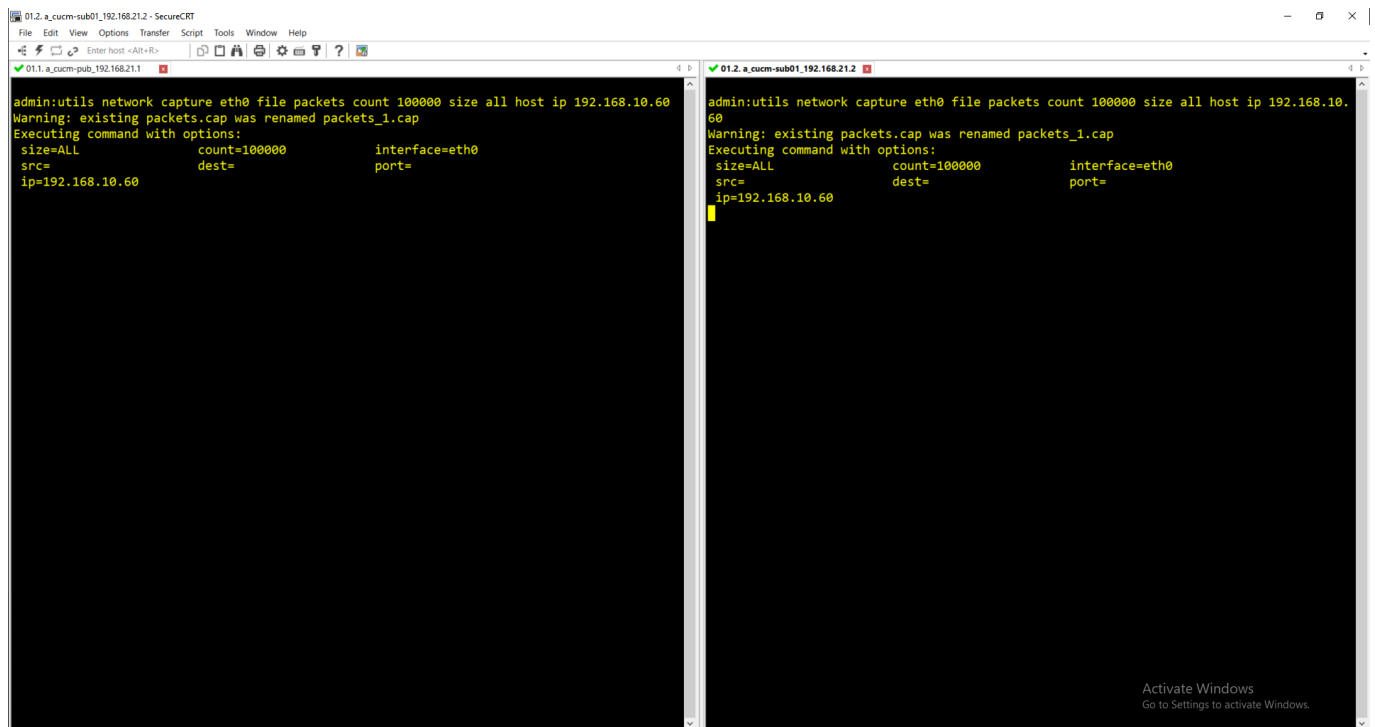
The screenshot shows the Cisco Unified CM Administration interface for Phone Configuration. The 'Span to PC Port' option is highlighted with a red box and is set to 'Enabled'. Other visible configuration options include:

- Display On Duration: 10:30
- Display Idle Timeout: 01:00
- Display On When Incoming Call*: Enabled
- Enable Power Save Plus: Sunday, Monday, Tuesday
- Phone On Time: 00:00
- Phone Off Time: 24:00
- Phone Off Idle Timeout*: 60
- ☐ Enable Audible Alert
- EnergyWise Domain
- EnergyWise Secret
- ☐ Allow EnergyWise Overrides
- Join And Direct Transfer Policy*: Same line, across line enable
- Span to PC Port*: Enabled**
- Recording Tone*: Disabled
- Recording Tone Local Volume*: 100
- Recording Tone Remote Volume*: 50
- Recording Tone Duration
- Log Server
- Cisco Discovery Protocol (CDP): Switch Port*: Enabled
- Cisco Discovery Protocol (CDP): PC Port*: Enabled
- Link Layer Discovery Protocol - Media Endpoint Discover (LLDP-MED): Switch Port*: Enabled
- Link Layer Discovery Protocol (LLDP): PC Port*: Enabled
- LLDP Asset ID

- To enable PCAPS from CUCM, use below command

`utils network capture eth0 file packets count 100000 size all host ip 192.168.10.60`

- This will start capturing Packets till you hit Control + C
- You need to do this on TFTP as well as the target CUCM Subscriber node



- If you are not sure about the Phone IP, then you can collect all packets using below command

`utils network capture eth0 file packets count 100000 size all`

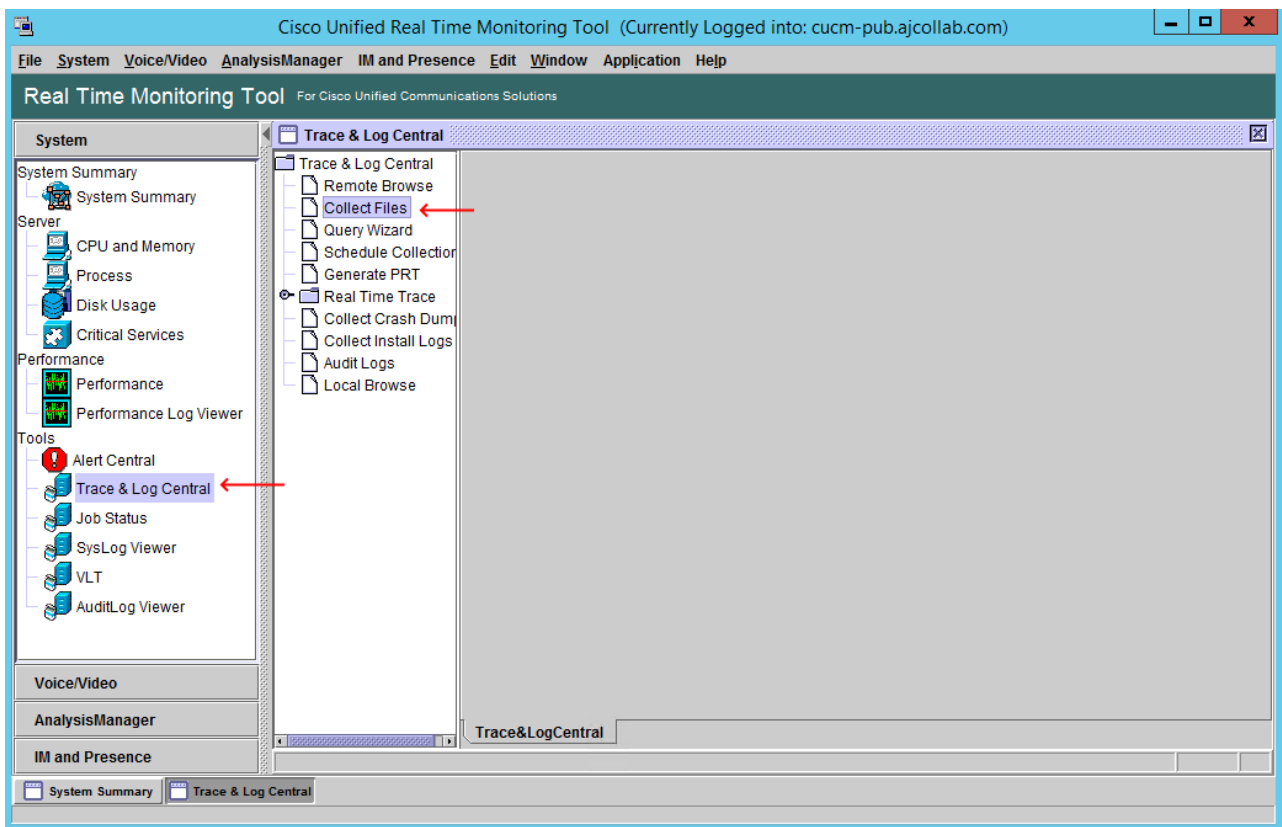
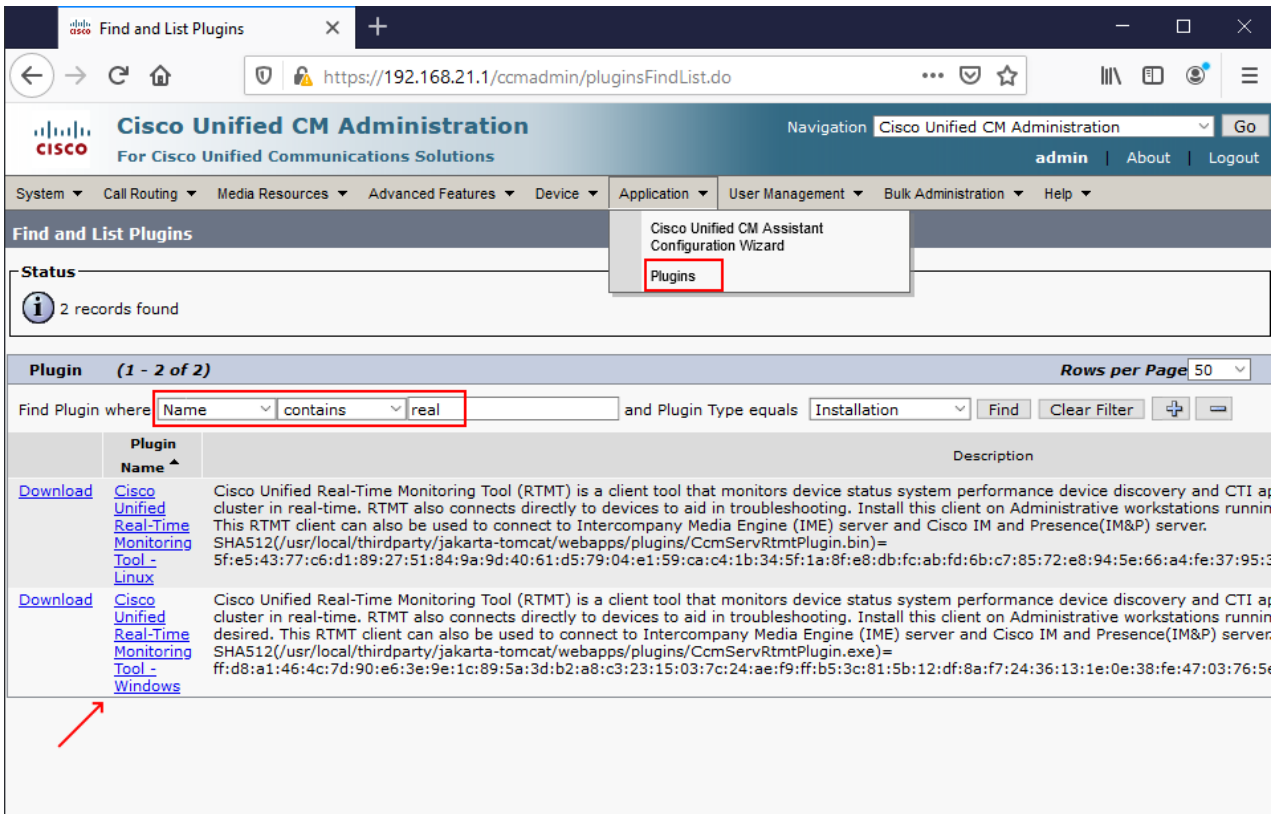
- This will have some serious CPU utilization on the node

- PCAPs will be available at **platform/cli/ location**
- You can collect the PCAP either from CLI to an SFTP Server or from RTMT

```
admin:utils network capture eth0 file packets count 100000 size all  
Executing command with options:  
size=ALL                count=100000            interface=eth0  
src=                    dest=                  port=  
ip=  
  
Control-C pressed ←  
  
admin:file list activelog platform/cli/  
packets.cap  
dir count = 0, file count = 1  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:  
admin:file get activelog platform/cli/packets.cap  
Please wait while the system is gathering files info ...  
Get file: active/platform/cli/packets.cap  
done.  
Sub-directories were not traversed.  
Number of files affected: 1  
Total size in Bytes: 54112785  
Total size in Kbytes: 52844.516  
Would you like to proceed [y/n]? y ←  
SFTP server IP: 192.168.11.5 ←  
SFTP server port [22]:  
User ID: sftp.admin ←  
Password: *****  
Download directory: /
```

RTMT To Collect Logs and PCAPs from CUCM Cluster

- We can download RTMT from Applications >> Plugins Menu
- RTMT can be used to Monitor the CUCM cluster as well as collecting log files



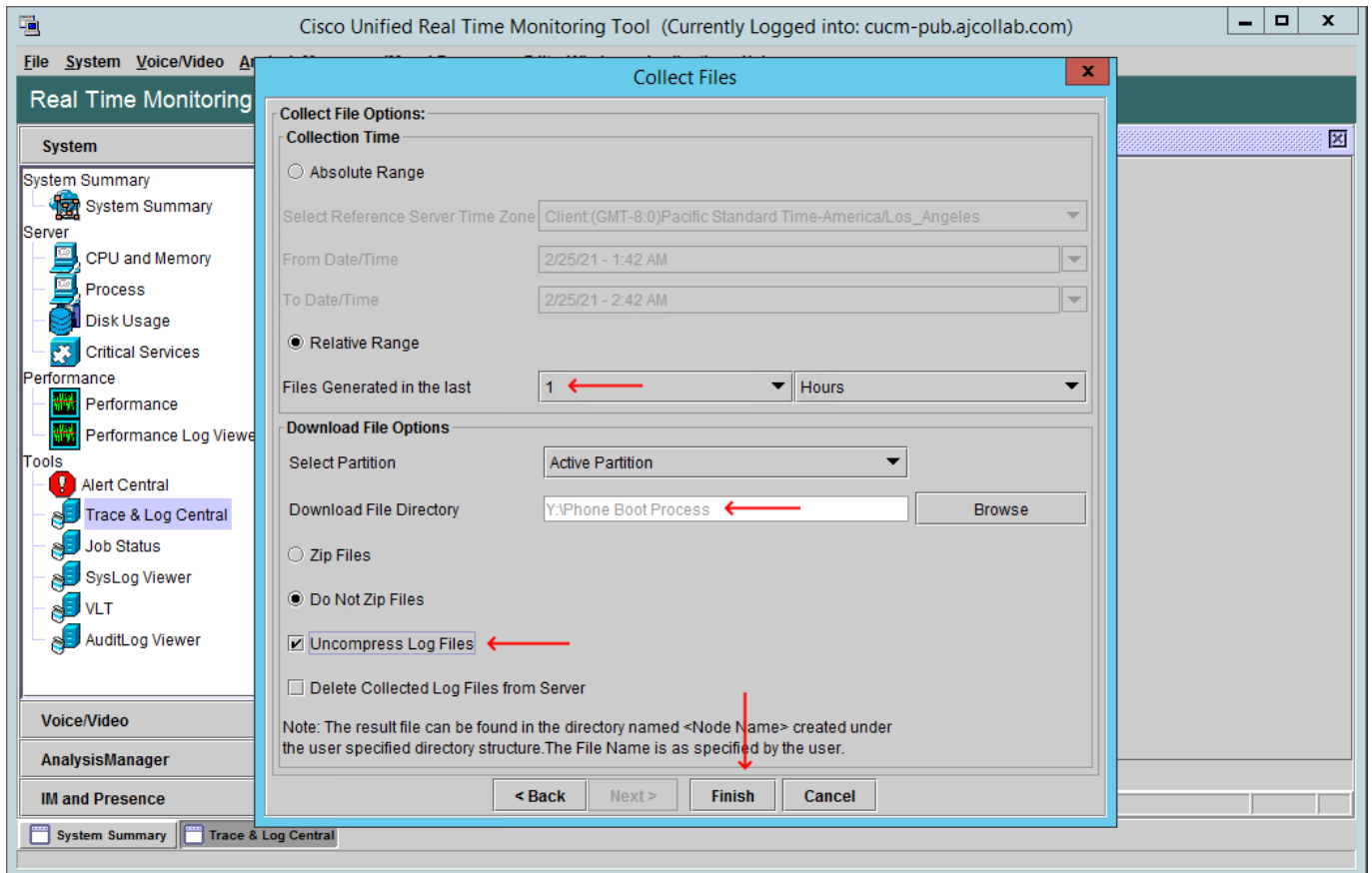
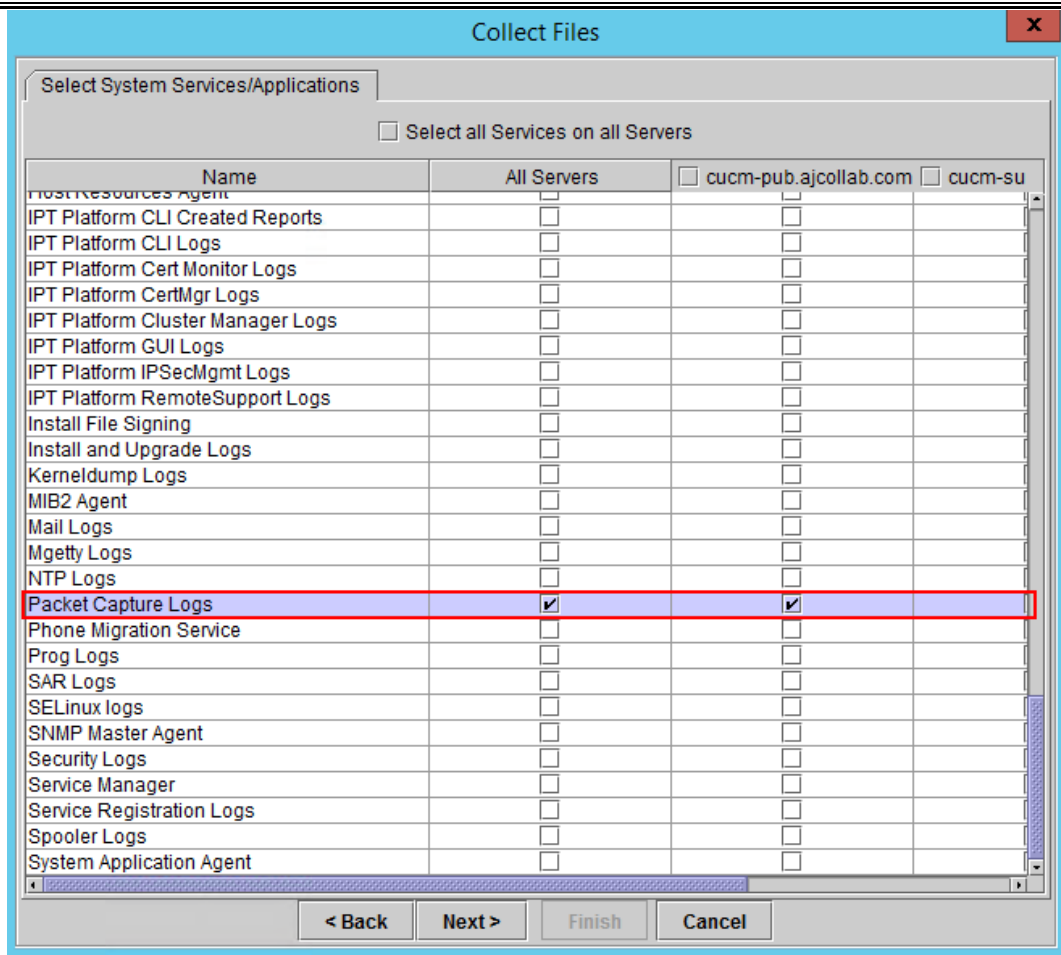
Collect Files X

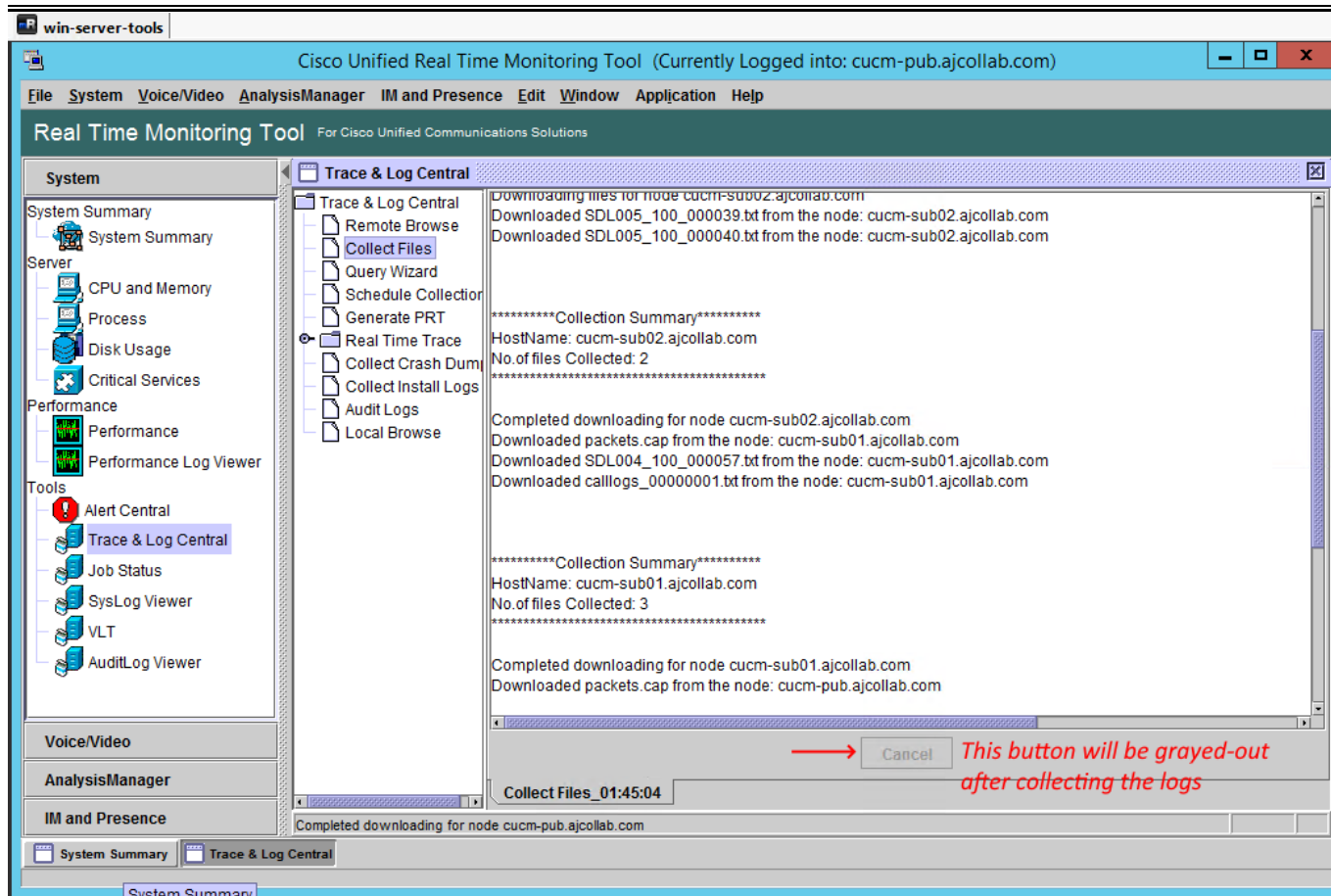
Select UCM Services/Applications

☐ Select all Services on all Servers

Name	All Servers	<input type="checkbox"/> cucm-pub.ajcollab.com	<input type="checkbox"/> cucm-su
Cisco CAR Scheduler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco CAR Web Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco CDR Agent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco CDR Repository Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco CDR files on CM server	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco CDR files on Publisher Processed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco CTIManager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco CTI Provider	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco CallManager	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cisco CallManager SNMP Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Certificate Authority Proxy Function	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Change Credential Application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco DHCP Monitor Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Dialed Number Analyzer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Dialed Number Analyzer Server	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Directory Number Alias Lookup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Directory Number Alias Sync	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Extended Functions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Extended Functions Report	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Extension Mobility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Extension Mobility Application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Headset Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco IP Manager Assistant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco IP Voice Media Streaming App	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Intercluster Lookup Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco License Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cisco Location Bandwidth Manager	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

< Back
Next >
Finish
Cancel





IP Phone Bootup Process and Registration

- When you connect an IP Phone to a network, there are some key steps that the IP Phone will go through to get register with CUCM
- We will now see the complete registration process with the help of Packet Captures

The image displays a Wireshark packet capture titled "Phone PCAP2.pcapng". The interface shows a list of captured packets with columns for No., Time, Source, Destination, Protocol, Length, and Info. The packets are filtered by "dhcp || http || sip".

Key packets in the list include:

- DHCP Discover (No. 180, Source 0.0.0.0, Destination 255.255.255.255)
- DHCP Offer (No. 189, Source 10.106.79.70, Destination 255.255.255.255)
- DHCP Request (No. 191, Source 0.0.0.0, Destination 255.255.255.255)
- DHCP ACK (No. 192, Source 10.106.79.70, Destination 255.255.255.255)
- DHCP Request (No. 206, Source 192.168.10.58, Destination 192.168.0.10)
- DHCP ACK (No. 207, Source 10.106.79.70, Destination 192.168.10.58)
- HTTP GET /CTLSEP501C800C71D5.tlv (No. 253, Source 192.168.10.60, Destination 192.168.21.1)
- HTTP 404 Not Found (No. 255, Source 192.168.21.1, Destination 192.168.10.60)
- HTTP GET /ITLSEP501C800C71D5.tlv (No. 263, Source 192.168.10.60, Destination 192.168.21.1)
- HTTP 200 OK (No. 271, Source 192.168.21.1, Destination 192.168.10.60)
- HTTP GET /SEP501C800C71D5.cnf.xml.sgn (No. 297, Source 192.168.10.60, Destination 192.168.21.1)
- HTTP 200 OK (No. 308, Source 192.168.21.1, Destination 192.168.10.60)
- HTTP GET /AppDialRules.xml (No. 334, Source 192.168.10.60, Destination 192.168.21.1)
- HTTP 200 OK (No. 337, Source 192.168.21.1, Destination 192.168.10.60)
- HTTP GET /SKb0ec918f-b9ee-994b-57ae-345883c1fde8.xml (No. 346, Source 192.168.10.60, Destination 192.168.21.1)
- HTTP 200 OK (No. 352, Source 192.168.21.1, Destination 192.168.10.60)
- SIP Request (No. 371, Source 192.168.10.60, Destination 192.168.10.60)
- SIP Status: 202 Accepted (No. 374, Source 192.168.10.60, Destination 192.168.10.60)
- SIP Request (No. 377, Source 192.168.10.60, Destination 192.168.21.2)
- SIP Status: 202 Accepted (No. 379, Source 192.168.10.60, Destination 192.168.10.60)
- SIP Request (No. 381, Source 192.168.10.60, Destination 192.168.21.2)
- SIP Status: 202 Accepted (No. 383, Source 192.168.10.60, Destination 192.168.10.60)
- SIP Request (No. 385, Source 192.168.10.60, Destination 192.168.21.2)
- SIP Status: 202 Accepted (No. 387, Source 192.168.10.60, Destination 192.168.10.60)
- SIP Request (No. 389, Source 192.168.10.60, Destination 192.168.21.2)
- SIP Status: 100 Trying (No. 391, Source 192.168.21.2, Destination 192.168.10.60)
- SIP Status: 200 OK (1 binding) (No. 393, Source 192.168.21.2, Destination 192.168.10.60)
- SIP Request (No. 395, Source 192.168.10.60, Destination 192.168.21.2)
- SIP Request (No. 398, Source 192.168.10.60, Destination 192.168.21.2)
- SIP Status: 202 Accepted (No. 400, Source 192.168.21.2, Destination 192.168.10.60)
- TCP ACKED unseen segment (No. 403, Source 192.168.21.3, Destination 192.168.10.60)

The packet details pane shows the selected packet (No. 1213) as an HTTP 200 OK response. The response body is a XML document containing registration information for the IP phone.

The packet bytes pane shows the raw data of the selected packet, with a red arrow pointing to the "REGISTER" request line in the SIP message.

Note: This is the PCAP from Phone Side. CUCM PCAPs won't have the DHCP part since DHCP is provided by the Lab switch.

Sample PCAPs can be downloaded from here: [IP Phone Packet Capture from Phone Side](#)

1. Obtain Power

- IP Phone gets power either from PoE Switch or from external power adapter
- When IP Phones are connected to PoE Switch, Phones will send Fast Link Pulse (FLP 147K Hz) to the Switch
- Up on receiving the FLP, switch will realize that the device requesting power and it delivers the maximum power over Ethernet cable
- Once the IP Phone boots-up, with the help of CDP messages, switch can understand that the device doesn't require maximum power and eventually reduces to the required level based on the Phone model

2. Run Bootstrap Loader

- IP Phone initializes the firmware image and boots from it, this will initialize the hardware and software.

3. Obtain VLAN Information

- IP Phone acts as a mini switch, meaning we can connect a co-located PC on IP Phone
- PC will get Data VLAN and Phone will get Voice VLAN
- With the help of CDP messages, Phone can understand the configured Voice and Data VLANs

4. Obtain IP Address from DHCP Server

- Phone uses port number 68 and DHCP Server use 67
- Phone will broadcast **DHCP DISCOVER** message
- Only the DHCP server will reply to that message by DHCP **OFFER** (L2 Unicast) contains Pool of IP Address, Subnet Mask, Default Gateway, TFTP Server IP, DNS Server, Domain Name and lease duration
- Now the Phone will send a broadcast **REQUEST** for one IP from this pool
- DHCP Server will **ACK** the message (L2 Unicast) saying that it accepts the request and mapped the IP to the client
- This process is known as **DORA** process in DHCP

5. Request CTL File

- IP Phone firmware is programmed to request CTL file from the TFTP Server after getting TFTP server IP from DHCP Server
- CTL file will be available only on secure clusters, hence most of the time Phone gets 404 Not Found from the TFTP Server
- CTL is used for encrypted Signaling and Media

6. Request ITL File

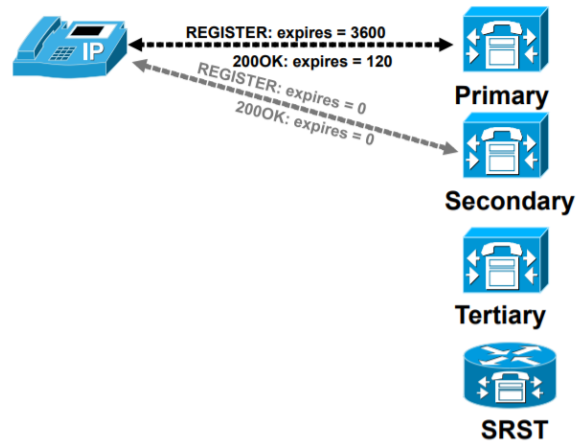
- IP Phone requests ITL file from the TFTP. CUCM V8 or later will provide ITL file by default
- The Phone configuration file will be signed by default and Phone uses ITL to verify the identity of TFTP server and decrypt the configuration file
- When an IP Phone downloads ITL file, then, it will not trust any other TFTP server. That is the reason we clear ITL file while connecting phone from one cluster to another cluster
- Signed configuration file will have '.sgn' at the end

7. Download Configuration File

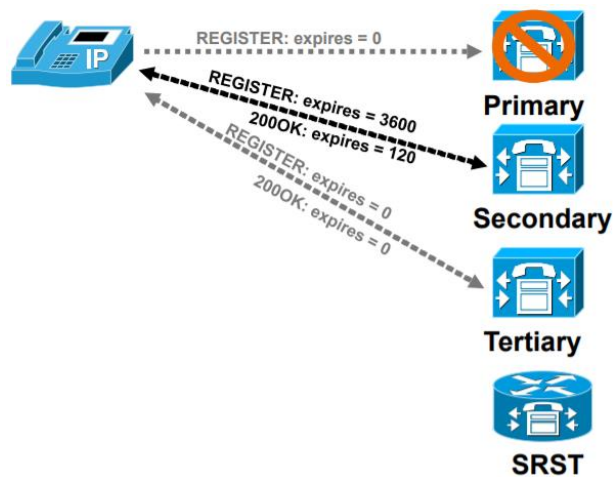
- Now the IP Phone send a request for SEP<MAC_ADDRESS>.cnf.xml.sgn
- This file will have the CUCM Node information to get register. This will also have details like firmware image, Date / Time format, etc.

8. Register with Primary CUCM Node

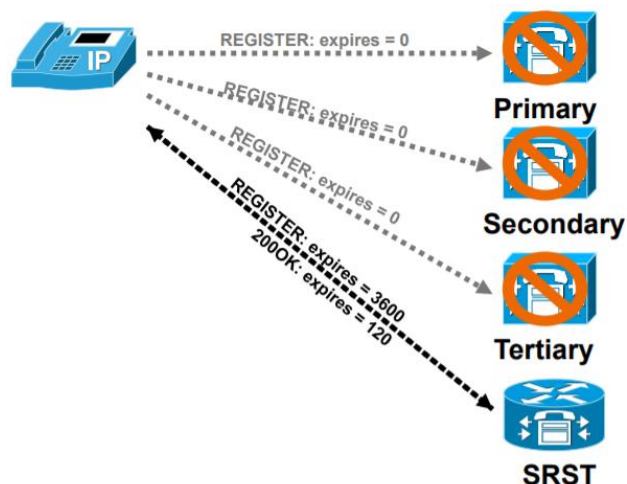
- Phone will send SIP Register message to the primary CUCM listed in the phone configuration file
- Phone will send a keep-alive every 120 seconds to the primary CUCM server
- In the initial REGISTER message from Phone, the EXPIRE timer set to 3600 seconds. As a response to this CUCM sends ACK by modifying the EXPIRE timer to 120 seconds
- Therefore, the phone sends keep-alive every 120 seconds (actually 115 seconds which is 120 minus the delta value configured in SIP profile, which is 5 seconds by default)
- In this case, the phone sends keep-alive every 115 seconds



- Phone exchanges the Register message to Backup CUCM with Expires field set to 0
- If primary goes down, phone switches over to secondary and establishes keepalive connection, begins polling primary periodically in order to fall back when it becomes available again



- When Phone is registered with Secondary CUCM, it maintains REGISTER messages with Primary and tertiary CUCM nodes
- When all the three nodes are down, Phone will try to register with SRST



IP Phone Registration CCM Logs

- We have collected the Cisco CallManager logs while collecting the PCAPs, let's see what the information are available in the CCM Logs regarding the Phone registration

The screenshot displays a Wireshark capture of a SIP message. The packet list on the left shows a selected packet (No. 188) with details in the middle pane. The packet details pane shows the SIP message structure, including the SIP header and body. The packet bytes pane shows the raw data in hexadecimal and ASCII. Red annotations highlight specific fields in the SIP message, such as the 'Call-ID' field in the 'To' header, the 'From' header, and the 'Expires' field in the 'Content-Type' header.

The screenshot displays a Wireshark capture of a SIP message. The packet list on the left shows a selected packet (No. 188) with details in the middle pane. The packet details pane shows the SIP message structure, including the SIP header and body. The packet bytes pane shows the raw data in hexadecimal and ASCII. Red annotations highlight specific fields in the SIP message, such as the 'Call-ID' field in the 'To' header, the 'From' header, and the 'Expires' field in the 'Content-Type' header.

Auto Registration CCM Logs

- I have taken an example of a Phone Auto Registration
- Phone MAC: 08CC6831D463; Phone IP 192.168.129.1; PUB+TFTP: 192.168.21.1; SUB01: 192.168.21.2; SUB02: 192.168.21.3

❖ Phone Sends Register Message to the SUB01 CUCM where we have enabled Auto Registration

```
00008705.001 |23:22:11.941 |AppInfo |//SIP/SIPUdp/wait_SdlDataInd: Incoming SIP UDP
message size 1049 from 192.168.129.1:[5060]:
[71,NET]
REGISTER sip:192.168.21.2 SIP/2.0
Via: SIP/2.0/UDP 192.168.129.1:5060;branch=z9hG4bK6763daf2
From: <sip:AUTO-REG@192.168.21.2>;tag=08cc6831d46300045c438d60-6315c0fe
To: <sip:AUTO-REG@192.168.21.2>
Call-ID: 08cc6831-d4630003-44a0964c-54e6773c@192.168.129.1
Max-Forwards: 70
Date: Fri, 01 Jan 1982 00:18:23 GMT
CSeq: 101 REGISTER
User-Agent: Cisco-CP9971/9.4.2
Contact: <sip:b5677e67-31dc-43ca-86f5-3ee19ef2345e@192.168.129.1:5060;transport=udp>;+sip.instance="<urn:uuid:00000000-0000-0000-0000-08cc6831d463>";+u.sip!devicename.ccm.cisco.com="SEP08CC6831D463";+u.sip!model.ccm.cisco.com="493";video
Supported: replaces,join,sdp-anat,norefersub,resource-priority,extended-refer,X-cisco-callinfo,X-cisco-serviceuri,X-cisco-escapecodes,X-cisco-service-control,X-cisco-srtp-fallback,X-cisco-monrec,X-cisco-config,X-cisco-sis-7.0.0,X-cisco-xsi-8.0.1
Content-Length: 0
Reason: SIP;cause=200;text="cisco-alarm:14 Name=SEP08CC6831D463
ActiveLoad=sip9971.9-4-2SR4-1.loads InactiveLoad=sip9971.9-4-2SR2-2.loads Last=cm-closed-tcp"
Expires: 3600
```

❖ CUCM Creates an Entry for the Phone in its DB and allocates a free DN

```
00008710.003 |23:22:12.051 |AppInfo |SIPStationD(3) - Register instanceId (MAC
addr) =08CC6831D463
00008710.004 |23:22:12.052 |AppInfo |SIPStationD(3) - Register deviceName (database
key) =SEP08CC6831D463
00008711.001 |23:22:12.103 |AppInfo |Auto Registration Stored proc - execute
procedure DeviceAutoReg_cmsp('SEP08CC6831D463',493,11,'6528882f-f4d0-40ba-95a1-925fb1b5b176')
00008711.004 |23:22:24.430 |AppInfo |AddDevice returns 21001
```

❖ CUCM Sends a Notify Message to IP Phone to go for a restart

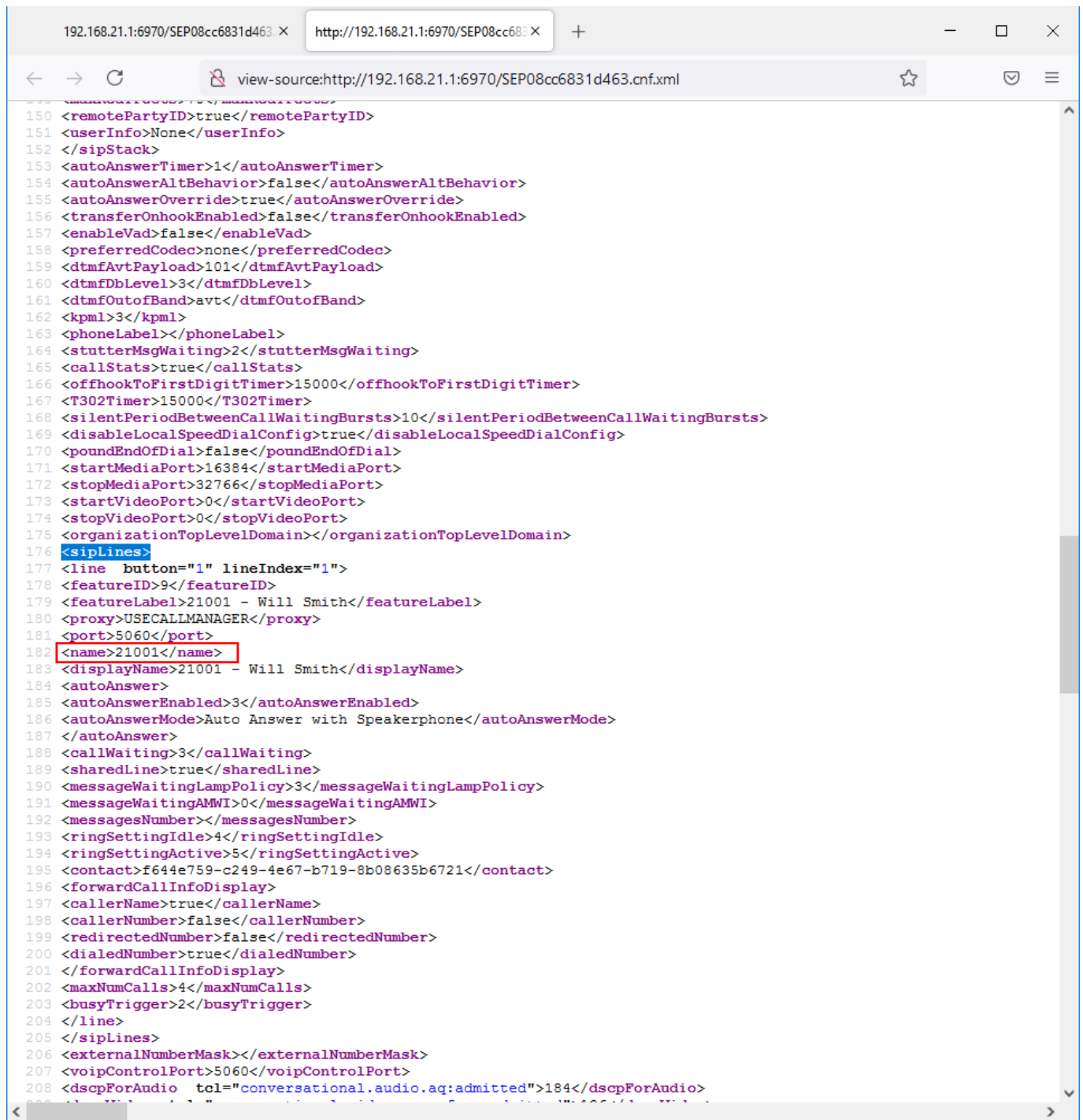
00009179.001 |23:23:06.566 |AppInfo |//SIP/SIPUdp/wait_SdISPISignal: Outgoing SIP
UDP message to 192.168.129.1:[5060]:
[101,NET]

NOTIFY sip:AUTO-REG@192.168.129.1:5060 SIP/2.0
Via: SIP/2.0/UDP 192.168.21.2:5060;branch=z9hG4bK3743b8bac
From: <sip:192.168.21.2>;tag=1645647548
To: <sip:AUTO-REG@192.168.129.1>
Call-ID: f1946280-dc1af62-4-215a8c0@192.168.21.2
CSeq: 101 NOTIFY
Max-Forwards: 70
Date: Wed, 30 Jun 2021 17:52:34 GMT
User-Agent: Cisco-CUCM11.5
Event: service-control
Subscription-State: active
Contact: <sip:192.168.21.2:5060>
Content-Type: text/plain
Content-Length: 84

action=restart

RegisterCallId={08cc6831-d4630003-44a0964c-54e6773c@192.168.129.1}

- ❖ At this point CUCM DB has an entry for the particular phone and its Configuration file has been created in TFTP as well. The configuration file contains the SIP Line information (DN 21001)



```
150 <remotePartyID>true</remotePartyID>
151 <userInfo>None</userInfo>
152 </sipStack>
153 <autoAnswerTimer>1</autoAnswerTimer>
154 <autoAnswerAltBehavior>>false</autoAnswerAltBehavior>
155 <autoAnswerOverride>true</autoAnswerOverride>
156 <transferOnhookEnabled>>false</transferOnhookEnabled>
157 <enableVad>>false</enableVad>
158 <preferredCodec>none</preferredCodec>
159 <dtmfAvPayload>101</dtmfAvPayload>
160 <dtmfDbLevel>3</dtmfDbLevel>
161 <dtmfOutofBand>avt</dtmfOutofBand>
162 <kpml>3</kpml>
163 <phoneLabel></phoneLabel>
164 <stutterMsgWaiting>2</stutterMsgWaiting>
165 <callStats>true</callStats>
166 <offhookToFirstDigitTimer>15000</offhookToFirstDigitTimer>
167 <T302Timer>15000</T302Timer>
168 <silentPeriodBetweenCallWaitingBursts>10</silentPeriodBetweenCallWaitingBursts>
169 <disableLocalSpeedDialConfig>true</disableLocalSpeedDialConfig>
170 <poundEndOfDial>>false</poundEndOfDial>
171 <startMediaPort>16384</startMediaPort>
172 <stopMediaPort>32766</stopMediaPort>
173 <startVideoPort>0</startVideoPort>
174 <stopVideoPort>0</stopVideoPort>
175 <organizationTopLevelDomain></organizationTopLevelDomain>
176 <siLines>
177 <line button="1" lineIndex="1">
178 <featureID>9</featureID>
179 <featureLabel>21001 - Will Smith</featureLabel>
180 <proxy>USECALLMANAGER</proxy>
181 <port>5060</port>
182 <name>21001</name>
183 <displayName>21001 - Will Smith</displayName>
184 <autoAnswer>
185 <autoAnswerEnabled>3</autoAnswerEnabled>
186 <autoAnswerMode>Auto Answer with Speakerphone</autoAnswerMode>
187 </autoAnswer>
188 <callWaiting>3</callWaiting>
189 <sharedLine>true</sharedLine>
190 <messageWaitingLampPolicy>3</messageWaitingLampPolicy>
191 <messageWaitingAMWI>0</messageWaitingAMWI>
192 <messagesNumber></messagesNumber>
193 <ringSettingIdle>4</ringSettingIdle>
194 <ringSettingActive>5</ringSettingActive>
195 <contact>f644e759-c249-4e67-b719-8b08635b6721</contact>
196 <forwardCallInfoDisplay>
197 <callerName>true</callerName>
198 <callerNumber>false</callerNumber>
199 <redirectedNumber>false</redirectedNumber>
200 <dialedNumber>true</dialedNumber>
201 </forwardCallInfoDisplay>
202 <maxNumCalls>4</maxNumCalls>
203 <busyTrigger>2</busyTrigger>
204 </line>
205 </siLines>
206 <externalNumberMask></externalNumberMask>
207 <voipControlPort>5060</voipControlPort>
208 <dscpForAudio tcl="conversational.audio.aq:admitted">184</dscpForAudio>
```


-
- ❖ During the rebooting stage, now the phone gets this configuration file and sends another Register message to CUCM with extension 21001

```
00009278.004 |23:23:47.172 |AppInfo |SIPTcp - wait_SdlReadRsp: Incoming SIP TCP
message from 192.168.129.1 on port 51584 index 3 with 2366 bytes:
[106,NET]
REGISTER sip:192.168.21.2 SIP/2.0
Via: SIP/2.0/TCP 192.168.129.1:51584;branch=z9hG4bK581b5ee2
From: <sip:21001@192.168.21.2>;tag=08cc6831d463000414fa4229-7106803b
To: <sip:21001@192.168.21.2>
Call-ID: 08cc6831-d4630003-33899d07-6ebc2d9b@192.168.129.1
Max-Forwards: 70
Date: Fri, 01 Jan 1982 00:00:49 GMT
CSeq: 101 REGISTER
User-Agent: Cisco-CP9971/9.4.2
Contact: <sip:f644e759-c249-4e67-b719-
8b08635b6721@192.168.129.1:51584;transport=tcp>;+sip.instance="<urn:uuid:00000000-
0000-0000-0000-
08cc6831d463>";+u.sip!devicename.ccm.cisco.com="SEP08CC6831D463";+u.sip!model.ccm.ci
sco.com="493"
Supported: replaces,join,sdp-anat,norefersub,resource-priority,extended-refer,X-
cisco-callinfo,X-cisco-serviceuri,X-cisco-escapecodes,X-cisco-service-control,X-
cisco-srtp-fallback,X-cisco-monrec,X-cisco-config,X-cisco-sis-7.0.0,X-cisco-xsi-
8.0.1
Reason: SIP;cause=200;text="cisco-alarm:14 Name=SEP08CC6831D463
ActiveLoad=sip9971.9-4-2SR2-2.loads InactiveLoad=sip9971.9-4-2SR4-1.loads Last=cm-
closed-tcp"
Expires: 3600
Content-Type: multipart/mixed; boundary=uniqueBoundary
Mime-Version: 1.0
Content-Length: 1249
```

- ❖ CUCM SUB01 will confirm the registration with 200OK. All the logs are available in the CUCM SUB01 server

```
00009301.001 |23:23:47.286 |AppInfo |SIPTcp - wait_SdlSPISignal: Outgoing SIP TCP
message to 192.168.129.1 on port 51584 index 3
[108,NET]
SIP/2.0 200 OK
Via: SIP/2.0/TCP 192.168.129.1:51584;branch=z9hG4bK581b5ee2
From: <sip:21001@192.168.21.2>;tag=08cc6831d463000414fa4229-7106803b
To: <sip:21001@192.168.21.2>;tag=1491078936
Date: Wed, 30 Jun 2021 17:53:47 GMT
Call-ID: 08cc6831-d4630003-33899d07-6ebc2d9b@192.168.129.1
Server: Cisco-CUCM11.5
CSeq: 101 REGISTER
Expires: 120
Contact: <sip:f644e759-c249-4e67-b719-
8b08635b6721@192.168.129.1:51584;transport=tcp>;+sip.instance="<urn:uuid:00000000-
0000-0000-0000-
08cc6831d463>";+u.sip!devicename.ccm.cisco.com="SEP08CC6831D463";+u.sip!model.ccm.ci
sco.com="493";x-cisco-newreg
Supported: X-cisco-srtp-fallback,X-cisco-sis-8.0.0
Content-Type: application/x-cisco-remotecc-response+xml
Content-Length: 367
```

❖ If we take a look at SUB02 Logs, we will see another backup Register request with Expire set to 0

00008660.002 |23:23:48.898 |AppInfo |SIPTcp - wait_SdlReadRsp: Incoming SIP TCP message from 192.168.129.1 on port 52141 index 3 with 904 bytes:
[61,NET]
REGISTER sip:192.168.21.3 SIP/2.0
Via: SIP/2.0/TCP 192.168.129.1:52141;branch=z9hG4bK70a3b429
From: <sip:21001@192.168.21.3>;tag=08cc6831d46300060bacb5a2-41cc1749
To: <sip:21001@192.168.21.3>
Call-ID: 08cc6831-d4630002-73b16e1e-656be1fe@192.168.129.1
Max-Forwards: 70
Date: Wed, 30 Jun 2021 17:53:48 GMT
CSeq: 101 REGISTER
User-Agent: Cisco-CP9971/9.4.2
Contact: <sip:f644e759-c249-4e67-b719-8b08635b6721@192.168.129.1:52141;transport=tcp>;+sip.instance="urn:uuid:00000000-0000-0000-0000-08cc6831d463">;+u.sip!devicename.ccm.cisco.com="SEP08CC6831D463";+u.sip!model.ccm.cisco.com="493";expires=0;cisco-keep-alive
Supported: replaces,join,sdp-anat,norefersub,resource-priority,extended-refer,X-cisco-callinfo,X-cisco-serviceuri,X-cisco-escapecodes,X-cisco-service-control,X-cisco-srtp-fallback,X-cisco-monrec,X-cisco-config,X-cisco-sis-7.0.0,X-cisco-xsi-8.0.1
Content-Length: 0
Expires: 0

❖ SUB02 will respond with 200OK

00008664.001 |23:23:48.899 |AppInfo |SIPTcp - wait_SdlSPISignal: Outgoing SIP TCP message to 192.168.129.1 on port 52141 index 3
[63,NET]
SIP/2.0 200 OK
Via: SIP/2.0/TCP 192.168.129.1:52141;branch=z9hG4bK70a3b429
From: <sip:21001@192.168.21.3>;tag=08cc6831d46300060bacb5a2-41cc1749
To: <sip:21001@192.168.21.3>;tag=116502652
Date: Wed, 30 Jun 2021 17:53:48 GMT
Call-ID: 08cc6831-d4630002-73b16e1e-656be1fe@192.168.129.1
CSeq: 101 REGISTER
Expires: 0
Content-Length: 0

Telepresence Device DX70 PCAP and Logs

Issues and Diagnostics

System Logs

A full archive of the logs on the device is useful for diagnosing problems.

This archive includes all current and historical logs, in addition to current system configuration, system status, packet captures and diagnostics information.

Download logs...
Download logs in legacy format...

Extended Logging

To help diagnose network issues and problems during call setup, the system can enter a timed extended logging mode. This mode is resource intensive, and populates the existing logs with more detailed information.

The extended logging mode can optionally include a full or partial capture of all network traffic.

Start

Include a limited packet capture
Include a full packet capture

Current Logs

File Name	Size	Last modified
auth.log	1 kB	2021-04-17 18:05
console	6 kB	2021-04-17 18:00
dhclient.log	1 kB	2021-04-17 18:00
dmesg	24 kB	2021-04-17 17:59
eventlog/all.log	60 kB	2021-04-17 18:05
eventlog/application.log	37 kB	2021-04-17 18:05
eventlog/audioctrl.log	9 kB	2021-04-17 18:00
eventlog/audit.log	21 kB	2021-04-17 18:05

192.168.128.5 - Issues and Diagr

Find and List Phones

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← → ↺ 🏠

🔒 <https://192.168.128.5/web/diagnostics/system-logs>

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👤

☰

Cisco Webex

Local Device Controls

🔍 Find page

?

👤

🖨️ 192.168.128.5
DX70

🏠 Home

📞 Call

SETUP

⚙️ Settings

👤 Users

🔒 Security

CUSTOMIZATION

📁 Personalization

✍️ UI Extensions Editor

📑 Macro Editor

🔧 Developer API

SYSTEM MAINTENANCE

🔄 Software

⚡ Issues and Diagnostics

🕒 Backup and Recovery

Issues and Diagnostics

Issues

System Logs

Call Logs

User Interface Screenshots

System Logs

A full archive of the logs on the device is useful for diagnosing problems.

This archive includes all current and historical logs, in addition to current system configuration, system status, packet captures and diagnostics information.

Download logs...

Download logs in legacy format...

Extended Logging

To help diagnose network issues and problems during call setup, the system can enter a timed extended logging mode. This mode is resource intensive, and populates the existing logs with more detailed information.

The extended logging mode can optionally include a full or partial capture of all network traffic.

Stop

Extended logging is active.

The device has packet capture files stored. These files are potentially very large and might contain sensitive data, and should be deleted once a troubleshooting session ends. They are automatically deleted the next time the device reboots.

Delete

Packet Captures

File Name	Size	Last modified
extendedlogging.pcap	220 kB	2021-04-17 12:43

Current Logs

File Name	Size	Last modified
auth.log	1 kB	2021-04-17 12:41

235

192.168.128.5 - Issues and Diagr

Find and List Phones

+

← → ↺ 🏠

🔒 <https://192.168.128.5/web/diagnostics/system-logs>

90% ⋮ 📄 ⌂

Cisco Webex
Local Device Controls

🔍 Find page ⓘ

👤

🖨 192.168.128.5
DX70

🏠 Home

📞 Call

SETUP

⚙ Settings

👤 Users

🔒 Security

CUSTOMIZATION

👤 Personalization

✍ UI Extensions Editor

☰ Macro Editor

🔧 Developer API

SYSTEM MAINTENANCE

🔄 Software

🔧 Issues and Diagnostics

🔄 Backup and Recovery

Issues and Diagnostics

Issues System Logs Call Logs User Interface Screenshots

System Logs

A full archive of the logs on the device is useful for diagnosing problems.

This archive includes all current and historical logs, in addition to current system configuration, system status, packet captures and diagnostics information.

Download logs...

Full logs (recommended)at

Anonymized logs

Extended Logging

To help diagnose network issues and problems during call setup, the system can enter a timed extended logging mode. This mode is resource intensive, and populates the existing logs with more detailed information.

The extended logging mode can optionally include a full or partial capture of all network traffic.

Start

Extended logging is inactive.

The device has packet capture files stored. These files are potentially very large and might contain sensitive data, and should be deleted once a troubleshooting session ends. They are automatically deleted the next time the device reboots.

Delete

Packet Captures

File Name	Size	Last modified
extendedlogging.pcap	220 kB	2021-04-17 12:43

Current Logs

File Name	Size	Last modified
auth.log	1 kB	2021-04-17 12:41

https://192.168.128.5/web/loqs/standardlogs?type=no_filter

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- PCAPs will be in \tmp\tcpdump_files

The screenshot displays the Wireshark network protocol analyzer interface. The top menu bar includes File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, and Help. The toolbar contains various icons for packet capture and analysis. The packet list pane shows a list of captured packets, with the selected packet (No. 588) highlighted in red. The packet details pane shows the structure of the selected packet, including the Request-Line, Method, Request-URI, and Message Header. The packet bytes pane shows the raw data of the packet, with the first 95 bytes highlighted.

No.	Time	Source	Destination	Protocol	Length	Info
287	77.587918	192.168.128.5	192.168.21.2	SIP	256	Request: REGISTER sip:cucm-sub01.ajcollab.com (1...
292	77.589237	192.168.21.2	192.168.128.5	SIP	405	Status: 100 Trying
301	77.702438	192.168.21.2	192.168.128.5	SIP	494	Status: 404 Not Found
588	104.668530	192.168.128.5	192.168.21.2	SIP	95	Request: REGISTER sip:cucm-sub01.ajcollab.com (1...
593	104.671055	192.168.21.2	192.168.128.5	SIP	405	Status: 100 Trying
602	104.789412	192.168.21.2	192.168.128.5	SIP	1107	Status: 200 OK (1 binding)
604	104.789547	192.168.21.2	192.168.128.5	SIP	886	Request: REFER sip:f09eb680-2d6c-10ab-16db-4ba86d...
606	104.789860	192.168.21.2	192.168.128.5	SIP	689	Request: NOTIFY sip:11003@192.168.128.5:41553 ...
608	104.790118	192.168.21.2	192.168.128.5	SIP	650	Request: NOTIFY sip:f09eb680-2d6c-10ab-16db-4ba86...
610	104.790364	192.168.21.2	192.168.128.5	SIP	629	Request: SUBSCRIBE sip:f09eb680-2d6c-10ab-16db-4b...
615	104.835069	192.168.128.5	192.168.21.2	SIP	387	Status: 200 OK
618	104.892174	192.168.128.5	192.168.21.3	SIP	560	Request: REGISTER sip:cucm-sub01.ajcollab.com (r...
621	104.893363	192.168.21.3	192.168.128.5	SIP	405	Status: 100 Trying
623	104.893613	192.168.21.3	192.168.128.5	SIP	428	Status: 200 OK (0 bindings)
625	104.897929	192.168.128.5	192.168.21.2	SIP	394	Status: 200 OK
627	104.904808	192.168.128.5	192.168.21.2	SIP	413	Status: 200 OK

Request-Line: REGISTER sip:cucm-sub01.ajcollab.com SIP/2.0
Method: REGISTER
Request-URI: sip:cucm-sub01.ajcollab.com
[Resent Packet: False]
Message Header
Via: SIP/2.0/TCP 192.168.128.5:41553;branch=z9hG4bK949dbd32844405f30c6beeb62d477ca5;rport
Call-ID: ad848e0c6448c32aced6e232b7c90d4d
[Generated Call-ID: ad848e0c6448c32aced6e232b7c90d4d]
CSeq: 18459 REGISTER
[truncated]Contact: <sip:f09eb680-2d6c-10ab-16db-4ba86d660bec@192.168.128.5:41553;transport=tcp>;+sip.instance="urn:uuid:00000000-0000-0000-0000-7426acf35a8e"
Contact URI: sip:f09eb680-2d6c-10ab-16db-4ba86d660bec@192.168.128.5:41553;transport=tcp
Contact parameter: +sip.instance="urn:uuid:00000000-0000-0000-0000-7426acf35a8e"
Contact parameter: +u.sip!model.ccm.cisco.com="36241"
Contact parameter: audio=TRUE
Contact parameter: video=TRUE
Contact parameter: mobility="fixed"
Contact parameter: display="full"

0020 2e 63 6f 6d 20 53 49 50 2f 32 2e 30 0d 0a 56 69 .com SIP /2.0 .Vi
0030 61 3a 20 53 49 50 2f 32 2e 30 2f 54 43 50 20 31 a: SIP/2 .0/TCP 1
0040 39 32 2e 31 36 38 2e 31 32 38 2e 35 3a 34 31 35 92.168.1 28.5:415
0050 35 33 3b 62 72 61 6e 63 68 3d 7a 39 68 47 34 62 53;branc h=z9hG4b
0060 4b 39 34 39 64 62 64 33 32 38 34 34 30 35 66 K949dbd3 2844405f
0070 33 30 63 36 62 65 65 62 36 32 64 34 37 37 63 61 30c6beeb 62d477ca
0080 35 3b 72 70 6f 72 74 0d 0a 43 61 6c 6c 2d 49 44 5;rport .Call-ID
0090 3a 20 61 64 38 34 38 65 30 63 36 34 34 38 63 33 : ad848e 0c6448c3
00a0 32 61 63 65 64 36 65 32 33 32 62 37 63 39 30 64 2aced6e2 32b7c90d
00b0 34 64 0d 0a 43 53 65 71 3a 20 31 38 34 35 39 20 4d .CSeq : 18459
00c0 52 45 47 49 53 54 45 52 0d 0a 43 6f 6e 74 61 63 REGISTER .Contac
00d0 74 3a 20 3c 73 69 70 3a 66 30 39 65 62 36 38 30 t: <sip: f09eb680
00e0 2d 32 64 36 63 2d 31 30 61 62 2d 31 36 64 62 2d -2d6c-10 ab-16db-
00f0 34 62 61 38 36 64 36 36 30 62 65 63 40 31 39 32 4ba86d66 0bec@192
0100 2e 31 36 38 2e 31 32 38 2e 35 3a 34 31 35 35 33 .168.128 .5:41553
0110 3b 74 72 61 6e 73 70 6f 72 74 3d 74 63 70 3e 3b ;transpo rt=tcp>;
0120 2b 73 69 70 2e 69 6e 73 74 61 6e 63 65 3d 22 3c +sip.ins tance="<
0130 75 72 6e 3a 75 75 69 64 3a 30 30 30 30 30 30 urn:uuid :00000000

Frame (95 bytes) Reassembled TCP (1565 bytes)
RFC 3261: Via Header (sip.Via), 91 bytes
Packets: 862 · Displayed: 23 (2.7%) Profile: Default

- **xconfig.txt**: Configuration summary
- **xstatus.txt**: Device and peripheral status summary
- **\var\log\eventlog\all.log**: Complete device logs
- **\tmp\tcpdump_files\extendedlogging.pcap**: Complete Packet Capture

The above logs can be downloaded from here: [DX70 Logs](#)

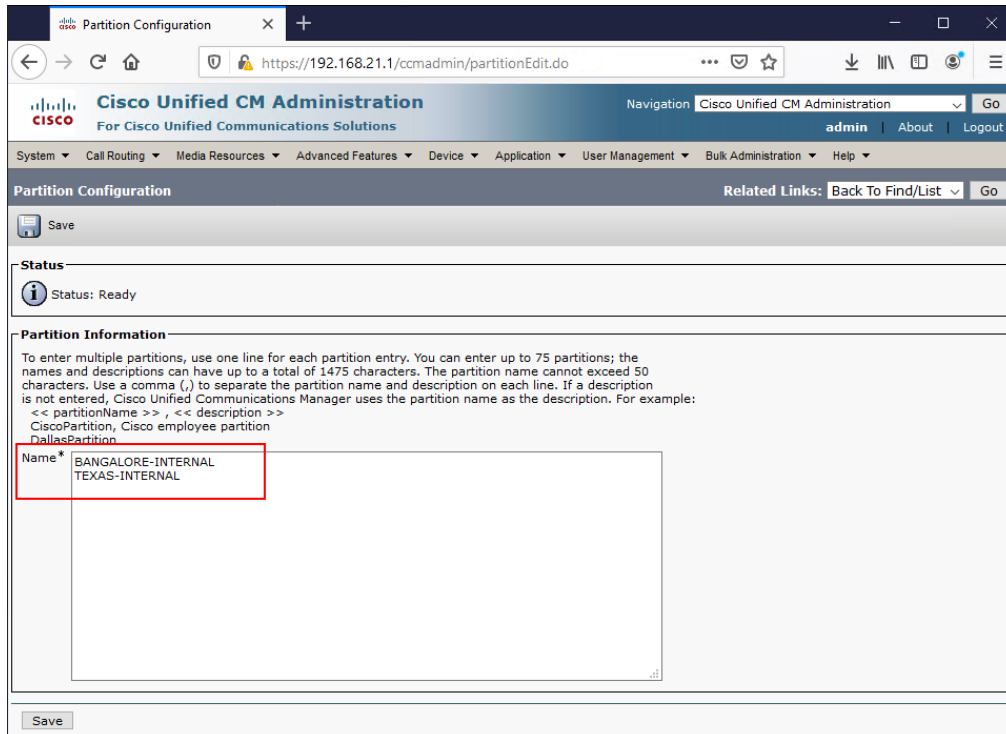
Calling Search Space (CSS) and Partition



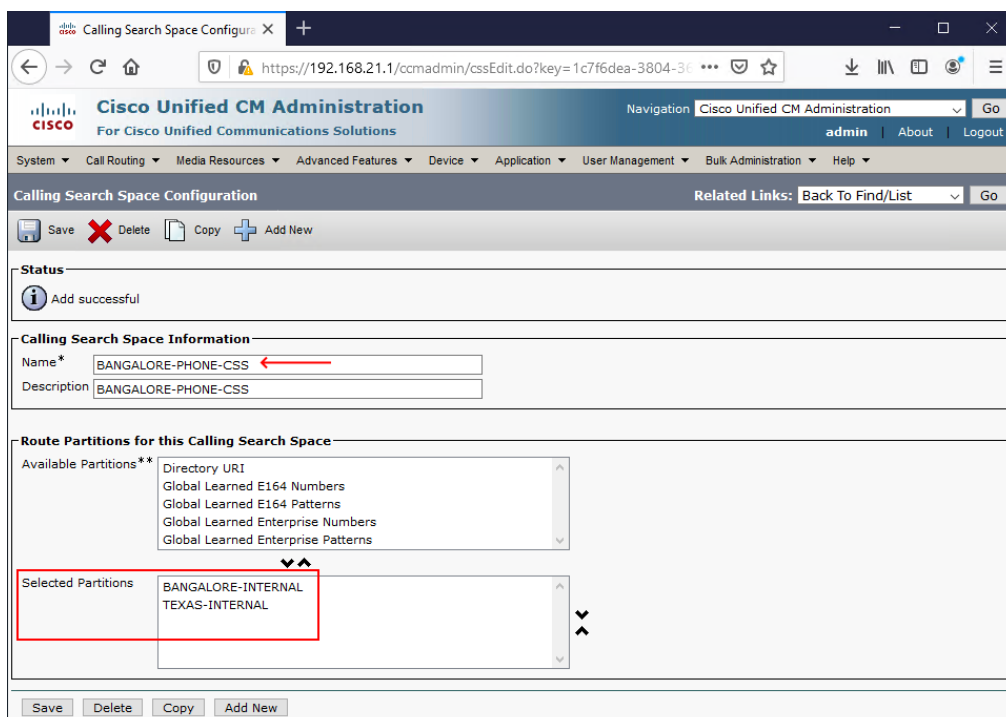
- Calling privileges (who can call what) in CUCM cluster can be implemented using CSS (Calling Search Space) and Partitions
- For example, some users can call Internal number only and some other users are allowed to call internal as well as Local external PSTN calls whereas other set of users are allowed to call Internal, Local, National and International numbers
- CSS and Partitions are also used to implement TEHO (Tail End Hop Off) that allows organizations to save money on PSTN toll charges by routing long distance and international call across the private IP WAN. TEHO is an application of LCR (Least Cost Routing)
- A partition is label attached to a directory number (DN) with similar reachability, for e.g. Internal numbers are labeled to INTERNAL-PT
- Partitions are a logical lock. All phone numbers are accessible by all devices by default. After partitions has been applied to a number, a lock has been placed on the phone number restricting who can dial it
- Every phone number, Route Pattern, Translation Patterns, on CUCM can be applied to a Partition
- All phone numbers are in null partition by default. All devices have access to Null Partition
- A CSS defines which partitions are accessible to a particular device
- CSS are assigned to device, Lines, Gateways, Trunks, Voice Mail Ports, etc.
- Restriction is placed by evaluating CSS of Calling party and Partition of called party (CSS is like a Phone book & Partition is Contacts)
- The CSS of calling party must contain the partition of called party
- Same number in different partitions are treated as two individual numbers

[Lab] CSS Partition Configuration

- Let's create partitions and CSS for the phones in Bangalore and Texas
- Our Aim: Bangalore Phones can call both Bangalore and Texas Phone whereas Texas Phones can call only Texas phones not Bangalore
- Call Routing >> Class of Control >> Partitions >> Add New
- We can add multiple Partitions in one go
- I have added BANGALORE-INTERNAL and TEXAS-INTERNAL partitions



The screenshot shows the 'Partition Configuration' page in the Cisco Unified CM Administration interface. The browser address bar displays 'https://192.168.21.1/ccmadmin/partitionEdit.do'. The page header includes the Cisco logo and navigation links. The main content area has a 'Status' section indicating 'Ready'. Below it, the 'Partition Information' section provides instructions on how to enter multiple partitions on a single line, separated by commas. A text input field labeled 'Name*' contains the text 'BANGALORE-INTERNAL' and 'TEXAS-INTERNAL' on two lines. A 'Save' button is located at the bottom of the form.



The screenshot shows the 'Calling Search Space Configuration' page in the Cisco Unified CM Administration interface. The browser address bar displays 'https://192.168.21.1/ccmadmin/cssEdit.do?key=1c7f6dea-3804-3e'. The page header includes the Cisco logo and navigation links. The main content area has a 'Status' section indicating 'Add successful'. Below it, the 'Calling Search Space Information' section shows the 'Name*' field set to 'BANGALORE-PHONE-CSS' and the 'Description' field set to 'BANGALORE-PHONE-CSS'. The 'Route Partitions for this Calling Search Space' section has two lists: 'Available Partitions**' and 'Selected Partitions'. The 'Selected Partitions' list contains 'BANGALORE-INTERNAL' and 'TEXAS-INTERNAL', which are highlighted with a red box. 'Save', 'Delete', 'Copy', and 'Add New' buttons are at the bottom.

Calling Search Space Configuration

Status: Add successful

Calling Search Space Information

Name*: TEXAS-PHONE-CSS

Description: TEXAS-PHONE-CSS

Route Partitions for this Calling Search Space

Available Partitions**

- BANGALORE-INTERNAL
- Directory URI
- Global Learned E164 Numbers
- Global Learned E164 Patterns
- Global Learned Enterprise Numbers

Selected Partitions

- TEXAS-INTERNAL

Save Delete Copy Add New

- In BANGALORE-PHONE-CSS, I have added BANGALORE-INTERNAL and TEXAS-INTERNAL Partitions hence Bangalore Phones can call both Bangalore as well as Texas phones
- In TEXAS-PHONE-CSS, I have added only TEXAS-INTERNAL Partition so that it can call only Texas Phones bit Bangalore
- 1XXXX range is used for Bangalore Phones and 2XXXX used for Texas phones
- As of now we added the directory numbers directly without partition, partition can be assigned while adding the DN or later
- When you add partition later, the number without partition will be left as unused in CUCM database, this must be deleted

Directory Number Configurati...

<https://192.168.21.1/ccmadmin/directoryNumberEdit.do?key=51d>

Cisco Unified CM Administration

Navigation Cisco Unified CM Administration

admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Directory Number Configuration

Related Links: Configure Device (SEP501CB00C71D5)

Save Delete Reset Apply Config Add New

Status

Add successful

Directory Number Information

Directory Number* 11001

Route Partition BANGALORE-INTERNAL

Description 11001 - Deepika Padukone

Alerting Name 11001 - Deepika Padukone

ASCII Alerting Name 11001 - Deepika Padukone

External Call Control Profile < None >

☒ Allow Control of Device from CTI

Associated Devices SEP501CB00C71D5

Edit Device

Edit Line Appearance

Dissociate Devices

Directory Number Settings

Voice Mail Profile < None > (Choose <None> to use system default)

Calling Search Space < None >

BLF Presence Group* Standard Presence group

User Hold MOH Audio Source < None >

Network Hold MOH Audio Source < None >

Auto Answer* Auto Answer with Speakerphone

☐ Reject Anonymous Calls

Enterprise Alternate Number

Add Enterprise Alternate Number

+E.164 Alternate Number

Add +E.164 Alternate Number

Directory URIs

Primary	URI	Partition	Advertise Globally via ILS	Rem
---------	-----	-----------	----------------------------	-----

Directory Number Configurati...

<https://192.168.21.1/ccmadmin/directoryNumberEdit.do?key=f75c>

Cisco Unified CM Administration

Navigation Cisco Unified CM Administration

admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Directory Number Configuration

Related Links: Configure Device (SEP7426ACF35A8E)

Save Delete Reset Apply Config Add New

Status

Add successful

Directory Number Information

Directory Number* 21001

Route Partition TEXAS-INTERNAL

Description 21001 - Jennifer Garner

Alerting Name 21001 - Jennifer Garner

ASCII Alerting Name 21001 - Jennifer Garner

External Call Control Profile < None >

☒ Allow Control of Device from CTI

Associated Devices SEP7426ACF35A8E

Edit Device

Edit Line Appearance

Dissociate Devices

Directory Number Settings

Voice Mail Profile < None > (Choose <None> to use system default)

Calling Search Space < None >

BLF Presence Group* Standard Presence group

User Hold MOH Audio Source < None >

Network Hold MOH Audio Source < None >

Auto Answer* Auto Answer with Speakerphone

☐ Reject Anonymous Calls

Enterprise Alternate Number

Add Enterprise Alternate Number

+E.164 Alternate Number

Add +E.164 Alternate Number

Directory URIs

Primary	URI	Partition	Advertise Globally via ILS	Rem
---------	-----	-----------	----------------------------	-----

- When we assign Partition to 11001 and 21001 DN, in the backed CUCM created new numbers and the old DNs are unused
- You can see that by navigating to Call Routing >> Route Plan Report >> Unassigned DN >> Find

The screenshot shows the Cisco Unified CM Administration interface. The main heading is "Find and List Route Plan Report". Below the heading, there are buttons for "Select All", "Clear All", "Delete Selected", and "Delete All Found Items". A status bar indicates "2 records found". The "Route Plan Report" section shows a search filter set to "Unassigned DN" and a "Find" button. Below the search bar, there is a table with the following columns: "Pattern or URI", "Partition", "Type", and "Route Detail". The table contains two rows of data:

Pattern or URI	Partition	Type	Route Detail
11001		Directory Number	
21001		Directory Number	

At the bottom of the table, there are buttons for "Select All", "Clear All", "Delete Selected", and "Delete All Found Items".

Now apply the CSS for the Phones. You can assign BANGALORE-PHONE-CSS to Bangalore phones and TEXAS-PHONE-CSS to Texas phones

- CSS can be applied to Phone level or Line (DN) level, if you apply on both, the Line CSS will take preference
- The total CSS will be the combination of Line and Device level CSS
- I'm applying CSS on the Phone level here, after the configuration, you can test the calls

Phone Configuration

<https://192.168.21.1/ccmadmin/phoneEdit.do?key=3b7e294b-ffac>

Cisco
Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go
admin | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Phone Configuration
Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

Status
Update successful

Association
Modify Button Items

1 Line [1] - 11001 in BANGALORE-INTERNAL
2 Line [2] - Add a new DN
3 Add a new SD
4 Add a new SD
5 Add a new SD
6 Add a new SD
7 Add a new SD
8 Add a new SD
9 Add a new SD
10 Add a new SD
----- Unassigned Associated Items -----
11 Add a new SD
12 Alerting Calls
13 All Calls
14 Answer Oldest
15 Add a new BLF Directed Call Park
16 Call Park
17 Call Pickup
18 CallBack
19 Do Not Disturb
20 Group Call Pickup
21 Hunt Group Logout
22 Intercom [1] - Add a new Intercom
23 Malicious Call Identification
24 Meet Me Conference
25 Mobility
26 Other Pickup
27 Quality Reporting Tool

Phone Type
Product Type: Cisco 8865
Device Protocol: SIP

Real-time Device Status
Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcollab.cor
IPv4 Address: 192.168.10.51
Active Load ID: sip8845_65.12-8-1-0001-455
Inactive Load ID: sip8845_65.12-5-1SR2-2
Download Status: None

Device Information
☒ Device is Active
☒ Device is trusted
MAC Address* 501CB00C71D5
Description 11001 - Deepika Padukone
Device Pool* BANGALORE-DEVICE-POOL View Details
Common Device Configuration < None > View Details
Phone Button Template* Standard 8865 SIP
Softkey Template < None >
Common Phone Profile* Standard Common Phone Profile View Details
Calling Search Space BANGALORE-PHONE-CSS
AAR Calling Search Space < None >
Media Resource Group List < None >
User Hold MOH Audio Source < None >
Network Hold MOH Audio Source < None >
Location* Hub_None
AAR Group < None >
User Locale < None >
Network Locale < None >
Built In Bridge* Default
Privacy* Default
Device Mobility Mode* Default View Current Device Mobility Settings
Wireless LAN Profile Group < None > View Details

Phone Configuration

https://192.168.21.1/ccmadmin/phoneEdit.do?key=dd6396a9-9a8...

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Phone Configuration Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

Status
Update successful

Association
Modify Button Items

1	Line [1] - 21001 in TEXAS-INTERNAL
----- Unassigned Associated Items -----	
2	Line [2] - Add a new DN

Phone Type
Product Type: Cisco TelePresence DX70
Device Protocol: SIP

Real-time Device Status
Registration: Registered with Cisco Unified Communications Manager cucm-sub02.ajcollab.com
IPv4 Address: 192.168.10.62
Active Load ID: ce-9.7.1-30bff6140aa-2019-04-02
Inactive Load ID: None
Download Status: None

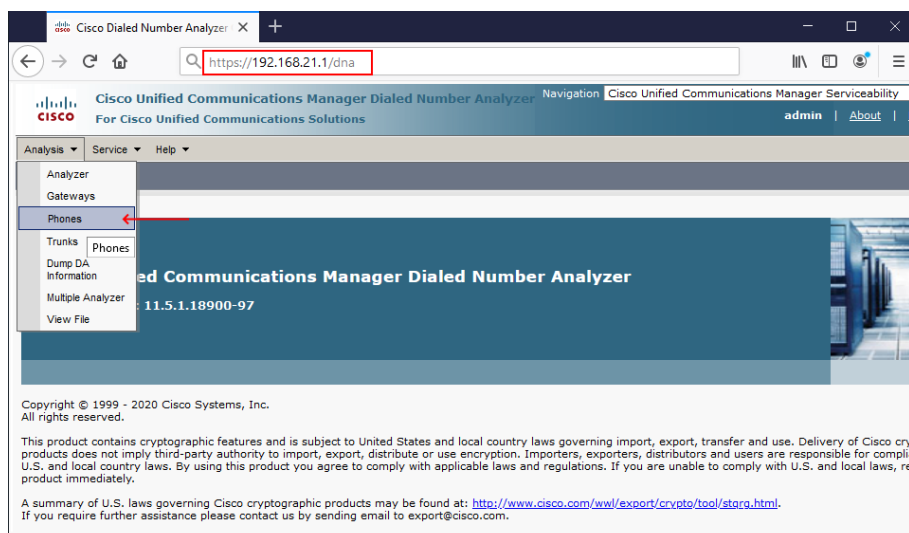
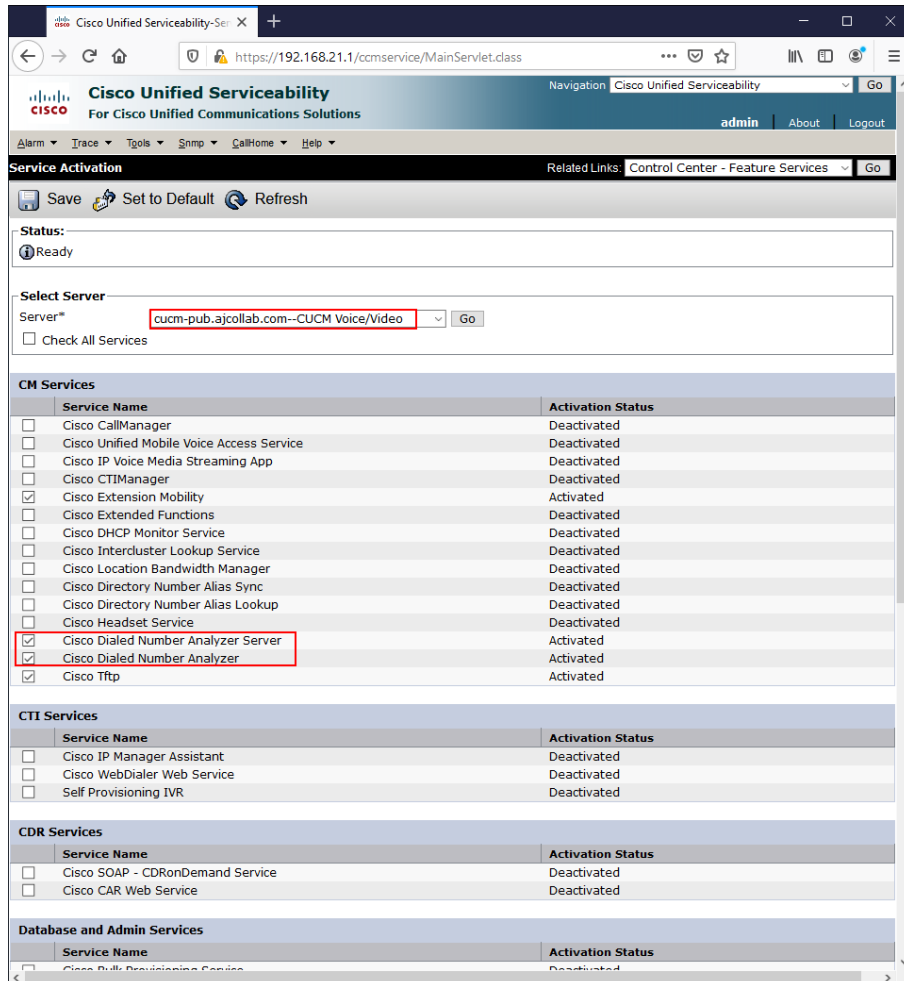
Device Information

- ☒ Device is Active
- ☒ Device is trusted
- MAC Address*: 7426ACF35A8E
- Description: 21001 - Jennifer Garner
- Device Pool*: TEXAS-DEVICE-POOL [View Details](#)
- Common Device Configuration: < None > [View Details](#)
- Phone Button Template*: Standard Cisco TelePresence DX70
- Common Phone Profile: Standard Common Phone Profile [View Details](#)
- Calling Search Space: TEXAS-PHONE-CSS
- AAR Calling Search Space: < None >
- Media Resource Group List: < None >
- User Hold MOH Audio Source: < None >
- Network Hold MOH Audio Source: < None >
- Location*: Hub_None
- AAR Group: < None >
- User Locale: < None >
- Network Locale: < None >
- Privacy*: Default
- Device Mobility Mode*: Default [View Current](#)

- After the test, I have added BANGALORE-INTERNAL partition to TEXAS-PHONE-CSS just make sure every phone can internally call every other phones irrespective of the location

Dialed Number Analyzer - DNA

- The tool allows you to test a Cisco CUCM dial plan configuration, this tool analyzes the dialed digits and shows details of the calls
- Because a dial plan can be complex, involving multiple devices, translation patterns, route patterns, route lists, route groups, calling and called party transformations, and device level transformations, a dial plan may contain errors



Find and List Phones

https://192.168.21.1/dna/phone.do

Cisco Unified Communications Manager Dialed Number Analyzer
For Cisco Unified Communications Solutions

Navigation Cisco Unified Communications Manager Serviceability
admin | About | L

Analysis Service Help

Find and List Phones

Status
10 records found

Search Options
Find Phone where Device Name begins with Find Search Within Results
Select item or enter search text

Search Results

	Device Name(Line)	Description	Device Pool	Device Protocol	Status	IP Add
CIPC	CIPC-ABDUL	11002 - Abdul Jaseem	BANGALORE-DEVICE-POOL	SCCP	Registered	192.168.1.1
9971	SEP08CC68310664	Auto 11001	Default	SIP	None	None
9971	SEP08CC6831D463	Auto 11003	Default	SIP	None	None
8855	SEP501CB00C71D5	11001 - Deepika Padukone	BANGALORE-DEVICE-POOL	SIP	Registered	192.168.1.1
0995	SEP503DE57D6C04	Auto 11005	Default	SIP	Registered	192.168.1.1
9971	SEP7426ACF35A8E	21001 - Jennifer Garner	BANGALORE-DEVICE-POOL	SIP	Registered	192.168.1.1
9971	SEP84B517AF4C43	Auto 11002	Default	SIP	None	None
9971	SEPA40CC39441D9	Auto 11004	Default	SIP	Registered	192.168.1.1
SIP	SEPAAAAAAAAAAAA1	11003 - Hrithik Roshan	BANGALORE-DEVICE-POOL	SIP	None	None
7960	SEPAAAAAAAAAAAA2	11002 - Abdul Jaseem	BANGALORE-DEVICE-POOL	SCCP	None	None

Rows per Page 50

Phone Configuration

https://192.168.21.1/dna/phoneEdit.do?key=dd6396a9-9a88-369e-cea1...

Cisco Unified Communications Manager Dialed Number Analyzer
For Cisco Unified Communications Solutions

Navigation Cisco Unified Communications Manager Serviceability
admin | About | L

Analysis Service Help

Phone Configuration

Related Links: Back To Find/List Phones

Status
Status: Ready

Device Information (Model = Cisco TelePresence DX70)

Registration Registered with Cisco Unified Communications Manager cucm-sub02.ajcollab.com
 IPv4 Address 192.168.10.55
 MAC Address 7426ACF35A8E
 Device Name 7426ACF35A8E
 Description 21001 - Jennifer Garner
 Owner User ID None
 Device Pool TEXAS-DEVICE-POOL
 Call Classification OnNet
 Calling Search Space TEXAS-PHONE-CSS
 AAR Calling Search Space None
 Media Resource Group List None
 Device Time Zone CST6CDT

Association Information
 Line [1] - 21001 in TEXAS-INTERNAL

Analyzer Input

Dialed Digit Settings
☐ Directory URI
☒ Dialed Digits 11001
 Pattern Analysis ☐ SIP Analysis
 ☒ Domain Route
 ☐ IP Route

Date and Time Settings
 Time Zone (GMT) Etc/GMT
 Date 2021 - Mar - 4 (YYYY - MMM - DD)
 Time 0 - 18 - 49 - 0 (HH : MM : SS : MS)

Do Analysis Clear

* - indicates required item

DNA Analysis Output — Mozilla Firefox

https://192.168.21.1/dna/dnaOutput.do?outputKey=2&radSelectExt=1f46b7f5-3390-a4b6-b605-fb6abe958d02&dialedDig ...

Cisco Unified Communications Manager Dialed Number Analyzer

DNA Analysis Output Save the Displayed Output Save

Cisco Unified Communications Manager Dialed Number Analyzer Results

Expand All Collapse All

- Results Summary
 - Calling Party Information
 - Dialed Digits = 11001
 - Match Result = RouteThisPattern
 - Matched Pattern Information
 - Called Party Number = 11001
 - Time Zone = CST6CDT
 - Call Classification = OnNet
 - InterDigit Timeout = NO
 - Device Override = Disabled
 - Outside Dial Tone = NO
- Call Flow
 - Directory Number :DN= 11001
 - Partition = BANGALORE-INTERNAL
 - TypeCFACSSPolicy = Use System Default
 - Call Classification = Unknown
 - Forwarding Information
 - Device :Type= Cisco 8865
 - Device Status = Registered
 - Device Name = SEP501CB00C71D5
 - Ignore Presentation Indicators = Disabled
 - Logged Into Hunt Groups = Enabled
 - Alerting Name = 11001 - Deepika Padukone
 - Dual Mode = Disabled
 - Do Not Disturb(DND)
 - Automated Alternate Routing (AAR)
 - Device :Type= Device Profile
 - Device Status = UnKnown
 - Device Name = 11001 - Deepika Padukone
 - Ignore Presentation Indicators = Disabled
 - Logged Into Hunt Groups = Disabled
 - Alerting Name = 11001 - Deepika Padukone
 - Dual Mode = Disabled
 - Do Not Disturb(DND)
 - DeviceProfile
 - Automated Alternate Routing (AAR)
- Alternate Matches

NOTE: The analysis results are purely based on configurations available in the Cisco Communications Manager database. For Gateway outbound calls, call details might differ depending on the Gateway's settings.

Call Detailed Record - CDR

- Every call that CUCM processes can be logged. It contains information about Calling Number, Called Number, Originator device name, Destination device name, Originator IP, Destination IP, Duration of the call, etc. These logs are called CDR (Call Detailed Record)
- Call Diagnostic details like Packet sent Packet received, packet loss, jitter, etc. are called CMR (Call Management Record)
- CDRs stored in Subscribers & uploaded to CDR/CAR Database of Publisher Server at regular interval (this interval can be administratively set)
- CDR Database can be used by 3rd party billing application to prepare internal or external phone billing reports. We should activate CDR & CMR on all the call processing CUCM nodes

The screenshot displays the Cisco Unified Serviceability web interface. The browser address bar shows the URL `https://192.168.21.1/ccmservice/MainServlet.class`. The page header includes the Cisco logo and the text "Cisco Unified Serviceability For Cisco Unified Communications Solutions". The navigation bar shows "admin", "About", and "Logout". The "Service Activation" section is active, with a "Related Links" dropdown set to "Control Center - Feature Services". Below this, there are buttons for "Save", "Set to Default", and "Refresh". The "Status" section shows "Ready". The "Select Server" section has a dropdown menu set to "cucm-pub.ajcollab.com--CUCM Voice/Video" and a "Go" button. Below the "Select Server" section, there are three tables: "CM Services", "CTI Services", and "CDR Services". Each table has columns for "Service Name" and "Activation Status".

CM Services	
Service Name	Activation Status
<input type="checkbox"/> Cisco CallManager	Deactivated
<input type="checkbox"/> Cisco Unified Mobile Voice Access Service	Deactivated
<input type="checkbox"/> Cisco IP Voice Media Streaming App	Deactivated
<input type="checkbox"/> Cisco CTIManager	Deactivated
<input checked="" type="checkbox"/> Cisco Extension Mobility	Activated
<input type="checkbox"/> Cisco Extended Functions	Deactivated
<input type="checkbox"/> Cisco DHCP Monitor Service	Deactivated
<input type="checkbox"/> Cisco Intercluster Lookup Service	Deactivated
<input type="checkbox"/> Cisco Location Bandwidth Manager	Deactivated
<input type="checkbox"/> Cisco Directory Number Alias Sync	Deactivated
<input type="checkbox"/> Cisco Directory Number Alias Lookup	Deactivated
<input type="checkbox"/> Cisco Headset Service	Deactivated
<input checked="" type="checkbox"/> Cisco Dialed Number Analyzer Server	Activated
<input checked="" type="checkbox"/> Cisco Dialed Number Analyzer	Activated
<input checked="" type="checkbox"/> Cisco Tftp	Activated

CTI Services	
Service Name	Activation Status
<input type="checkbox"/> Cisco IP Manager Assistant	Deactivated
<input type="checkbox"/> Cisco WebDialer Web Service	Deactivated
<input type="checkbox"/> Self Provisioning IVR	Deactivated

CDR Services	
Service Name	Activation Status
<input type="checkbox"/> Cisco SOAP - CDRonDemand Service	Deactivated
<input checked="" type="checkbox"/> Cisco CAR Web Service	Activated

Service Parameter Configuratio
+

https://192.168.21.1/ccmadmin/serviceParamEdit.do?server=ea5cb40

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go
admin | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Service Parameter Configuration Related Links: Parameters for All Servers Go

Save Set to Default Advanced

Status
i Status: Ready

Select Server and Service
Server* cucm-pub.ajcollab.com--CUCM Voice/Video (Active)
Service* Cisco CallManager (Inactive)
All parameters apply only to the current server except parameters that are in the cluster-wide group(s).

Cisco CallManager (Inactive) Parameters on server cucm-pub.ajcollab.com--CUCM Voice/Video (Active)

Parameter Name	Parameter Value	Suggested Value
Call Throttling		
Code Yellow Entry Latency *	20	20
Code Yellow Exit Latency Calculation *	40	40
Code Yellow Duration *	5	5
Max Events Allowed *	2000	2000
System Throttle Sample Size *	10	10
Memory Throttling		
Enable Memory Throttling *	True	True
There are hidden parameters in this group. Click on Advanced button to see hidden parameters.		
System		
CDR Enabled Flag *	True	False
CDR Log Calls with Zero Duration Flag *	True	False
Digit Analysis Complexity *	StandardAnalysis	StandardAnalysis
Database Debounce Timer *	0	0
Maximum Phone Fallback Queue Depth *	10	10
Maximum Number of Registered Devices *	5000	5000
System Initialization Timer *	60	60
There are hidden parameters in this group. Click on Advanced button to see hidden parameters.		
SDL Trace		
SDL Trace Data Flags *	0x00000111	0x00000111

Service Parameter Configuration

https://192.168.21.1/ccmadmin/serviceParamEdit.do?server=b01282

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go
admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Service Parameter Configuration Related Links: Parameters for All Servers Go

Save Set to Default Advanced

Status
Status: Ready

Select Server and Service
Server* cucm-sub01.ajcollab.com--CUCM Voice/Video (Active)
Service* Cisco CallManager (Active)
All parameters apply only to the current server except parameters that are in the cluster-wide group(s).

Cisco CallManager (Active) Parameters on server cucm-sub01.ajcollab.com--CUCM Voice/Video (Active)

Parameter Name	Parameter Value	Suggested Value
Call Throttling		
Code Yellow Entry Latency *	20	20
Code Yellow Exit Latency Calculation *	40	40
Code Yellow Duration *	5	5
Max Events Allowed *	2000	2000
System Throttle Sample Size *	10	10
Memory Throttling		
Enable Memory Throttling *	True	True
There are hidden parameters in this group. Click on Advanced button to see hidden parameters.		
System		
CDR Enabled Flag *	True	False
CDR Log Calls with Zero Duration Flag *	True	False
Digit Analysis Complexity *	StandardAnalysis	StandardAnalysis
Database Debounce Timer *	0	0
Maximum Phone Fallback Queue Depth *	10	10
Maximum Number of Registered Devices *	5000	5000
System Initialization Timer *	60	60
There are hidden parameters in this group. Click on Advanced button to see hidden parameters.		

Service Parameter Configuration

https://192.168.21.1/ccmadmin/serviceParamEdit.do?server=fc5e563

Cisco Unified CM Administration
For Cisco Unified Communications Solutions

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admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Service Parameter Configuration Related Links: Parameters for All Servers Go

Save Set to Default Advanced

Status
Status: Ready

Select Server and Service
Server* cucm-sub02.ajcollab.com--CUCM Voice/Video (Active)
Service* Cisco CallManager (Active)
All parameters apply only to the current server except parameters that are in the cluster-wide group(s).

Cisco CallManager (Active) Parameters on server cucm-sub02.ajcollab.com--CUCM Voice/Video (Active)

Parameter Name	Parameter Value	Suggested Value
Call Throttling		
Code Yellow Entry Latency *	20	20
Code Yellow Exit Latency Calculation *	40	40
Code Yellow Duration *	5	5
Max Events Allowed *	2000	2000
System Throttle Sample Size *	10	10
Memory Throttling		
Enable Memory Throttling *	True	True
There are hidden parameters in this group. Click on Advanced button to see hidden parameters.		
System		
CDR Enabled Flag *	True	False
CDR Log Calls with Zero Duration Flag *	True	False
Digit Analysis Complexity *	StandardAnalysis	StandardAnalysis
Database Debounce Timer *	0	0
Maximum Phone Fallback Queue Depth *	10	10
Maximum Number of Registered Devices *	5000	5000
System Initialization Timer *	60	60
There are hidden parameters in this group. Click on Advanced button to see hidden parameters.		

- Also enable 'Call Diagnostics' on all the nodes to get CMR data
- This is responsible for generating CMR Data

Service Parameter Configuration

Navigation: Cisco Unified CM Administration Go

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Service Parameter Configuration Related Links: Parameters for All Servers Go

Save Set to Default Advanced

CDR Enabled Flag *	False	False
CDR Log Calls with Zero Duration Flag *	False	False
Digit Analysis Complexity *	StandardAnalysis	StandardAnalysis
Database Debounce Timer *	0	0
Maximum Phone Fallback Queue Depth *	10	10
Maximum Number of Registered Devices *	5000	5000
System Initialization Timer *	60	60

There are hidden parameters in this group. Click on Advanced button to see hidden parameters.

SDL Trace

SDL Trace Data Flags *	0x00000111	0x00000111
SDL Trace Flush Immediately *	False	False
SDL Trace Data Size *	0	0
SDL Trace Flag *	True	True
SDL TraceType Flags *	0x8000EB15	0x8000EB15

There are hidden parameters in this group. Click on Advanced button to see hidden parameters.

Clusterwide Parameters (Device - General)

Call Diagnostics Enabled *	Enabled Only When CDR Enabled Flag is True	Disabled
Show Line Group Member DN in finalCalledPartyNumber CDR Field *	False	False
Show Line Group Member Non Masked DN in finalCalledPartyNumber CDR Field *	False	False
CTI New Call Accept Timer *	4	4
CTI Generate Digits Interval *	250	250
CTI Dial Digits Interval *	250	250
CTI Await Further Digits *	False	False
CTI Use Wildcard Pattern as calledPartyDN *	False	False
CTI Report Ringback on SIP 183 with SDP *	True	True
Retain Media on Disconnect with PI for Active Call *	False	False
Station and Backup Server KeepAlive Interval *	60	60
Station KeepAlive Interval *	30	30
Status Enquiry Poll Flag *	False	False
Strip # Sign from Called Party Number *	True	True
Session Handoff Alerting Timer *	10	10
T301 Timer *	180000	180000
T302 Timer *	15000	15000
T303 Timer *	4000	4000

CDR Analysis and Reporting - C X New Tab

https://192.168.21.1/car/CallDetailSearch.jsp

Cisco Unified CM CDR Analysis and Reporting
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration GO

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User Reports System Reports Device Reports CDR System Report Config Help Logout

CDR Search by User Phone number

Search By User/Phone Number/SIP URL
Export CDR/CMR

Select Phone Number/SIP URL(s)

Type or Search Internal Phone Number/SIP URL(s) based on User(s) Search Internal Phone Number/SIP URL based User

Phone Number/SIP URL Add Phone Number/SIP URL

Selected Phone Number/SIP URL(s)

11001

Remove Phone Number/SIP URL(s)

Remove All Phone Number/SIP URL(s)

Note: The Phone Numbers can have wildcards "*" and or "X" for a generic search. The consecutive use of the wildcard "*" is not a valid Phone Number. Multiple entries can be added by providing ";" separated values.

Current Time UTC: Mar 3, 2021 19:20:29, Local: Mar 04, 2021 00:50:29

Select TimeZone Asia/Kolkata

From Date* Mar 03 2021 00 Hr 49 Min 15 Sec

To Date* Mar 04 2021 23 Hr 49 Min 15 Sec

☐ With Grouping

Status: Ready

Ok Close

Warning: Please select the date/time in UTC(GMT) or in Local time zone for CDR Search.
* indicates required item

CDR Analysis and Reporting - C X

https://192.168.21.1/car/CallDetailSearchOutput.jsp

Cisco Unified CM CDR Analysis and Reporting
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration GO

Logged in | admin

User Reports System Reports Device Reports CDR System Report Config Help Logout

CDR Search by User Phone number - CDR-CMR Search Results

Report Criteria

From Time: Mar 2, 2021 19:20:43 To Time: Mar 3, 2021 19:20:43

SI No	Call Type	GCID CMID GCID CallId	Orig Node Id Dest Node Id	Orig Leg Id Dest Leg Id	Calling No Calling No Partition	Called No Called No Partition	Dest No Dest No Partition	Last Rd No Last Rd No Partition	Media Info Orig Pkts Rcd Dest Pkts Rcd Orig Pkts Lost Dest Pkts Lost	CDR - CMR Dump
1	Simple	5 49	5 4	96132318 96132319	21001 TEXAS- INTERNAL	11001 BANGALORE- INTERNAL	11001 BANGALORE- INTERNAL	11001 BANGALORE- INTERNAL	null null null null Others	View

Status: Ready

<< < > >> Send Report Back Page 1 of 1 Get Page 1

* indicates required item

CDR

Close

Help

cdrRecordType	globalCallID_callManagerId	globalCallID_callId
1	5	49
origLegcallIdentifier	dateTimeOrigination	origNodeId
96132318	Mar 4, 2021 12:38:31 AM	5
origSpan	origIpAddr	callingPartyNumber
0	192.168.10.55	21001
callingPartyUnicodeLoginUserID	origCause_location	origCause_value
	0	16
origPrecedenceLevel	origMediaTransportAddress_IP	origMediaTransportAddress_Port
4	192.168.10.55	18938
origMediaCap_payloadCapability	origMediaCap_maxFramesPerPacket	origMediaCap_g723BitRate
90	20	0
origVideoCap_Codec	origVideoCap_Bandwidth	origVideoCap_Resolution
103	376	10
origVideoTransportAddress_IP	origVideoTransportAddress_Port	origRSVPVideoStat
192.168.10.55	21614	0
origRSVPVideoStat	destLegIdentifier	destNodeId
0	96132319	4
destSpan	destIpAddr	originalCalledPartyNumber
0	192.168.10.61	11001
finalCalledPartyNumber	finalCalledPartyUnicodeLoginUserID	destCause_location
11001	deepika.padukone	0
destCause_value	destPrecedenceLevel	destMediaTransportAddress_IP
0	4	192.168.10.61
destMediaTransportAddress_Port	destMediaCap_payloadCapability	destMediaCap_maxFramesPerPacket
20672	90	20
destMediaCap_g723BitRate	destVideoCap_Codec	destVideoCap_Bandwidth
0	103	376
destVideoCap_Resolution	destVideoTransportAddress_IP	destVideoTransportAddress_Port
10	192.168.10.61	32298
destRSVPVideoStat	destRSVPVideoStat	dateTimeConnect
0	0	Mar 4, 2021 12:38:32 AM
dateTimeDisconnect	lastRedirectDn	pkid
Mar 4, 2021 12:39:06 AM	11001	68d60c8b-1038-4519-8b18-6248fa3dabc4
originalCalledPartyNumberPartition	callingPartyNumberPartition	finalCalledPartyNumberPartition
BANGALORE-INTERNAL	TEXAS-INTERNAL	BANGALORE-INTERNAL
lastRedirectDnPartition	duration	origDeviceName
BANGALORE-INTERNAL	34	SEP7426ACF35A8E
destDeviceName	origCallTerminationOnBehalfOf	destCallTerminationOnBehalfOf
SEP501CB00C71D5	12	0
origCalledPartyRedirectOnBehalfOf	lastRedirectRedirectOnBehalfOf	origCalledPartyRedirectReason
0	0	0
lastRedirectRedirectReason	destConversationId	globalCallId_ClusterID
0	0	StandAloneCluster
joinOnBehalfOf	comment	authCodeDescription
0	null	null
authorizationLevel	clientMatterCode	origDTMFMethod
0	null	2
destDTMFMethod	callSecuredStatus	origConversationId
3	0	0
origMediaCap_Bandwidth	destMediaCap_Bandwidth	authorizationCodeValue
8	8	null
outpulsedCallingPartyNumber	outpulsedCalledPartyNumber	
null	null	
origIpv4v6Addr	destIpv4v6Addr	origVideoCap_Codec_Channel2
192.168.10.55	192.168.10.61	0

CDR Analysis and Reporting - CDR CMR DUMP — Mozilla Firefox		
https://192.168.21.1/car/CDRSearchDump.jsp		
origVideoCap_Bandwidth_Channel2	origVideoCap_Resolution_Channel2	origVideoTransportAddress_IP_Channel2
0	0	0.0.0.0
origVideoTransportAddress_Port_Channel2	origVideoChannel_Role_Channel2	destVideoCap_Codec_Channel2
0	0	0
destVideoCap_Bandwidth_Channel2	destVideoCap_Resolution_Channel2	destVideoTransportAddress_IP_Channel2
0	0	0.0.0.0
destVideoTransportAddress_Port_Channel2	destVideoChannel_Role_Channel2	incomingProtocolID
0	0	0
incomingProtocolCallRef	outgoingProtocolID	outgoingProtocolCallRef
null	0	null
currentRoutingReason	origRoutingReason	lastRedirectingRoutingReason
0	0	0
huntPilotDN	huntPilotPartition	calledPartyPatternUsage
null	null	2
outpulsedOriginalCalledPartyNumber	outpulsedLastRedirectingNumber	wasCallQueued
null	null	0
totalWaitTimeInQueue	callingPartyNumber_uri	originalCalledPartyNumber_uri
0	null	null
finalCalledPartyNumber_uri	lastRedirectDn_uri	mobileCallingPartyNumber
null	null	null
finalMobileCalledPartyNumber	origMobileDeviceName	destMobileDeviceName
null	null	null
origMobileCallDuration	destMobileCallDuration	mobileCallType
0	0	0
originalCalledPartyPattern	finalCalledPartyPattern	lastRedirectingPartyPattern
11001	11001	11001
huntPilotPattern		
null		
Origination CMR		
cdrRecordType	globalCallID_callManagerId	globalCallID_callId
1	5	49
nodeId	directoryNum (callingPartyNumber)	directoryNum (finalCalledPartyNumber)
5	21001	11001
callIdentifier	numberPacketsSent	numberOctetsSent
96132318	null	null
numberPacketsReceived	numberOctetsReceived	numberPacketsLost
null	null	null
jitter	latency	pkid
null	null	68d60c8b-1038-4519-8b18-6248fa3dabc4
directoryNumPartition (callingPartyNumberPartition)	globalCallId_ClusterID	deviceName
TEXAS-INTERNAL	StandAloneCluster	SEP7426ACF35A8E
varVQMetrics		
null		
Destination CMR		
cdrRecordType	globalCallID_callManagerId	globalCallID_callId
1	5	49
nodeId	directoryNum (callingPartyNumber)	directoryNum (finalCalledPartyNumber)
4	21001	11001
callIdentifier	numberPacketsSent	numberOctetsSent
96132319	null	null
numberPacketsReceived	numberOctetsReceived	numberPacketsLost
null	null	null
jitter	latency	pkid
null	null	68d60c8b-1038-4519-8b18-6248fa3dabc4
directoryNumPartition (finalCalledPartyNumberPartition)	globalCallId_ClusterID	deviceName
BANGALORE-INTERNAL	StandAloneCluster	SEP501CB00C71D5
varVQMetrics		
null		
Close Help		

- If the CMR data always shows 'null', then disable the 'Load CDR only' from System >> Scheduled >> CDR Load

CDR Analysis and Reporting - C X

https://192.168.121.1/car/DailyCdrLoad.jsp

Cisco Unified CM CDR Analysis and Reporting
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration GO

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User Reports System Reports Device Reports CDR **System** Report Config Help Logout

CDR Load

- System Parameters
- Scheduler ←
- Database
- Log Screens

- CDR Load ←
- Daily
- Weekly
- Monthly

☐ Disable Loader
☒ Continuous Loading 24/7
☐ Load CDR only ←

Load CDR & CMR

Time* 00 Hr 00 Min Time to start loading of CDRs & CMRs

Loading interval* Every 24 hours Loading interval

Duration* 30 Min Duration of a loading cycle

Uninhibited Loading

From* 00 Hr 00 Min Time range for uninhibited loading of CDRs & CMRs

To* 05 Hr 00 Min

Status: Update completed

Note: Changes made, will take effect at midnight. Restart the Cisco CDR Analysis and Reporting Scheduler service, for the changes to take effect immediately. If defaults are restored or Continuous Loading 24/7 is updated, the service will be automatically restarted and changes will take effect immediately.

Update Restore Defaults

* indicates required item

- ```
01.1. a_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
01.1. a_cucm-pub_192.168.21.1
admin file list activelog /cm/cdr_repository/processed/20210303 ← 2021/March/04
cdr_StandAloneCluster_05_202103031909_0 ←
dir count = 0, file count = 1
admin file view activelog /cm/cdr_repository/processed/20210303/cdr_StandAloneCluster_05_202103031909_0

"cdrRecordType","globalCallID_callManagerId","globalCallID_callId","origLegCallIdentifier","dateTimeOrigin
location","origCause_value","origPrecedenceLevel","origMediaTransportAddress_IP","origMediaTransportAddres
deoCap_Codec","origVideoCap_Bandwidth","origVideoCap_Resolution","origVideoTransportAddress_IP","origVideo
estIpAddr","originalCalledPartyNumber","finalCalledPartyNumber","finalCalledPartyUnicodeLoginUserID","dest
ress_Port","destMediaCap_payloadCapability","destMediaCap_maxFramesPerPacket","destMediaCap_g723BitRate","
deoTransportAddress_Port","destRSVPAudioStat","destRSVPVideoStat","dateTimeConnect","dateTimeDisconnect","
mberPartition","lastRedirectDnPartition","duration","origDeviceName","destDeviceName","origCallTermination
Of","origCalledPartyRedirectReason","lastRedirectRedirectReason","destConversationId","globalCallId_Cluste
","destDTMFMethod","callSecuredStatus","origConversationId","origMediaCap_Bandwidth","destMediaCap_Bandwid
tipv4v6Addr","origVideoCap_Codec_Channel2","origVideoCap_Bandwidth_Channel2","origVideoCap_Resolution_Chann
e_Channel2","destVideoCap_Codec_Channel2","destVideoCap_Bandwidth_Channel2","destVideoCap_Resolution_Chann
_Channel2","IncomingProtocolID","IncomingProtocolCallRef","OutgoingProtocolID","OutgoingProtocolCallRef","
calledPartyPatternUsage","IncomingICID","IncomingOrigIOI","IncomingTermIOI","OutgoingICID","OutgoingOrigIO
otalWaitTimeInQueue","callingPartyNumber_uri","originalCalledPartyNumber_uri","finalCalledPartyNumber_uri"
obileDeviceName","origMobileCallDuration","destMobileCallDuration","mobileCallType","originalCalledPartyPa
INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, VARCHAR(50), VARCHAR(128), INTEGER, INTEGER, I
), INTEGER, INTEGER, INTEGER, INTEGER, VARCHAR(50), VARCHAR(50), VARCHAR(128), INTEGER, INTEGER, INTEGER, INTEGER, INT
VARCHAR(50), UNIQUEIDENTIFIER, VARCHAR(50), VARCHAR(50), VARCHAR(50), VARCHAR(50), INTEGER, VARCHAR(129), VARCHAR(
TEGER, VARCHAR(32), INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, INTEGER, VARCHAR(32), VARCHAR(50), VARCHAR(50), VARC
NTEGER, INTEGER, VARCHAR(32), INTEGER, VARCHAR(32), INTEGER, INTEGER, INTEGER, VARCHAR(50), VARCHAR(50), INTEGER, VAR
VARCHAR(255), VARCHAR(255), VARCHAR(255), VARCHAR(255), VARCHAR(50), VARCHAR(50), VARCHAR(129), VARCHAR(129), INTE
1,5,49,96132318,1614798511,5,0,923445440,"21001","",0,16,4,923445440,18938,90,20,0,103,376,10,923445440,21
,10,1024108736,32298,"0","0",1614798512,1614798546,"11001","68d60c8b-1038-4519-8b18-6248fa3dabc4","BANGALO
",12,0,0,0,0,0,0,"StandAloneCluster",0,"","","",0,"",2,3,0,0,8,8,"","","","192.168.10.55","192.168.10.61",0,0
","11001","11001",""

end of the file reached
options: q=quit, n=next, p=prev, b=begin, e=end (lines 1 - 3 of 3) :
```



## IP Phone to IP Phone Call Flow

- Now let us see SIP call flow between an IP Phone to another IP Phone that is registered on a different node
- When you deal with any call flow issues or while working with Cisco TAC, call sample data is crucial to isolate the failure. Always try to get below information before troubleshooting any call. These can be obtained from CDR
  - Calling Number: 21001; SEP7426ACF35A8E; DX70
  - Called Number: 11001; SEP501CB00C71D5; Cisco 8865
  - Time of the call: Mar/04/2021; 12:38:31 AM IST
  - Duration of the call: 34 Sec
- Collect the CallManager logs, drag and drop the entire folder to Translator X and then generate a 'Call List' filter

The screenshot displays two windows from the Cisco Collaboration Trace Translator application.

The top window, titled "Cisco Collaboration Trace Translator", shows a table of SIP messages. The table has columns: Timestamp, Node/Interface, Remote Device, Direction, Protocol, Message Name, TCP Handle/From Tag, and Call Ref / ID. A red arrow points to the "Call List..." button in the top right of this window.

The bottom window, titled "Call List", shows a search interface with fields for "Calling Number" and "Called Number", and a dropdown for "All Calls". Below the search fields, a table lists call records. A red arrow points to the "Generate Filter" button at the bottom right of this window.

Below the "Call List" window, there are several checkboxes for filtering and processing options:

- Lines Processed: 35883
- Msgs Processed: 283
- Msgs Displayed: 168
- ☒ SCCP
- ☐ H.245
- ☒ SIP
- ☐ MGCP
- ☐ Q.931 / H.225
- ☐ MGCP BH
- ☒ Exclude SCCP and MGCP Keepalives
- ☒ Exclude SIP REGISTER
- ☒ Exclude SIP OPTIONS
- ☐ Exclude SIP SUBSCRIBE / NOTIFY / PUBLISH
- ☐ Generate Diagram
- 
-

- This filter may not work all the time (situations like the log doesn't have the complete messages or some failed call) but most of the time it works

Cisco Collaboration Trace Translator

File Edit Filter Calls Help

☒ Filters Enabled   New Filter   Filters...   Clear Filters   2 Filters Configured   Call List...   Clear

| Timestamp               | Node/Interface | Remote Device | Direction | Protocol | Message Name | TCP Handle/From Tag      | Call Ref / ID             |
|-------------------------|----------------|---------------|-----------|----------|--------------|--------------------------|---------------------------|
| 03/04/2021 00:38:31.535 | 192.168.21.3   | 192.168.10.55 | In        | SIP      | NOTIFY       | 98a47e49d2698dc6         | 2e379380-1ec19a53-26ab... |
| 03/04/2021 00:38:31.537 | 192.168.21.3   | 192.168.10.55 | Out       | SIP      | 200 OK       | 98a47e49d2698dc6         | 2e379380-1ec19a53-26ab... |
| 03/04/2021 00:38:31.580 | 192.168.21.3   | 192.168.10.55 | In        | SIP      | INVITE       | 02a47b6a995c84de         | 4db73bb7bdec0f431ffb12... |
| 03/04/2021 00:38:31.581 | 192.168.21.3   | 192.168.10.55 | Out       | SIP      | 100 Trying   | 02a47b6a995c84de         | 4db73bb7bdec0f431ffb12... |
| 03/04/2021 00:38:31.588 | 192.168.21.2   | 192.168.10.61 | Out       | SIP      | INVITE       | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |
| 03/04/2021 00:38:31.595 | 192.168.21.2   | 192.168.10.61 | In        | SIP      | 100 Trying   | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |
| 03/04/2021 00:38:31.664 | 192.168.21.2   | 192.168.10.61 | In        | SIP      | 180 Ringing  | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |
| 03/04/2021 00:38:31.664 | 192.168.21.3   | 192.168.10.55 | Out       | SIP      | 180 Ringing  | 02a47b6a995c84de         | 4db73bb7bdec0f431ffb12... |
| 03/04/2021 00:38:32.799 | 192.168.21.2   | 192.168.10.61 | In        | SIP      | 200 OK       | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |
| 03/04/2021 00:38:32.805 | 192.168.21.3   | 192.168.10.55 | Out       | SIP      | 200 OK       | 02a47b6a995c84de         | 4db73bb7bdec0f431ffb12... |
| 03/04/2021 00:38:32.806 | 192.168.21.2   | 192.168.10.61 | Out       | SIP      | ACK          | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |
| 03/04/2021 00:38:32.806 | 192.168.21.2   | 192.168.10.61 | Out       | SIP      | UPDATE       | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |
| 03/04/2021 00:38:32.830 | 192.168.21.2   | 192.168.10.61 | In        | SIP      | 200 OK       | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |
| 03/04/2021 00:38:32.861 | 192.168.21.3   | 192.168.10.55 | In        | SIP      | ACK          | 02a47b6a995c84de         | 4db73bb7bdec0f431ffb12... |
| 03/04/2021 00:39:06.799 | 192.168.21.3   | 192.168.10.55 | In        | SIP      | BYE          | 02a47b6a995c84de         | 4db73bb7bdec0f431ffb12... |
| 03/04/2021 00:39:06.801 | 192.168.21.3   | 192.168.10.55 | Out       | SIP      | 200 OK       | 02a47b6a995c84de         | 4db73bb7bdec0f431ffb12... |
| 03/04/2021 00:39:06.802 | 192.168.21.2   | 192.168.10.61 | Out       | SIP      | BYE          | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |
| 03/04/2021 00:39:07.215 | 192.168.21.2   | 192.168.10.61 | In        | SIP      | 200 OK       | 16042~ea5cb40c-2e42-4... | d69b2700-1ec19a56-9d5...  |

Call Flow Sequence Diagram

File Edit

Combine >>

SEP7426ACF35A8E   cucm-sub02   cucm-sub01   SEP501CB00C71D5

192.168.10.55   192.168.21.3   192.168.21.2   192.168.10.61

|              |                                       |  |                                       |  |
|--------------|---------------------------------------|--|---------------------------------------|--|
| 00:38:31.535 | NOTIFY (103 NOTIFY)                   |  |                                       |  |
| 00:38:31.537 | 200 OK (103 NOTIFY)                   |  |                                       |  |
| 00:38:31.580 | INVITE w/ SDP (sendrecv) (100 INVITE) |  |                                       |  |
| 00:38:31.581 | 100 Trying (100 INVITE)               |  |                                       |  |
| 00:38:31.588 |                                       |  | INVITE (101 INVITE)                   |  |
| 00:38:31.595 |                                       |  | 100 Trying (101 INVITE)               |  |
| 00:38:31.664 |                                       |  | 180 Ringing (101 INVITE)              |  |
| 00:38:31.664 | 180 Ringing (100 INVITE)              |  |                                       |  |
| 00:38:32.799 |                                       |  | 200 OK w/ SDP (sendrecv) (101 INVITE) |  |
| 00:38:32.805 | 200 OK w/ SDP (inactive) (100 INVITE) |  |                                       |  |
| 00:38:32.806 |                                       |  | ACK w/ SDP (101 ACK)                  |  |
| 00:38:32.806 |                                       |  | UPDATE (102 UPDATE)                   |  |
| 00:38:32.830 |                                       |  | 200 OK (102 UPDATE)                   |  |
| 00:38:32.861 | ACK (100 ACK)                         |  |                                       |  |
| 00:39:06.799 | BYE (101 BYE)                         |  |                                       |  |
| 00:39:06.801 | 200 OK (101 BYE)                      |  |                                       |  |
| 00:39:06.802 |                                       |  | BYE (103 BYE)                         |  |
| 00:39:07.215 |                                       |  | 200 OK (103 BYE)                      |  |

- 
- IP Phone 1 (192.168.10.55) sends INVITE to CUCM-SUB2 where it is registered. This INVITE is called EARLY OFFER since the message contains SDP (Session Description Protocol) that talks about media attributes (IP, Port, Codec, etc.) of Phone 1
  - CUCM-SUB2 sends 100 TRYING back to the IP Phone and sends SDL signal to CUCM-SUB01. SDL signals are not visible in Translator X. SDL signal used to communicate between CUCM Nodes
  - Now CUCM-SUB01 passes the INVITE to IP Phone 2 (192.168.10.61), since CUCM is not a PROXY but B2BA (Back to Back User Agent), it alters the SIP Headers. This INVITE is DELAYED OFFER since it doesn't have SDP in it
  - IP Phone 2 will respond with 100 Trying and 180 Ringing to CUCM-SUB01
  - CUCM-SUB01 signals CUCM-SUB02 via SDL messages and 180 Ringing flows to IP Phone 1
  - When Phone 2 is answered, it sends 200 OK with SDP where we have the media attributes of Phone 2
  - CUCM picks a codec based on the initial INVITE from DX70 and 200OK from 8865 Phone
  - CUCM-SUB2 sends 200 OK message with selected SDP attributes to DX70, hence DX70 got the media attributes of 8865 Phone
  - CUCM-SUB01 sends ACK message 8865 Phone that contains the selected media attributes of DX70 that has been shared on the initial INVITE. Now 8865 got the media information
  - DX70 sends ACK message to CUCM-SUB02.
  - When DX70 disconnects the call, it sends BYE message to CUCM-SUB02 and CUCM-SUB2 responds with 200 OK
  - The BYE message eventually forwarded to 8865 Phone from CUCM-SUB01 and it gets a 200 OK response from 8865

## IP Phone Web Access

- It gives all device information (MAC, Host Name, Model, DN, Firmware, Network Configuration & statistics, logs, etc.)
- Device Page >> Web Access >> Enabled >> Reset
- Now click IP Phone IP Address to get web page

The screenshot shows the Cisco Unified CM Administration web interface. The browser address bar displays the URL: `https://192.168.21.1/ccmadmin/phoneEdit.do?key=3b7e294b-ffac-f7`. The page title is "Cisco Unified CM Administration" with the subtitle "For Cisco Unified Communications Solutions". The navigation menu includes "System", "Call Routing", "Media Resources", "Advanced Features", "Device", "Application", "User Management", "Bulk Administration", and "Help". The "Phone Configuration" section is active, and the "Related Links" dropdown shows "Back To Find/List".

The configuration page includes a "DND Incoming Call Alert" dropdown set to "< None >". Below this is the "Secure Shell Information" section with fields for "Secure Shell User" and "Secure Shell Password".

The "Product Specific Configuration Layout" section contains a table of parameters:

| Parameter                                                 | Value          | Override Enterprise/Comm Phone Profile Settings |
|-----------------------------------------------------------|----------------|-------------------------------------------------|
| <input type="checkbox"/> Disable Speakerphone             |                |                                                 |
| <input type="checkbox"/> Disable Speakerphone and Headset |                |                                                 |
| <input type="checkbox"/> Disable Handset                  |                | <input type="checkbox"/>                        |
| PC Port *                                                 | Enabled        |                                                 |
| Settings Access*                                          | Enabled        | <input type="checkbox"/>                        |
| PC Voice VLAN Access*                                     | Enabled        |                                                 |
| Video Capabilities*                                       | Enabled        | <input type="checkbox"/>                        |
| <b>Web Access*</b>                                        | <b>Enabled</b> | <input checked="" type="checkbox"/>             |
| Disable TLS 1.0 and TLS 1.1 for Web Access*               | Disabled       | <input type="checkbox"/>                        |
| Enbloc Dialing*                                           | Disabled       | <input type="checkbox"/>                        |
| Days Display Not Active                                   | Sunday         | <input type="checkbox"/>                        |
| Display On Time                                           | 07:30          | <input type="checkbox"/>                        |
| Display On Duration                                       | 10:30          | <input type="checkbox"/>                        |
| Display Idle Timeout                                      | 01:00          | <input type="checkbox"/>                        |
| Display On When Incoming Call*                            | Enabled        | <input type="checkbox"/>                        |
| Enable Power Save Plus                                    | Sunday         | <input type="checkbox"/>                        |
| Phone On Time                                             | 00:00          | <input type="checkbox"/>                        |
| Phone Off Time                                            | 24:00          | <input type="checkbox"/>                        |
| Phone Off Idle Timeout*                                   | 60             | <input type="checkbox"/>                        |
| <input type="checkbox"/> Enable Audible Alert             |                | <input type="checkbox"/>                        |

The screenshot shows a web browser window with the address bar displaying `192.168.10.61/CGI/Java/Serviceability?adapter=device.statistics.device`. The page title is "Device information" for a "Cisco IP Phone CP-8865 (SEP501CB00C71D5)".

**Device information**

|                          |                                                                       |
|--------------------------|-----------------------------------------------------------------------|
| Service mode             | On-premise                                                            |
| Service domain           |                                                                       |
| Service state            | Idle                                                                  |
| Active network interface | Ethernet                                                              |
| MAC address              | 501CB00C71D5                                                          |
| Wireless MAC address     | 501CB00C71D7                                                          |
| Host name                | SEP501CB00C71D5                                                       |
| Phone DN                 | 11001                                                                 |
| App load ID              | rootfs8845_65.12-8-1-0001-455                                         |
| Boot load ID             | sb28845_65.BEV-01-015                                                 |
| Version                  | sip8845_65.12-8-1-0001-455                                            |
| Key expansion module 1   |                                                                       |
| Key expansion module 2   |                                                                       |
| Key expansion module 3   |                                                                       |
| Hardware revision        | V01                                                                   |
| Serial number            | PUC21498MPM                                                           |
| Model number             | CP-8865                                                               |
| Message waiting          | No                                                                    |
| UDI                      | phone<br>Cisco IP Phone 8865, Global<br>CP-8865<br>V05<br>PUC21498MPM |
| Time                     | 1:54:49am                                                             |
| Time zone                | Asia/Kolkata                                                          |
| Date                     | 04-03-21                                                              |
| System free memory       | 2147483647                                                            |
| Java heap free memory    | 1635864                                                               |
| Java pool free memory    | 2147483647                                                            |
| FIPS mode enabled        | No                                                                    |

- This can be used to identify media streams status as well, this is helpful while troubleshooting 'one way or no way audio' issues

Phone Configuration

Cisco Systems, Inc.

192.168.10.55 - Call Control

192.168.10.61/CGI/Java/Serviceability?adapter=device.statistics.streamin

## Streaming statistics

Cisco IP Phone CP-8865 ( SEP501CB00C71D5 )

[Device information](#)  
[Network setup](#)  
[Network statistics](#)  
[Ethernet information](#)  
[Access](#)  
[Network](#)  
[Device logs](#)  
[Console logs](#)  
[Core dumps](#)  
[Status messages](#)  
[Debug display](#)  

Streaming statistics

[Stream 1](#)  
[Stream 2](#)  
[Stream 3](#)  
[Stream 4](#)  
[Stream 5](#)

|                             |                     |
|-----------------------------|---------------------|
| Remote address              | 192.168.10.55/18846 |
| Local address               | 192.168.10.61/17864 |
| Start time                  | 1:56:08am           |
| Stream status               | Active              |
| Host name                   | SEP501CB00C71D5     |
| Sender packets              | 634                 |
| Sender octets               | 31700               |
| Sender codec                | OPUS                |
| Sender reports sent         | 2                   |
| Sender report time sent     | 1:56:18am           |
| Rcvr lost packets           | 0                   |
| Avg jitter                  | 0                   |
| Receiver codec              | OPUS                |
| Receiver reports sent       | 0                   |
| Receiver report time sent   | 00:00:00            |
| Rcvr packets                | 1278                |
| Rcvr octets                 | 69437               |
| Cumulative conceal ratio    | 0.0008              |
| Interval conceal ratio      | 0.0000              |
| Max conceal ratio           | 0.0035              |
| Conceal seconds             | 1                   |
| Severely conceal seconds    | 0                   |
| Latency                     | 9                   |
| Max jitter                  | 1                   |
| Sender size                 | 20 ms               |
| Sender reports received     | 2                   |
| Sender report time received | 1:56:21am           |
| Receiver size               | 10 ms               |
| Receiver discarded          | 1                   |
| Receiver reports received   | 0                   |

## DX70 Web Management Console

- Every telepresence endpoints have a dedicated Web interface to manage the device
- The default username is admin without password

The screenshot shows the 'System Information' page of the Cisco TelePresence DX70 web management console. The browser address bar shows 'https://192.168.10.55/web'. The page header includes the Cisco logo and the IP address '192.168.10.55 Cisco TelePresence DX70'. The navigation menu has 'Home' highlighted. A yellow warning box states: 'There is 1 possible issue with your system. See [Diagnostics](#) for more info.'

**System Information**

| General            |                                 | H323        |                               |
|--------------------|---------------------------------|-------------|-------------------------------|
| Product:           | Cisco TelePresence DX70         | Status:     | Inactive                      |
| System time:       | 01:54 AM                        | Gatekeeper: | -                             |
| Browser time:      | 11:48 AM                        | Number:     | -                             |
| Last boot:         | today at 00:10                  | ID:         | -                             |
| Serial number:     | FOC1846N3S3                     | SIP         |                               |
| Software version:  | ce 9.7.1 30bff6140aa 2019-04-02 | Status:     | Registered                    |
| Installed options: | Encryption                      | Proxy:      | 192.168.21.3                  |
| System name:       | -                               | URI:        | 21001@cucm-sub02.ajcollab.com |
| IPv4:              | 192.168.10.55                   |             |                               |
| IPv6:              | -                               |             |                               |
| MAC address:       | 74:26:AC:F3:5A:8E               |             |                               |
| Temperature:       | 47°C / 116.6°F                  |             |                               |

The screenshot shows the 'Call Control' page of the Cisco TelePresence DX70 web management console. The browser address bar shows 'https://192.168.10.55/web/call-control'. The page header includes the Cisco logo and the IP address '192.168.10.55 Cisco TelePresence DX70'. The navigation menu has 'Call Control' highlighted. A red arrow points to the 'Microphone: On' status indicator. Another red arrow points to the 'Start Presentation' button. A third red arrow points to the 'Call' button in the '11001' contact entry.

**Call Control**

Microphone: On

Main: No presets

Presentation: HDMI 2

[Start Presentation](#)

**Contacts**

11001

[Call](#)

[Show call settings](#)

*No participants connected*

**Favorites**

No matches found

**Directory**

No matches found

**Recents**

→ 11001 - Deepika Padukone  
Placed (4) - 2019-10-04

11001@cucm-sub02.ajcollab.com  
NoAnswer - 2019-09-27

192.168.10.55

https://192.168.10.55/web/config/Provisioning

192.168.10.55  
Cisco TelePresence DX70

Home Call Control Setup Security Maintenance Integration admin

Search...

Configuration

Provisioning

Connectivity Auto

LoginName (0 to 80 characters)

Mode CUCM

Password (0 to 64 characters)

ExternalManager

Address (0 to 64 characters)

AlternateAddress (0 to 64 characters)

Domain (0 to 64 characters)

Path (0 to 255 characters)

Protocol HTTP

192.168.10.55

https://192.168.10.55/web/config/SIP

192.168.10.55  
Cisco TelePresence DX70

Home Call Control Setup Security Maintenance Integration admin

Search...

Configuration

SIP

ANAT On

DefaultTransport TCP

DisplayName 21001 - Jennifer Garner (0 to 550 characters)

Line Private

ListenPort Off

Mailbox (0 to 255 characters)

MinimumTLSVersion TLSv1.0

PreferredIPSignaling IPv4

Proxy 1 Address cucm-sub02.ajcollab.com (0 to 255 characters)

Proxy 2 Address cucm-sub01.ajcollab.com (0 to 255 characters)

Proxy 3 Address (0 to 255 characters)

Proxy 4 Address (0 to 255 characters)

TlsVerify On

Type Cisco

URI 21001@cucm-sub02.ajcollab.com (0 to 255 characters)



192.168.10.55

https://192.168.10.55/web/status/Provisioning

192.168.10.55  
Cisco TelePresence DX70

Home Call Control Setup Security Maintenance Integration admin

Search...

Audio Bookings Cameras Capabilities Conference Diagnostics H320 H323 ICE Logging Network NetworkServices Phonebook Provisioning Proximity

Status

Configuration Status Peripherals Personalization Favorites

Provisioning

|            |              |
|------------|--------------|
| Discovered | None         |
| NextRetry  |              |
| Reason     |              |
| Server     | 192.168.21.1 |
| Status     | Provisioned  |

CUCM

|                        |                                                   |
|------------------------|---------------------------------------------------|
| CTL State              | NotInstalled                                      |
| Customization Checksum |                                                   |
| ITL State              | Installed                                         |
| Phonebook URL          | https://cucm-pub.ajcollab.com:8443/cucm-uds/users |
| ProvisionSecurity      | Signed                                            |
| Userid                 |                                                   |

192.168.10.55 - Personalization

https://192.168.10.55/web/personalization

192.168.10.55  
Cisco TelePresence DX70

Home Call Control Setup Security Maintenance Integration admin

Personalization

Branding Custom wallpaper

Configuration Status Peripherals Personalization Favorites


Add your branding

Branding customization allows you to add your own brand image and logo to your system, while at the same time maintaining a rich user interface.

Wake-up flow

When the video system wakes up from standby, the screen will first display the background image, before automatically showing instructions about how to use it. Instructions will also be displayed on the touch panel.

Put the system in standby state Put the system in halfwake state



Custom brand background

The brand image will be displayed as a background on both the main screen and on the touch panel when the video system is in the halfwake state.

The recommended image size is 1920x1080 pixels, in png or jpeg format. When uploading the image, it will be scaled to the recommended size.

Upload image

Brand logo (halfwake)

This light brand logo will be displayed on a dark background in the bottom right corner on both the main screen and the touch panel.

For best results, the logo should be an all white version without padding, in png format with a transparent background. The recommended size is 272x272 pixels. When uploading the logo, it will be scaled to the recommended size.

Upload image

Awake state

When the system is awake, the touch panel will display instructions about how to use the

https://192.168.10.55/web/personalization

192.168.10.55 - Users

https://192.168.10.55/web/users

Cisco TelePresence Desktop

Home Call Control Setup **Security** Maintenance Integration

**Users**

- Service Certificates
- CUCM Certificates
- Certificate Authorities
- Strong Security Mode
- Sign In Banner
- Non-persistent Mode

| Username | Status | Roles                       |
|----------|--------|-----------------------------|
| admin    | Active | RoomControl Integrator User |

+ Add new user...

192.168.10.55

https://192.168.10.55/web/service-certificates

Cisco TelePresence Desktop

Home Call Control Setup **Security** Maintenance Integration

**Service Certificates**

- Users
- Service Certificates**
- CUCM Certificates
- Certificate Authorities
- Strong Security Mode
- Sign In Banner
- Non-persistent Mode

| Certificate             | Issuer            | Audit | HTTPS | SIP | Actions                 |
|-------------------------|-------------------|-------|-------|-----|-------------------------|
| Self-signed Certificate | TemporaryDefaultC | Off   | On    | Off | Delete View Certificate |

Add Certificate

Certificate  Browse... No file selected.

Private key (optional)  Browse... No file selected.

Passphrase (optional)

This system supports PEM formatted certificate files (.pem). The certificate file may contain the certificate and a RSA or DSA encrypted private key with or without a passphrase. Optionally the private key file may be supplied separately.

Add certificate...



192.168.10.55 - System Diagnostics

https://192.168.10.55/web/diagnostics

**System Diagnostics**

Diagnostics help identify issues that may cause the system to fail or

**OK: System Temperature**  
The system is running at an acceptable temperature.

**OK: External Audio Delay**  
External audio delay is at a reasonable level.

**WARNING: NTP Status**  
Connection to NTP server not yet established. This might be that we have not yet had the time to establish connection, or that the NTP server is unavailable. If this message persists, please check that the NTP server is reachable.

**INFO: HTTPS Mode Security**  
The HTTP mode is set to HTTP+HTTPS. In order to avoid eavesdropping, please consider changing this setting to HTTPS.

**OK: Standby Control**  
The system goes into standby automatically after 10 minutes. Standby can be configured through the standby configuration.

**Diagnostics**

- System Logs
- Call Logs
- User Interface Screenshots
- Software Upgrade
- Option Keys
- Backup and Restore
- System Recovery
- Restart

Re-run diagnostic

192.168.10.55 - System Logs

https://192.168.10.55/web/system-logs

**System Logs**

Download log archive

A full archive of the logs on the device is useful for diagnosing problems. This archive includes all current and historical logs, in addition to current system configuration, system status, packet captures and diagnostic information. Anonymized call history is included.

Download logs archive...

- No call history
- Full call history

Extended logging is inactive.

**Current Logs**

| File Name                          | Size   | Last modified    |
|------------------------------------|--------|------------------|
| auth.log                           | 2 kB   | 2019-10-04 01:53 |
| console                            | 7 kB   | 2019-10-03 14:16 |
| dhclient.log                       | 374 kB | 2019-10-04 02:18 |
| dmesh                              | 24 kB  | 2019-10-03 14:15 |
| eventlog/all.log                   | 67 kB  | 2019-10-04 02:18 |
| eventlog/all.log.first             | 513 kB | 2019-10-03 16:58 |
| eventlog/all.log.previous          | 513 kB | 2019-10-04 01:49 |
| eventlog/all.log.truncated         | 1 kB   | 2019-10-04 01:49 |
| eventlog/application.log           | 30 kB  | 2019-10-04 02:18 |
| eventlog/application.log.first     | 513 kB | 2019-10-03 17:05 |
| eventlog/application.log.previous  | 513 kB | 2019-10-04 02:08 |
| eventlog/application.log.truncated | 1 kB   | 2019-10-04 02:08 |

https://192.168.10.55/web/system-logs

**Diagnostics**

- System Logs
- Call Logs
- User Interface Screenshots
- Software Upgrade
- Option Keys
- Backup and Restore
- System Recovery
- Restart

192.168.10.55 - System Logs

https://192.168.10.55/web/system-logs

CISCO 192.168.10.55 Cisco TelePresence DX70

Home Call Control Setup Security Maintenance Integration admin

### System Logs

**Download log archive**

A full archive of the logs on the device is useful for diagnosing problems. This archive includes all current and historical logs, in addition to current system configuration, system status, packet captures and diagnostics information. Anonymized call history is included.

Download logs archive...

**Extended logging**

To help diagnose network issues and problems during call setup, the system can enter a timed extended logging mode. This mode is resource intensive, and populates the existing logs with more detailed information. The extended logging mode can optionally include a full or partial capture of all network traffic.

Start extended logging...  
 Include a limited packet capture  
 Include a full packet capture

**Current Logs**

| File Name                          | Size   | Last modified    |
|------------------------------------|--------|------------------|
| auth.log                           | 2 kB   | 2019-10-04 01:53 |
| console                            | 7 kB   | 2019-10-03 14:16 |
| dhclient.log                       | 374 kB | 2019-10-04 02:18 |
| dmesg                              | 24 kB  | 2019-10-03 14:15 |
| eventlog/all.log                   | 67 kB  | 2019-10-04 02:18 |
| eventlog/all.log.first             | 513 kB | 2019-10-03 16:58 |
| eventlog/all.log.previous          | 513 kB | 2019-10-04 01:49 |
| eventlog/all.log.truncated         | 1 kB   | 2019-10-04 01:49 |
| eventlog/application.log           | 30 kB  | 2019-10-04 02:18 |
| eventlog/application.log.first     | 513 kB | 2019-10-03 17:05 |
| eventlog/application.log.previous  | 513 kB | 2019-10-04 02:08 |
| eventlog/application.log.truncated | 1 kB   | 2019-10-04 02:08 |
| eventlog/audioctrl.log             | 18 kB  | 2019-10-04 02:06 |
| eventlog/audit.log                 | 103 kB | 2019-10-04 02:18 |
| eventlog/dsp.log                   | 1 kB   | 2019-10-03 14:16 |
| eventlog/ducati.log                | 16 kB  | 2019-10-04 01:51 |
| eventlog/events.log                | 33 kB  | 2019-10-04 02:15 |

current

File Home Share View

Pin to Quick access Copy Paste Cut Copy path Paste shortcut Move to Copy to Delete Rename New folder Easy access New item Properties Open Select all Select none Invert selection

Clipboard Organize Open Select

« log\_bundle-SEP7426ACF35A8E-20191004-0223 » logs-SEP7426ACF35A8E » current » Search current

| Name                      | Date modified      | Type           | Size   |
|---------------------------|--------------------|----------------|--------|
| eventlog                  | 04-Mar-21 12:18 PM | File folder    |        |
| nginx                     | 04-Mar-21 12:18 PM | File folder    |        |
| auth.log                  | 04-Oct-19 12:52 PM | Text Document  | 3 KB   |
| bookings.txt              |                    | Text Document  | 1 KB   |
| call_history.txt          |                    | Text Document  | 38 KB  |
| camera_presets.txt        |                    | Text Document  | 1 KB   |
| configuration.txt         |                    | Text Document  | 19 KB  |
| console                   | 04-Oct-19 12:46 AM | File           | 7 KB   |
| dhclient.log              | 04-Oct-19 12:52 PM | Text Document  | 376 KB |
| diagnostics.txt           |                    | Text Document  | 12 KB  |
| dmesg                     | 04-Oct-19 12:45 AM | File           | 24 KB  |
| firmware.log              | 04-Oct-19 12:46 AM | Text Document  | 1 KB   |
| kern.log                  | 04-Oct-19 12:51 PM | Text Document  | 46 KB  |
| kernerr.log               | 04-Oct-19 12:45 AM | Text Document  | 2 KB   |
| last_kmsg                 | 04-Oct-19 12:45 AM | File           | 28 KB  |
| latest-provisioning       | 04-Oct-19 12:47 AM | File           | 16 KB  |
| latest-valid-provisioning | 04-Oct-19 12:47 AM | File           | 16 KB  |
| messages.log              | 04-Oct-19 12:52 PM | Text Document  | 476 KB |
| messages.log.first        | 04-Oct-19 4:53 AM  | FIRST File     | 513 KB |
| messages.log.previous     | 04-Oct-19 9:01 AM  | PREVIOUS File  | 513 KB |
| messages.log.truncated    | 04-Oct-19 9:01 AM  | TRUNCATED File | 1 KB   |
| osversion                 | 04-Oct-19 12:45 AM | File           | 1 KB   |
| participantlist.txt       |                    | Text Document  | 1 KB   |
| peripherals.txt           |                    | Text Document  | 1 KB   |
| platform-sanity-tests.xml | 04-Oct-19 12:52 PM | XML Document   | 1 KB   |
| remotesupport.txt         |                    | Text Document  | 1 KB   |
| status.txt                |                    | Text Document  | 30 KB  |
| vcinfo.txt                | 04-Oct-19 12:45 AM | Text Document  | 1 KB   |
| version.json              | 04-Oct-19 12:45 AM | JSON File      | 1 KB   |
| wpa_supplicant.log        | 04-Oct-19 12:46 AM | Text Document  | 12 KB  |

192.168.10.55 - Call Logs

https://192.168.10.55/web/call-logs

192.168.10.55  
Cisco TelePresence DX70

Home Call Control Setup Security Maintenance Integration admin

Call Logs

Diagnostics  
System Logs  
Call Logs  
User Interface Screenshots  
Software Upgrade  
Option Keys  
Backup and Restore  
System Recovery  
Restart

Clear History

| Start time          | Duration   | Direction  | Remote number                 | Disconnect cause type |
|---------------------|------------|------------|-------------------------------|-----------------------|
| 2019-10-04T02:21:37 | 6 seconds  | → Outgoing |                               | LocalDisconnect       |
| 2019-10-03T16:01:20 | 10 hours   | → Outgoing |                               | LocalDisconnect       |
| 2019-10-03T14:43:46 | 34 seconds | → Outgoing |                               | LocalDisconnect       |
| 2019-10-03T14:29:35 | 45 seconds | → Outgoing |                               | LocalDisconnect       |
| 2019-10-03T14:17:35 | 12 seconds | ← Incoming |                               | RemoteDisconnect      |
| 2019-10-03T13:30:38 | 30 seconds | ← Incoming | 11002 - Abdul Jaseem          | RemoteDisconnect      |
| 2019-10-03T12:44:55 | 8 seconds  | ← Incoming | 11002 - Abdul Jaseem          | RemoteDisconnect      |
| 2019-10-03T09:10:46 | a minute   | ← Incoming | 11002 - Abdul Jaseem          | LocalDisconnect       |
| 2019-09-28T05:32:32 | 20 seconds | → Outgoing | 11001 - Deepika Padukone      | LocalDisconnect       |
| 2019-09-28T04:48:16 | 35 seconds | ← Incoming | 11002 - Abdul Jaseem          | RemoteDisconnect      |
| 2019-09-28T04:44:29 | a minute   | ← Incoming | 11002 - Abdul Jaseem          | LocalDisconnect       |
| 2019-09-28T04:27:26 | 47 seconds | ← Incoming | 11002 - Abdul Jaseem          | LocalDisconnect       |
| 2019-09-28T04:26:07 | 9 seconds  | ← Incoming | 11002 - Abdul Jaseem          | RemoteDisconnect      |
| 2019-09-26T14:54:50 | 0 seconds  | → Outgoing | 11001@cucm-sub02.ajcollab.com | NetworkRejected       |
| 2019-09-26T14:53:54 | 0 seconds  | → Outgoing | 11002@cucm-sub02.ajcollab.com | NetworkRejected       |
| 2019-09-26T14:52:05 | 0 seconds  | → Outgoing | 11002@cucm-sub02.ajcollab.com | NetworkRejected       |
| 2019-09-26T14:50:17 | 0 seconds  | → Outgoing | 11002@cucm-sub02.ajcollab.com | NetworkRejected       |

Previous Page 1 of 1 20 rows Next

https://192.168.10.55/web/call-logs

192.168.10.55 - Call Logs

https://192.168.10.55/web/call-logs

192.168.10.55  
Cisco TelePresence DX70

Home Call Control Setup Security Maintenance Integration admin

Call Logs

Call details

Call ID 6

Remote number sip:11001@192.168.21.3

Callback number sip:11001@cucm-sub02.ajcollab.com

Display name 11001 - Deepika Padukone

Direction Outgoing

Protocol Sip

Call rate 3072 kbps

Encryption type None

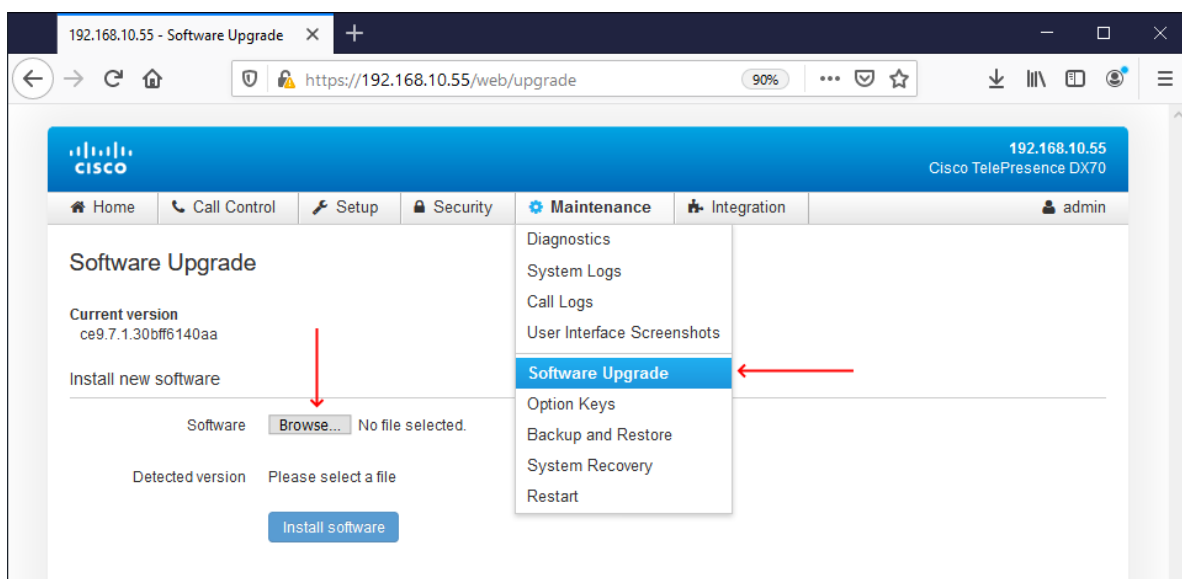
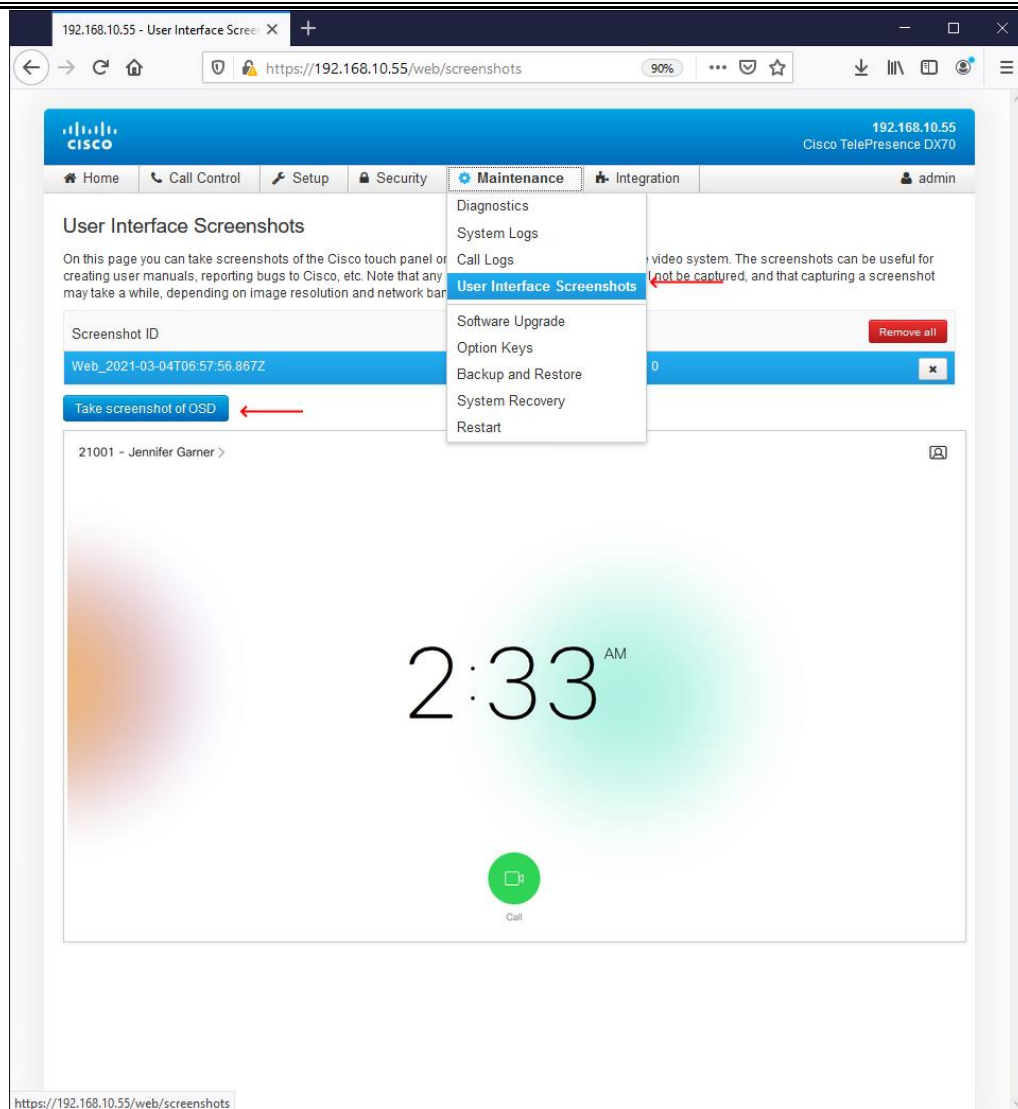
Duration 6 seconds

Start time 2019-10-04 12:51:37

End time 2019-10-04 12:51:43

Disconnect cause

Cancel OK



192.168.10.55 - Restart Phone Configuration

https://192.168.21.1/ccmadmin/phoneEdit.do?key=dd6396a9-...

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration Go

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

**Phone Configuration** Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

Common Phone Profile: Standard Common Phone Profile [View Details](#)

Calling Search Space: TEXAS-PHONE-CSS

AAR Calling Search Space: < None >

Media Resource Group List: < None >

User Hold MOH Audio Source: 1-SampleAudioSource

Network Hold MOH Audio Source: 1-SampleAudioSource

Location\*: Hub\_None

AAR Group: < None >

User Locale: < None >

Network Locale: < None >

Privacy\*: Default

Device Mobility Mode\*: Default [View Current](#)  
[Device Mobility Settings](#)

Owner: ☐ User ☒ Anonymous (Public/Shared Space)

Owner User ID:

Mobility User ID: < None >

Phone Load Name: ce-9.7.1-30bff6140aa-2019-04-02

Use Trusted Relay Point\*: Default

Always Use Prime Line\*: Default

Always Use Prime Line for Voice Message\*: Default

Geolocation: < None >

☒ Retry Video Call as Audio

☐ Ignore Presentation Indicators (internal calls only)

☒ Allow Control of Device from CTI

☒ Logged Into Hunt Group

☐ Remote Device

**Number Presentation Transformation**

**Caller ID For Calls From This Phone**

Calling Party Transformation CSS: < None >

☒ Use Device Pool Calling Party Transformation CSS (Caller ID For Calls From This Phone)

**Remote Number**

Calling Party Transformation CSS: < None >

☒ Use Device Pool Calling Party Transformation CSS (Device Mobility Related Information)

192.168.10.55 - Option Keys

https://192.168.10.55/web/optionkeys

90%

**Cisco** 192.168.10.55  
Cisco TelePresence DX70

Home | Call Control | Setup | Security | Maintenance | Integration admin

**Option Keys**

| Type             | Description                           | Key | Status        |
|------------------|---------------------------------------|-----|---------------|
| RemoteMonitoring | Enables snapshots of local and remote |     | Not installed |

Add option key

Serial number: FOC1846N3S3

Option key:

[Add option key](#)

Option keys are used to enable optional features

Contact your Cisco representative to obtain option keys. You need to provide the serial number to get option keys.

[Diagnostics](#)  
[System Logs](#)  
[Call Logs](#)  
[User Interface Screenshots](#)  
[Software Upgrade](#)  
[Option Keys](#)  
[Backup and Restore](#)  
[System Recovery](#)  
[Restart](#)



192.168.10.55 - Backup and Restore

https://192.168.10.55/web/backup

90%

192.168.10.55  
Cisco TelePresence DX70

HomeCall ControlSetupSecurityMaintenanceIntegrationadmin

Backup and Restore

This page lets you backup and restore many aspects of the video system.

Create backupRestore backup

Select items to include in your backup. Make sure you leave all items selected.

Download backup file

|                 |                                             |
|-----------------|---------------------------------------------|
| Branding        | No items installed                          |
| Favorites       | No items installed                          |
| In-Room Control | No items installed                          |
| Macros          | No items installed                          |
| Sign In Banner  | <input checked="" type="checkbox"/> Include |
| Configuration   | <input checked="" type="checkbox"/> Include |

The configuration listed below can be modified for a partial backup of the configuration.

**Note:** Settings such as `Network`, `SIP URI` and `SystemUnit Name` may specifically apply to a certain video system. Applying a backup with these settings to a different video system may result in the device becoming unreachable on the network. To avoid this, consider removing those settings from the list below.

Remove system-specific configurations

Audio DefaultVolume: 50  
Audio Microphones Mute Enabled: True  
Audio SoundsAndAlerts RingTone: "Sunrise"  
Audio SoundsAndAlerts RingVolume: 50  
Audio Ultrasound MaxVolume: 60  
Audio Ultrasound Mode: Dynamic  
Bluetooth Allowed: True  
Bluetooth Enabled: False  
CallHistory Mode: On  
Cameras Camera 1 Backlight DefaultMode: Off  
Conference ActiveControl Mode: Auto

☒ Select all

Download backup

Diagnostics  
System Logs  
Call Logs  
User Interface Screenshots  
Software Upgrade  
Option Keys  
Backup and Restore  
System Recovery  
Restart

273



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## SSL Certificates

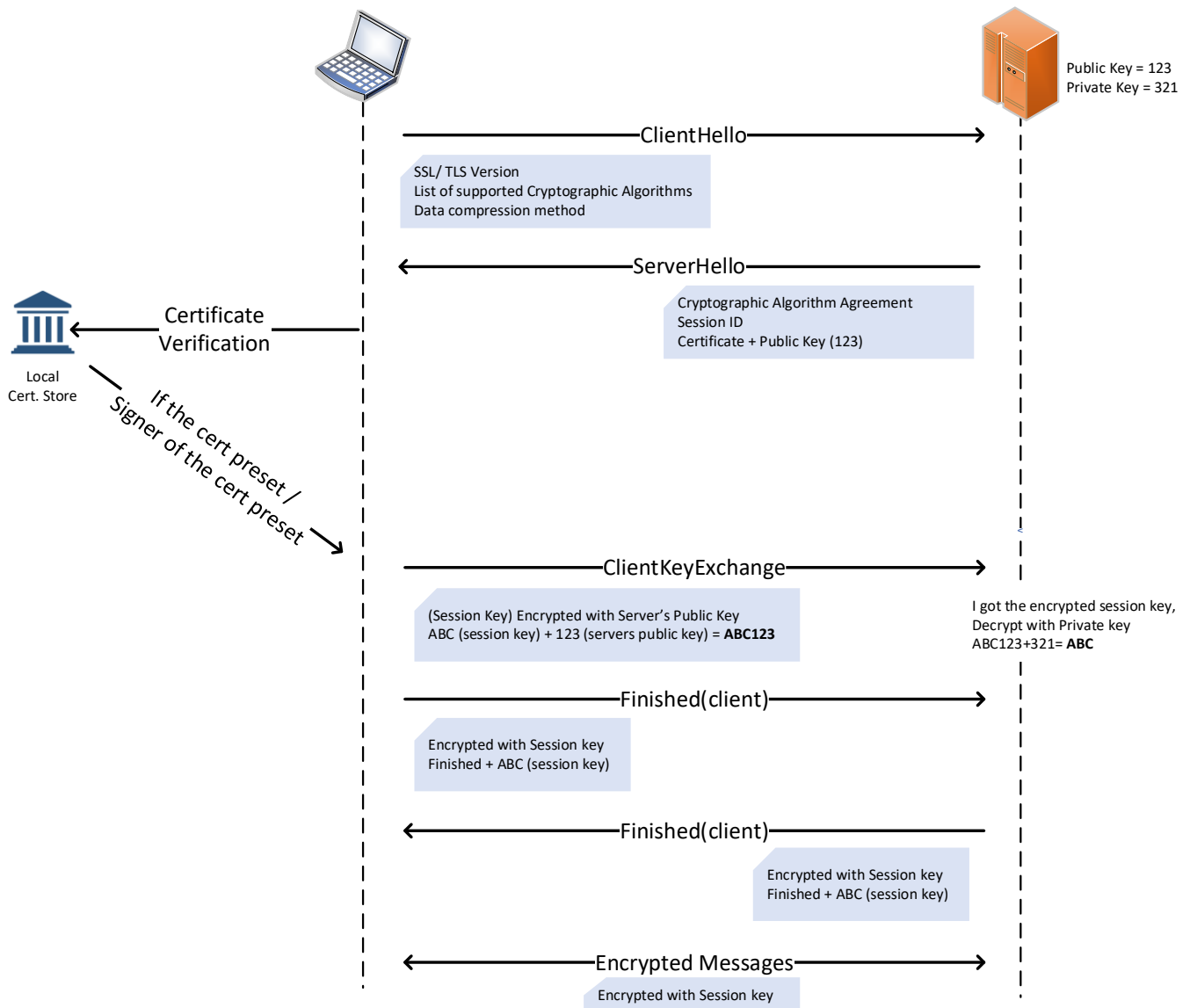


- SSL Certificates are used between end points to build a trust/authentication and encryption of data
- This confirms that the endpoints communicate with the intended device and have the option to encrypt the data between the two endpoints
- When systems communicate each other initially they will exchange SSL certificates. If one system trusts the other system's certificates, then the connection is established otherwise it terminated
- To trust a certificate, there are 2 ways, Remote system's certificate must be locally installed on the local system or there should be globally trusted authority who issued certificate for remote system. Since the authority is globally trusted, the local system trusts the authority as well as all the certificates' issues by the authority
- This authority is called CA (Certificate Authority). We can have internal CA or Public CA. Internal CA is trusted by all systems inside the enterprise and public CA is trusted by everyone in the world

---

## SSL /TLS Handshake and PKI Infrastructure

- Secure Socket Layer (SSL) and its newer version Transport Layer Security (TLS) are cryptographic protocols that provide security in the internet communication
- The fundamental idea is that when a message is encrypted with a device's Public Key, only same device's Private Key can decrypt it



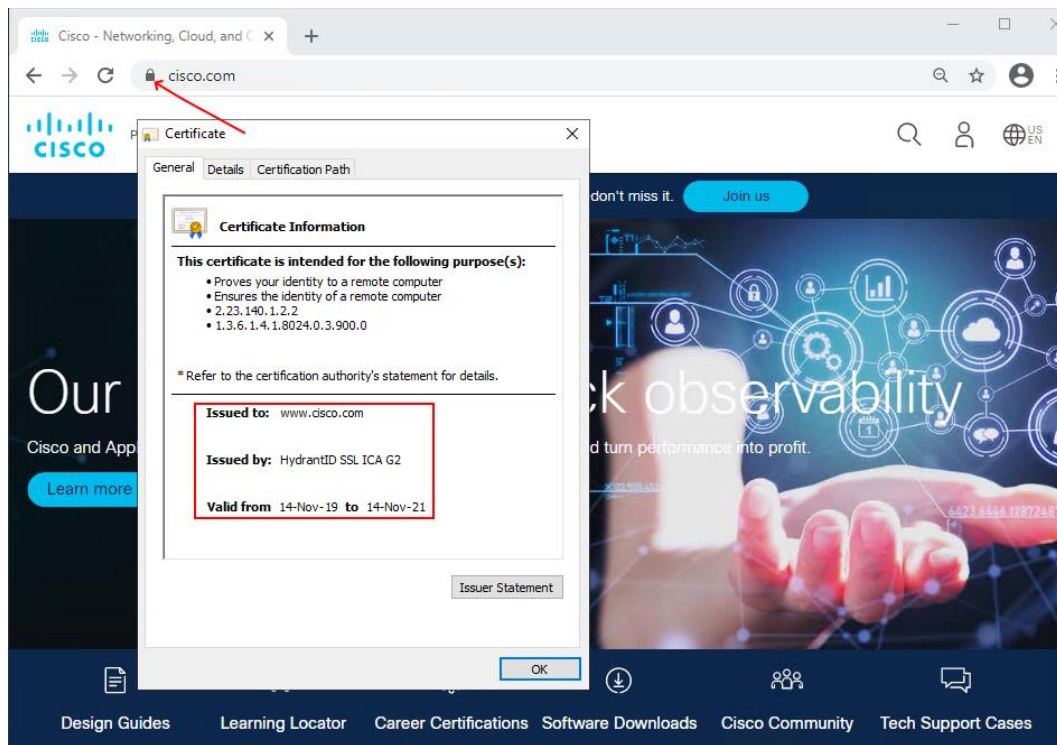
1. Client sends CLIENT HELLO message to the server. CLIENT HELLO contains SSL or TLS Version, list of Cryptographic algorithms, Data compression method
2. Server responds with SERVER HELLO that contains Cryptographic algorithm agreement, Session ID, Server Certificate, Public key
3. Client verifies the certificate (either locally trusted or public CA) and trusts the server
4. Client sends CLIENT KEY; it is a shared secret key (also called session key) encrypted with server's public key. Now server got the session key, and it can decrypt using it's own private key

- 
5. Client sends FINISHED (client) message encrypted with previous session key. Now the client part handshake is complete
  6. Server responds with FINISHED (server) message encrypted with session key. Now the server part handshake is complete
  7. Now client and server can exchange messages that are symmetrically encrypted with the session key
- 
- Till we generate the Session key, the process is called Asymmetric Encryption
  - Once we have the session key exchanged between Client and Server, then the message encryption is using the session key and this process is called Symmetric Encryption
  - This complete process of key exchange and encryption is collectively called PKI (Public Key Infrastructure)

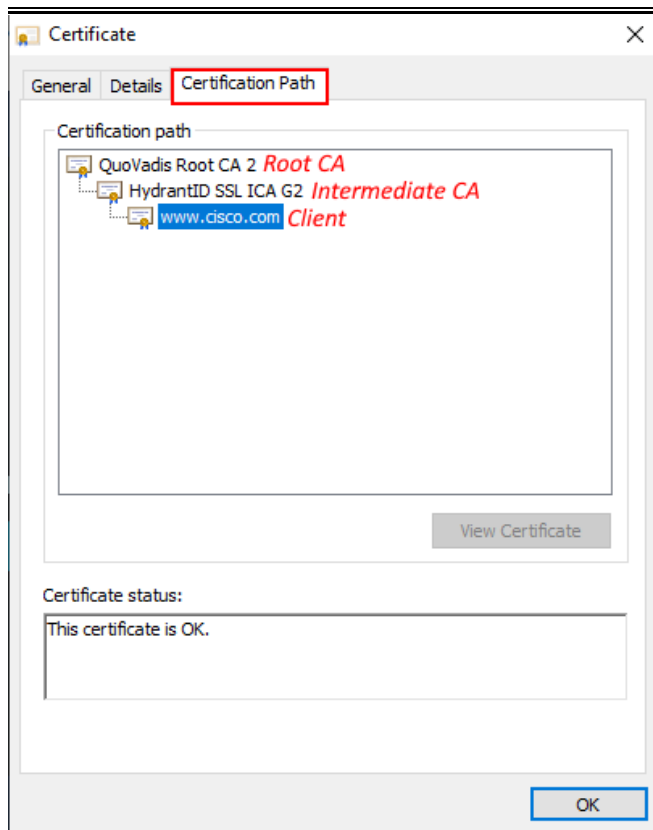
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## Understanding Public CA Signed Certificate

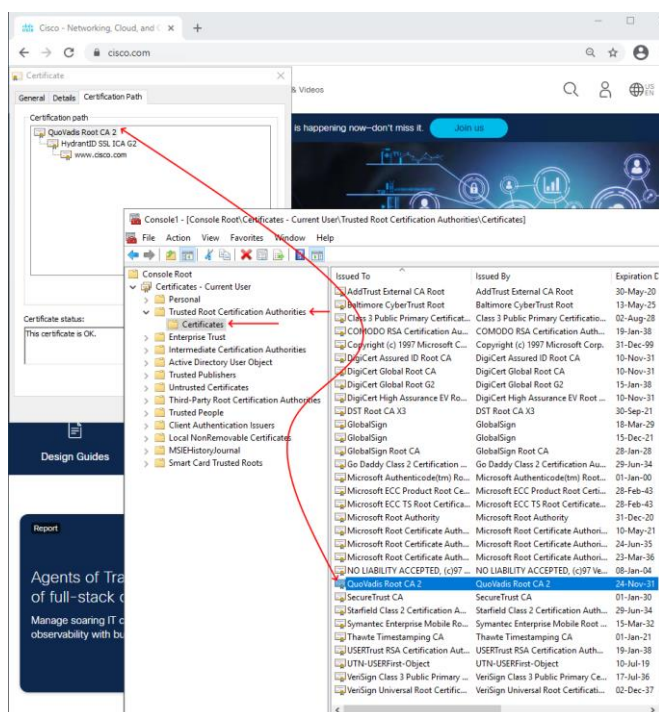
- These certificates are signed by a central Certificate Authority CA
- When we browse any SSL enabled website, we can click on the lock sign and view the certificate



- **Issued to:** Tells that this certificate has been issued to www.cisco.com
- **Issued by:** The globally trusted Certificate Authority CA who signed the certificate
- **Validity:** Is the date range that this certificate is usable

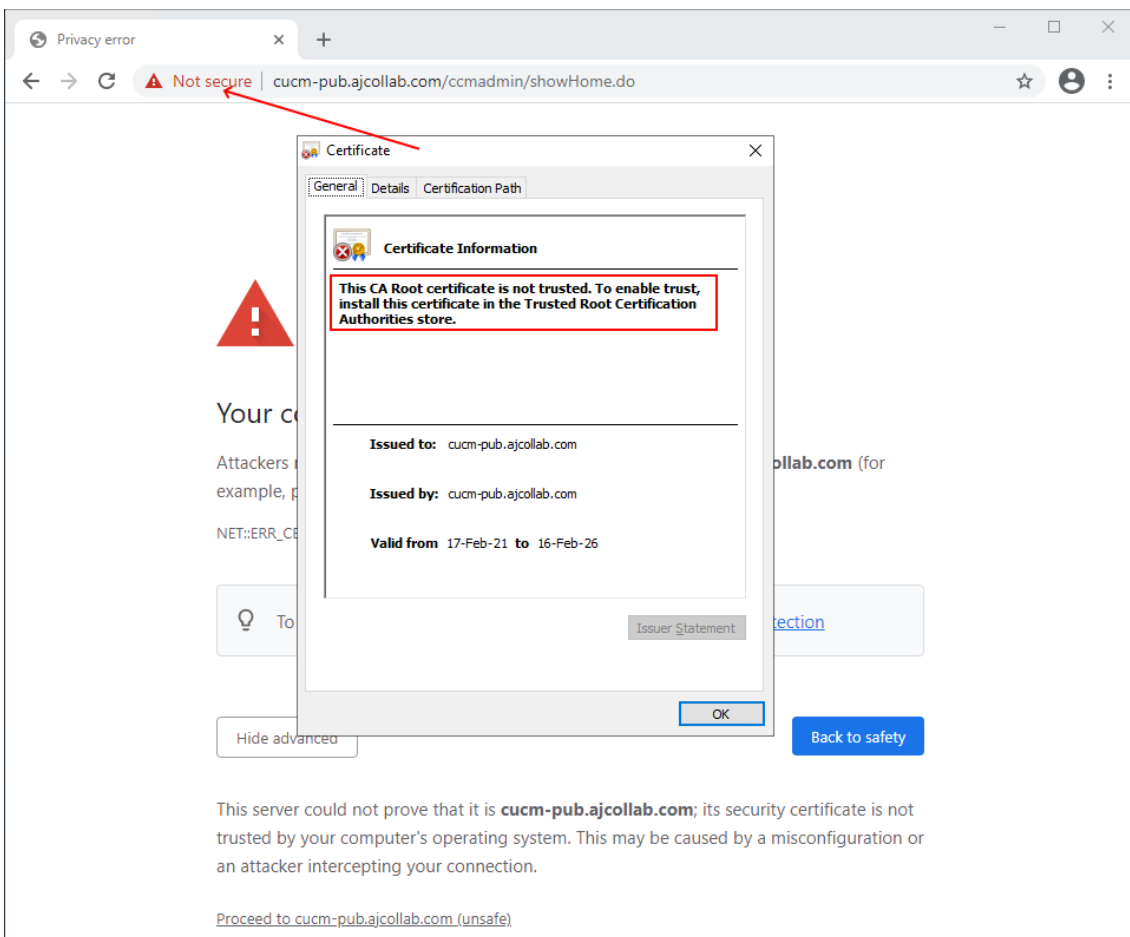
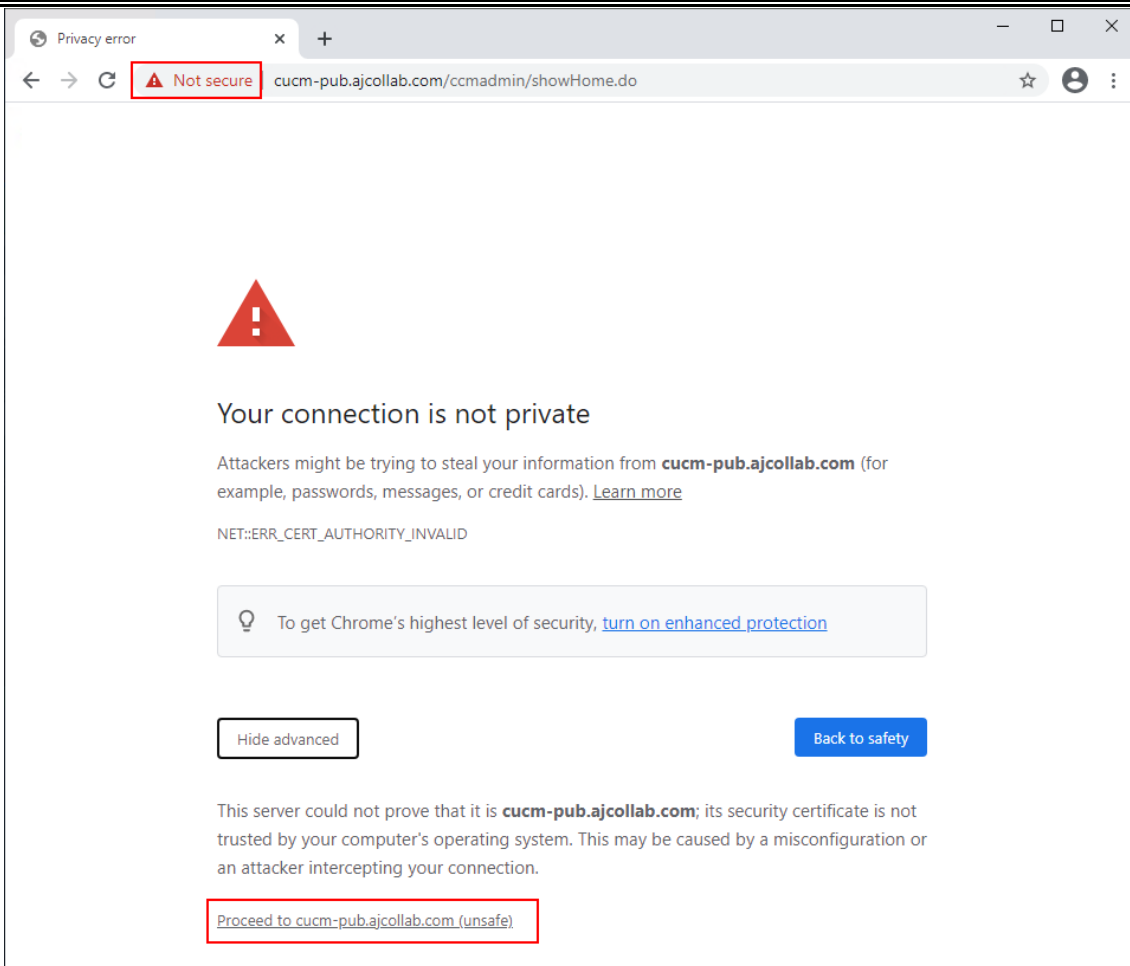


- If we go to the Certification Path, we could see the Authority Chain
- Here 'QuoVadis Root CA 2' is the Root Level CA and 'HydrantID SSL ICA G2' is the Intermediate CA who signs the certificate
- Here my system trusts the 'QuoVadis Root CA 2' authority since my OS Manufacture has installed 'QuoVadis Root CA 2' inside my operating system itself



- You can verify this by going to MMC >> Add or Remove Snap-in >> Certificates >> Trusted Root Certification Authorities >> Certificates

- Getting a public CA signed certificate involve some cost, it is not free
- If the signing authority is not trusted, we will get warning whether to accept or reject the certificate. When we accept the certificate, it will be added to the Trusted Root CA section of your OS or locally store on the browsers

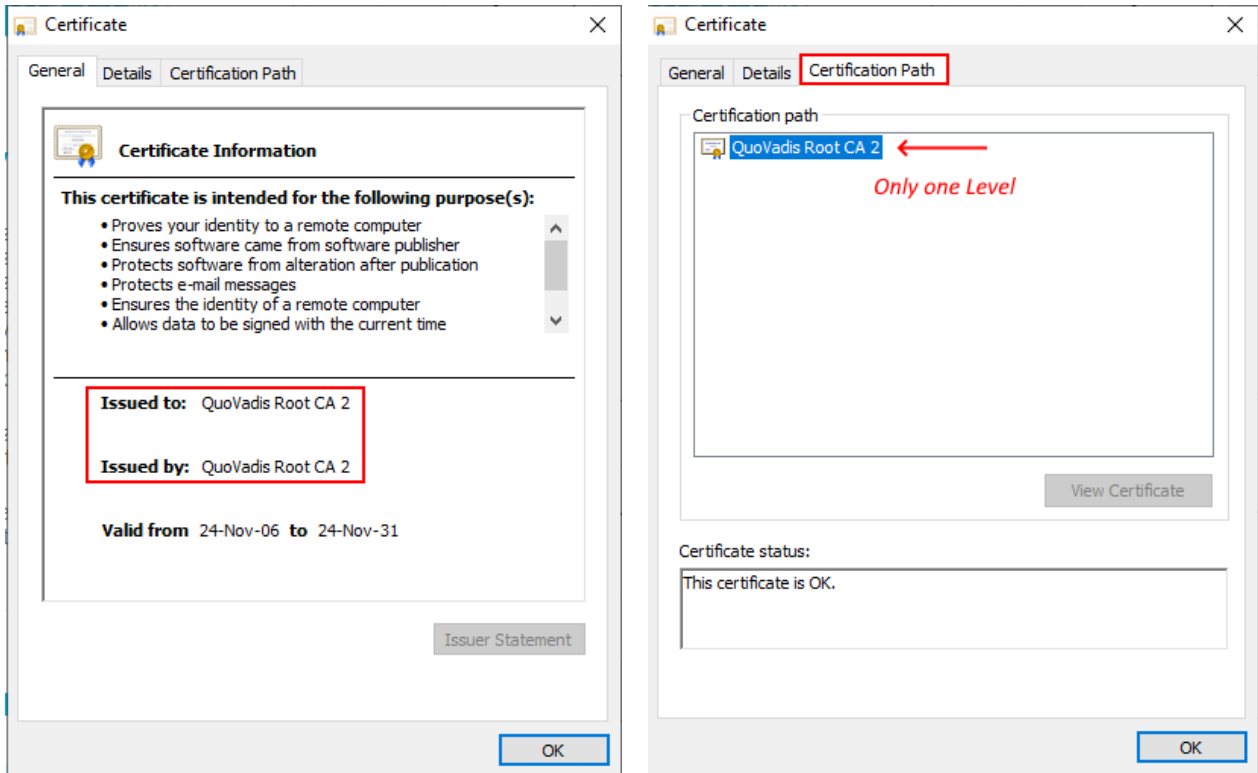




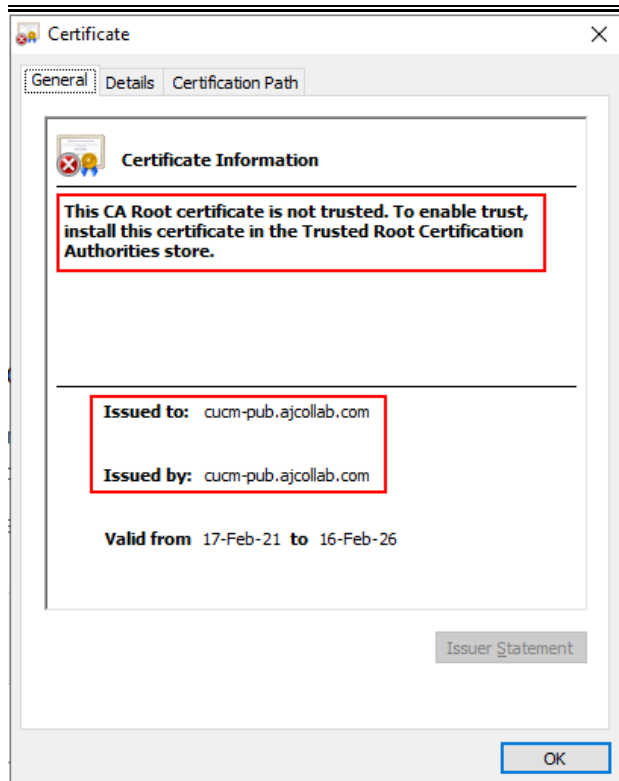
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## Understanding Self Signed Certificate

- Who will sign the certificate of Root CA? We know that there is not entity above that. Hence the certificate of CA is signed by CA itself
- Such certificates are called Self Signed Certificates



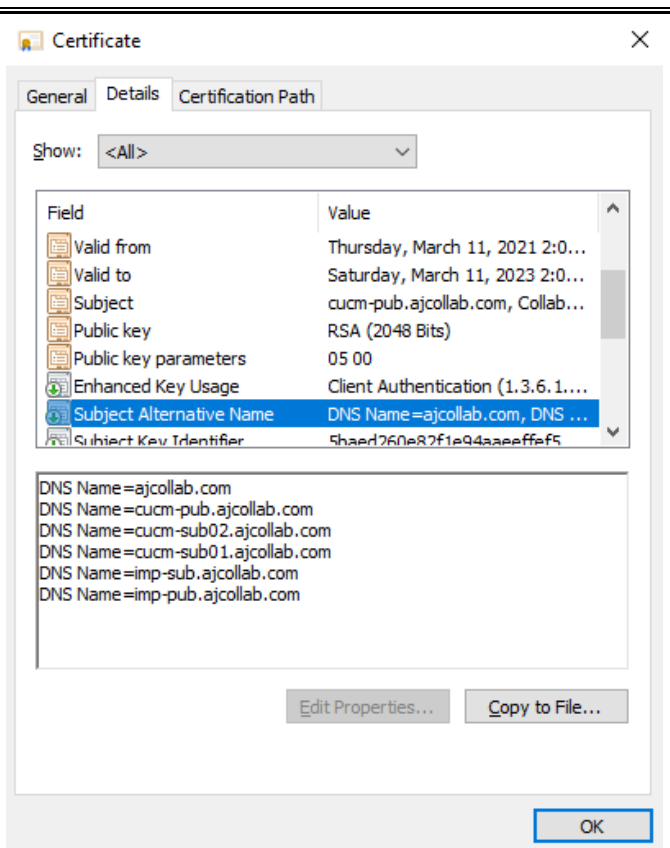
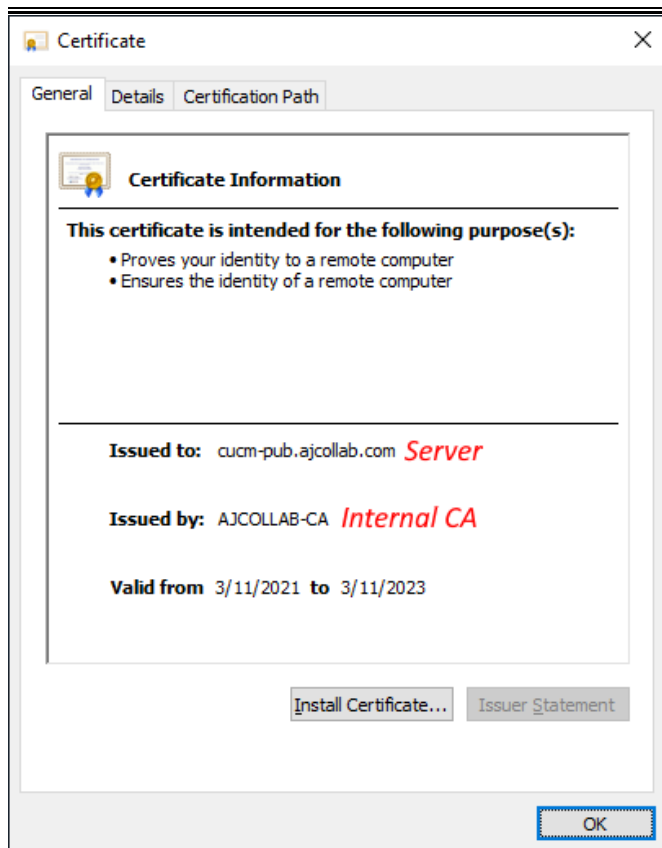
- If the Issued to and Issued by are the same system, then the certificate is called Self Signed Certificate. Also, the Certification path will have only one level



- When we install CUCM, it will have some self-signed certificates, means CUCM will sign its own certificate. CUCM is not a CA but it generates a certificate during the installation
- This certificate is not trusted by our OS; hence we get warning when we browse the CUCM web page

### Internal or Enterprise CA Signed Certificate

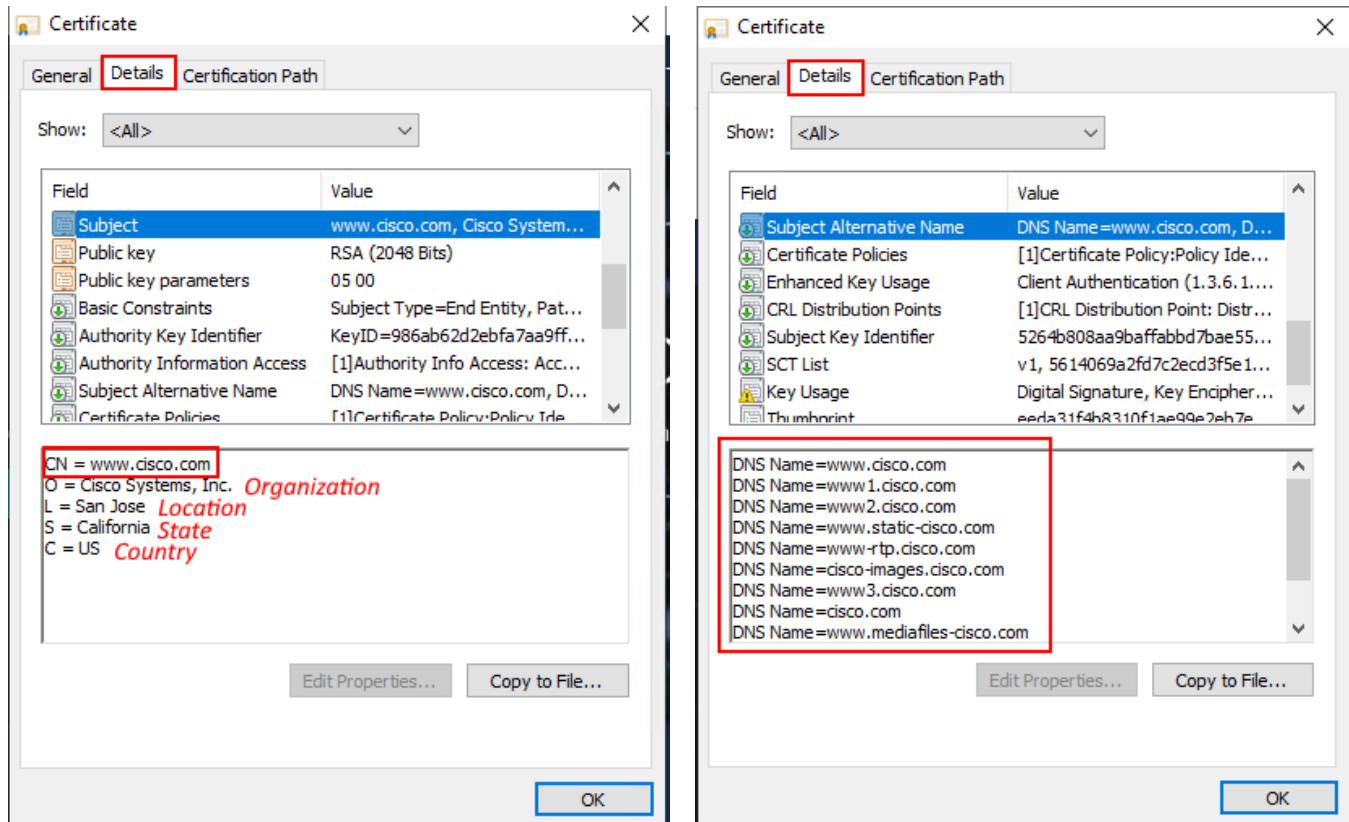
- Since getting a Public CA Signed certificate is not feasible for all the servers in an enterprise and manually accepting the certificate warning of self-signed certificate gives end user uncertainties, to address this issue, we use Enterprise or Internal CA
- The internal CA Certificate is trusted by all the entities in the organization (installed in Trusted Root CA) hence we can trust the connection, as well as we don't get the warning
- We can enable Microsoft Windows Server to be an Internal CA server, then use this server to issue certificates for all systems in the organization



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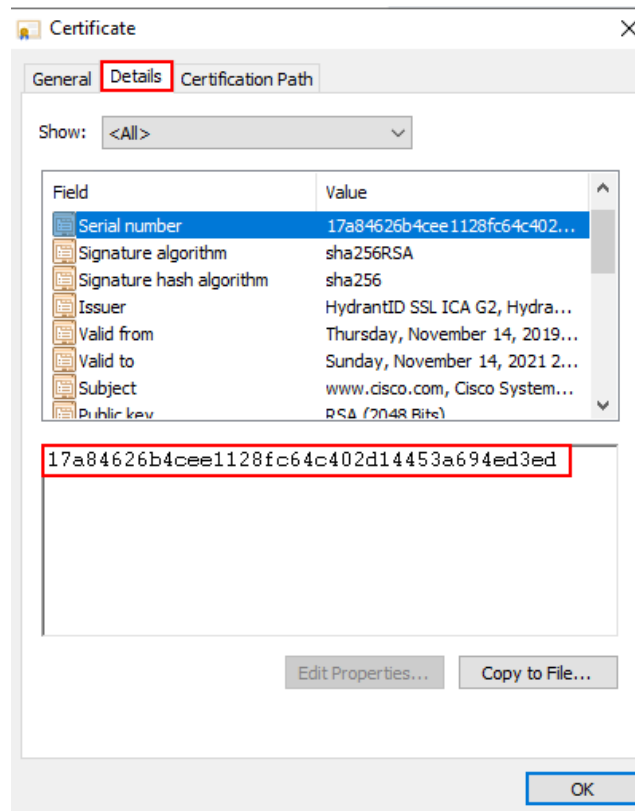
## Understanding Components of Certificates

- **Common Names (CN)** references to the IP address or Fully Qualified Domain Name (FQDN) of the address that is requested. For instance, if you enter `https://www.cisco.com`, then the CN or SAN must have `www.cisco.com` in the header
- **Subject Alternative Names (SAN)** references other FQDNs that can use the same certificate. This will be an alternate FQDN of the or different server that offers same service

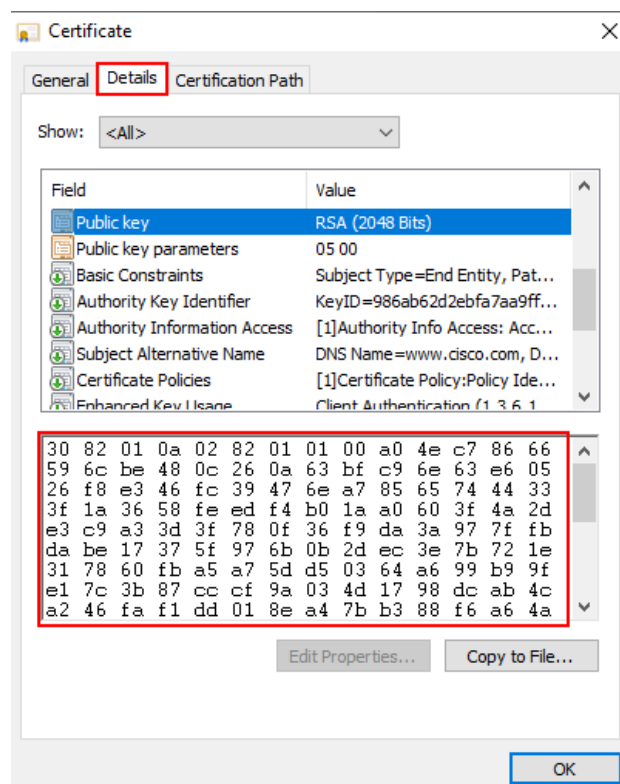


- We can see the above information in the Details tab of the Certificate
- Here all other FQDNs can use the same certificate. These fields are added by CA after receiving our Certificate Signing Request (CSR)
- The URL request for `www.cisco.com` from the browser checks the URL FQDN against the information the CN or SAN of certificate.
- In this case, they match, and it shows the SSL handshake is successful. This website has been verified to be the correct website and communications are now encrypted between the desktop and the website
- In this case Certificates CN must be `www.cisco.com` or SAN must contain `www.cisco.com`
- In CUCM infrastructure, we can use all the Subscriber servers FQDNs as SAN field so that only one certificate is needed for the entire cluster

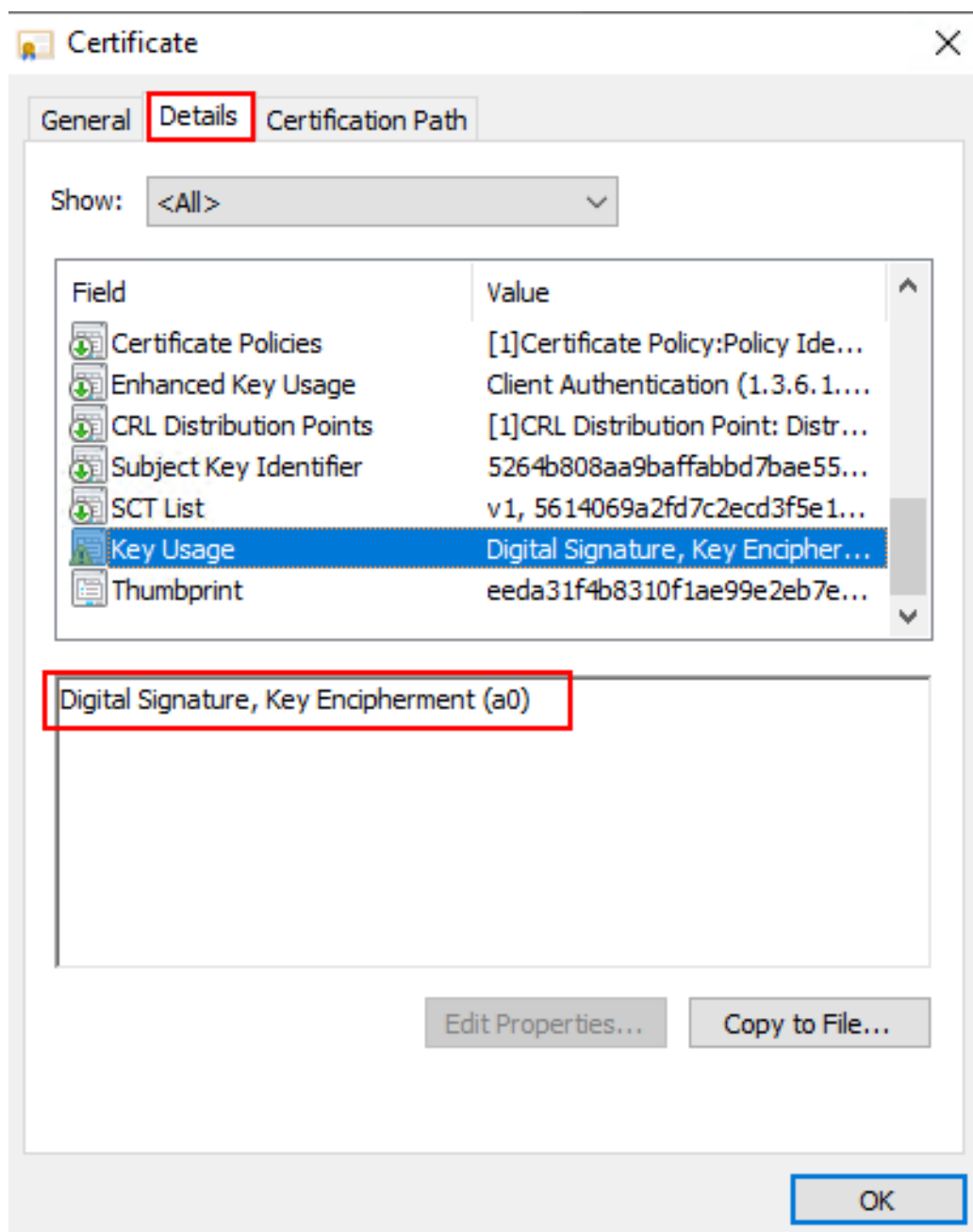
- **Serial Number:** All certificates have a unique serial number. You can use this to compare if the certificates are the same certificates, regenerated, or bogus



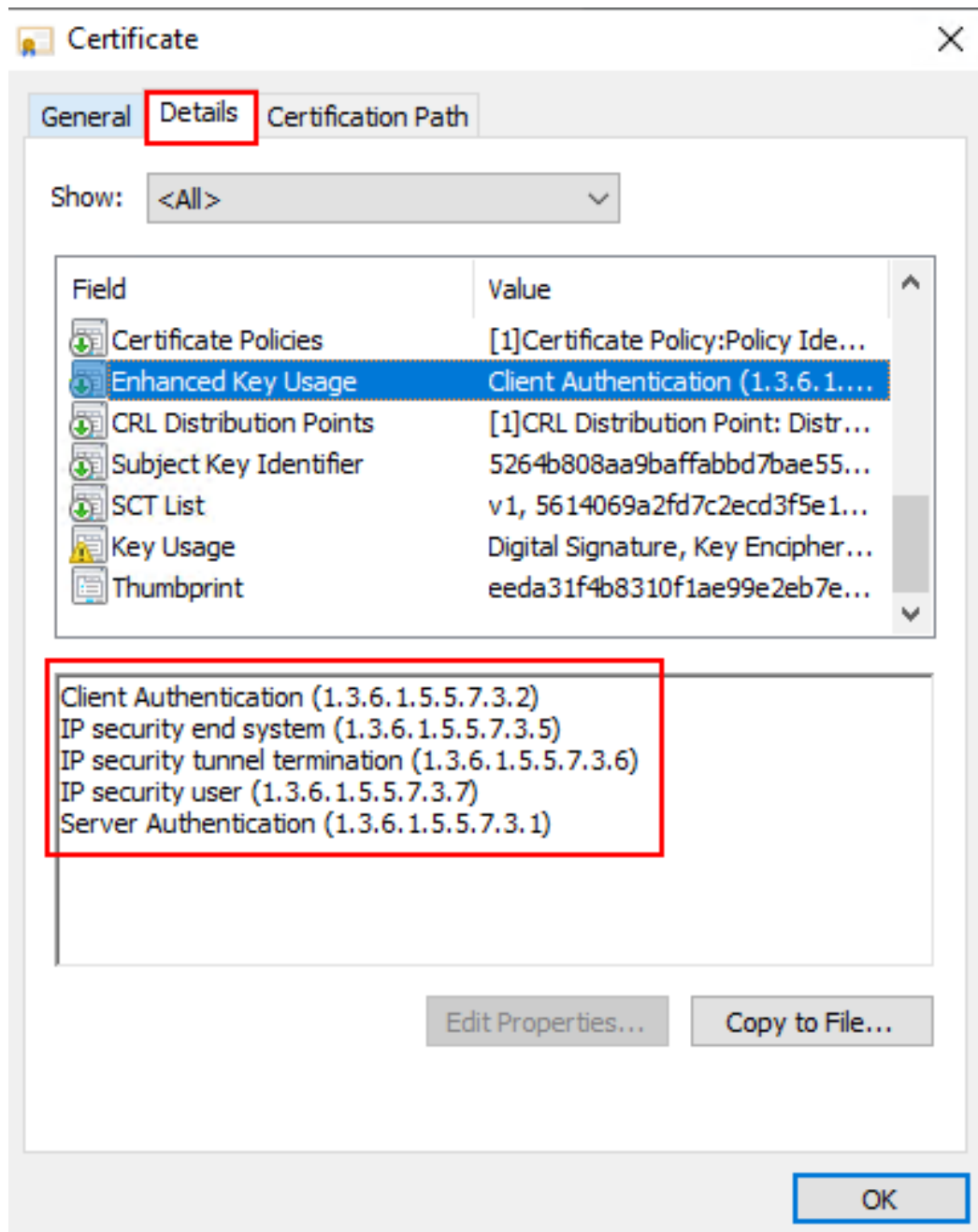
- **Public Key:** Used to encrypt the data during communication. It is based on PKI infrastructure. Client uses server's Public Key to encrypt the data, Whatever data is encrypted by the Public Key, only same server's private key can decrypt



- **Key Usage:** This extension defines the purpose of the public key contained in a certificate
  - Key encipherment: Indicates that the certificate may be used to encrypt the symmetric key
  - Digital signature: When public key used to verify the authenticity
  - Data Encipherment: When the public key is used for encrypting user data, other than cryptographic keys
  - Certificate Signing: When public key is used to verify a signature on certificates. This extension can be used only in CA or self-signed certificates
  - Key agreement: Use when the sender and receiver of the public key need to derive the key without using encryption. This key can then be used to encrypt messages between the sender and receiver



- **Enhanced Key Usage:** This is an extension of key usage, it used for non-critical purpose
  - Server authentication: Digital signature, key encipherment or key agreement
  - Client authentication: Digital signature and/or key agreement



# CUCM SSL Certificates

## Tomcat

- CUCM WEB GUI uses Tomcat Certificate to encrypt HTTP communications to the server
- Phones will use this certificate when they access HTTPS services like Corporate Directory
- Secure Extension Mobility and Secure Extension Mobility Cross Cluster
- Below figure shows the Tomcat certificates in CUCM right after the cluster installation
- The highlighted one is the CUCM-PUB self-signed certificate

**Certificate List**

Find Certificate List where: Certificate begins with tomcat, Key Type begins with rsa

| Certificate  | Common Name             | Type        | Key Type | Distribution            | Issued By               | Expiration | Description                                 |
|--------------|-------------------------|-------------|----------|-------------------------|-------------------------|------------|---------------------------------------------|
| tomcat       | cucm-pub.ajcollab.com   | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com   | 02/16/2026 | Self-signed certificate generated by system |
| tomcat-trust | cucm-sub01.ajcollab.com | Self-signed | RSA      | cucm-sub01.ajcollab.com | cucm-sub01.ajcollab.com | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub02.ajcollab.com | Self-signed | RSA      | cucm-sub02.ajcollab.com | cucm-sub02.ajcollab.com | 02/17/2026 | Signed Certificate                          |
| tomcat-trust | imp-pub.ajcollab.com    | Self-signed | RSA      | imp-pub.ajcollab.com    | imp-pub.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-pub.ajcollab.com   | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com   | 02/16/2026 | Trust Certificate                           |
| tomcat-trust | imp-sub.ajcollab.com    | Self-signed | RSA      | imp-sub.ajcollab.com    | imp-sub.ajcollab.com    | 02/17/2026 | Trust Certificate                           |

**Certificate Details (Self-signed) — Mozilla Firefox**

Find Certificate List where: Certificate begins with tomcat, Key Type begins with rsa

**Certificate Settings**

File Name: tomcat.pem  
Certificate Purpose: tomcat  
Certificate Type: certs  
Certificate Group: product-cpi  
Description (friendly name): Self-signed certificate generated by system

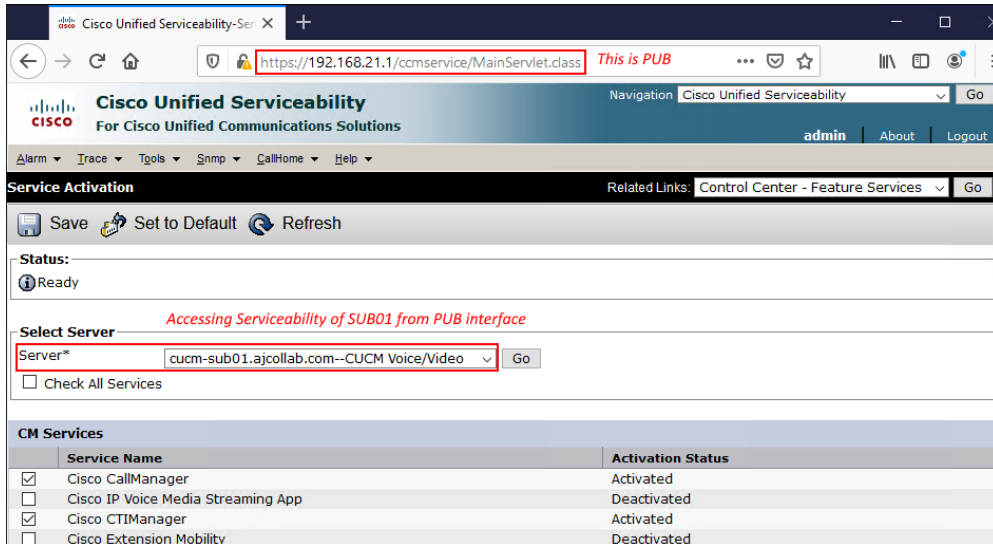
**Certificate File Data**

```
[
 Version: V3
 Serial Number: 511D2EC283C99AEAC43885A88884D4E8
 Signature: sha256withRSA (1.2.840.113549.1.1.11)
 Issuer Name: L=Bangalore, ST=Karnataka, CN=cucm-pub.ajcollab.com, OU=Collab, O=Aj Collab, C=IN
 Validity From: Wed Feb 17 14:32:10 IST 2021
 To: Mon Feb 16 14:32:09 IST 2026
 Subject Name: ucspub01.ajcollab.com, cn=cucm-pub.ajcollab.com, ou=Collab, o=Aj Collab, c=IN
 Key: RSA (1.2.840.113549.1.1.1)
 Key value:
 3082010a0282010100b640f50c2bc0dae60738644b9744de049b6a5e9a3d10f8eb999970fb5069
 174359c3362744402370f2a0f0347ed98931d65c5e0d0225b151ad7f533abba325075eab05e007
 f60f01c39e6351ba5f1a9a82882120335354547ff1f129abd700d50e0f7672e738e877271c2444ff
 9a40a10ce88046e6446b6081b193b385a7774ec40386152a4792ac81811769566b4c4ef198
 -----END CERTIFICATE-----
]
```

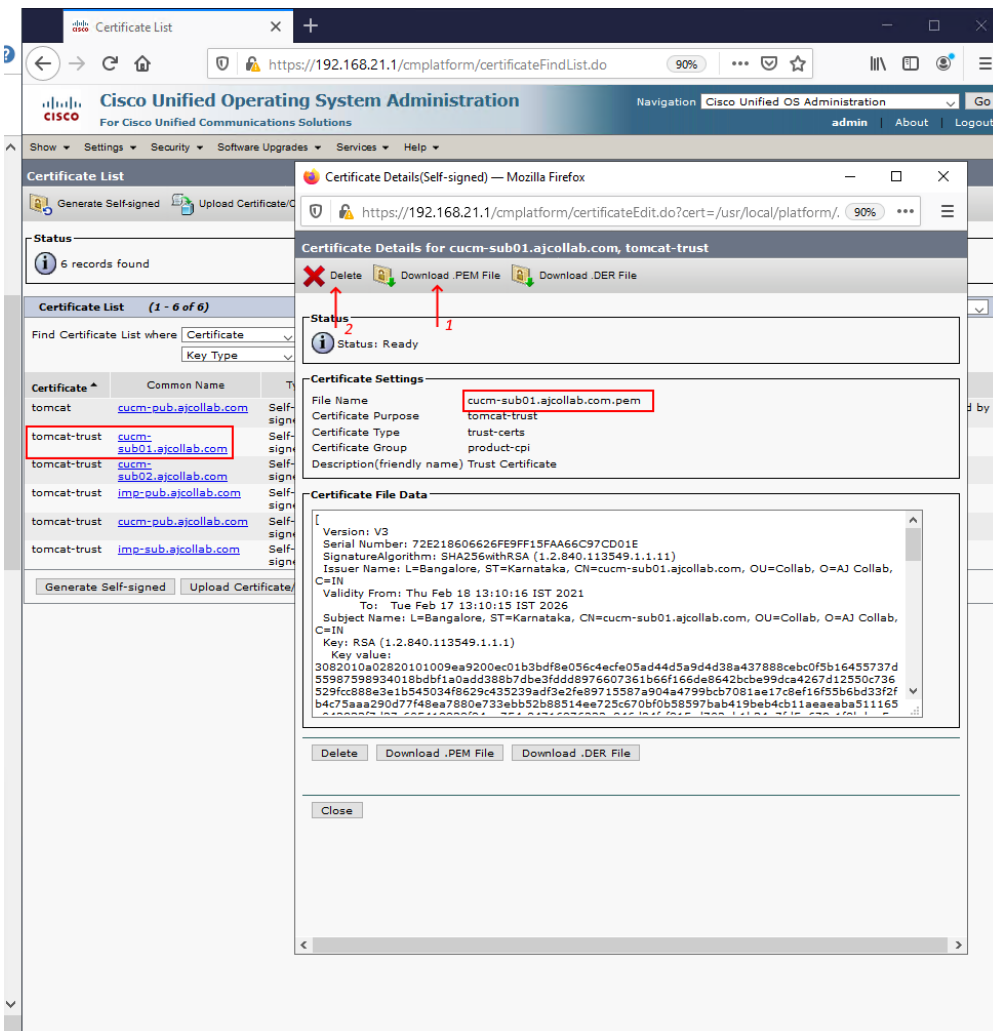


## Tomcat Trust

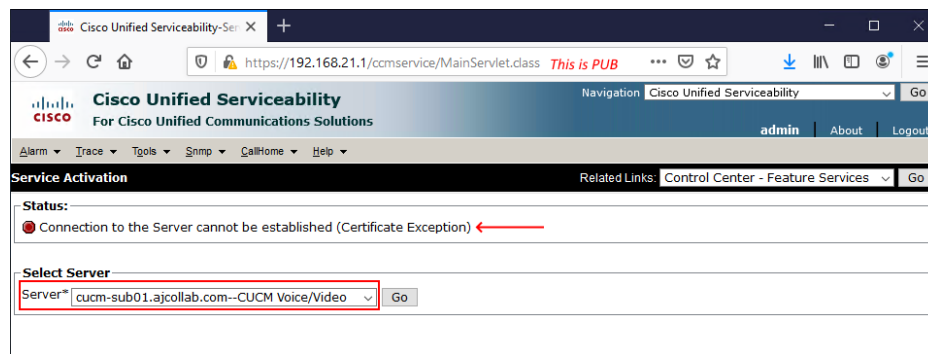
- Tomcat trust store will have self-signed certificates of other nodes; hence we will be able to access other nodes from Service Ability Page of CUCM



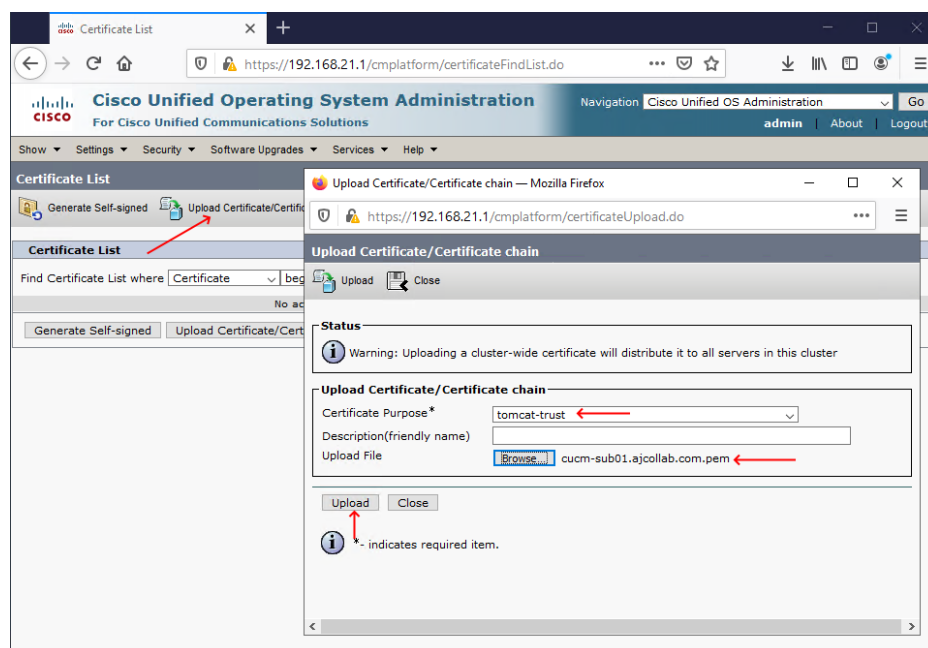
- What if I delete the tomcat-trust of CUCM-SUB01 from PUB? I'm going to delete the tomcat-trust of 'cucm-sub01.ajcollab.com' from CUCM-PUB after downloading it (so that I can upload it back again)



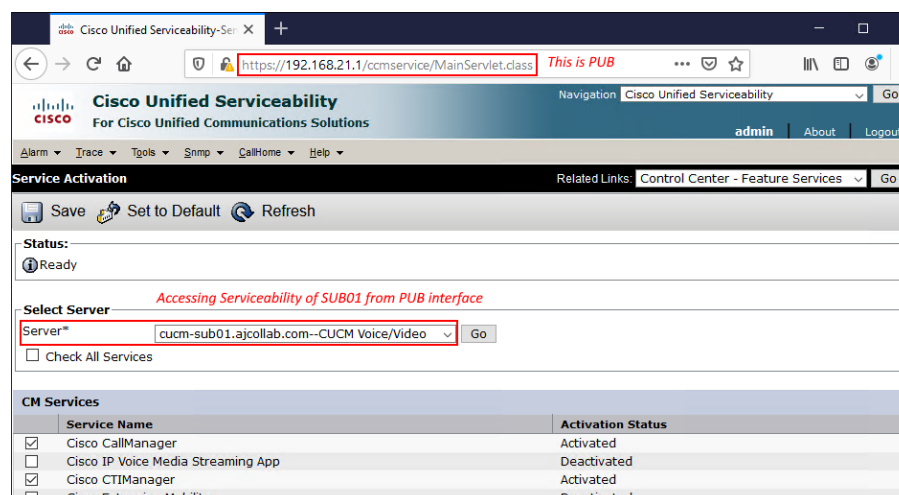
- Now if I access CUCM-SUB01 from serviceability of CUCM-PUB, I get “Connection to the Server cannot be established (Certificate Exception)” error



- Upload the CUCM-SUB01 certificate back to CUCM-PUB as tomcat-trust and then try to access the Serviceability of CUCM-SUB01 from CUCM-PUB

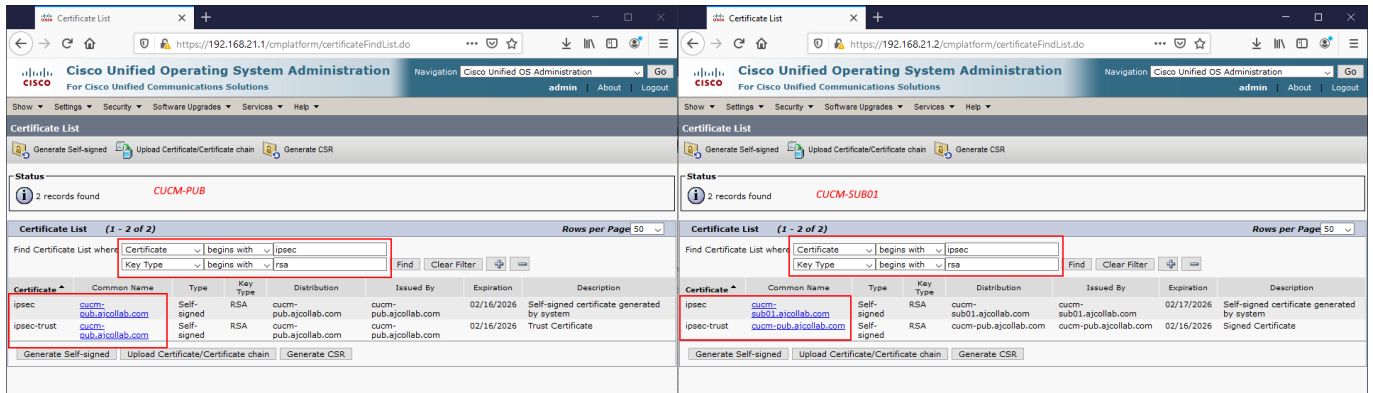


- We will be able to access the Serviceability of SUCM-SUB01 from CUCM-PUB.
- Though it asks for restarting Cisco Tomcat service after the trust certificate upload, it is not necessary, but it is recommended

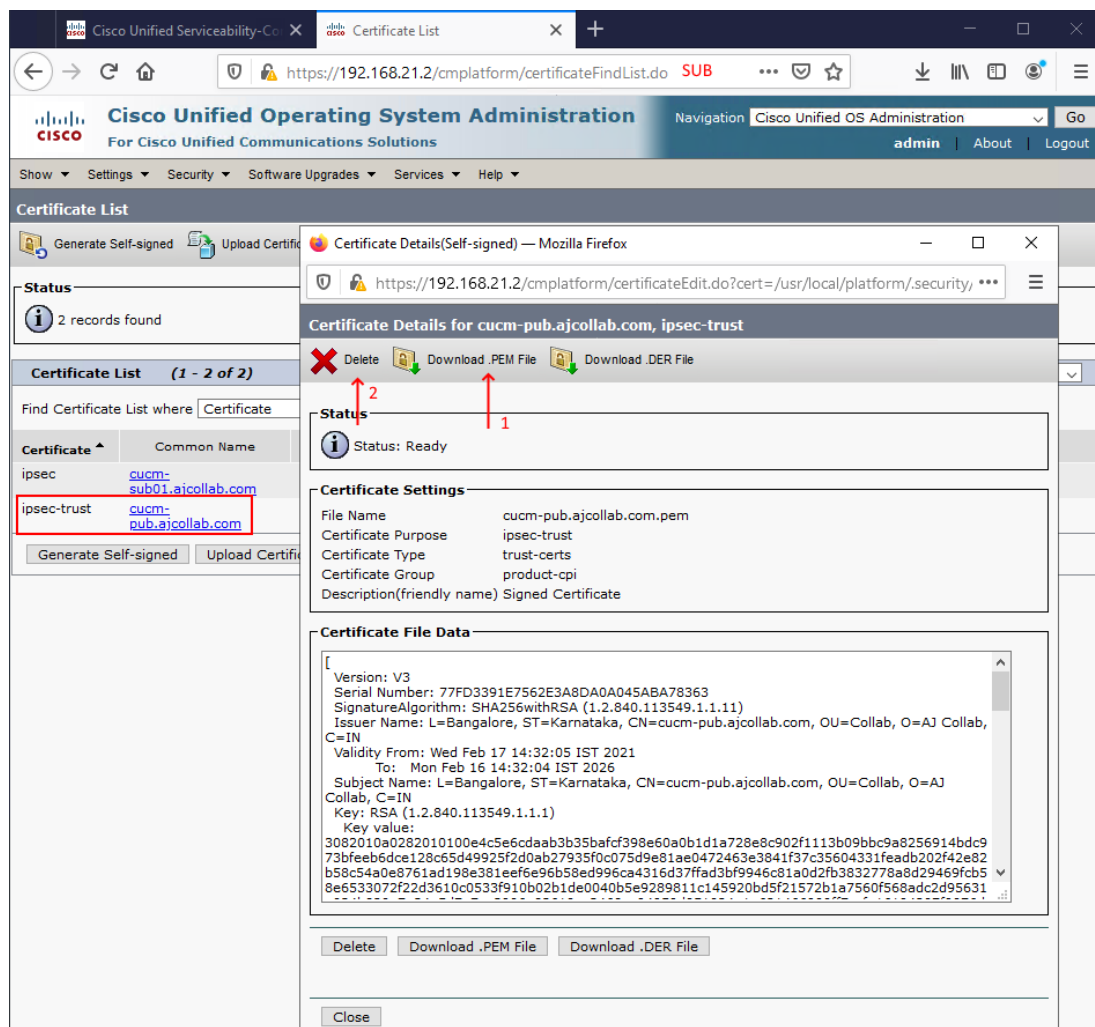


## IPSec

- Disaster Recovery System (DRS) or Disaster Recovery Framework (DRF) uses IPSec while communicating between DRF Master and DRF Local
- We use CUCM-PUB as the master server to take backup of other servers
- CUCM-PUB will have CUCM-PUB IPSec and CUCM-PUB as IPSec trust
- All Subscribers will have its own IPSec and CUCM-PUB IPSec certificate as IPSec trust certificate



- To test the DRF failure, you can delete the IPSec Trust certificate from CUCM-SUB01, the backup will fail (download the certificate before delete)



- We can see the DRS Backup failed for CUCM-SUB01

Backup Status

Cisco Unified Operating System

<https://192.168.21.1/dfs/backupstatus.do>
70%

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Backup Status

Refresh Cancel

**Status**  
ERROR: Unable to transfer the tar file over SFTP channel as currently configured SFTP server does not support output stream, Backup Completed...

**Backup details**  
Tar Filename: 2021-02-27-00-03-11.tar  
Backup Device: NETWORK  
Operation: BACKUP  
Percentage Complete: 87%

| Feature         | Server     | Component  | Status | Result ** | Start Time                   | Log File *                                                  |
|-----------------|------------|------------|--------|-----------|------------------------------|-------------------------------------------------------------|
| IM_AND_PRESENCE | IMP-PUB    | PLATFORM   | 100    | SUCCESS   | Sat Feb 27 00:03:11 IST 2021 | 2021-02-27-00-03-11-b-imp:pub-im_and_presence-platform.log  |
| IM_AND_PRESENCE | IMP-PUB    | CLM        | 100    | SUCCESS   | Sat Feb 27 00:03:22 IST 2021 | 2021-02-27-00-03-11-b-imp:pub-im_and_presence-clm.log       |
| IM_AND_PRESENCE | IMP-PUB    | XCP        | 100    | SUCCESS   | Sat Feb 27 00:03:23 IST 2021 | 2021-02-27-00-03-11-b-imp:pub-im_and_presence-xcp.log       |
| IM_AND_PRESENCE | IMP-PUB    | PREFS      | 100    | SUCCESS   | Sat Feb 27 00:05:17 IST 2021 | 2021-02-27-00-03-11-b-imp:pub-im_and_presence-prefs.log     |
| IM_AND_PRESENCE | IMP-PUB    | TCT        | 100    | SUCCESS   | Sat Feb 27 00:05:18 IST 2021 | 2021-02-27-00-03-11-b-imp:pub-im_and_presence-tct.log       |
| IM_AND_PRESENCE | IMP-PUB    | SYSLOGAGT  | 100    | SUCCESS   | Sat Feb 27 00:05:19 IST 2021 | 2021-02-27-00-03-11-b-imp:pub-im_and_presence-syslogagt.log |
| IM_AND_PRESENCE | IMP-PUB    | CDPAGT     | 100    | SUCCESS   | Sat Feb 27 00:05:19 IST 2021 | 2021-02-27-00-03-11-b-imp:pub-im_and_presence-cdpagt.log    |
| IM_AND_PRESENCE | IMP-PUB    | DB         | 100    | SUCCESS   | Sat Feb 27 00:05:20 IST 2021 | 2021-02-27-00-03-11-b-imp:pub-im_and_presence-db.log        |
| IM_AND_PRESENCE | IMP-SUB    | PLATFORM   | 100    | SUCCESS   | Sat Feb 27 00:05:46 IST 2021 | 2021-02-27-00-03-11-b-imp:sub-im_and_presence-platform.log  |
| IM_AND_PRESENCE | IMP-SUB    | CLM        | 100    | SUCCESS   | Sat Feb 27 00:05:58 IST 2021 | 2021-02-27-00-03-11-b-imp:sub-im_and_presence-clm.log       |
| IM_AND_PRESENCE | IMP-SUB    | XCP        | 100    | SUCCESS   | Sat Feb 27 00:05:59 IST 2021 | 2021-02-27-00-03-11-b-imp:sub-im_and_presence-xcp.log       |
| IM_AND_PRESENCE | IMP-SUB    | CDPAGT     | 100    | SUCCESS   | Sat Feb 27 00:07:57 IST 2021 | 2021-02-27-00-03-11-b-imp:sub-im_and_presence-cdpagt.log    |
| IM_AND_PRESENCE | IMP-SUB    | TCT        | 100    | SUCCESS   | Sat Feb 27 00:07:58 IST 2021 | 2021-02-27-00-03-11-b-imp:sub-im_and_presence-tct.log       |
| IM_AND_PRESENCE | IMP-SUB    | SYSLOGAGT  | 100    | SUCCESS   | Sat Feb 27 00:07:59 IST 2021 | 2021-02-27-00-03-11-b-imp:sub-im_and_presence-syslogagt.log |
| PLM             | CUCM-SUB01 | ELM-AGENT  | 100    | SUCCESS   | Sat Feb 27 00:07:59 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub01-elm-elm-agent.log          |
| PLM             | CUCM-SUB01 | ELM-SERVER | 100    | SUCCESS   | Sat Feb 27 00:08:00 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub01-elm-elm-server.log         |
| PLM             | CUCM-SUB02 | ELM-AGENT  | 100    | SUCCESS   | Sat Feb 27 00:08:01 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub02-elm-elm-agent.log          |
| PLM             | CUCM-SUB02 | ELM-SERVER | 100    | SUCCESS   | Sat Feb 27 00:08:02 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub02-elm-elm-server.log         |
| PLM             | CUCM-PUB   | ELM-AGENT  | 100    | SUCCESS   | Sat Feb 27 00:08:02 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-elm-elm-agent.log            |
| PLM             | CUCM-PUB   | ELM-SERVER | 100    | SUCCESS   | Sat Feb 27 00:08:03 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-elm-elm-server.log           |
| CDR_CAR         | CUCM-PUB   | CAR        | 100    | SUCCESS   | Sat Feb 27 00:08:04 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-cdr-car-car.log              |
| UCM             | CUCM-PUB   | ANN        | 100    | SUCCESS   | Sat Feb 27 00:09:42 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-ann.log                  |
| UCM             | CUCM-PUB   | MOH        | 100    | SUCCESS   | Sat Feb 27 00:09:43 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-moh.log                  |
| UCM             | CUCM-PUB   | PLATFORM   | 100    | SUCCESS   | Sat Feb 27 00:09:46 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-platform.log             |
| UCM             | CUCM-PUB   | CLM        | 100    | SUCCESS   | Sat Feb 27 00:09:48 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-clm.log                  |
| UCM             | CUCM-PUB   | TCT        | 100    | SUCCESS   | Sat Feb 27 00:09:48 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-tct.log                  |
| UCM             | CUCM-PUB   | CCMPREFS   | 100    | SUCCESS   | Sat Feb 27 00:09:49 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-ccmprefs.log             |
| UCM             | CUCM-PUB   | CCMDB      | 100    | SUCCESS   | Sat Feb 27 00:09:52 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-ccmdb.log                |
| UCM             | CUCM-PUB   | SYSLOGAGT  | 100    | SUCCESS   | Sat Feb 27 00:10:09 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-syslogagt.log            |
| UCM             | CUCM-PUB   | CDPAGT     | 100    | SUCCESS   | Sat Feb 27 00:10:10 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-cdpagt.log               |
| UCM             | CUCM-PUB   | TFTP       | 100    | SUCCESS   | Sat Feb 27 00:10:11 IST 2021 | 2021-02-27-00-03-11-b-cucm:pub-ucm-tftp.log                 |
| UCM             | CUCM-SUB01 | PLATFORM   | 0      | ERROR     | Sat Feb 27 00:13:14 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub01-ucm-platform.log           |
| UCM             | CUCM-SUB01 | CLM        | 0      | CANCELLED | ---                          | 2021-02-27-00-03-11-b-cucm:sub01-ucm-clm.log                |
| UCM             | CUCM-SUB01 | CDPAGT     | 0      | CANCELLED | ---                          | 2021-02-27-00-03-11-b-cucm:sub01-ucm-cdpagt.log             |
| UCM             | CUCM-SUB01 | SYSLOGAGT  | 0      | CANCELLED | ---                          | 2021-02-27-00-03-11-b-cucm:sub01-ucm-syslogagt.log          |
| UCM             | CUCM-SUB01 | TCT        | 0      | CANCELLED | ---                          | 2021-02-27-00-03-11-b-cucm:sub01-ucm-tct.log                |
| UCM             | CUCM-SUB02 | PLATFORM   | 100    | SUCCESS   | Sat Feb 27 00:13:24 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub02-ucm-platform.log           |
| UCM             | CUCM-SUB02 | CLM        | 100    | SUCCESS   | Sat Feb 27 00:13:26 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub02-ucm-clm.log                |
| UCM             | CUCM-SUB02 | CDPAGT     | 100    | SUCCESS   | Sat Feb 27 00:13:26 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub02-ucm-cdpagt.log             |
| UCM             | CUCM-SUB02 | SYSLOGAGT  | 100    | SUCCESS   | Sat Feb 27 00:13:27 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub02-ucm-syslogagt.log          |
| UCM             | CUCM-SUB02 | TCT        | 100    | SUCCESS   | Sat Feb 27 00:13:28 IST 2021 | 2021-02-27-00-03-11-b-cucm:sub02-ucm-tct.log                |


Refresh Cancel Backup

\* Click on the filename to view the log file

\*\* Result column indicates results of staging of individual components. Status section indicates the entire Backup Status

The DRS backup has a timeout of 20 hours associated with it. If your backup does not complete within 20 hours, the DRS process will be timed out.

- You can re-upload the CUCM-PUB IPsec certificate to CUCM-SUB01 as IPsec trust to perform proper backup


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**Backup Status**

**Status**  
 SUCCESS: Backup Completed...

**Backup details**  
 Tar Filename: 2021-02-27-00-41-07.tar  
 Backup Device: NETWORK  
 Operation: BACKUP  
 Percentage Complete: 100%

| Feature | Server     | Component  | Status | Result ** | Start Time                   | Log File *                                                          |
|---------|------------|------------|--------|-----------|------------------------------|---------------------------------------------------------------------|
| PLM     | CUCM-SUB01 | ELM-AGENT  | 100    | SUCCESS   | Sat Feb 27 00:41:07 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub01_plm_elm-agent.log</a>  |
| PLM     | CUCM-SUB01 | ELM-SERVER | 100    | SUCCESS   | Sat Feb 27 00:41:07 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub01_plm_elm-server.log</a> |
| PLM     | CUCM-SUB02 | ELM-AGENT  | 100    | SUCCESS   | Sat Feb 27 00:41:08 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub02_plm_elm-agent.log</a>  |
| PLM     | CUCM-SUB02 | ELM-SERVER | 100    | SUCCESS   | Sat Feb 27 00:41:09 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub02_plm_elm-server.log</a> |
| PLM     | CUCM-PUB   | ELM-AGENT  | 100    | SUCCESS   | Sat Feb 27 00:41:09 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_plm_elm-agent.log</a>    |
| PLM     | CUCM-PUB   | ELM-SERVER | 100    | SUCCESS   | Sat Feb 27 00:41:10 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_plm_elm-server.log</a>   |
| CDR_CAR | CUCM-PUB   | CAR        | 100    | SUCCESS   | Sat Feb 27 00:41:11 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_cdr_car_carlog</a>       |
| UCM     | CUCM-PUB   | ANN        | 100    | SUCCESS   | Sat Feb 27 00:42:49 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_ann.log</a>          |
| UCM     | CUCM-PUB   | MOH        | 100    | SUCCESS   | Sat Feb 27 00:42:49 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_moh.log</a>          |
| UCM     | CUCM-PUB   | PLATFORM   | 100    | SUCCESS   | Sat Feb 27 00:42:53 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_platform.log</a>     |
| UCM     | CUCM-PUB   | CLM        | 100    | SUCCESS   | Sat Feb 27 00:42:55 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_clm.log</a>          |
| UCM     | CUCM-PUB   | TCT        | 100    | SUCCESS   | Sat Feb 27 00:42:55 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_tct.log</a>          |
| UCM     | CUCM-PUB   | CCMPREFS   | 100    | SUCCESS   | Sat Feb 27 00:42:56 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_ccmprefs.log</a>     |
| UCM     | CUCM-PUB   | CCMDB      | 100    | SUCCESS   | Sat Feb 27 00:42:59 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_ccmdb.log</a>        |
| UCM     | CUCM-PUB   | SYSLOGAGT  | 100    | SUCCESS   | Sat Feb 27 00:43:16 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_syslogagt.log</a>    |
| UCM     | CUCM-PUB   | CDPAGT     | 100    | SUCCESS   | Sat Feb 27 00:43:17 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_cdpagt.log</a>       |
| UCM     | CUCM-PUB   | TFTP       | 100    | SUCCESS   | Sat Feb 27 00:43:17 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-pub_ucm_tftp.log</a>         |
| UCM     | CUCM-SUB01 | PLATFORM   | 100    | SUCCESS   | Sat Feb 27 00:46:22 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub01_ucm_platform.log</a>   |
| UCM     | CUCM-SUB01 | CLM        | 100    | SUCCESS   | Sat Feb 27 00:46:24 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub01_ucm_clm.log</a>        |
| UCM     | CUCM-SUB01 | CDPAGT     | 100    | SUCCESS   | Sat Feb 27 00:46:24 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub01_ucm_cdpagt.log</a>     |
| UCM     | CUCM-SUB01 | SYSLOGAGT  | 100    | SUCCESS   | Sat Feb 27 00:46:25 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub01_ucm_syslogagt.log</a>  |
| UCM     | CUCM-SUB01 | TCT        | 100    | SUCCESS   | Sat Feb 27 00:46:25 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub01_ucm_tct.log</a>        |
| UCM     | CUCM-SUB02 | PLATFORM   | 100    | SUCCESS   | Sat Feb 27 00:46:26 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub02_ucm_platform.log</a>   |
| UCM     | CUCM-SUB02 | CLM        | 100    | SUCCESS   | Sat Feb 27 00:46:27 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub02_ucm_clm.log</a>        |
| UCM     | CUCM-SUB02 | CDPAGT     | 100    | SUCCESS   | Sat Feb 27 00:46:28 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub02_ucm_cdpagt.log</a>     |
| UCM     | CUCM-SUB02 | SYSLOGAGT  | 100    | SUCCESS   | Sat Feb 27 00:46:28 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub02_ucm_syslogagt.log</a>  |
| UCM     | CUCM-SUB02 | TCT        | 100    | SUCCESS   | Sat Feb 27 00:46:29 IST 2021 | <a href="#">2021-02-27-00-41-07_b_cucm-sub02_ucm_tct.log</a>        |

\* Click on the filename to view the log file  
 \*\* Result column indicates results of staging of individual components. Status section indicates the entire Backup Status  
 ⓘ The DRS backup has a timeout of 20 hours associated with it. If your backup does not complete within 20 hours, the DRS process will be timed out.

---

## CallManager

- Used to sign the Phone configuration file
- Secure Session Initiation Protocol (SIP) trunks or media resources (Conference bridges, Media Termination Point (MTP), Xcoders, and so on) uses CallManager Certificate, any issues on these certificates will affect respective services
- The AXL request also uses CallManager certificate
- CUCM-PUB will have its CUCM-PUB CallManager certificate and CallManager certificates of other CUCM nodes as CallManager-trust

## Trust Verification Service (TVS)

- IP Phone won't have enough memory to store certificates, hence it keeps TVS certificate
- Phone will have the TVS Certificate of the node where it is currently registered to
- During HTTPS request from IP Phone, the certificate is verified by CUCM node where it is registered since phone doesn't have trust store
- TVS Certificate also used to authenticate configuration files

## CAPF Certificate

- Used for encryption of call signaling and media
- This enables the functionalities of CTL File
- By default, CAPF is not enabled and hence the cluster is called Non-secure cluster
- When CAPF is enabled, then the cluster is called Mixed mode cluster

Note: Cluster security is vast area to study, and it is not the scope of this article

## Table Showing Certificate and Trust Store

| CUCM-PUB    |                                                            | CUCM-SUB01  |                                                            |
|-------------|------------------------------------------------------------|-------------|------------------------------------------------------------|
| tomcat      | tomcat-trust                                               | tomcat      | tomcat-trust                                               |
| CUCM-PUB    | CUCM-PUB<br>CUCM-SUB01<br>CUCM-SUB02<br>IMP-PUB<br>IMP-PUB | CUCM-SUB01  | CUCM-PUB<br>CUCM-SUB01<br>CUCM-SUB02<br>IMP-PUB<br>IMP-PUB |
| ipsec       | ipsec-trust                                                | ipsec       | ipsec-trust                                                |
| CUCM-PUB    | CUCM-PUB                                                   | CUCM-SUB01  | CUCM-PUB                                                   |
| callmanager | callmanager-trust                                          | callmanager | callmanager-trust                                          |
| CUCM-PUB    | CUCM-SUB01<br>CUCM-SUB02                                   | CUCM-SUB01  | CUCM-PUB<br>CUCM-SUB02                                     |
| tvS         | tvS-trust                                                  | tvS         | tvS-trust                                                  |
| CUCM-PUB    |                                                            | CUCM-SUB01  |                                                            |

---

Note: When certificates are expired, we must regenerate it. For certificate regeneration process, please refer Cisco Document

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## **Certificate Signing Request - CSR**

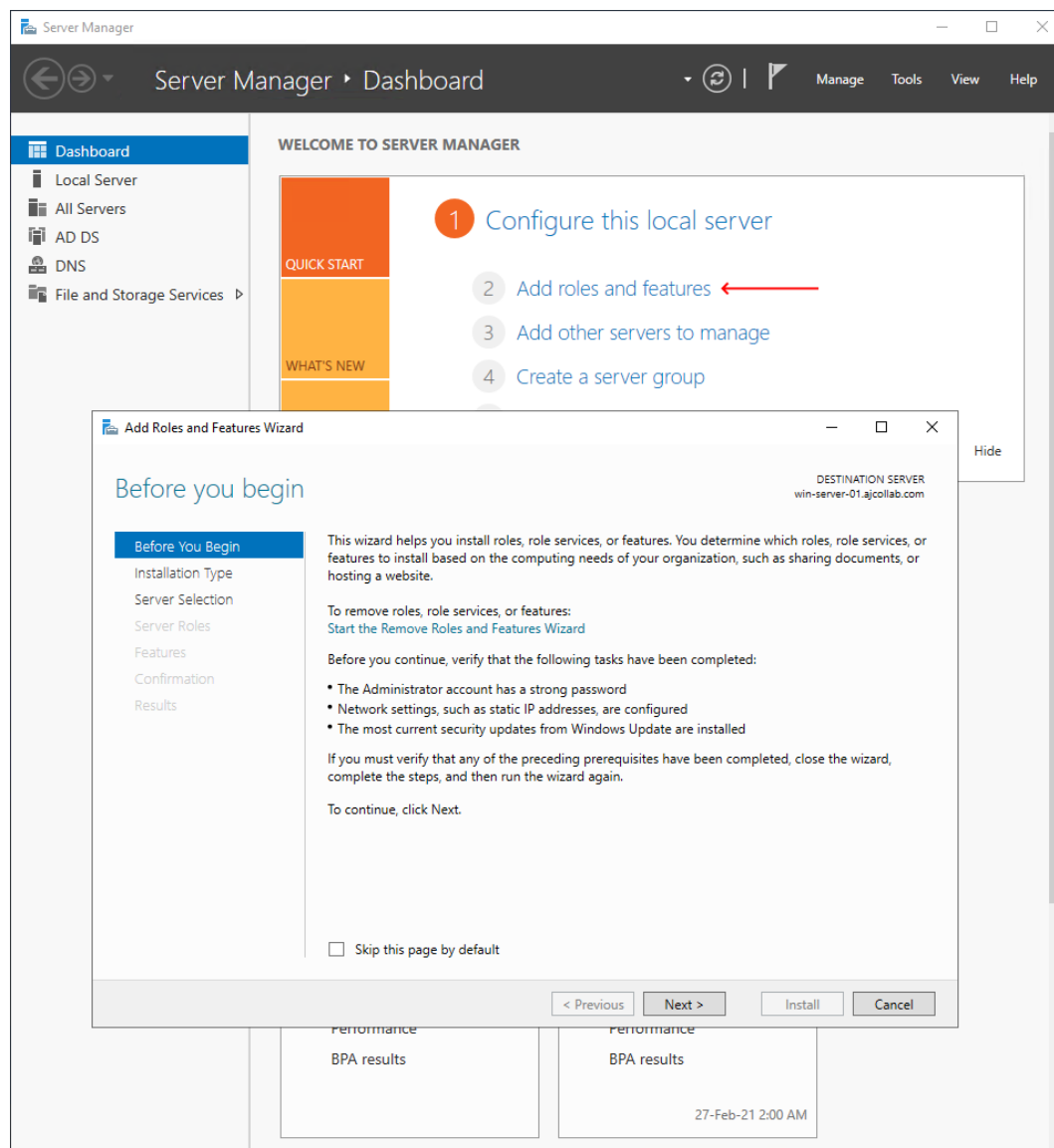
- Many of the enterprises never use self-signed certificate for Cisco Tomcat, rest of the certificates stays as self-signed most of the time (unless specific compliance requirements are in place)
- We generate CSR and pass it to CA; they will sign the certificate and provide identity certificate. We can then upload this to our server
- To create a third-party certificate for a CUCM server, you need a CSR to present to the CA
- Every time this option is used, a new private key and CSR is generated
- Cisco Unified Operating System Administration > Security > Certificate Management > Generate CSR > choose the service you want to create the certificate > then Generate CSR

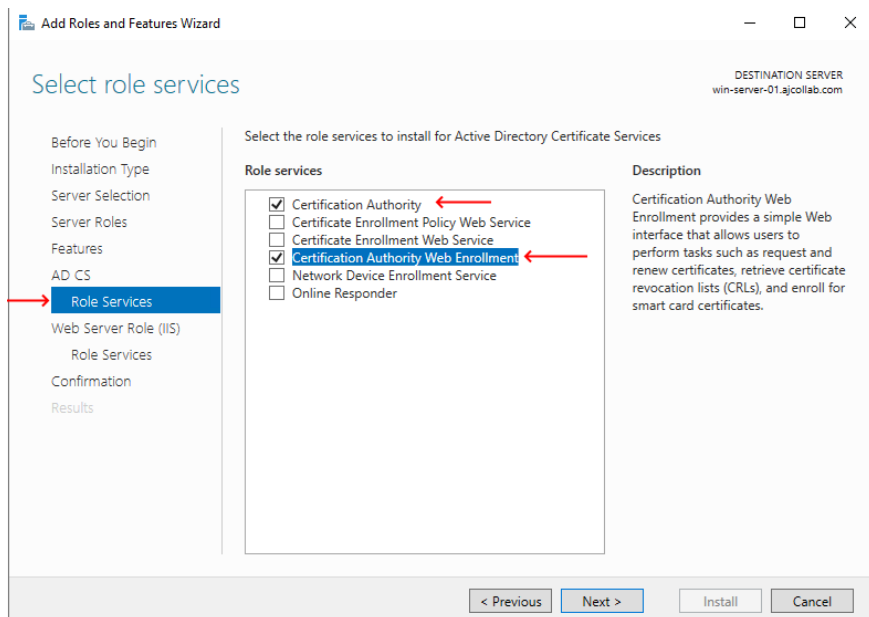
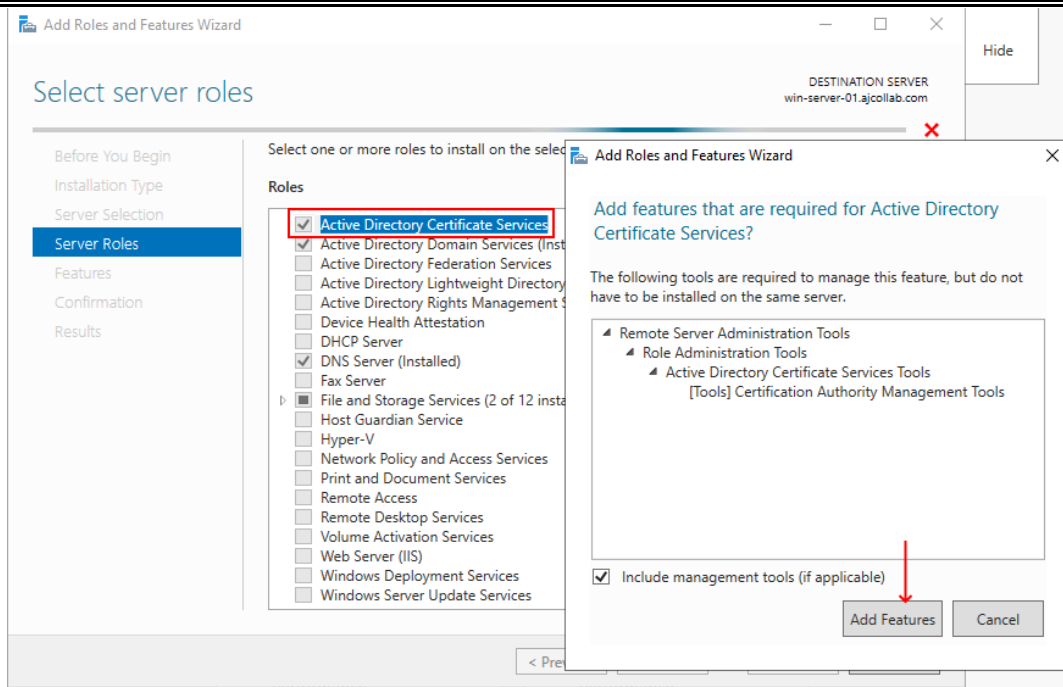
## **CUCM SAN (Multi-Server Subject Alternate Name) Certificate**

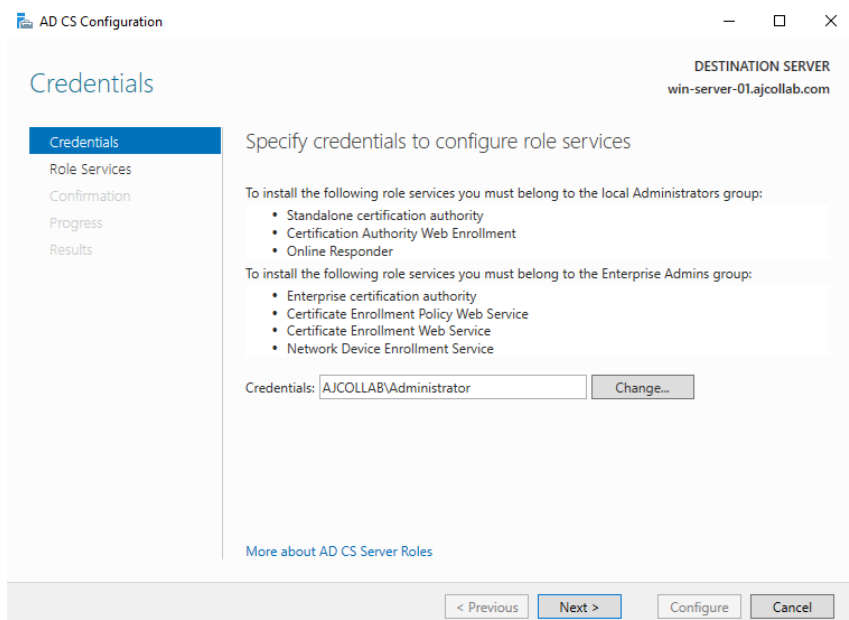
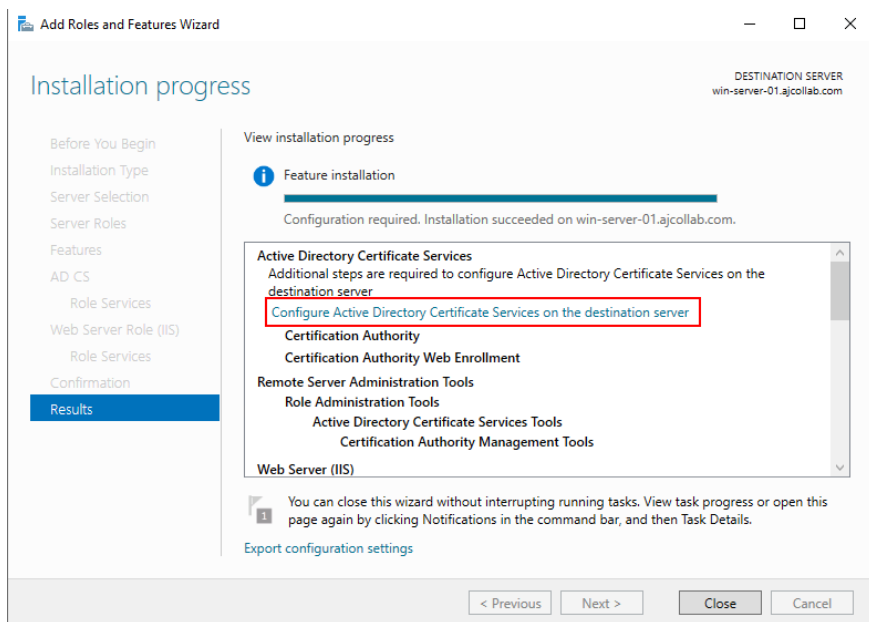
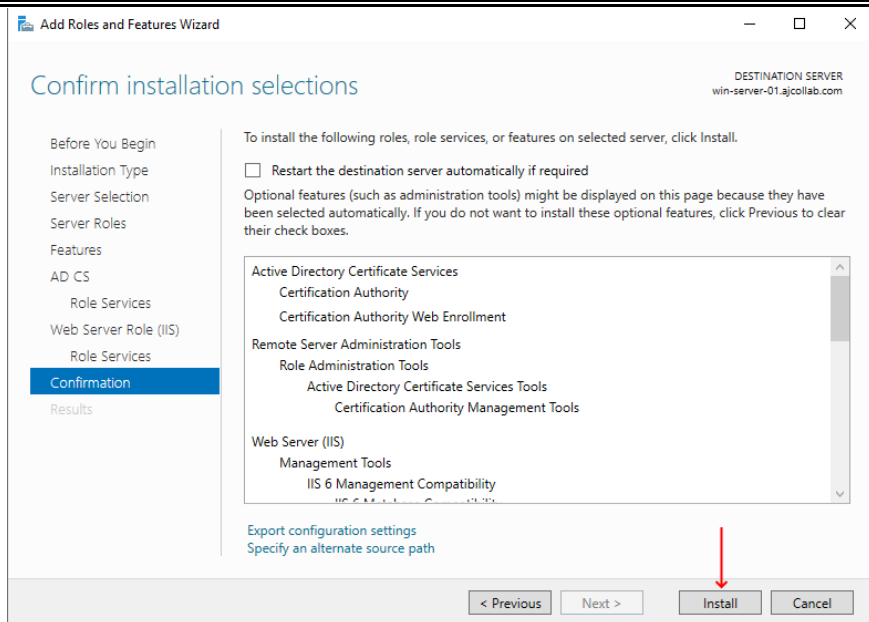
- The Subject Alternative Name field lets you specify additional host names (sites, IP addresses, common names, etc.) to be protected by a single SSL Certificate
- This can be used as a cluster wide certificate; we do not need separate certificates for each node
- From I experience, I have seen most of the enterprises are using Multi SAN certificate for Cisco Tomcat Service



## [Lab] Setting up Internal / Enterprise CA in Windows Server 2019







AD CS Configuration

DESTINATION SERVER  
win-server-01.ajcollab.com

### Role Services

Credentials  
Role Services  
Setup Type  
CA Type  
Private Key  
Cryptography  
CA Name  
Validity Period  
Certificate Database  
Confirmation  
Progress  
Results

Select Role Services to configure

- ☒ Certification Authority
- ☒ Certification Authority Web Enrollment
- ☐ Online Responder
- ☐ Network Device Enrollment Service
- ☐ Certificate Enrollment Web Service
- ☐ Certificate Enrollment Policy Web Service

[More about AD CS Server Roles](#)

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AD CS Configuration

DESTINATION SERVER  
win-server-01.ajcollab.com

### Setup Type

Credentials  
Role Services  
Setup Type  
CA Type  
Private Key  
Cryptography  
CA Name  
Validity Period  
Certificate Database  
Confirmation  
Progress  
Results

Specify the setup type of the CA

Enterprise certification authorities (CAs) can use Active Directory Domain Services (AD DS) to simplify the management of certificates. Standalone CAs do not use AD DS to issue or manage certificates.

- ☒ Enterprise CA  
Enterprise CAs must be domain members and are typically online to issue certificates or certificate policies.
- ☐ Standalone CA  
Standalone CAs can be members or a workgroup or domain. Standalone CAs do not require AD DS and can be used without a network connection (offline).

[More about Setup Type](#)

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AD CS Configuration

DESTINATION SERVER  
win-server-01.ajcollab.com

### CA Type

Credentials  
Role Services  
Setup Type  
CA Type  
Private Key  
Cryptography  
CA Name  
Validity Period  
Certificate Database  
Confirmation  
Progress  
Results

Specify the type of the CA

When you install Active Directory Certificate Services (AD CS), you are creating or extending a public key infrastructure (PKI) hierarchy. A root CA is at the top of the PKI hierarchy and issues its own self-signed certificate. A subordinate CA receives a certificate from the CA above it in the PKI hierarchy.

- ☒ Root CA  
Root CAs are the first and may be the only CAs configured in a PKI hierarchy.
- ☐ Subordinate CA  
Subordinate CAs require an established PKI hierarchy and are authorized to issue certificates by the CA above them in the hierarchy.

[More about CA Type](#)

< Previous Next > Configure Cancel

AD CS Configuration

DESTINATION SERVER  
win-server-01.ajcollab.com

### Private Key

Credentials  
Role Services  
Setup Type  
CA Type  
**Private Key**  
Cryptography  
CA Name  
Validity Period  
Certificate Database  
Confirmation  
Progress  
Results

Specify the type of the private key

To generate and issue certificates to clients, a certification authority (CA) must have a private key.

☒ Create a new private key  
Use this option if you do not have a private key or want to create a new private key.

☐ Use existing private key  
Use this option to ensure continuity with previously issued certificates when reinstalling a CA.

☐ Select a certificate and use its associated private key  
Select this option if you have an existing certificate on this computer or if you want to import a certificate and use its associated private key.

☐ Select an existing private key on this computer  
Select this option if you have retained private keys from a previous installation or want to use a private key from an alternate source.

[More about Private Key](#)

< Previous Next > Configure Cancel

AD CS Configuration

DESTINATION SERVER  
win-server-01.ajcollab.com

### Cryptography for CA

Credentials  
Role Services  
Setup Type  
CA Type  
Private Key  
**Cryptography**  
CA Name  
Validity Period  
Certificate Database  
Confirmation  
Progress  
Results

Specify the cryptographic options

Select a cryptographic provider: RSA#Microsoft Software Key Storage Provider Key length: 2048

Select the hash algorithm for signing certificates issued by this CA:

SHA256  
SHA384  
SHA512  
SHA1  
MD5

☐ Allow administrator interaction when the private key is accessed by the CA.

[More about Cryptography](#)

< Previous Next > Configure Cancel

AD CS Configuration

DESTINATION SERVER  
win-server-01.ajcollab.com

### CA Name

Credentials  
Role Services  
Setup Type  
CA Type  
Private Key  
Cryptography  
**CA Name**  
Validity Period  
Certificate Database  
Confirmation  
Progress  
Results

Specify the name of the CA

Type a common name to identify this certification authority (CA). This name is added to all certificates issued by the CA. Distinguished name suffix values are automatically generated but can be modified.

Common name for this CA: AJCOLLAB-CA

Distinguished name suffix: DC=ajcollab,DC=com

Preview of distinguished name: CN=AJCOLLAB-CA,DC=ajcollab,DC=com

[More about CA Name](#)

< Previous Next > Configure Cancel

AD CS Configuration

DESTINATION SERVER  
win-server-01.ajcollab.com

### Validity Period

Credentials  
Role Services  
Setup Type  
CA Type  
Private Key  
Cryptography  
CA Name  
**Validity Period**  
Certificate Database  
Confirmation  
Progress  
Results

Specify the validity period

Select the validity period for the certificate generated for this certification authority (CA):

5 Years

CA expiration Date: 27-Feb-26 2:10:00 AM

The validity period configured for this CA certificate should exceed the validity period for the certificates it will issue.

[More about Validity Period](#)

< Previous Next > Configure Cancel

AD CS Configuration

DESTINATION SERVER  
win-server-01.ajcollab.com

### CA Database

Credentials  
Role Services  
Setup Type  
CA Type  
Private Key  
Cryptography  
CA Name  
Validity Period  
**Certificate Database**  
Confirmation  
Progress  
Results

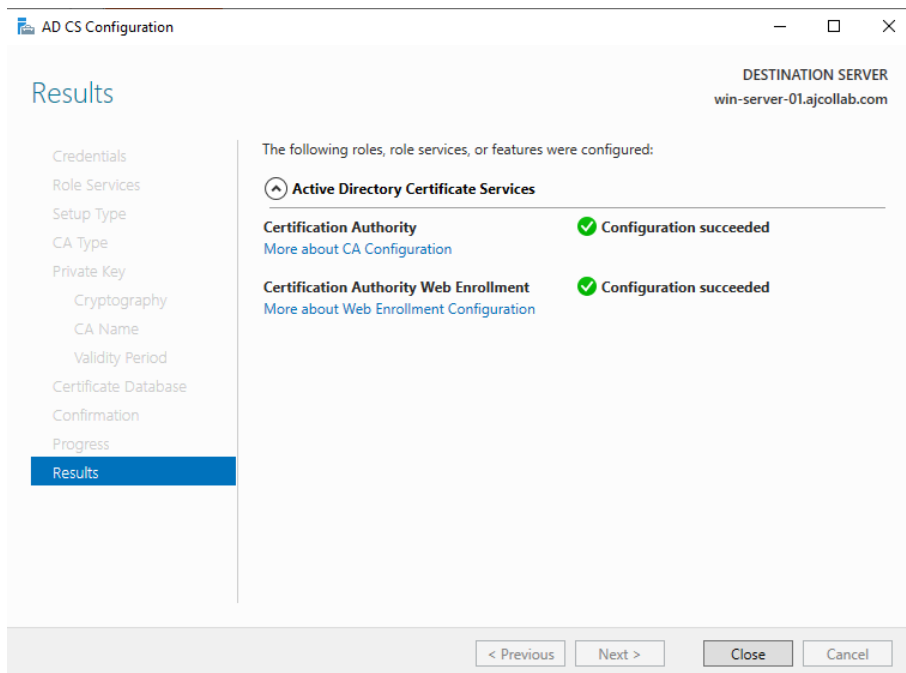
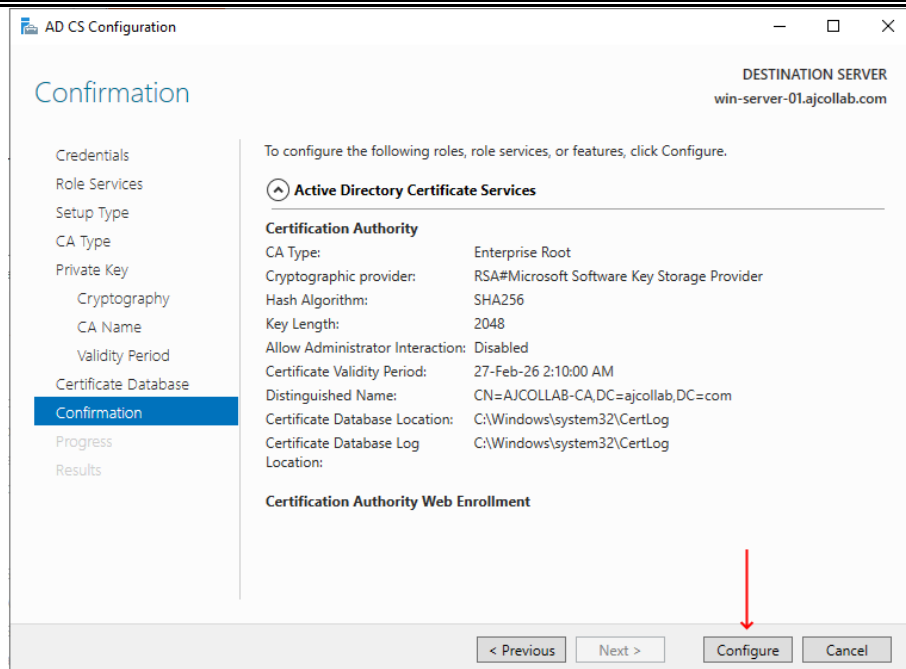
Specify the database locations

Certificate database location:  
C:\Windows\system32\CertLog

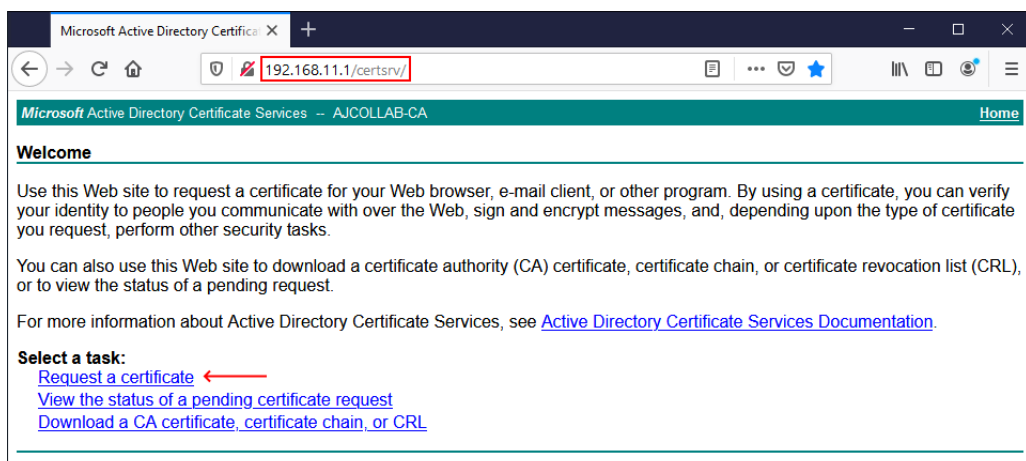
Certificate database log location:  
C:\Windows\system32\CertLog

[More about CA Database](#)

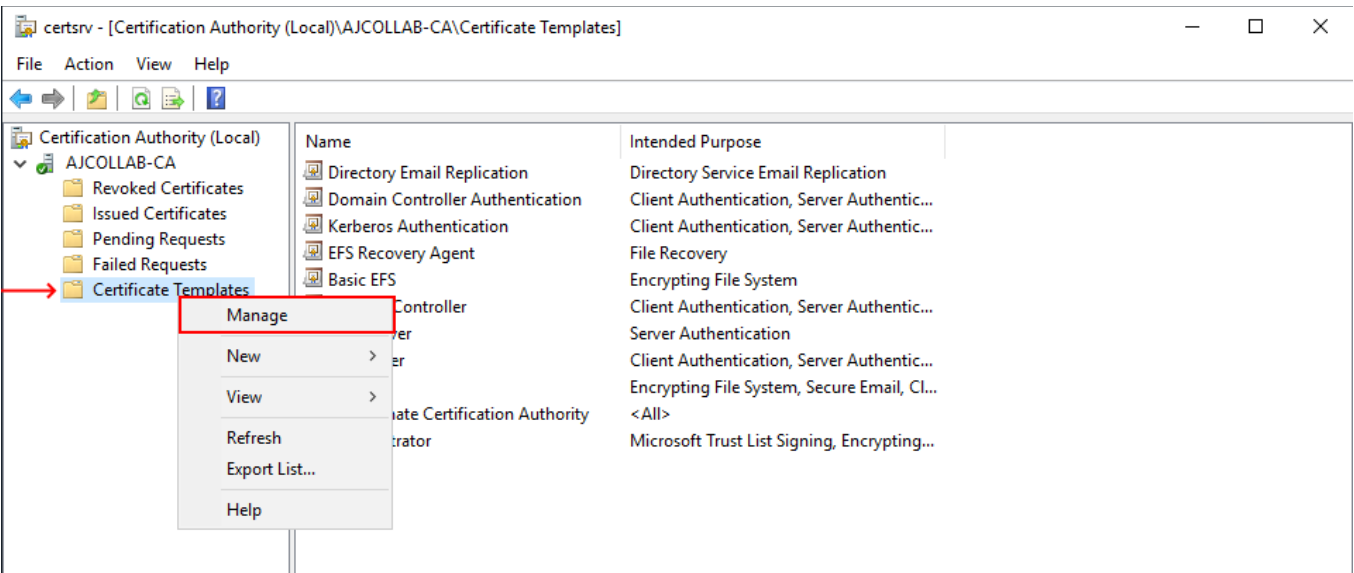
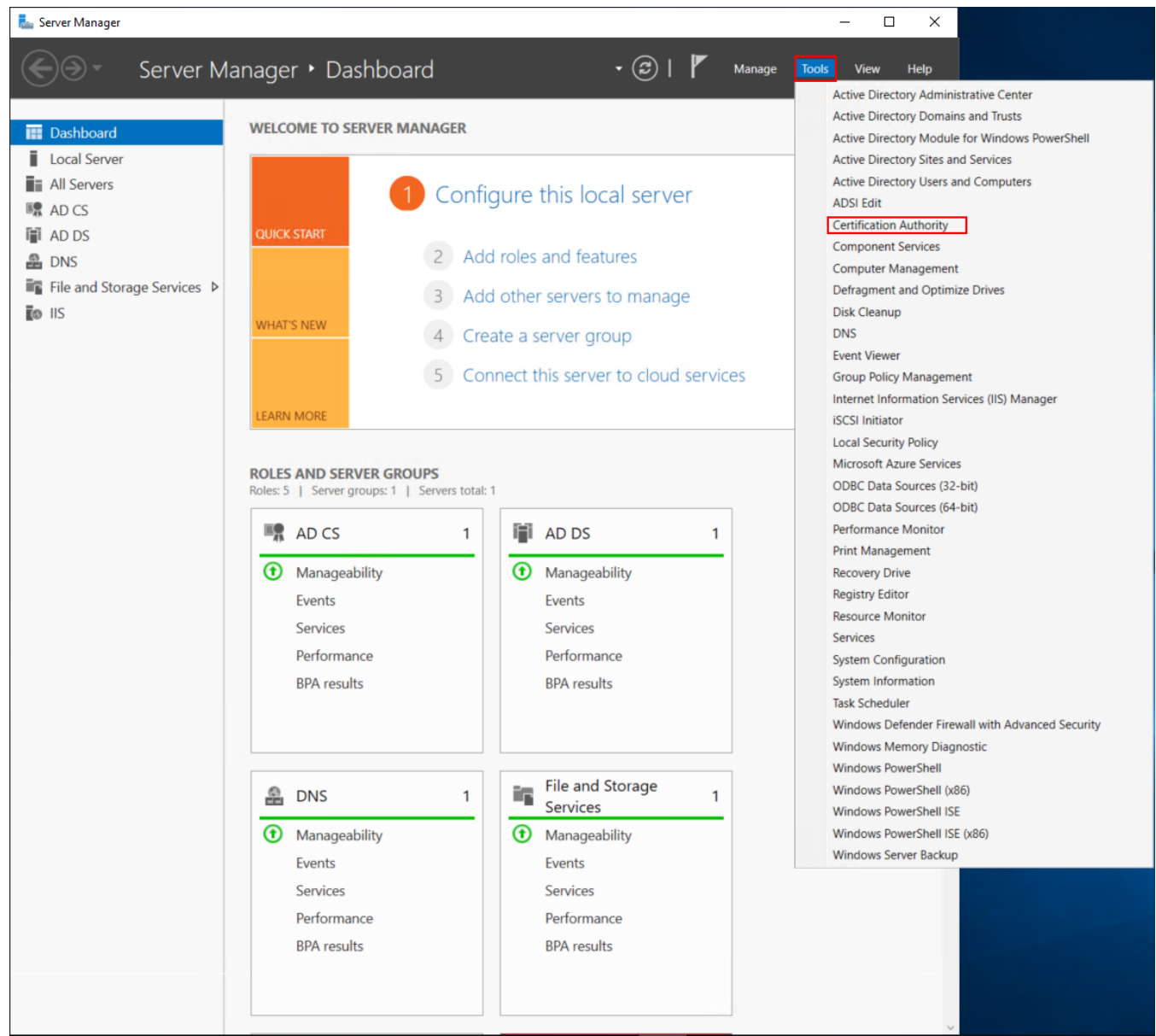
< Previous Next > Configure Cancel



- Access the Certificate Services by going to **http://WINDOWS-SERVER-IP/certsrv/**



[Lab] Create UC Certificate Templates in Windows Server Enterprise CA





Certificate Templates Console

File
Action
View
Help

Certificate Templates (win-server-01)

| Template Display Name                       | Schema Version | Version | Intended Purpose      | Actions                                                     |
|---------------------------------------------|----------------|---------|-----------------------|-------------------------------------------------------------|
| Administrator                               | 1              | 4.1     |                       | Certificate Templates (win-server-01.ajc...<br>More Actions |
| Authenticated Session                       | 1              | 3.1     |                       |                                                             |
| Basic EFS                                   | 1              | 3.1     |                       |                                                             |
| CA Exchange                                 | 2              | 106.0   | Private Key           | Web Server<br>More Actions                                  |
| CEP Encryption                              | 1              | 4.1     |                       |                                                             |
| Code Signing                                | 1              | 3.1     |                       |                                                             |
| Computer                                    | 1              | 5.1     |                       |                                                             |
| Cross Certification Authority               | 2              | 105.0   |                       |                                                             |
| Directory Email Replication                 | 2              | 115.0   | Directory             |                                                             |
| Domain Controller                           | 1              | 4.1     |                       |                                                             |
| Domain Controller Authentication            | 2              | 110.0   | Client Authentication |                                                             |
| EFS Recovery Agent                          | 1              | 6.1     |                       |                                                             |
| Enrollment Agent                            | 1              | 4.1     |                       |                                                             |
| Enrollment Agent (Computer)                 | 1              | 5.1     |                       |                                                             |
| Exchange Enrollment Agent (Offline request) | 1              | 4.1     |                       |                                                             |
| Exchange Signature Only                     | 1              | 6.1     |                       |                                                             |
| Exchange User                               | 1              | 7.1     |                       |                                                             |
| IPSec                                       | 1              | 8.1     |                       |                                                             |
| IPSec (Offline request)                     | 1              | 7.1     |                       |                                                             |
| Kerberos Authentication                     | 2              | 110.0   | Client Authentication |                                                             |
| Key Recovery Agent                          | 2              | 105.0   | Key Recovery          |                                                             |
| OCSP Response Signing                       | 3              | 101.0   | OCSP Signing          |                                                             |
| RAS and IAS Server                          | 2              | 101.0   | Client Authentication |                                                             |
| Root Certification Authority                | 1              | 5.1     |                       |                                                             |
| Router (Offline request)                    | 1              | 4.1     |                       |                                                             |
| Smartcard Logon                             | 1              | 6.1     |                       |                                                             |
| Smartcard User                              | 1              | 11.1    |                       |                                                             |
| Subordinate Certification Authority         | 1              | 5.1     |                       |                                                             |
| Trust List Signing                          | 1              | 3.1     |                       |                                                             |
| User                                        | 1              | 3.1     |                       |                                                             |
| User Signature Only                         | 1              | 4.1     |                       |                                                             |
| Web Server                                  | 1              | 4.1     |                       |                                                             |
| Workstation Authentication                  | 1              | 01.0    | Client Authentication |                                                             |

Duplicate Template
All Tasks
Properties
Help

33 certificate templates

Properties of New Template

| Subject Name         | Server       | Issuance Requirements |
|----------------------|--------------|-----------------------|
| Superseded Templates | Extensions   | Security              |
| Compatibility        | General      | Request Handling      |
|                      | Cryptography | Key Attestation       |

Template display name:  
UC Certificate Template

Template name:  
UCCertificateTemplate

Validity period: 2 years  
Renewal period: 6 weeks

☐ Publish certificate in Active Directory  
☐ Do not automatically reenroll if a duplicate certificate exists in Active Directory

OK Cancel Apply Help

Properties of New Template

| Subject Name         | Server       | Issuance Requirements |
|----------------------|--------------|-----------------------|
| Compatibility        | General      | Request Handling      |
|                      | Cryptography | Key Attestation       |
| Superseded Templates | Extensions   | Security              |

To modify an extension, select it, and then click Edit.

Extensions included in this template:

- Application Policies
- Basic Constraints
- Certificate Template Information
- Issuance Policies
- Key Usage

Edit...

Description of Application Policies:  
Server Authentication

OK Cancel Apply Help

Properties of New Template

| Subject Name         | Server       | Issuance Requirements |
|----------------------|--------------|-----------------------|
| Compatibility        | General      | Request Handling      |
|                      | Cryptography | Key Attestation       |
| Superseded Templates | Extensions   | Security              |

Edit Application Policies Extension

To modify an extension, select it, and then click Edit.

Extensions included in this template:

- Application Policies
- Basic Constraints
- Certificate Template Information
- Issuance Policies
- Key Usage

Description of Application Policies:  
Server Authentication

Add... Edit... Remove

☐ Make this extension critical

OK Cancel

Properties of New Template

| Subject Name         | Server       | Issuance Requirements |
|----------------------|--------------|-----------------------|
| Compatibility        | General      | Request Handling      |
|                      | Cryptography | Key Attestation       |
| Superseded Templates | Extensions   | Security              |

Add Application Policy

An application policy (called enhanced key usage in Windows 2000) defines how a certificate can be used. Select the application policy required for valid signatures of certificates issued by this template.

Application policies:

- Any Purpose
- Attestation Identity Key Certificate
- Certificate Request Agent
- Client Authentication
- Code Signing
- CTL Usage
- Digital Rights
- Directory Service Email Replication
- Disallowed List
- Document Encryption
- Document Signing
- Domain Name System (DNS) Server Trust
- Dynamic Code Generator

New...

OK Cancel

Properties of New Template

Subject Name    Server    Issuance Requirements

Compatibility    General    Request Handling    Cryptography    Key Attestation

Superseded Templates    Extensions    Security

To modify an extension, select it, and then click Edit.

Extensions included in this template:

- Application Policies
- Basic Constraints
- Certificate Template Information
- Issuance Policies
- Key Usage

Edit...

Description of Application Policies:

- Client Authentication
- Server Authentication

OK    Cancel    Apply    Help

Properties of New Template

Subject Name    Server    Issuance Requirements

Compatibility    General    Request Handling    Cryptography    Key Attestation

Superseded Templates    Extensions    Security

To modify an extension, select it, and then click Edit.

Extensions included in this template:

- Application Policies
- Basic Constraints
- Certificate Template Information
- Issuance Policies
- Key Usage

Edit...

Description of Key Usage:

Signature requirements:  
Digital signature

Allow key exchange only with key encryption  
Critical extension.

OK    Cancel    Apply    Help

Properties of New Template

Subject Name    Server    Issuance Requirements

Compatibility    General    Request Handling    Cryptography    Key Attestation

Superseded Templates    Extensions    Security

Edit Key Usage Extension

Specify the required signature and security options for a key usage extension.

Signature

- ☒ Digital signature
- ☒ Signature is proof of origin (nonrepudiation)
- ☐ Certificate signing
- ☐ CRL signing

Encryption

- ☐ Allow key exchange without key encryption (key agreement)
- ☒ Allow key exchange only with key encryption (key encipherment)
- ☒ Allow encryption of user data

☒ Make this extension critical

OK    Cancel

Properties of New Template

Subject Name    Server    Issuance Requirements

Compatibility    General    Request Handling    Cryptography    Key Attestation

Superseded Templates    Extensions    Security

Provider Category: Legacy Cryptographic Service Provider

Algorithm name: Determined by CSP

Minimum key size: 2048

Choose which cryptographic providers can be used for requests

☐ Requests can use any provider available on the subject's computer

☒ Requests must use one of the following providers:

Providers:

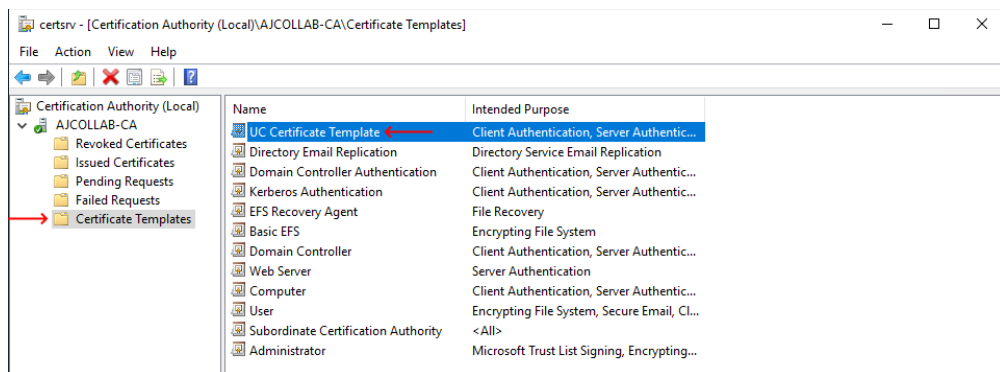
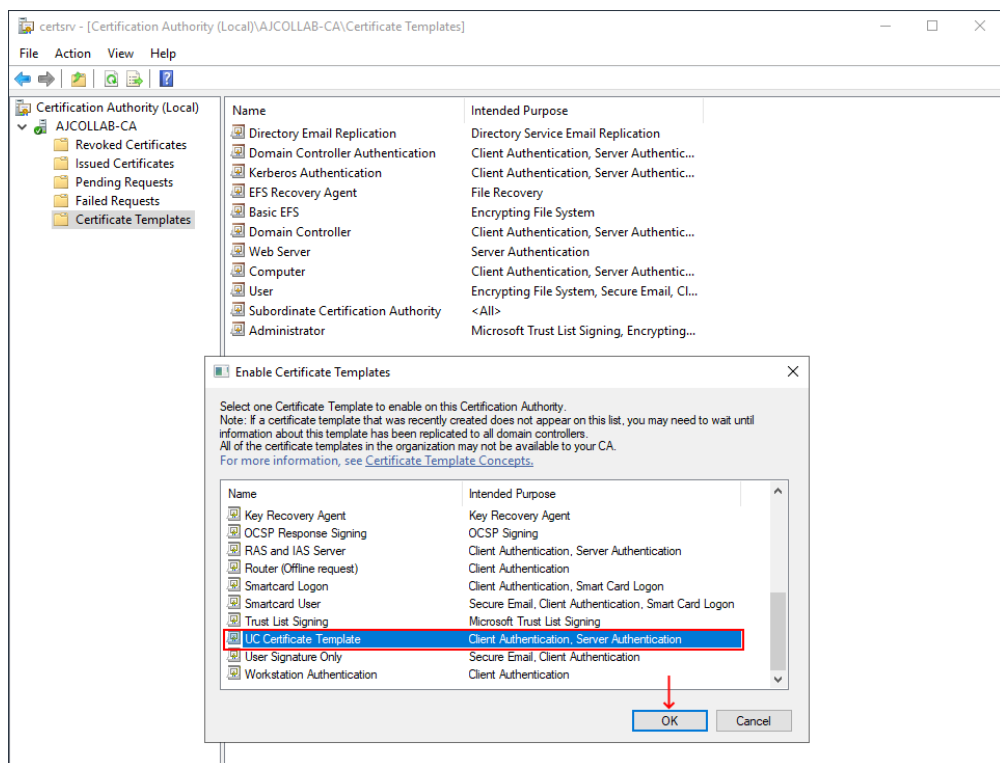
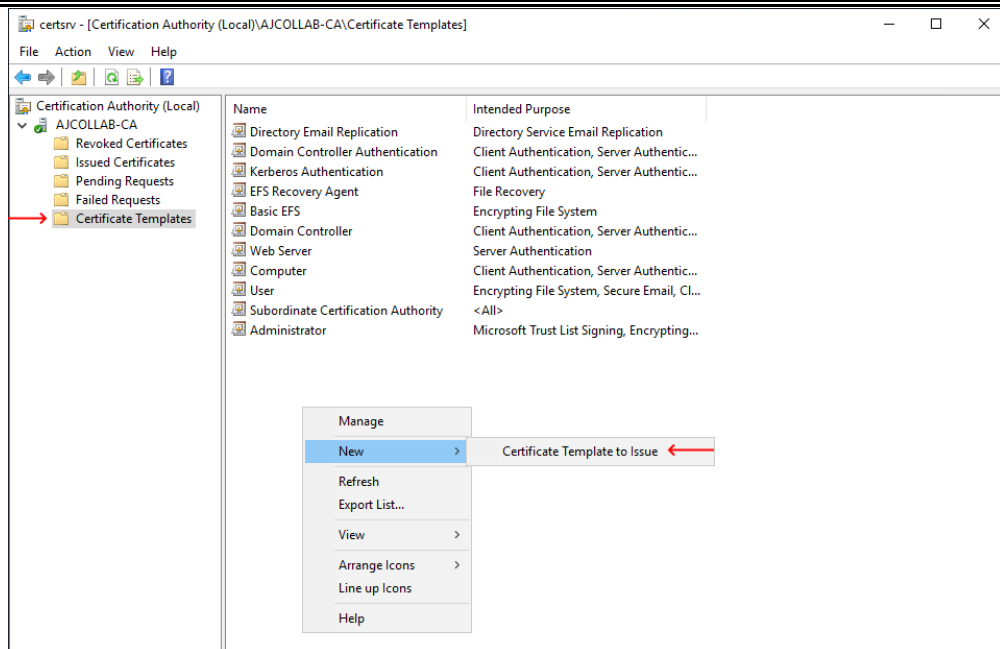
- ☒ Microsoft RSA SChannel Cryptographic Provider
- ☒ Microsoft DH SChannel Cryptographic Provider
- ☐ Microsoft Base Smart Card Crypto Provider
- ☐ Microsoft Enhanced Cryptographic Provider v1.0
- ☐ Microsoft Enhanced DSS and Diffie-Hellman Cryptographic Pr

Request hash: Determined by CSP

☐ Use alternate signature format

OK    Cancel    Apply    Help

| Certificate Templates Console              |                |         |           |  |
|--------------------------------------------|----------------|---------|-----------|--|
| File Action View Help                      |                |         |           |  |
| Certificate Templates (win-serve           |                |         |           |  |
| Template Display Name                      | Schema Version | Version | Intended  |  |
| Administrator                              | 1              | 4.1     |           |  |
| Authenticated Session                      | 1              | 3.1     |           |  |
| Basic EFS                                  | 1              | 3.1     |           |  |
| CA Exchange                                | 2              | 106.0   | Private K |  |
| CEP Encryption                             | 1              | 4.1     |           |  |
| Code Signing                               | 1              | 3.1     |           |  |
| Computer                                   | 1              | 5.1     |           |  |
| Cross Certification Authority              | 2              | 105.0   |           |  |
| Directory Email Replication                | 2              | 115.0   | Directory |  |
| Domain Controller                          | 1              | 4.1     |           |  |
| Domain Controller Authentication           | 2              | 110.0   | Client A  |  |
| EFS Recovery Agent                         | 1              | 6.1     |           |  |
| Enrollment Agent                           | 1              | 4.1     |           |  |
| Enrollment Agent (Computer)                | 1              | 5.1     |           |  |
| Exchange Enrollment Agent (Offline requ... | 1              | 4.1     |           |  |
| Exchange Signature Only                    | 1              | 6.1     |           |  |
| Exchange User                              | 1              | 7.1     |           |  |
| IPSec                                      | 1              | 8.1     |           |  |
| IPSec (Offline request)                    | 1              | 7.1     |           |  |
| Kerberos Authentication                    | 2              | 110.0   | Client A  |  |
| Key Recovery Agent                         | 2              | 105.0   | Key Rec   |  |
| OCSP Response Signing                      | 3              | 101.0   | OCSP Sig  |  |
| RAS and IAS Server                         | 2              | 101.0   | Client A  |  |
| Root Certification Authority               | 1              | 5.1     |           |  |
| Router (Offline request)                   | 1              | 4.1     |           |  |
| Smartcard Logon                            | 1              | 6.1     |           |  |
| Smartcard User                             | 1              | 11.1    |           |  |
| Subordinate Certification Authority        | 1              | 5.1     |           |  |
| Trust List Signing                         | 1              | 3.1     |           |  |
| User                                       | 1              | 3.1     |           |  |
| User Signature Only                        | 1              | 4.1     |           |  |
| Web Server                                 | 1              | 4.1     |           |  |
| Workstation Authentication                 | 2              | 101.0   | Client A  |  |
| UC Certificate Template                    | 2              | 100.4   | Client A  |  |



## [Lab] Install Multi SAN Certificate for CUCM Cluster Tomcat Service

- On System >> Server >> Set all the server names to FQDNs
- OS Administration >> Security >> Generate CSR

The screenshot displays the Cisco Unified Operating System Administration web interface. The main page is titled "Certificate List" and includes a navigation bar with "admin", "About", and "Logout" links. A sidebar on the left contains a "Certificate List" section with a "Generate Self-signed" button. The main content area shows a "Generate Certificate Signing Request" dialog box. This dialog box has a "Status" section with a warning icon and text: "Warning: Generating a new CSR for a specific certificate type will overwrite the existing CSR for that type". Below this is the "Generate Certificate Signing Request" section, which includes a "Certificate Purpose" dropdown set to "tomcat", a "Distribution" dropdown set to "Multi-server(SAN)", and a "Common Name" field containing "cucm-pub.ajcollab.com". A red box highlights the "Subject Alternate Names (SANs)" field, which contains a list of domains: "cucm-pub.ajcollab.com", "cucm-sub01.ajcollab.com", "cucm-sub02.ajcollab.com", "imp-pub.ajcollab.com", and "imp-sub.ajcollab.com". A red arrow points to the "Generate" button at the bottom of the dialog box. The background shows a table of certificates with columns for "Description" and "Rows per Page" set to 50.

The screenshot displays the Cisco Unified Operating System Administration web interface. The main page is titled "Certificate List" and includes navigation links for Settings, Security, Software Upgrades, Services, and Help. A modal window titled "Generate Certificate Signing Request" is open, showing the "Status" section with a success message: "Success: Certificate Signing Request Generated" and "CSR export operation successful on the nodes [imp-sub.ajcollab.com, cucm-sub02.ajcollab.com, cucm-sub01.ajcollab.com, cucm-pub.ajcollab.com, imp-pub.ajcollab.com].". The "Generate Certificate Signing Request" section includes fields for Certificate Purpose (tomcat), Distribution (Multi-server(SAN)), Common Name (cucm-pub.ajcollab.com), Subject Alternate Names (SANS) (cucm-pub.ajcollab.com, cucm-sub01.ajcollab.com, cucm-sub02.ajcollab.com, imp-pub.ajcollab.com, imp-sub.ajcollab.com), Parent Domain (ajcollab.com), Other Domains, Key Type (RSA), Key Length (2048), and Hash Algorithm (SHA256). A "Generate" button is visible at the bottom of the modal.

- The same CSR has been pushed to all other nodes in the cluster
- Respective private keys for each node will be created now even if we are performing this task on CUCM-PUB



Certificate List

https://192.168.21.1/cmplatform/certificateFindList.do

Cisco Unified Operating System Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration admin About Logout

Show Settings Security Software Upgrades Services Help

Certificate List

Generate Self-signed Upload Certificate/Certificate chain Generate CSR Download CSR

Status

13 records found

Certificate List (1 - 13 of 13) Rows per Page 50

Find Certificate List where Certificate begins with tomcat Find Clear Filter

| Certificate  | Common Name                | Type        | Key Type | Distribution            | Issued By                  | Expiration | Description                                 |
|--------------|----------------------------|-------------|----------|-------------------------|----------------------------|------------|---------------------------------------------|
| tomcat       | cucm-pub.ajcollab.com      | CSR Only    | RSA      | Multi-server(SAN)       | --                         | --         |                                             |
| tomcat       | cucm-pub.ajcollab.com      | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com      | 02/16/2026 | Self-signed certificate generated by system |
| tomcat-ECDSA | cucm-pub-EC.ajcollab.com   | Self-signed | EC       | cucm-pub.ajcollab.com   | cucm-pub-EC.ajcollab.com   | 02/16/2026 | Self-signed certificate generated by system |
| tomcat-trust | imp-sub-EC.ajcollab.com    | Self-signed | EC       | imp-sub.ajcollab.com    | imp-sub-EC.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub01.ajcollab.com    | Self-signed | RSA      | cucm-sub01.ajcollab.com | cucm-sub01.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub02-EC.ajcollab.com | Self-signed | EC       | cucm-sub02.ajcollab.com | cucm-sub02-EC.ajcollab.com | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub02.ajcollab.com    | Self-signed | RSA      | cucm-sub02.ajcollab.com | cucm-sub02.ajcollab.com    | 02/17/2026 | Signed Certificate                          |
| tomcat-trust | imp-pub-EC.ajcollab.com    | Self-signed | EC       | imp-pub.ajcollab.com    | imp-pub-EC.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | imp-pub.ajcollab.com       | Self-signed | RSA      | imp-pub.ajcollab.com    | imp-pub.ajcollab.com       | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub01-EC.ajcollab.com | Self-signed | EC       | cucm-sub01.ajcollab.com | cucm-sub01-EC.ajcollab.com | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-pub-EC.ajcollab.com   | Self-signed | EC       | cucm-pub.ajcollab.com   | cucm-pub-EC.ajcollab.com   | 02/16/2026 | Trust Certificate                           |
| tomcat-trust | cucm-pub.ajcollab.com      | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com      | 02/16/2026 | Trust Certificate                           |
| tomcat-trust | imp-sub.ajcollab.com       | Self-signed | RSA      | imp-sub.ajcollab.com    | imp-sub.ajcollab.com       | 02/17/2026 | Trust Certificate                           |

Generate Self-signed Upload Certificate/Certificate chain Generate CSR Download CSR

Certificate List

https://192.168.21.1/cmplatform/certificateFindList.do

Cisco Unified Operating System Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration admin About Logout

Show Settings Security Software Upgrades Services Help

Certificate List

Generate Self-signed Upload Certificate/Certificate chain Generate CSR Download CSR

Status

13 records found

Certificate List (1 - 13 of 13) Rows per Page 50

Find Certificate List where Certificate begins with tomcat Find Clear Filter

| Certificate  | Common Name                | Type        | Key Type | Distribution            | Issued By                  | Expiration | Description                                 |
|--------------|----------------------------|-------------|----------|-------------------------|----------------------------|------------|---------------------------------------------|
| tomcat       | cucm-pub.ajcollab.com      | CSR Only    | RSA      | Multi-server(SAN)       | --                         | --         |                                             |
| tomcat       | cucm-pub.ajcollab.com      | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com      | 02/16/2026 | Self-signed certificate generated by system |
| tomcat-ECDSA | cucm-pub-EC.ajcollab.com   | Self-signed | EC       | cucm-pub.ajcollab.com   | cucm-pub-EC.ajcollab.com   | 02/16/2026 | Self-signed certificate generated by system |
| tomcat-trust | imp-sub-EC.ajcollab.com    | Self-signed | EC       | imp-sub.ajcollab.com    | imp-sub-EC.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub01.ajcollab.com    | Self-signed | RSA      | cucm-sub01.ajcollab.com | cucm-sub01.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub02-EC.ajcollab.com | Self-signed | EC       | cucm-sub02.ajcollab.com | cucm-sub02-EC.ajcollab.com | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub02.ajcollab.com    | Self-signed | RSA      | cucm-sub02.ajcollab.com | cucm-sub02.ajcollab.com    | 02/17/2026 | Signed Certificate                          |
| tomcat-trust | imp-pub-EC.ajcollab.com    | Self-signed | EC       | imp-pub.ajcollab.com    | imp-pub-EC.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | imp-pub.ajcollab.com       | Self-signed | RSA      | imp-pub.ajcollab.com    | imp-pub.ajcollab.com       | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub01-EC.ajcollab.com | Self-signed | EC       | cucm-sub01.ajcollab.com | cucm-sub01-EC.ajcollab.com | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-pub-EC.ajcollab.com   | Self-signed | EC       | cucm-pub.ajcollab.com   | cucm-pub-EC.ajcollab.com   | 02/16/2026 | Trust Certificate                           |
| tomcat-trust | cucm-pub.ajcollab.com      | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com      | 02/16/2026 | Trust Certificate                           |
| tomcat-trust | imp-sub.ajcollab.com       | Self-signed | RSA      | imp-sub.ajcollab.com    | imp-sub.ajcollab.com       | 02/17/2026 | Trust Certificate                           |

Generate Self-signed Upload Certificate/Certificate chain Generate CSR Download CSR

Download Certificate Signing Request — Mozilla Firefox

https://192.168.21.1/cmplatform/certificateDownloadNe ...

Download Certificate Signing Request

Download CSR Close

Status

Warning Certificate names not listed below do not have a corresponding CSR

Download Certificate Signing Request

Certificate Purpose\* tomcat

Download CSR Close

\* indicates required item.



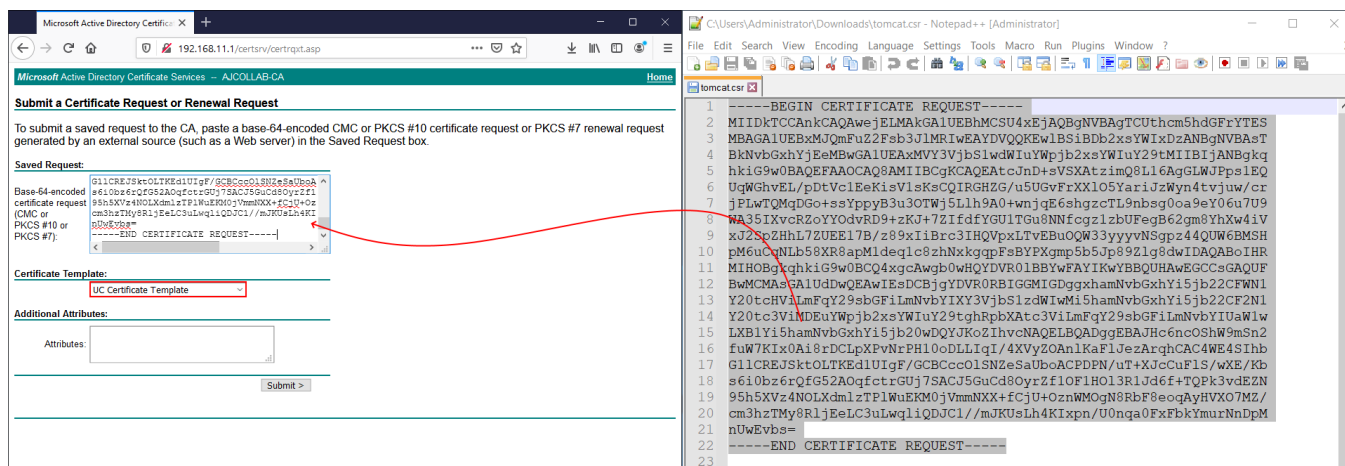
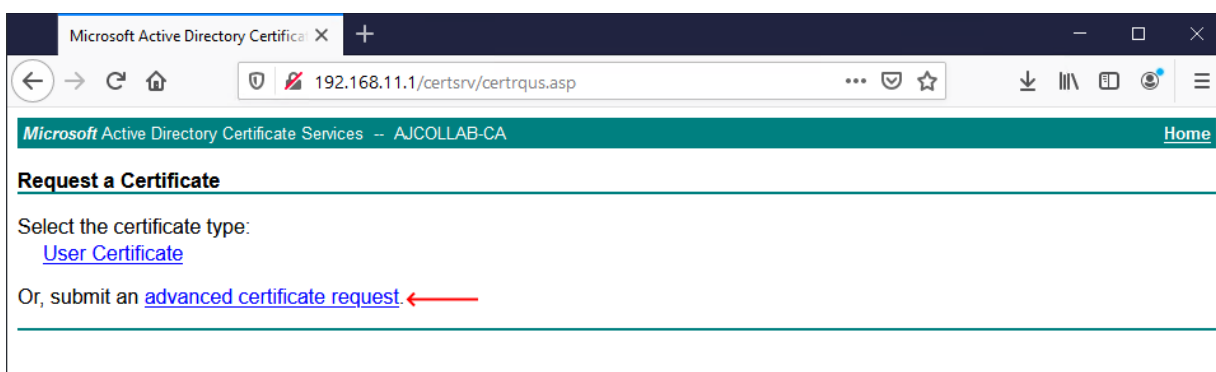
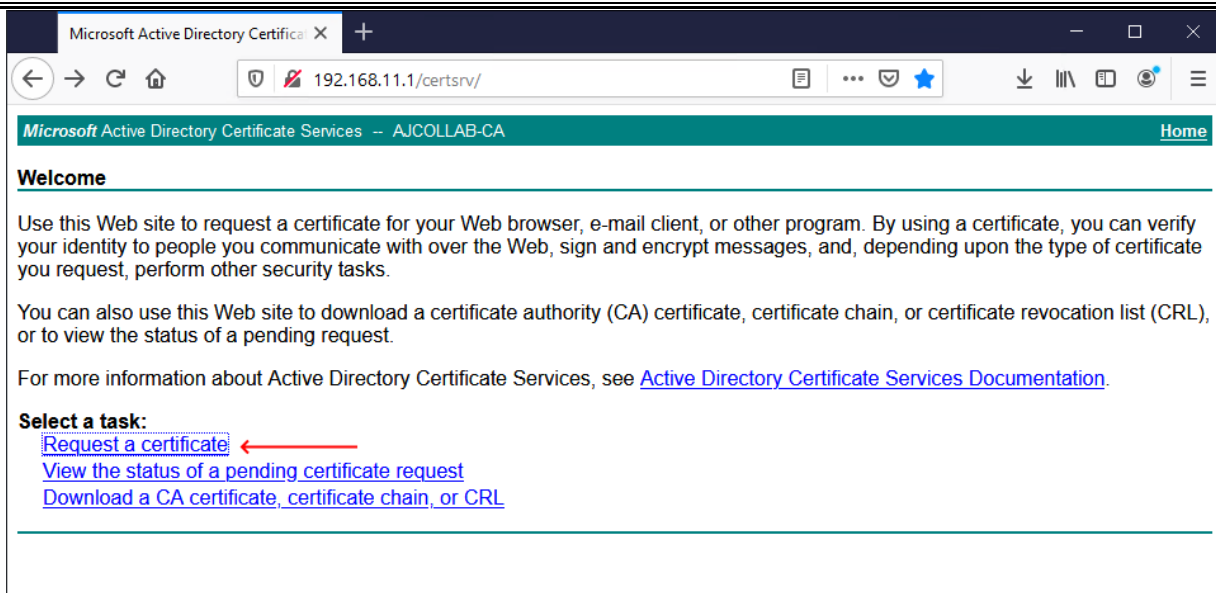
- CUCM-PUB

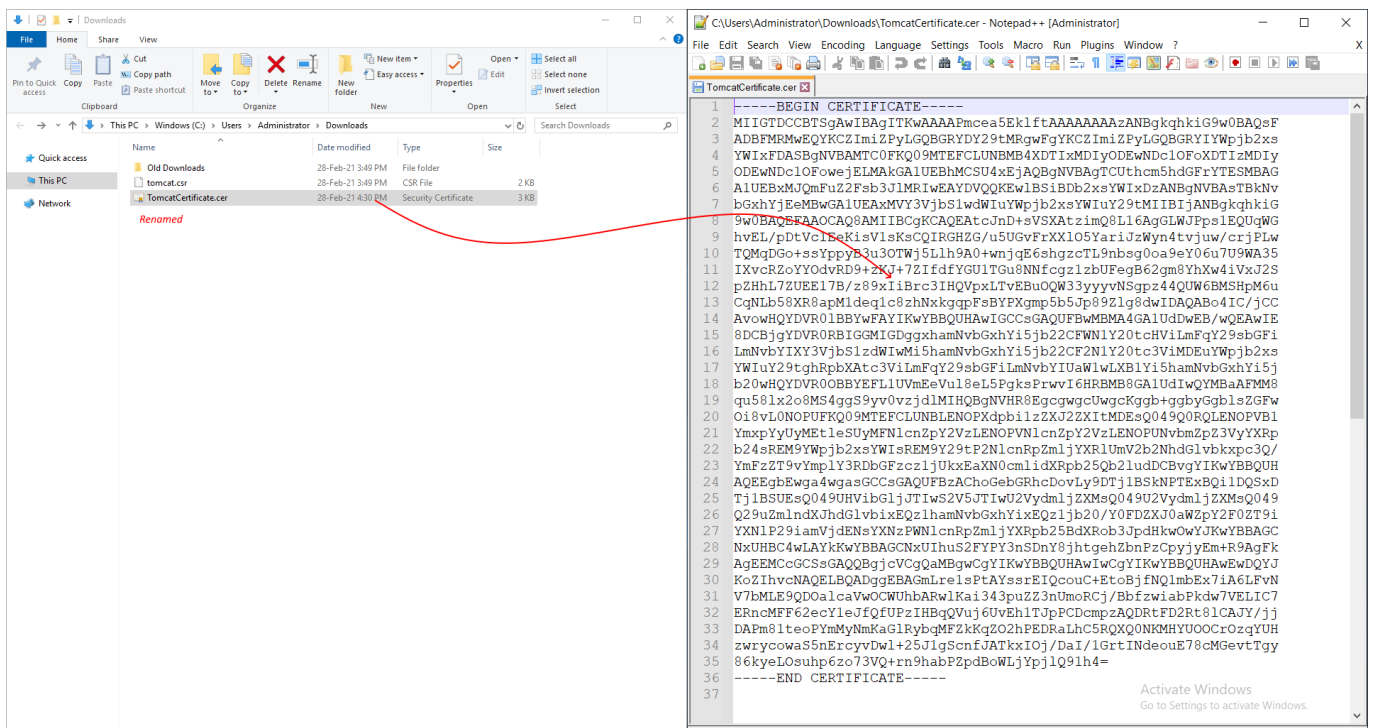
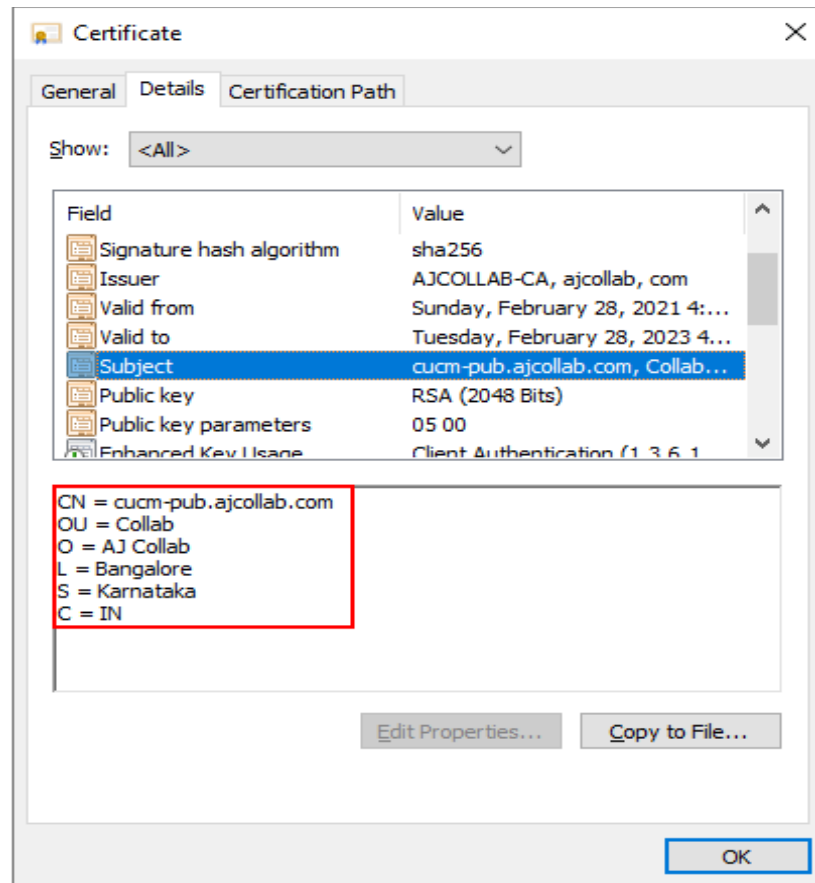
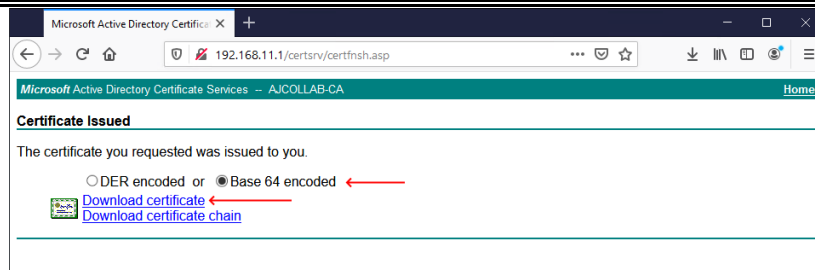
*This is CUCM-SUB01*

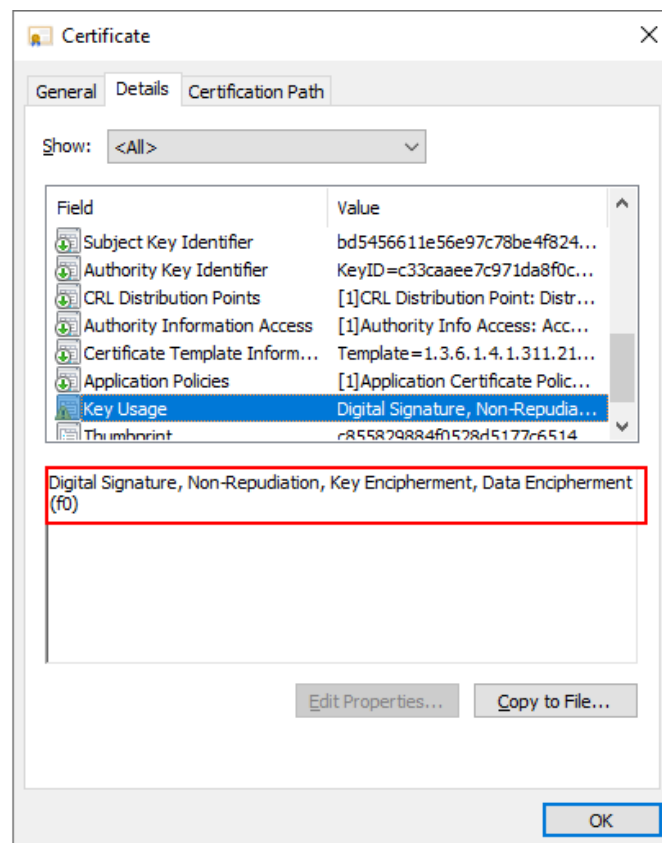
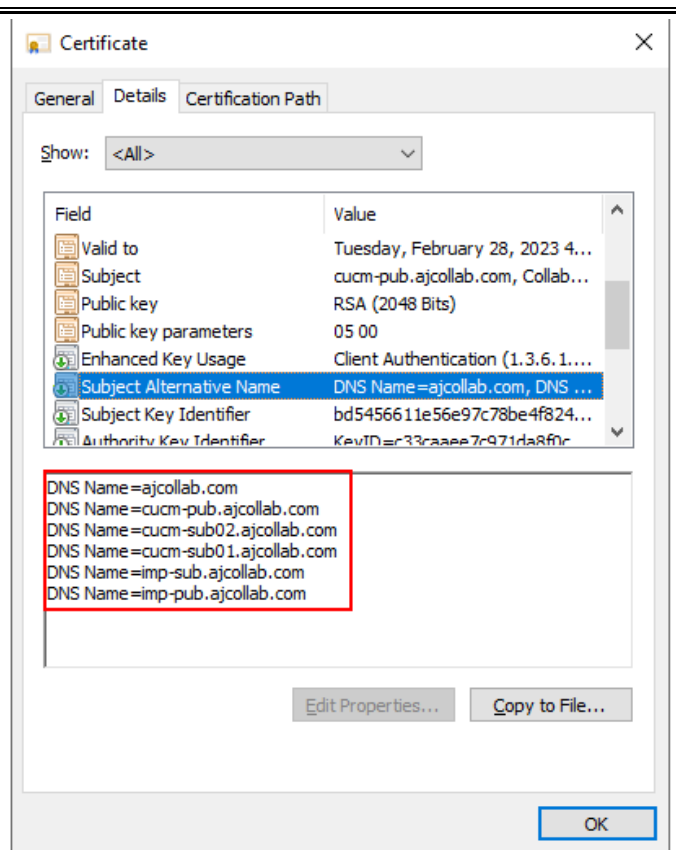
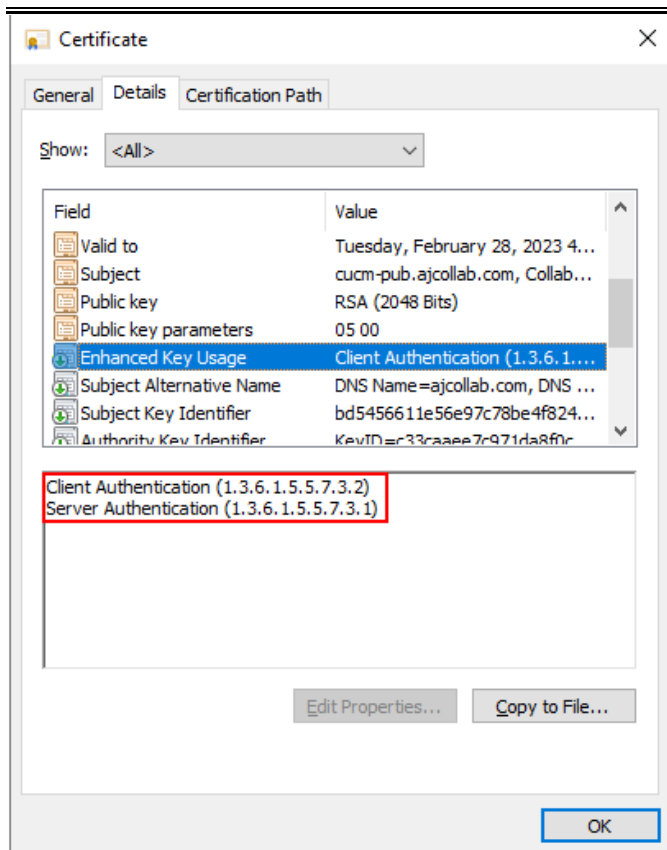
```

1-- BEGIN CERTIFICATE REQUEST-----
2- MIIDKTCANCAkQAweRjELMAkGA1UEBhMCUS4xEjAQBGNVBAAGTCUthcm5hdGFRVTE5
3- MBBAGAlUEBmJGUAwRjELMAkGA1UEBhMCUS4xEjAQBGNVBAAGTCUthcm5hdGFRVTE5
4- MBAGNkxYhYjEmB2F1EQAuXaV3Yj5v1sdUwv3YyW1YU2N0MIIBIjANBgkqhkiG
5- 9w0BAQEEQAAQCAQAM1BgCqKAQgIUGuVn8t+VSXZATzom8QL6agG6g3v1sEQ
6- UqHgwEVLpfDPAo1EeKis1v5uCsQIRGH2GzAJSuGFRXJ05X5AY7j2yn4vtjwvJr
7- JpLW1QMqDGo+ssppryB3u3J0TWJ5lh9AU0wnjgE6shgczTl9nsgo0a9Ye0U670y9
8- r3W3TQwR3Y0adRwdR+zKJ471FdfGUgUJtGo6NfNfcgzLzbFvEG6e2gmYhXw4V1x
9- x2pScZhh7I2UEE17B/28z91Kx3p3HQVpLzEtBuOcu3399y1N5sgp24UQ6W8MS
10- jC6CqCNL58H88apM1deqlc28hNkcggFSBYTPKgm65b5p22y2ldQA0A0IHR
11- M1H0B6gkqhkiG9w0BQC4AgEwCgYDVDR0B1BGMVFAWYkUWBBQUhAEGCCGCAQUF
12- BMCMA4AgUldwEQAAQsDcbjgDVDR0B1BGMVFAWYkUWBBQUhAEGCCGCAQUF
13- Y20tcHVmlmVwJ29eBgG1MmNvbYXV3Yj5v1sdUwv1M5h4mVnBgNkxYhYj5v2C2F2N1
14- Y20t3v1sMDEUwFpjb2xsYVY29t9gRkQCA3VlMfUwJ29sBgG1MmNvbYXV3Yj5v1s
15- LXk1Y15hamVnBgNkxY5j5b2b0WQ0J0zIvncA0E0BAQgEBAUJhcn0S05Hns2
16- w7Kix0A0IrdCPLKpXNvPD10Q0DLl1q/4XVY0z0AnKafJZeAqrhCA4W45ItnB
17- Gl1RCeJStk0LTKedUtg7/GCBC0c0NMSzeA0uAPCPDNvU4+JXcuF1s/wXc/18
18- sb0hz6rgZ502AqoctrGf7Y3AC5JG6d80yrfI0L3R1dJ64d7+PQk3p3zE2N
19- 95h5Y24N0LXmLdZP1UwEKM0jVmmNXX+FCJ4+0znWM0g8RbF8eqcAyHVX07M/
20- cm3hZ2TjRjELc3LwUq1QD1l//mKtUK4L4Xpn/U0nq0a0zFxbYmurnNdPm
21- nUwEvbs=
22-- END CERTIFICATE REQUEST-----

```







Microsoft Active Directory Certificate Services -- AJCOLLAB-CA

## Welcome

Use this Web site to request a certificate for your Web browser, e-mail client, or other program. By using a certificate, you can verify your identity to people you communicate with over the Web, sign and encrypt messages, and, depending upon the type of certificate you request, perform other security tasks.

You can also use this Web site to download a certificate authority (CA) certificate, certificate chain, or certificate revocation list (CRL), or to view the status of a pending request.

For more information about Active Directory Certificate Services, see [Active Directory Certificate Services Documentation](#).

**Select a task:**

- [Request a certificate](#)
- [View the status of a pending certificate request](#)
- [Download a CA certificate, certificate chain, or CRL](#)

Microsoft Active Directory Certificate Services -- AJCOLLAB-CA

## Download a CA Certificate, Certificate Chain, or CRL

To trust certificates issued from this certification authority, [install this CA certificate](#).

To download a CA certificate, certificate chain, or CRL, select the certificate and encoding method.

**CA certificate:**

Current [AJCOLLAB-CA]

**Encoding method:**

☐ DER

☒ Base 64

[Install CA certificate](#)

[Download CA certificate](#)

[Download CA certificate chain](#)

[Download latest base CRL](#)

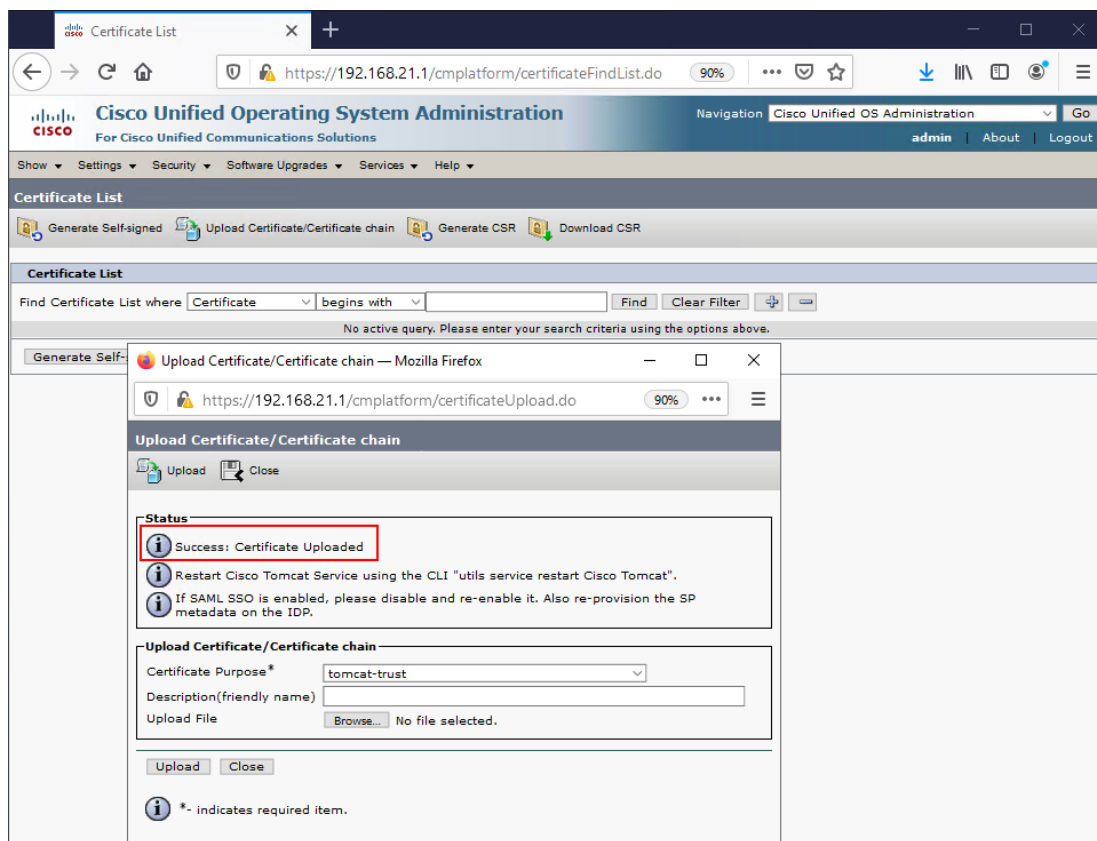
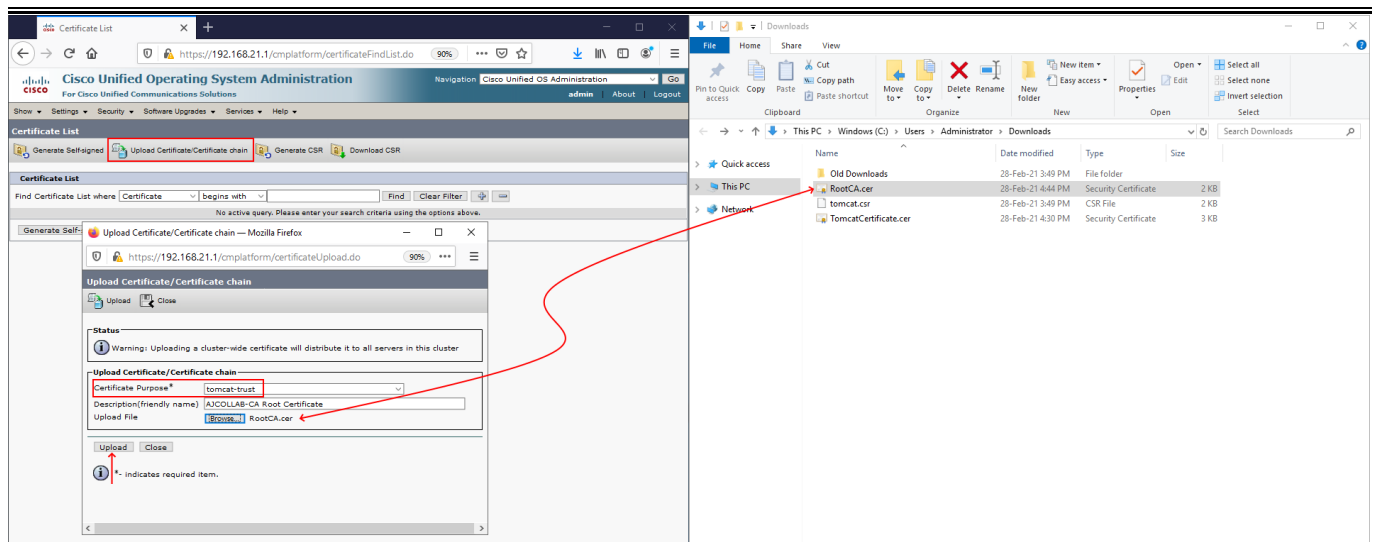
[Download latest delta CRL](#)

Downloads

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

RootCA.cer

```
1 -----BEGIN CERTIFICATE-----
2 MIIDZTCCAk2gAwIBAgIQdFmgTKibo5JBSqXQH/14vDANBgkqhkiG9w0BAQsFADBF
3 MRMwEQYKCZImiZPyLQBGRYDy29tMRgwFgYKCZImiZPyLQBGRYIYWpb2xsYWIx
4 FDASBgNVBAMTC0FKQ09MTFELUNBMB4XDTEyMDIyNjIwMzkwNjFoXDTI2MDIyNjIw
5 NDkwMTowRTETMBEGCgmSjOmT8ixkARKWA2NvbTEyYMBYGCgmSjOmT8ixkARKWCFq
6 Y29tMRgwFgYKCZImiZPyLQBGRYDy29tMRgwFgYKCZImiZPyLQBGRYIYWpb2xsYWIx
7 ggEPADCCAgCgGBALyq+NMHW0bHmJb+6LZjKNVx9S9ehXshuYy6GgKXzMB3Xkel
8 dv6KEZxW5rZhlAQCffJhoJM82fukCbleEpyxFHga9eDgo3yeshP25g5XZeJv9Cu
9 3LHLpz2gA6ryjtSpstbOz12fQXne4cfge5AffzMo144ZIOBvfFFH+a/Mx/FQd41C
10 wdre44ocPb1I7jFkMTVM9ADK311FpwnL6IMaloOasYpi8NyTGGrdgt9k5QTXGxf
11 sRwQFbKOEu7PFxsKb7KvAmBaufh5A3+S0B4FSicgDwt+a0+WSAthT4Ath2R2sNV
12 bhhidpJbEpJniFsg4Vwyhh2CnB7d8bD4uAd1R4UCAwEAANRME8wCwYDVR0PBAQD
13 AgGGA8GALUdEwEB/wQFMAMBAf8wHQYDVR0OBBYEFMM8qu581x2o8MS4ggS9yv0v
14 zjd1MBAGCSGAQOBgcVAQQAQAgEAMAGCSGIB3DQEBGCUAA4IBAQApxu9NMNSf
15 xDswDND8tdbowTta6x2NR00yAy6JORXzH1j+pFfFWPMEKACUixBh6WA8z7b95D3w
16 ktV7eL8hQ0Jx57W9D2bHfmcDwtGQVLb/kvDRhPL/Ug/9JgiNDDUpWzPMNkVc/NP
17 CphkZi2Rk25ki+CBjv0WbduTBYcL8qUG1NHK1MTVMKTZLEqR366Qt5A6/HBbN5x
18 oHUpBbOjJn37awpBwCPDAqIVFmTIQn4sKSQ+SUVBKEDwK0skfZKevoIUietmrJ
19 b56Efy76WHieyhoygAhyhuJA/Vsb64CugTzh5fBcYSU1BeVmFtJq0kMNdOxyOk1
20 ADTM9VgssypYQ
21 -----END CERTIFICATE-----
22
```





Certificate List

https://192.168.21.1/cmplatform/certificateFindList.do?sc=90%

Cisco Unified Operating System Administration  
For Cisco Unified Communications Solutions

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Certificate List

Generate Self-signed Upload Certificate/Certificate chain Generate CSR Download CSR

Status  
8 records found CUCM-PUB

Certificate List (1 - 8 of 8) Rows per Page 50

Find Certificate List where Certificate begins with tomcat  
Key Type begins with rsa Find Clear Filter

| Certificate  | Common Name ^           | Type        | Key Type | Distribution            | Issued By               | Expiration | Description                                 |
|--------------|-------------------------|-------------|----------|-------------------------|-------------------------|------------|---------------------------------------------|
| tomcat-trust | AJCOLLAB-CA             | Self-signed | RSA      | AJCOLLAB-CA             | AJCOLLAB-CA             | 02/27/2026 | AJCOLLAB-CA Root Certificate                |
| tomcat       | cucm-pub.ajcollab.com   | CSR Only    | RSA      | Multi-server(SAN)       | --                      | --         | Self-signed certificate generated by system |
| tomcat       | cucm-pub.ajcollab.com   | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com   | 02/16/2026 | Trust Certificate                           |
| tomcat-trust | cucm-pub.ajcollab.com   | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com   | 02/16/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub01.ajcollab.com | Self-signed | RSA      | cucm-sub01.ajcollab.com | cucm-sub01.ajcollab.com | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub02.ajcollab.com | Self-signed | RSA      | cucm-sub02.ajcollab.com | cucm-sub02.ajcollab.com | 02/17/2026 | Signed Certificate                          |
| tomcat-trust | imp-pub.ajcollab.com    | Self-signed | RSA      | imp-pub.ajcollab.com    | imp-pub.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | imp-sub.ajcollab.com    | Self-signed | RSA      | imp-sub.ajcollab.com    | imp-sub.ajcollab.com    | 02/17/2026 | Trust Certificate                           |

Generate Self-signed Upload Certificate/Certificate chain Generate CSR Download CSR

Certificate List

https://192.168.21.2/cmplatform/certificateFindList.do?sc=90%

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Certificate List

Generate Self-signed Upload Certificate/Certificate chain Generate CSR Download CSR

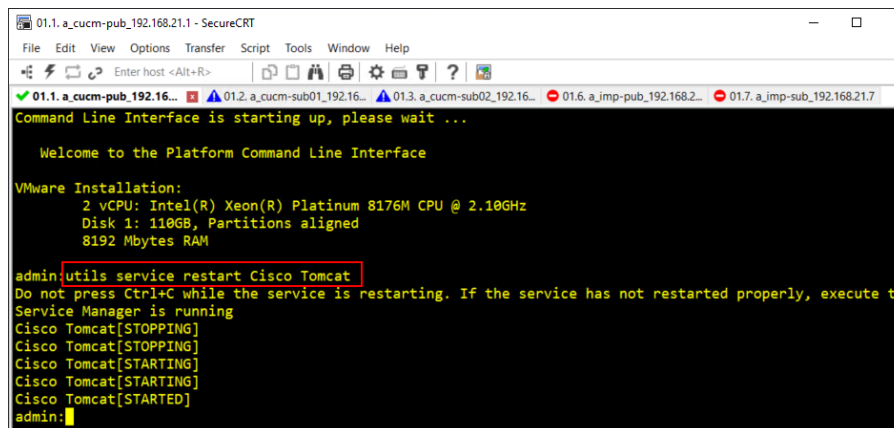
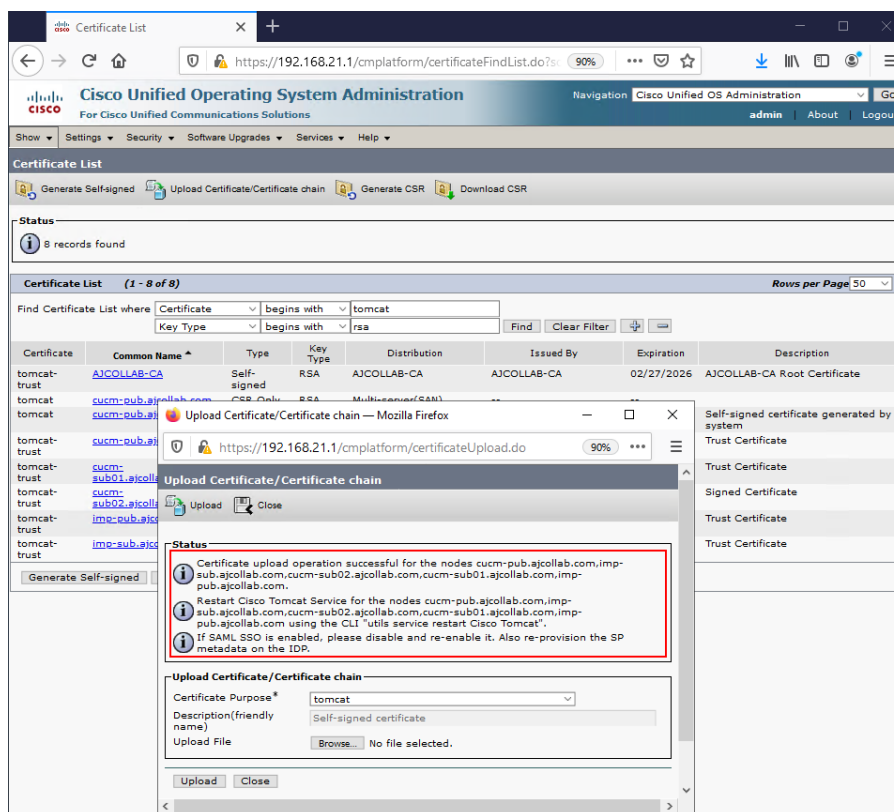
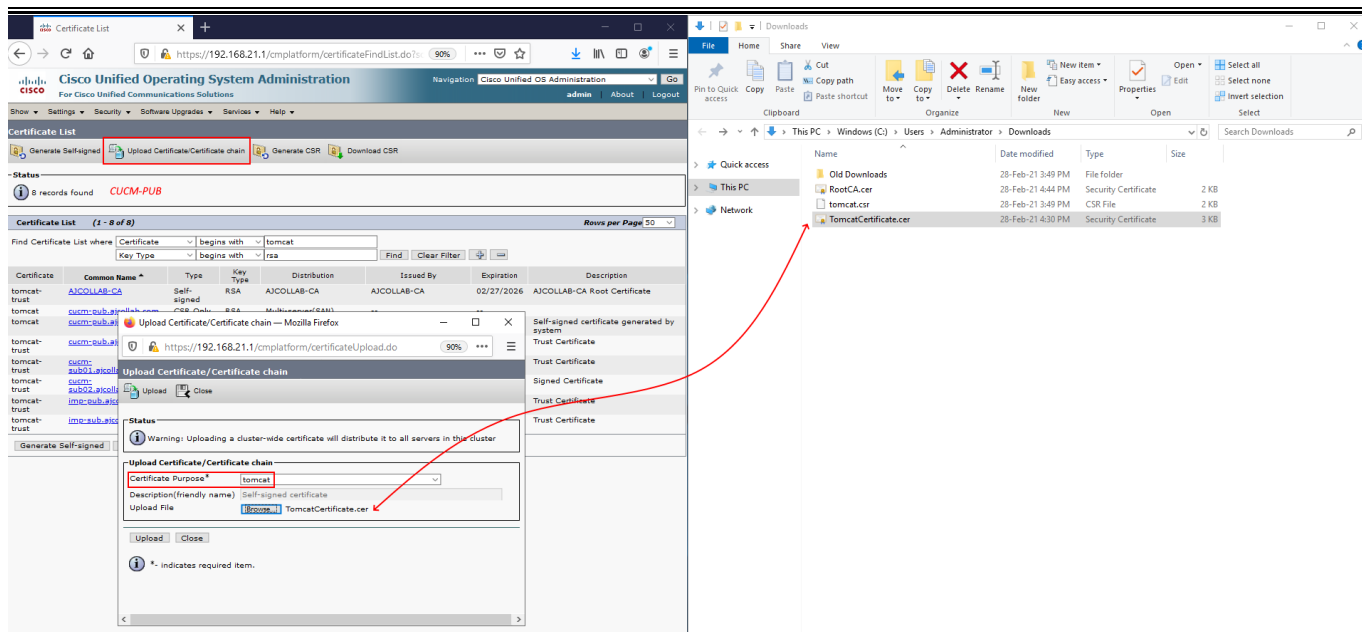
Status  
7 records found CUCM-SUB01

Certificate List (1 - 7 of 7) Rows per Page 50

Find Certificate List where Certificate begins with tomcat  
Key Type begins with rsa Find Clear Filter

| Certificate  | Common Name ^           | Type        | Key Type | Distribution            | Issued By               | Expiration | Description                                 |
|--------------|-------------------------|-------------|----------|-------------------------|-------------------------|------------|---------------------------------------------|
| tomcat-trust | AJCOLLAB-CA             | Self-signed | RSA      | AJCOLLAB-CA             | AJCOLLAB-CA             | 02/27/2026 | Trust Certificate                           |
| tomcat       | cucm-pub.ajcollab.com   | CSR Only    | RSA      | Multi-server(SAN)       | --                      | --         | Self-signed certificate generated by system |
| tomcat-trust | cucm-pub.ajcollab.com   | Self-signed | RSA      | cucm-pub.ajcollab.com   | cucm-pub.ajcollab.com   | 02/16/2026 | Trust Certificate                           |
| tomcat       | cucm-sub01.ajcollab.com | Self-signed | RSA      | cucm-sub01.ajcollab.com | cucm-sub01.ajcollab.com | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | cucm-sub02.ajcollab.com | Self-signed | RSA      | cucm-sub02.ajcollab.com | cucm-sub02.ajcollab.com | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | imp-pub.ajcollab.com    | Self-signed | RSA      | imp-pub.ajcollab.com    | imp-pub.ajcollab.com    | 02/17/2026 | Trust Certificate                           |
| tomcat-trust | imp-sub.ajcollab.com    | Self-signed | RSA      | imp-sub.ajcollab.com    | imp-sub.ajcollab.com    | 02/17/2026 | Trust Certificate                           |

Generate Self-signed Upload Certificate/Certificate chain Generate CSR Download CSR





Certificate List

https://192.168.21.1/cmplatform/certificateFindList.do

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For Cisco Unified Communications Solutions

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Certificate List

Generate Self-signed Upload Certificate/Certificate chain Generate CSR

Status

3 records found **CUCM-PUB**

Certificate List (1 - 3 of 3) Rows per Page 50

Find Certificate List where Certificate begins with tomcat  
Key Type begins with rsa Find Clear Filter

| Certificate  | Common Name                                                       | Type        | Key Type | Distribution      | Issued By   | Expiration | Description                       |
|--------------|-------------------------------------------------------------------|-------------|----------|-------------------|-------------|------------|-----------------------------------|
| tomcat       | <a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a> | CA-signed   | RSA      | Multi-server(SAN) | AJCOLLAB-CA | 02/28/2023 | Certificate Signed by AJCOLLAB-CA |
| tomcat-trust | <a href="https://ajcollab-ca">AJCOLLAB-CA</a>                     | Self-signed | RSA      | AJCOLLAB-CA       | AJCOLLAB-CA | 02/27/2026 | AJCOLLAB-CA Root Certificate      |
| tomcat-trust | <a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a> | CA-signed   | RSA      | Multi-server(SAN) | AJCOLLAB-CA | 02/28/2023 | Trust Certificate                 |

Generate Self-signed Upload Certificate/Certificate chain Generate CSR

Certificate List

https://192.168.21.2/cmplatform/certificateFindList.do

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For Cisco Unified Communications Solutions

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Certificate List

Generate Self-signed Upload Certificate/Certificate chain Generate CSR

Status

3 records found **CUCM-SUB01**

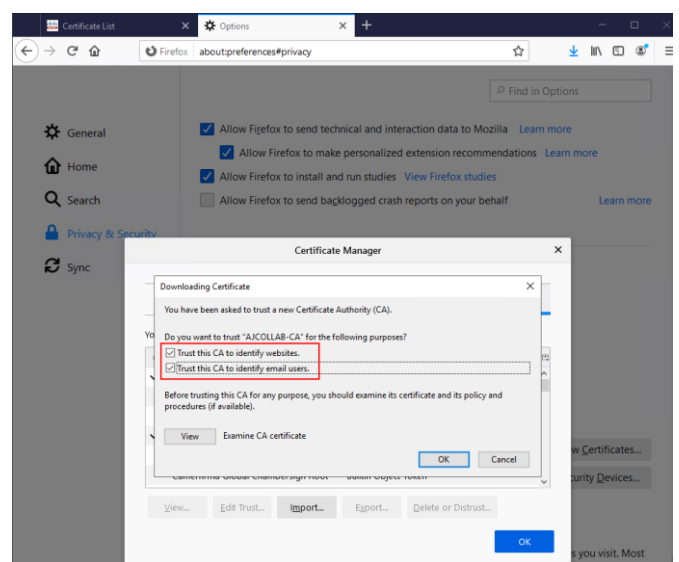
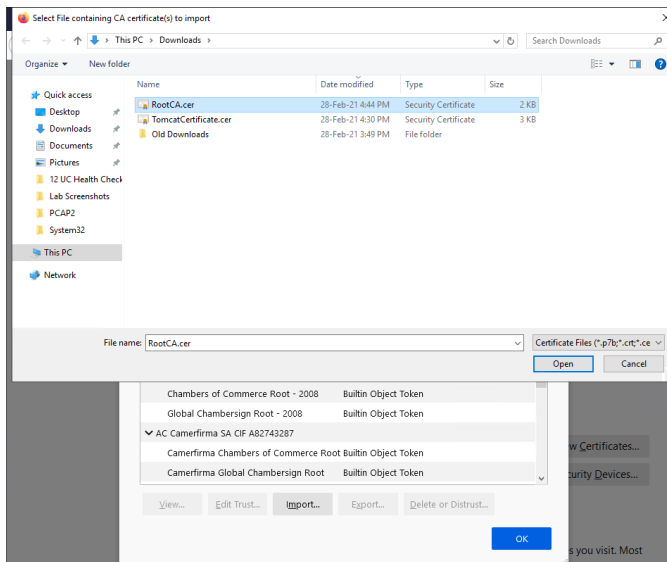
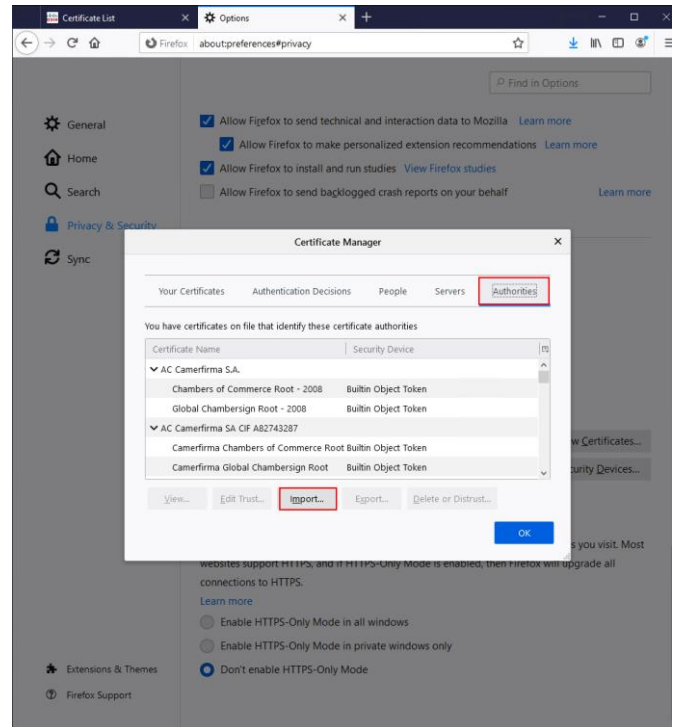
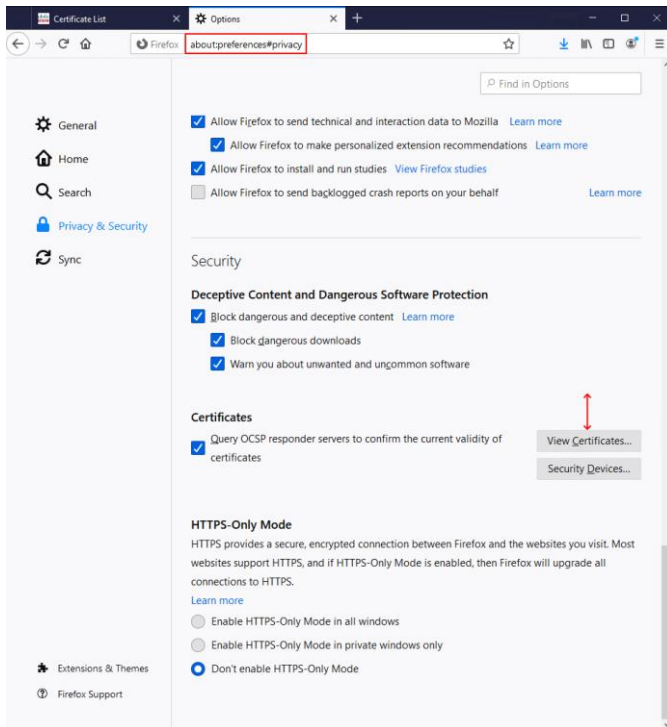
Certificate List (1 - 3 of 3) Rows per Page 50

Find Certificate List where Certificate begins with tomcat  
Key Type begins with rsa Find Clear Filter

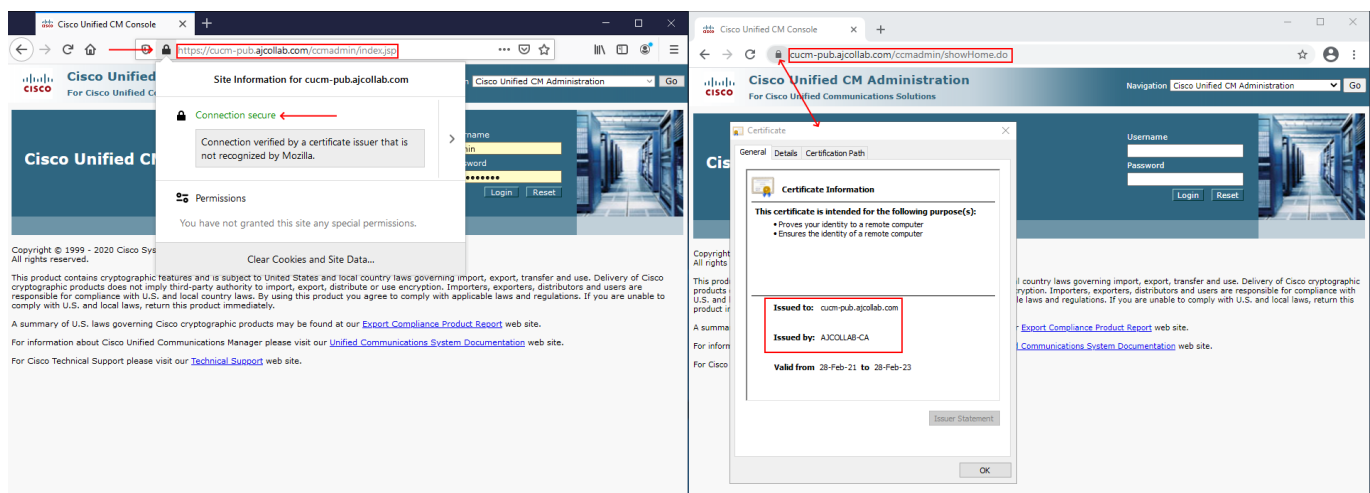
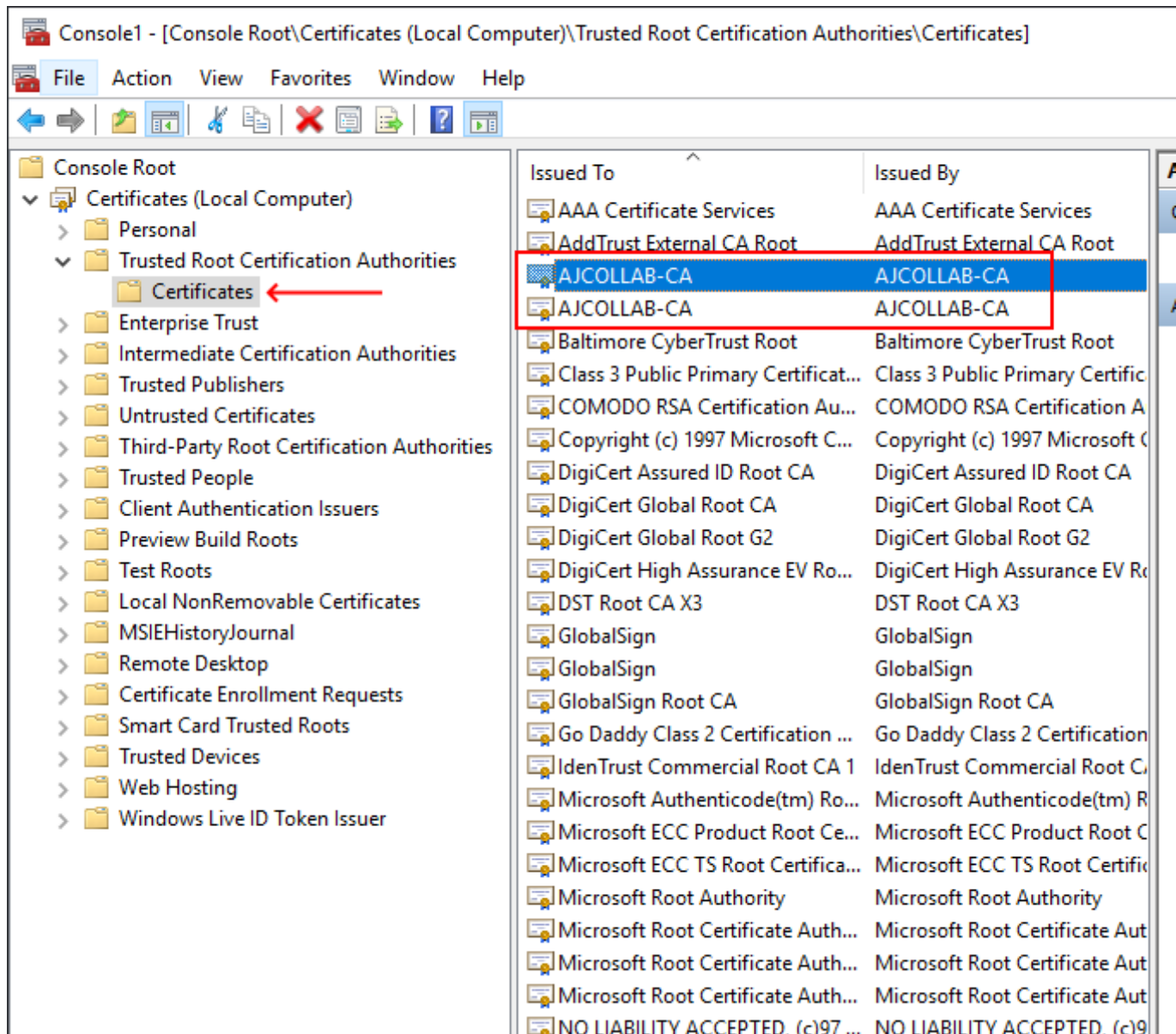
| Certificate  | Common Name                                                       | Type        | Key Type | Distribution      | Issued By   | Expiration | Description                       |
|--------------|-------------------------------------------------------------------|-------------|----------|-------------------|-------------|------------|-----------------------------------|
| tomcat       | <a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a> | CA-signed   | RSA      | Multi-server(SAN) | AJCOLLAB-CA | 02/28/2023 | Certificate Signed by AJCOLLAB-CA |
| tomcat-trust | <a href="https://ajcollab-ca">AJCOLLAB-CA</a>                     | Self-signed | RSA      | AJCOLLAB-CA       | AJCOLLAB-CA | 02/27/2026 | Trust Certificate                 |
| tomcat-trust | <a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a> | CA-signed   | RSA      | Multi-server(SAN) | AJCOLLAB-CA | 02/28/2023 | Trust Certificate                 |

Generate Self-signed Upload Certificate/Certificate chain Generate CSR

- Adding the Root-CA as trust in local Firefox Browser certificate store



- You can add the certificate via the MMC Certificate Interface



---

## Cisco IP Phone Services



- Cisco IP Phones services are applications that use the web client, web server and XML capabilities of Cisco IP Phone
- IP Phone firmware contains a micro web browser that enables limited web browsing capability
- For example, IP Phone can be used to turn ON and OFF the lights in a conference hall, IP Phones can be used to order food from a hotel room, etc.
- These services are subscribed to the specific IP Phones so that those phones can get these features. Enterprise subscription will make sure all the IP Phones will get that service
- Following list represents some of the configuration parameters related to IP Phone services and XML operations

- 
- To tune the IP Phone service URLs, go to System >> Enterprise Parameters)

**URL Authentication:** <http://ANY-CUCM-NODE-IP:8080/ccmcip/authenticate.jsp>

This URL gets used to validate requests made directly to the phone. This URL is automatically configured at install time. If the URL is removed, the push capabilities to the Cisco IP Phones will be disabled.

**URL Directories:** <http://ANY-CUCM-NODE-IP:8080/ccmcip/xmldirectory.jsp>

This parameter specifies the URL when the Directory button is pressed (missed calls, dialed calls, etc.).

**URL Idle:**

Points to a service that provides text or image to be displayed on the phone screen when the phone is idle

**URL Idle Time:**

Parameter indicates the time in seconds that a phone wait before initiating URL idle service

**URL Information:** <http://ANY-CUCM-NODE-IP:8080/ccmcip/GetTelecasterHelpText.jsp>

It points GetTelecasterHelpText.jsp service in CUCM. It provides help or call statistics when user pushes '?' button

**URL Services:** <http://ANY-CUCM-NODE-IP:8080/ccmcip/getservicesmenu.jsp>

It points to getservicesmenu.jsp services. It returns a CiscoIPPhoneMenu object with a list of services that are subscribed to the device when the user presses the service (Globe) button

**Note:** If your Phones doesn't have proper DNS server to resolve these DNS host names, the services will fail. Such scenarios, you can change these services to IP Address based instead of FQDN.

Find and List IP Phone Services

Navigation: Cisco Unified CM Administration admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Find and List IP Phone Services

Add New Select All Clear All Delete Selected

Status

7 records found

IP Phone Service (1 - 7 of 7) Rows per Page 50

Find IP Phone Service where IP Phone Service begins with Find Clear Filter

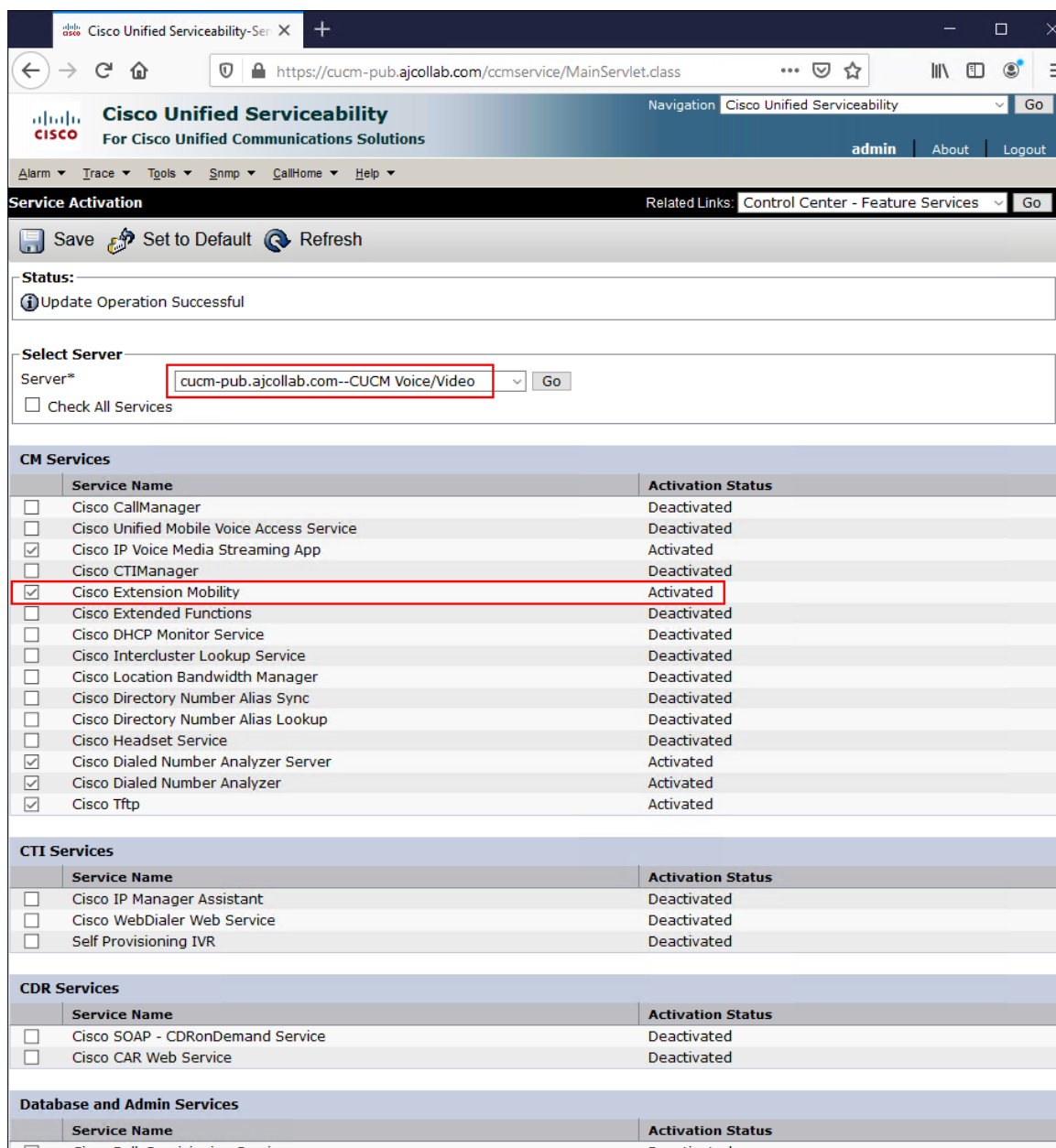
| <input type="checkbox"/> | IP Phone Service ^                  | Description         | Enterprise Subscription |
|--------------------------|-------------------------------------|---------------------|-------------------------|
| <input type="checkbox"/> | <a href="#">Corporate Directory</a> | Corporate Directory | true                    |
| <input type="checkbox"/> | <a href="#">Intercom Calls</a>      | Intercom Calls      | false                   |
| <input type="checkbox"/> | <a href="#">Missed Calls</a>        | Missed Calls        | true                    |
| <input type="checkbox"/> | <a href="#">Personal Directory</a>  | Personal Directory  | true                    |
| <input type="checkbox"/> | <a href="#">Placed Calls</a>        | Placed Calls        | true                    |
| <input type="checkbox"/> | <a href="#">Received Calls</a>      | Received Calls      | true                    |
| <input type="checkbox"/> | <a href="#">Voicemail</a>           | Voicemail           | true                    |

Add New Select All Clear All Delete Selected

- There are few default build in services available
- Device >> Device Settings >> IP Phone Services

## [Lab] Extension Mobility

- Allows roaming users to login to any device and get their personal settings such as Line number, Speed dial, Forward settings, calling privileges, Music on Hold source etc.
- Device specific parameter remain the same
- Instead of configuring phones for users, we just create Device Profile. It is a virtual phone profile that can move around to whatever phones the user logs into
- The configuration changes are triggered by a user login with a user ID & password, when the user stops using the phone, he / she logs out and default configuration reapplied
- It is implemented as a phone service and works on single cluster. From CUCM V8 onwards Extension Mobility Cross Cluster (EMCC) can be implemented
- Line CSS Pulled from Device Profile Device CSS remains same



The screenshot displays the Cisco Unified Serviceability web interface. The browser address bar shows the URL `https://cucm-pub.ajcollab.com/ccmservice/MainServlet.class`. The page title is "Cisco Unified Serviceability For Cisco Unified Communications Solutions". The user is logged in as "admin".

The "Service Activation" section is active, showing a status message: "Update Operation Successful". Below this, the "Select Server" dropdown is set to "cucm-pub.ajcollab.com--CUCM Voice/Video".

The "CM Services" table lists various services and their activation status:

| Service Name                                                            | Activation Status |
|-------------------------------------------------------------------------|-------------------|
| <input type="checkbox"/> Cisco CallManager                              | Deactivated       |
| <input type="checkbox"/> Cisco Unified Mobile Voice Access Service      | Deactivated       |
| <input checked="" type="checkbox"/> Cisco IP Voice Media Streaming App  | Activated         |
| <input type="checkbox"/> Cisco CTIManager                               | Deactivated       |
| <input checked="" type="checkbox"/> Cisco Extension Mobility            | Activated         |
| <input type="checkbox"/> Cisco Extended Functions                       | Deactivated       |
| <input type="checkbox"/> Cisco DHCP Monitor Service                     | Deactivated       |
| <input type="checkbox"/> Cisco Intercluster Lookup Service              | Deactivated       |
| <input type="checkbox"/> Cisco Location Bandwidth Manager               | Deactivated       |
| <input type="checkbox"/> Cisco Directory Number Alias Sync              | Deactivated       |
| <input type="checkbox"/> Cisco Directory Number Alias Lookup            | Deactivated       |
| <input type="checkbox"/> Cisco Headset Service                          | Deactivated       |
| <input checked="" type="checkbox"/> Cisco Dialed Number Analyzer Server | Activated         |
| <input checked="" type="checkbox"/> Cisco Dialed Number Analyzer        | Activated         |
| <input checked="" type="checkbox"/> Cisco Tftp                          | Activated         |

The "CTI Services" table lists:

| Service Name                                         | Activation Status |
|------------------------------------------------------|-------------------|
| <input type="checkbox"/> Cisco IP Manager Assistant  | Deactivated       |
| <input type="checkbox"/> Cisco WebDialer Web Service | Deactivated       |
| <input type="checkbox"/> Self Provisioning IVR       | Deactivated       |

The "CDR Services" table lists:

| Service Name                                              | Activation Status |
|-----------------------------------------------------------|-------------------|
| <input type="checkbox"/> Cisco SOAP - CDRonDemand Service | Deactivated       |
| <input type="checkbox"/> Cisco CAR Web Service            | Deactivated       |

The "Database and Admin Services" table lists:

| Service Name                                             | Activation Status |
|----------------------------------------------------------|-------------------|
| <input type="checkbox"/> Cisco Bulk Provisioning Service | Deactivated       |



Service Parameter Configuration

Navigation: Cisco Unified CM Administration

admin | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Service Parameter Configuration

Related Links: Parameters for All Servers

Save | Set to Default | Condensed

Status: Ready

Select Server and Service

Server\*: cucm-pub.ajcollab.com--CUCM Voice/Video (Active)

Service\*: Cisco Extension Mobility (Active)

All parameters apply only to the current server except parameters that are in the cluster-wide group(s).

Cisco Extension Mobility (Active) Parameters on server cucm-pub.ajcollab.com--CUCM Voice/Video (Active)

| Parameter Name                                                       | Parameter Value                                           | Suggested Value                                           |
|----------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| <b>Clusterwide Parameters (Parameters that apply to all servers)</b> |                                                           |                                                           |
| Enforce Intra-cluster Maximum Login Time *                           | False                                                     | False                                                     |
| Intra-cluster Maximum Login Time *                                   | 8:00                                                      | 8:00                                                      |
| Inter-cluster Maximum Login Time *                                   | 10:00                                                     | 10:00                                                     |
| Maximum Concurrent Requests *                                        | 15                                                        | 15                                                        |
| Intra-cluster Multiple Login Behavior *                              | Multiple Logins Not Allowed                               | Multiple Logins Not Allowed                               |
| Alphanumeric User ID *                                               | True                                                      | True                                                      |
| Remember the Last User Logged In *                                   | False                                                     | False                                                     |
| Clear Call Logs on Intra-Cluster EM *                                | False                                                     | False                                                     |
| Headset-based Extension Mobility *                                   | Allow headset for Extension Mobility sign in and sign out | Allow headset for Extension Mobility sign in and sign out |
| Auto logout timer after headset disconnect (minutes)                 | 5                                                         | 5                                                         |
| Validate IP Address *                                                | False                                                     | False                                                     |
| Trusted List of IPs                                                  |                                                           |                                                           |
| Allow Proxy *                                                        | True                                                      | True                                                      |
| EMCC Allow Proxy *                                                   | True                                                      | True                                                      |
| Extension Mobility Cache Size *                                      | 10000                                                     | 10000                                                     |

Save | Set to Default | Condensed

- **Enforce Intra-cluster Maximum Login Time:** This parameter determines whether a maximum login time is enforced for local login.
- **Intra-cluster Maximum Login Time:** This parameter specifies the maximum time that a user is allowed to be locally logged in to a device. (Default 8 hours). After 8 hours the user automatically logged out. The system ignores this parameter if the Enforce Maximum Login Time parameter is set to False.
- **Inter-cluster Maximum Login Time:** This parameter specifies the maximum time that a user is allowed to be remotely logged in to a device in EMCC mode. EMCC always enforce auto logout based on this value irrespective of the value of Enforce Maximum Login Time parameter (Default is 10 Hours)
- **Intra-cluster Multiple Login Behavior:** This parameter specifies the behavior for multiple attempted logins by the same user on different devices within the same cluster allowed or not. For EMCC, multiple logins are always allowed
- **Alphanumeric User ID:** This parameter specifies whether the user ID to be used is alphanumeric or numeric.
- **Remember the Last User Logged In:** This parameter specifies whether the user ID of the last user logged in on a phone is remembered by the extension mobility application.



- **Clear Call Logs on Intra-Cluster EM:** This parameter determines whether the call information stored on the phone directory (missed calls, placed calls, received calls) is cleared when a user manually logs in or out of a phone in the same cluster. For Extension Mobility Cross-Cluster (EMCC), the call log is always cleared when the user logs in or out of a phone)
- Device >> Device Settings >> Phone Services >> Add New >>
- **<http://cucm-pub.ajcollab.com:8080/emapp/EMAppServlet?device=#DEVICENAME#>**
- Here CUCM-PUB runs Extension Mobility Service
- If you enable Enterprise Subscription, then all the phones will get the service

**IP Phone Services Configuration**

Navigation: Cisco Unified CM Administration [Go](#)

admin | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Related Links: [Back To Find/List](#) [Go](#)

**Status**

Status: Ready

**Service Information**

Service Name\* EXTENSION-MOBILITY

Service Description EXTENSION-MOBILITY

Service URL\* <http://cucm-pub.ajcollab.com:8080/emapp/EMAppServlet?device=#DEVICENAME#>

Secure-Service URL

Service Category\* XML Service

Service Type\* Standard IP Phone Service

Service Vendor

Service Version

☒ Enable

☐ Enterprise Subscription

[Save](#)

\* - indicates required item.

*CUCM node where Extension Mobility Service running*

Device Profile Configuration

<https://cucm-pub.ajcollab.com/ccmadmin/deviceProfileEdit.do?key=829>

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Device Profile Configuration Related Links: Back To Find/List

Save Delete Copy Add New

Status  
Add successful

Association

Modify Button Items

1 [Line \[1\] - Add a new DN](#)

2 [Line \[2\] - Add a new DN](#)

3 [Add a new SD](#)

4 [Add a new SD](#)

5 [Add a new SD](#)

6 [Add a new SD](#)

7 [Add a new SD](#)

8 [Add a new SD](#)

9 [Add a new SD](#)

10 [Add a new SD](#)

----- Unassigned Associated Items -----

11 [Add a new SD](#)

12 Alerting Calls

13 All Calls

14 Answer Oldest

15 [Add a new BLF Directed Call Park](#)

16 Call Park

17 Call Pickup

18 CallBack

19 Do Not Disturb

User Device Profile Information

Product Type: Cisco 8865

Device Protocol: SIP

Device Profile Name\* 11001 - Deepika Padukone

Description 11001 - Deepika Padukone

User Hold MOH Audio Source < None >

User Locale < None >

Phone Button Template\* Standard 8865 SIP

Softkey Template Standard User

Privacy\* Default

Always Use Prime Line\* Default

Always Use Prime Line for Voice Message\* Default

☐ Ignore Presentation Indicators (internal calls only)

☐ Do Not Disturb

DND Option\* Use Common Phone Profile Setting

DND Incoming Call Alert < None >

Extension Mobility Cross Cluster CSS < None >

MLPP and Confidential Access Level Information

MLPP Domain < None >

MLPP Indication\* Default

MLPP Preemption\* Default

Logged Out (Default) Profile Information

Login User Id < None >

Directory Number Configuratio

<https://cucm-pub.ajcollab.com/ccmadmin/directoryNumberEdit.do?key=829>

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Directory Number Configuration Related Links: Configure Device (11001 - Deepika Padukone)

Save Delete Reset Apply Config Add New

Status  
Update successful

Directory Number Information

Directory Number\* 11001 ☐ Urgent Priority

Route Partition BANGALORE-INTERNAL

Description 11001 - Deepika Padukone

Alerting Name 11001 - Deepika Padukone

ASCII Alerting Name 11001 - Deepika Padukone

External Call Control Profile < None >

☒ Allow Control of Device from CTI

Associated Devices

SEP501CB00C71D5

11001 - Deepika Padukone

Dissociate Devices

Edit Device  
Edit Line Appearance

Directory Number Configuration

Save Delete Reset Apply Config Add New

Call Pickup Group: Use System Default

Audio Alert Setting(Phone Idle): Use System Default

Call Pickup Group: Use System Default

Audio Alert Setting(Phone Active): Use System Default

Recording Option\*: Call Recording Disabled

Recording Profile: < None >

Recording Media Source\*: Gateway Preferred

Monitoring Calling Search Space: < None >

☒ Log Missed Calls

Submit Propagate Selected

Multiple Call/Call Waiting Settings on Device 11001 - Deepika Padukone

Note: The range to select the Max Number of calls is: 1-200

Maximum Number of Calls\*: 6

Busy Trigger\*: 2 (Less than or equal to Max. Calls)

Forwarded Call Information Display on Device 11001 - Deepika Padukone

☐ Caller Name

☐ Caller Number

☐ Redirected Number

☐ Dialed Number

Users Associated with Line

|                                     | Full Name        | User ID          | Permission |
|-------------------------------------|------------------|------------------|------------|
| <input checked="" type="checkbox"/> | Padukone,Deepika | deepika.padukone |            |

Associate End Users Select All Clear All Delete Selected

Save Delete Reset Apply Config Add New

- indicates required item.

\*\*: Changes to Line or Directory Number settings require restart.

Device Profile Configuration

Save Delete Copy Add New

Related Links: Subscribe/Unsubscribe Services

Status: Ready

Association

Modify Button Items

- Line [1] - 11001 in BANGALORE-INTERNAL
- Line [2] - Add a new DN
- Add a new SD
- Add a new SD
- Add a new SD

User Device Profile Information

Product Type: Cisco 8865

Device Protocol: SIP

Device Profile Name\*: 11001 - Deepika Padukone

Description: 11001 - Deepika Padukone

User Hold MOH Audio Source: < None >

User Locale: < None >

Phone Button Template\*: Standard 8865 SIP

Softkey Template: Standard User

Subscribed Cisco IP Phone Services for 11001 - Deepika Padukone — Mozilla Firefox

https://cucm-pub.ajcollab.com/ccmadmin/ipphoneServiceSubscribeEdit.do?device=8

### Subscribed Cisco IP Phone Services for 11001 - Deepika Padukone

Next Help

**Status**  
Status: Ready

**Service Information**  
Service Subscription: New  
Select a Service\* EXTENSION-MOBILITY  
Service Description  
EXTENSION-MOBILITY

**Subscribed Services**  
Next Close

\* - indicates required item.

Subscribed Cisco IP Phone Services for 11001 - Deepika Padukone — Mozilla Firefox

https://cucm-pub.ajcollab.com/ccmadmin/ipphoneServiceSubscribeEdit.do?device=8

### Subscribed Cisco IP Phone Services for 11001 - Deepika Padukone

Save Help

**Status**  
Status: Ready

**Service Information**  
Service Subscription: EXTENSION-MOBILITY  
Service Name\* EXTENSION-MOBILITY

**Subscribed Services**  
Subscribe Back

\* - indicates required item.

End User Configuration

Navigation: Cisco Unified CM Administration

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

End User Configuration Related Links: Back to Find List Users

Save Delete Add New

Controlled Devices

Available Profiles

CTI Controlled Device Profiles

Device Association

Line Appearance Association for Presence

Extension Mobility

Available Profiles

Controlled Profiles

Default Profile

BLF Presence Group

SUBSCRIBE Calling Search Space

Allow Control of Device from CTI

Enable Extension Mobility Cross Cluster

Phone Configuration

Navigation: Cisco Unified CM Administration

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Phone Configuration Related Links: Subscribe/Unsubscribe Services

Save Delete Copy Reset Apply Config Add New

Status

Status: Ready

Association

Phone Type

Product Type: Cisco IP Communicator

Device Protocol: SCCP

Real-time Device Status

Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcollab.com

IPv4 Address: 192.168.11.1

Active Load ID: CIPC-8-6-6-0

Download Status: None

Device Information

Device is Active

Device is trusted

Device Name: CIPC-ABDUL

Description: 11002 - Abdul Jaseem

Subscribed Cisco IP Phone Services for CIPC-ABDUL — Mozilla Firefox

https://cucm-pub.ajcollab.com/ccmadmin/ipphoneServiceSubscribeEdit.do?device=f8f18d63-b...

### Subscribed Cisco IP Phone Services for CIPC-ABDUL

Next Help

**Status**

Status: Ready

**Service Information**

Service Subscription: New

Select a Service\* EXTENSION-MOBILITY

Service Description

EXTENSION-MOBILITY

**Subscribed Services**

Next Close

\* - indicates required item.

Subscribed Cisco IP Phone Services for CIPC-ABDUL — Mozilla Firefox

https://cucm-pub.ajcollab.com/ccmadmin/ipphoneServiceSubscribeEdit.do?device=f8f18d63-b...

### Subscribed Cisco IP Phone Services for CIPC-ABDUL

Save Help

**Status**

Status: Ready

**Service Information**

Service Subscription: EXTENSION-MOBILITY

Service Name\* EXTENSION-MOBILITY

**Subscribed Services**

Subscribe Back

Phone Configuration

https://cucm-pub.ajcollab.com/ccmadmin/phoneEdit.do?key=f8f18d63-b...

**Cisco Unified CM Administration**

Navigation Cisco Unified CM Administration admin About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Phone Configuration Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

Operation Completes by 2021 03 11 12 (YYYY:MM:DD:HH)

Certificate Operation Status: None

Note: Security Profile Contains Addition CAPF Settings.

**External Data Locations Information (Leave blank to use default)**

Information

Directory

Messages

Services

Authentication Server

Proxy Server

Idle

Idle Timer (seconds) 1

Secure Authentication URL

Secure Directory URL

Secure Idle URL

Secure Information URL

Secure Messages URL

Secure Services URL

**Extension Information**

☒ Enable Extension Mobility

Log Out Profile -- Use Current Device Settings --

Log in Time < None >

Log out Time < None >



---

## **Troubleshooting Extension Mobility and Common Error Codes**

While working in any enterprise UC infrastructure we usually face some common issues associated with extension mobility. I have added most familiar issues that I have dealt with in the past.

### **Error: Host not found**

- Make sure IP Phone can reach the service URL FQDN
- Make sure IP Phone can resolve the service URL FQDN
- Check Tomcat service is running on the Extension Mobility Enabled node
- If service URL is updated, please update the subscriptions in the phone

### **You can't see the EM feature after hitting the services button**

- Verify that you have configured the Extension Mobility service
- Verify the service URL is correct
- Start/Restart the EM services on the node

### **You can't log in/out of the EM feature, but you can see it after pressing the services button**

- This error comes when you haven't enabled the extension mobility on the Phone
- Subscribed the service to the phones/device profiles but haven't associated user to a device profile

### **Error: -After performing a login or logout, the user finds that the phone resets instead of restarting**

- Locale change may provide the basis for reset.
- If the User Locale that is associated with the login user or profile is not the same as the locale or device, after a successful login, the phone will perform a restart that is followed by a reset.
- This occurs because the phone configuration file is being rebuilt

### **Error [201] - Authentication error**

- The user should check that the correct User ID and PIN were entered

### **Error [22] - Dev.logon disabled**

- Make sure that you have chosen "Enable Extension Mobility" check box on the Phone Configuration window.

### **Error [205] - User Profile Absent**



- 
- Make sure that you have associated a Device Profile to the user

#### **Error [208] - EMService Conn. error**

- Verify that the Cisco Extension Mobility service is running on the node where service URL is pointed to

#### **Error [25] - User logged in elsewhere**

- Check whether the user is logged in to another phone.
- If multiple logins need to be allowed, ensure the Multiple Login Behavior service parameter is set to Multiple Logins Allowed or Auto logout

#### **Error [503] - Http Error**

- Check that the Cisco Extension Mobility Application service is running on the node where service URL is pointed to

#### **Error [202] - Blank user ID or Pin**

- Make sure that you enter a valid user ID and Pin

#### **Error [26] - Busy, please try again**

- Check whether the number of concurrent login/logout requests is greater than the Maximum Concurrent requests service parameter. If so, lower the number of concurrent requests
- To verify the number of concurrent login/logout requests, use Cisco Unified Communications Manager Cisco Unified Real-Time Monitoring Tool to view the Requests in Progress counter in the Extension Mobility object.

#### **Error [6] - Database Error**

- Check whether a large number of requests exists
- If large number of requests exists, the Requests in Progress counter in the Extension Mobility object counter specifies a high value.
- If the requests are rejected due to large number of concurrent requests, the Requests Throttled counter also specifies a high value.

#### **Error [207] - Device Name Empty or Error: - XML Error [4] Parse Error**

- 
- Check that the URL that is configured for Cisco Extension Mobility is correct and there shouldn't be any space in between

#### **Error - Cisco 8945 IP Phone does not show EM service**

- Set service provisioning to default or internal. Refer Bug CSCtx70127

#### **Error [http-8080-9]**

EMX509TrustManager - checkServerTrusted: BSCUCM001.blocksolutions.local Certificate not found in the keystore : the certificate chain is not trusted, Could not validate path.

- This happens when we have HTTPS in the service URL
- TVS Service failed to verify the service URL certificate, usually happens when there was a certificate related activity (regenerate, install new, etc.)
- You can try restarting TVS service of the node where phone is registered
- Make sure certificate activities are done in proper way

#### **Error [213] - Login is unavailable**

- This error comes when the device or phone load does not support EMCC (e.g. non-supported phone models, supported phone models with older phone load)
- It could also be the incorrect service URL and/or secure Service URL

#### **Error - Untrusted IP Error**

- This error comes when "Validate IP Address" service parameter is set to true and user tries to login/logout from a machine whose IP address is not trusted i.e. not listed in Trusted List of Ips service parameter

#### **Error - 79XX phones cannot access certain SURLs when running firmware 9-0-3+**

- Upgrade or Downgrade to the supported firmware

## DNS Based Redundancy in Extension Mobility

- As we know that we can configure only one service URL per service in Extension Mobility that is `http://cucm-pub.ajcollab.com:8080/emapp/EMAppServlet?device=#DEVICENAME#`
- Here if EM service cucm-pub.ajcollab.com is down or the node itself down, then the future fails for the users
- To provide redundancy on EM Future, we can enable Extension Mobility Service on other nodes, then create a DNS A Record that points to IP Address of the nodes those are running EM Service

The screenshot shows the DNS Manager console for a Windows Server. The left pane shows the hierarchy: DNS > WIN-SERVER-01 > Forward Lookup Zones > \_msdcs.ajcollab.com > ajcollab.com. The right pane displays a list of DNS records for the ajcollab.com zone. The records are as follows:

| Name                    | Type                     | Data                             | Timestamp             |
|-------------------------|--------------------------|----------------------------------|-----------------------|
| _msdcs                  |                          |                                  |                       |
| _sites                  |                          |                                  |                       |
| _tcp                    |                          |                                  |                       |
| _udp                    |                          |                                  |                       |
| DomainDnsZones          |                          |                                  |                       |
| ForestDnsZones          |                          |                                  |                       |
| (same as parent folder) | Host (A)                 | 10.106.79.66                     | 25-Feb-21 2:30:00 PM  |
| (same as parent folder) | Host (A)                 | 192.168.11.1                     | 24-Feb-21 11:30:00 AM |
| aus-cucm-pub            | Host (A)                 | 192.168.23.1                     | static                |
| cuc-pub                 | Host (A)                 | 192.168.21.4                     | static                |
| cuc-sub                 | Host (A)                 | 192.168.21.5                     | static                |
| cucm-pub                | Host (A)                 | 192.168.21.1                     | static                |
| cucm-sub01              | Host (A)                 | 192.168.21.2                     | static                |
| cucm-sub02              | Host (A)                 | 192.168.21.3                     | static                |
| imp-pub                 | Host (A)                 | 192.168.21.6                     | static                |
| imp-sub                 | Host (A)                 | 192.168.21.7                     | static                |
| sme-cucm-pub            | Host (A)                 | 192.168.22.1                     | static                |
| sme-cucm-sub01          | Host (A)                 | 192.168.22.2                     | static                |
| win-server-01           | Host (A)                 | 10.106.79.66                     | static                |
| win-server-01           | Host (A)                 | 192.168.11.1                     | static                |
| (same as parent folder) | Name Server (NS)         | win-server-01.ajcollab.com.      | static                |
| (same as parent folder) | Start of Authority (SOA) | [80] win-server-01.ajcollab.com. | static                |
| em-service              | Host (A)                 | 192.168.21.1                     |                       |
| em-service              | Host (A)                 | 192.168.21.2                     |                       |
| em-service              | Host (A)                 | 192.168.21.3                     |                       |

- The FQDN resolves to each IP address alternatively, this is a kind of stateless load balancing and uses default behavior of DNS Server


- Update the service URL with new FQDN
- Update the Subscriptions

IP Phone Services Configuration

+


← → ↻ 🏠


🔒 https://cucm-pub.ajcollab.com/ccmadmin/phoneSe


 **Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions


System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾

**IP Phone Services Configuration**


 Save

 Delete

 Update Subscriptions

 Add New

**Status**

 Update successful

**Service Information**

Service Name\*

EXTENSION-MOBILITY

Service Description

EXTENSION-MOBILITY

Service URL\*

http://em-service.ajcollab.com:8080/emapp/EMAppServlet?dev

Secure-Service URL

Service Category\*

XML Service ▾

Service Type\*

Standard IP Phone Service ▾

Service Vendor

Service Version

☒ Enable

---

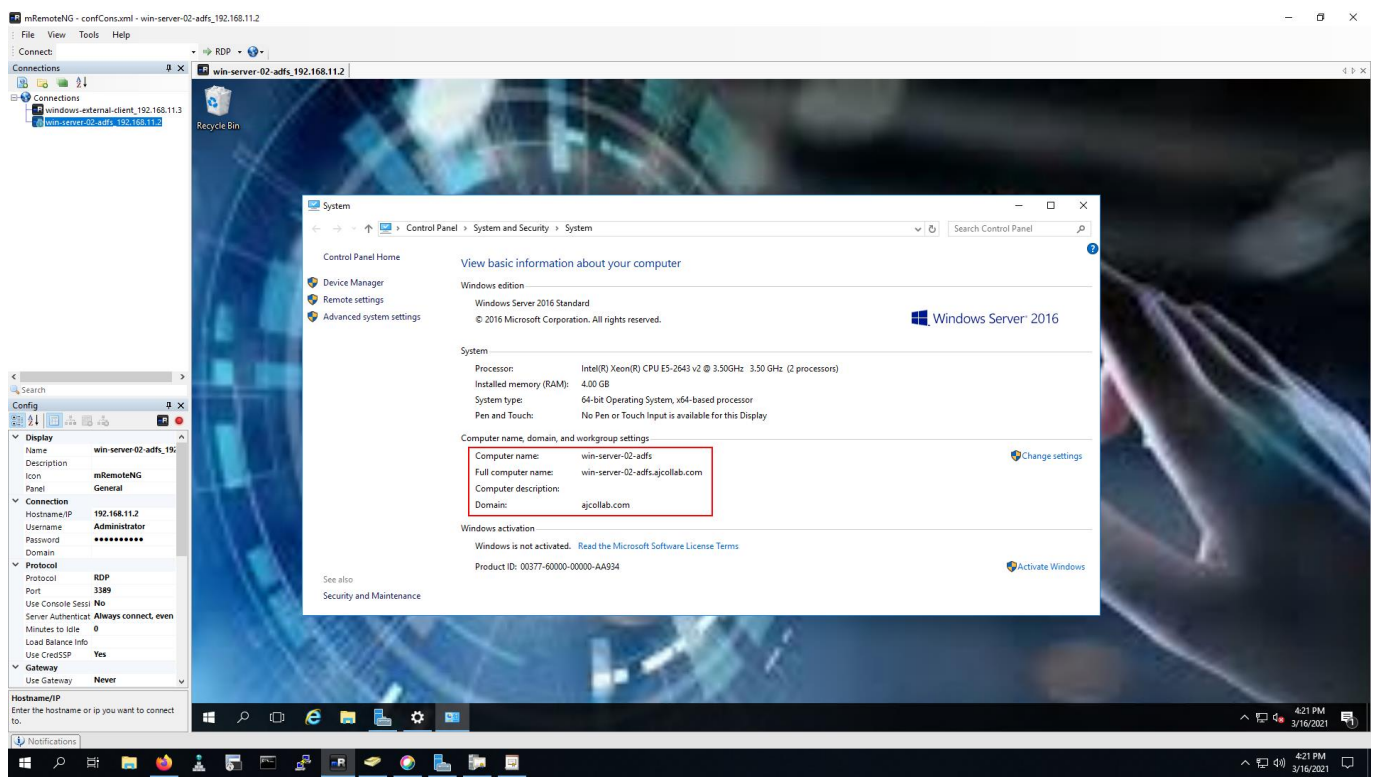
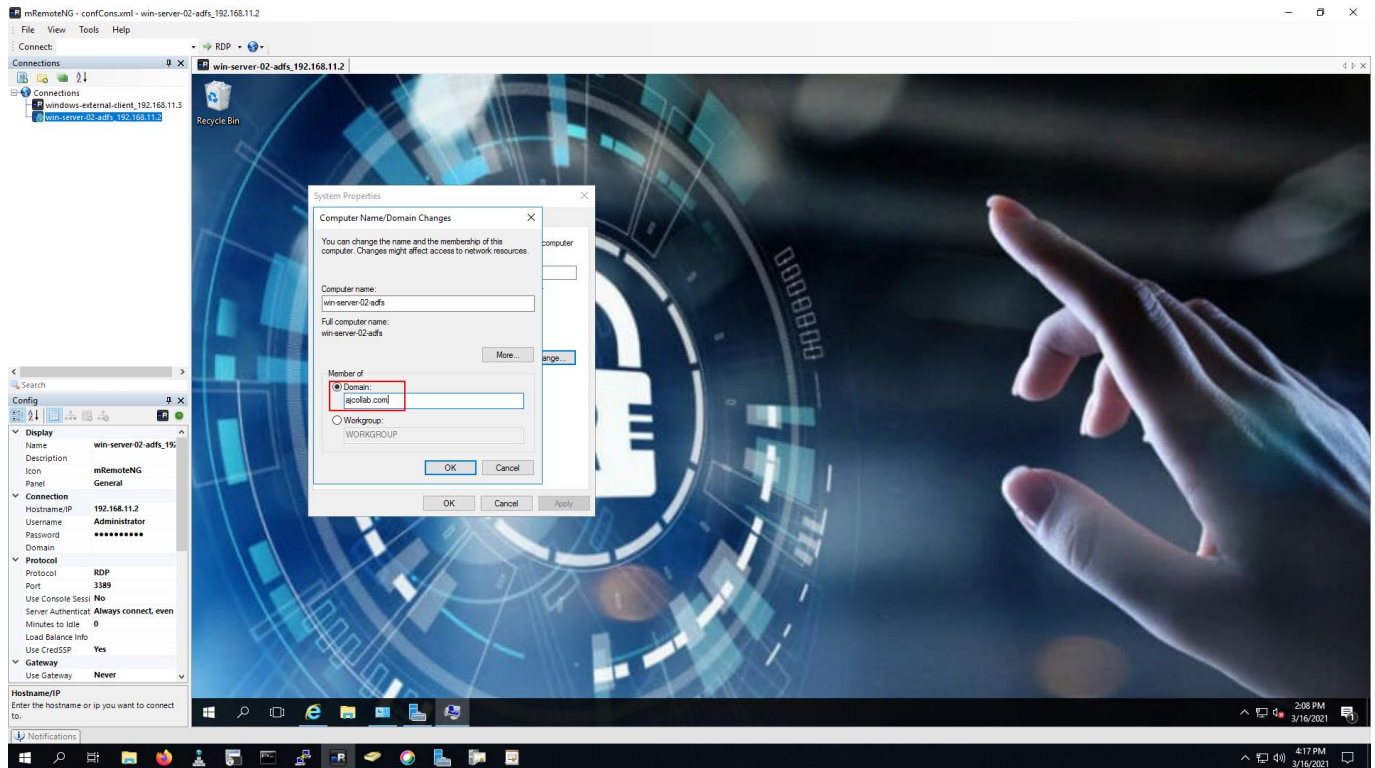
## Single sign-on (SSO)



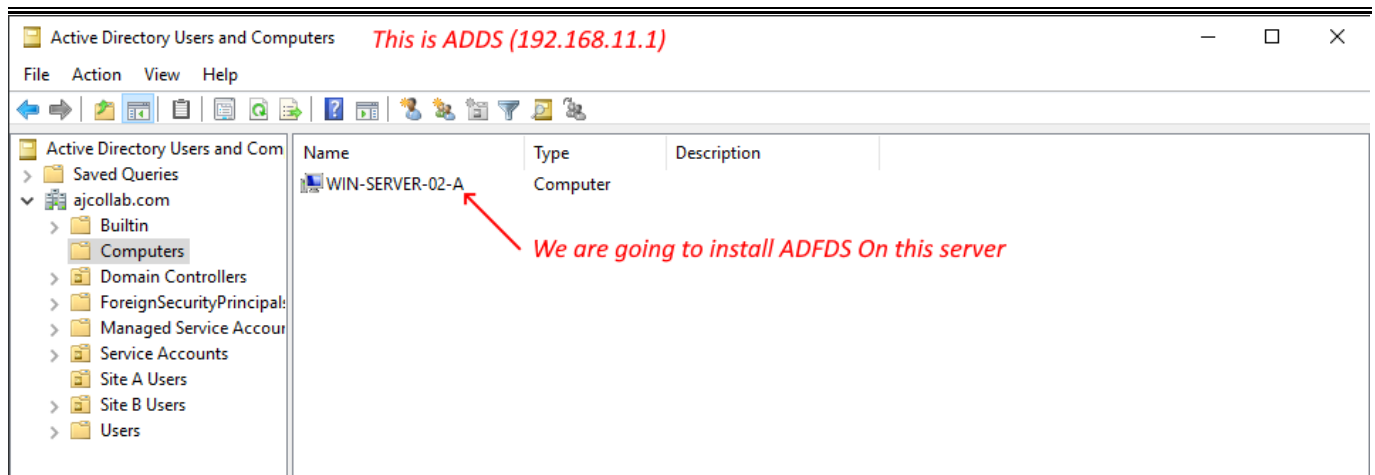
- Single sign-on (SSO) is an authentication method that enables users to securely authenticate with multiple applications and websites by using just one set of credentials
- One set of credentials to access multiple different services
- Authentication handled by IdP (Identity Provider) server, there are 2 types of SSO
- Intra-Organizational SSO: Access resources within the organization
- Inter-Organizational SSO: Also known as federated SSO, establish trust between multiple orgs to authenticate users
- Identity information formatted using Security Assertion Markup Language (SAML) 2.0, XML based open standard
- **Service Provider (SP):** Provides the service that being utilized (application or system that user logs in to. e.g. CUCM, CUC, IMP, etc.)
- **Identity Provider (IdP):** System that challenges a user for their credentials and tells the SP if the login was successful or not. Microsoft Azure and okta are cloud based IdPs Microsoft Windows ADFS, PingID etc. are other IdPs
- **Claim:** An IdP configuration that determines what information is to send to SP. It's basically taking some attributes (uid as SAM-AccountName)
- In the CUCM SSO, the SP is CUCM and the IdP can be a Windows Server with ADFS installed

## [Lab] Configure Active Directory Federation Services (ADFS)

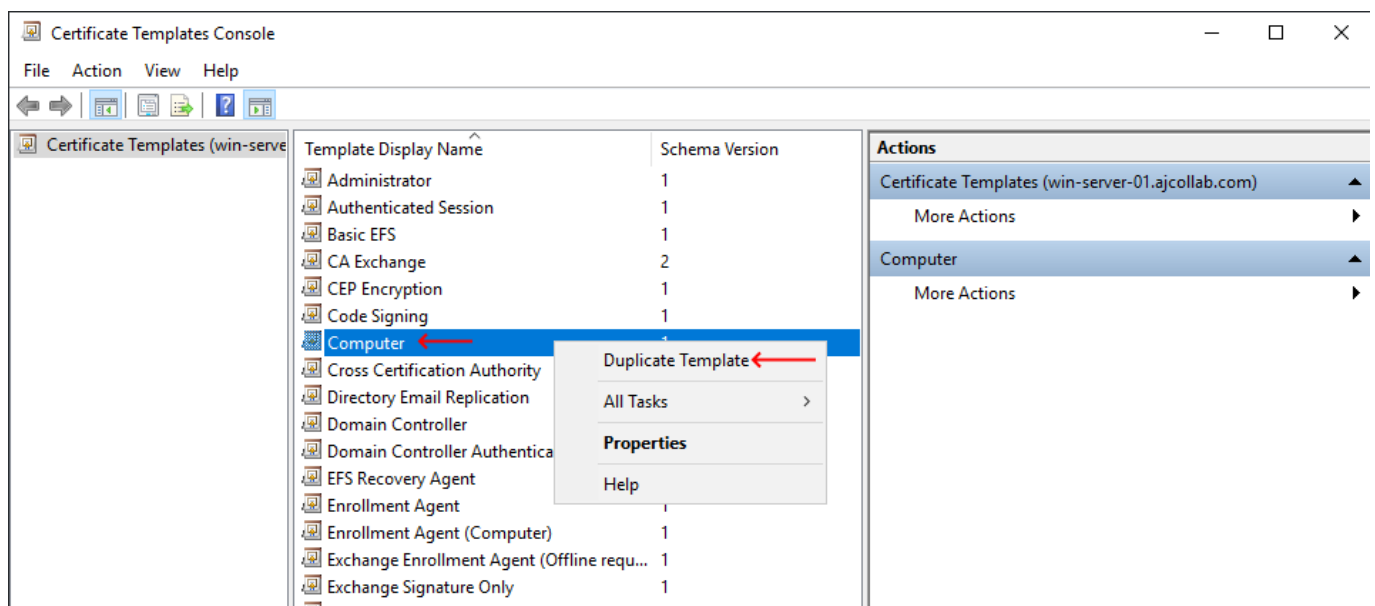
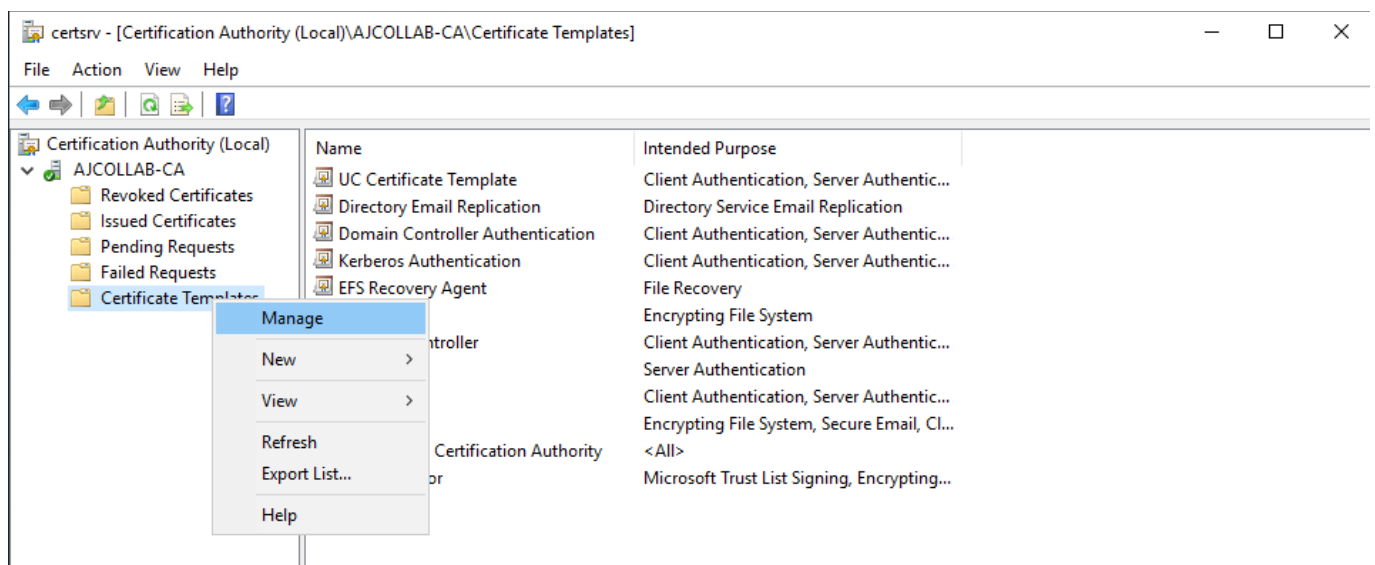
- I have installed a Windows Server 2016 for the ADFS Service, again, installing Windows Server is out of the scope of this article
- 192.168.11.1 - AD DS, CA
- 192.168.11.2 - AD FDS
- Add your ADFS Server to the Domain







- On your CA Server Create a Certificate Template that will be used by ADFS machine after setting up ADFS





Properties of New Template

| Subject Name         | Server         | Issuance Requirements |
|----------------------|----------------|-----------------------|
| Superseded Templates | Extensions     | Security              |
| Compatibility        | <b>General</b> | Request Handling      |
|                      |                | Cryptography          |
|                      |                | Key Attestation       |

Template display name:  
ADFS Certificate Template

Template name:  
ADFSCertificateTemplate

Validity period: 1 years  
Renewal period: 6 weeks

☒ Publish certificate in Active Directory  
☐ Do not automatically reenroll if a duplicate certificate exists in Active Directory

OK Cancel Apply Help

Properties of New Template

| Subject Name         | Server     | Issuance Requirements   |
|----------------------|------------|-------------------------|
| Superseded Templates | Extensions | Security                |
| Compatibility        | General    | <b>Request Handling</b> |
|                      |            | Cryptography            |
|                      |            | Key Attestation         |

Purpose: Signature and encryption

☐ Delete revoked or expired certificates (do not archive)  
☐ Include symmetric algorithms allowed by the subject  
☐ Archive subject's encryption private key

☐ Authorize additional service accounts to access the private key (\*)  
 Key Permissions...

☒ Allow private key to be exported  
☐ Renew with the same key (\*)  
☐ For automatic renewal of smart card certificates, use the existing key if a new key cannot be created (\*)

Do the following when the subject is enrolled and when the private key associated with this certificate is used:

☒ Enroll subject without requiring any user input  
☐ Prompt the user during enrollment  
☐ Prompt the user during enrollment and require user input when the private key is used

\* Control is disabled due to [compatibility settings](#).

OK Cancel Apply Help

Properties of New Template

| Subject Name         | Server     | Issuance Requirements |
|----------------------|------------|-----------------------|
| Superseded Templates | Extensions | <b>Security</b>       |
| Compatibility        | General    | Request Handling      |
|                      |            | Cryptography          |
|                      |            | Key Attestation       |

Group or user names:

- Authenticated Users
- Administrator
- Domain Admins (AJCOLLAB\Domain Admins)
- Domain Computers (AJCOLLAB\Domain Computers)
- Enterprise Admins (AJCOLLAB\Enterprise Admins)

Add... Remove

Permissions for Authenticated Users

|              | Allow                               | Deny                     |
|--------------|-------------------------------------|--------------------------|
| Full Control | <input type="checkbox"/>            | <input type="checkbox"/> |
| Read         | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Write        | <input type="checkbox"/>            | <input type="checkbox"/> |
| Enroll       | <input type="checkbox"/>            | <input type="checkbox"/> |
| Autoenroll   | <input type="checkbox"/>            | <input type="checkbox"/> |

For special permissions or advanced settings, click Advanced.

Advanced

OK Cancel Apply Help

Properties of New Template

Select Users, Computers, Service Accounts, or Groups

Select this object type: Users, Groups, or Built-in security principals

From this location: ajcollab.com

Enter the object names to select (examples):

Advanced... OK Cancel

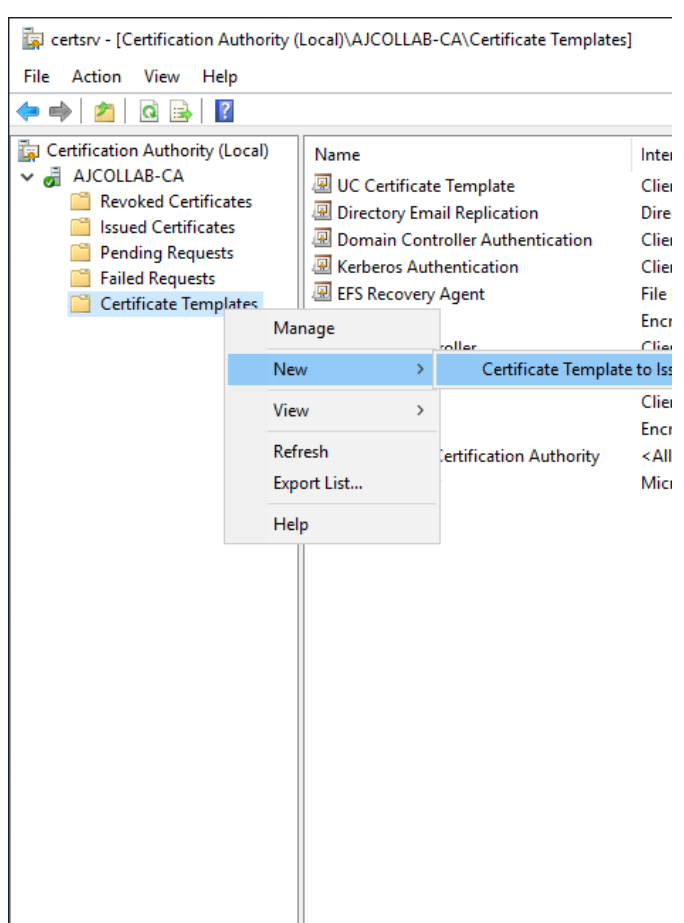
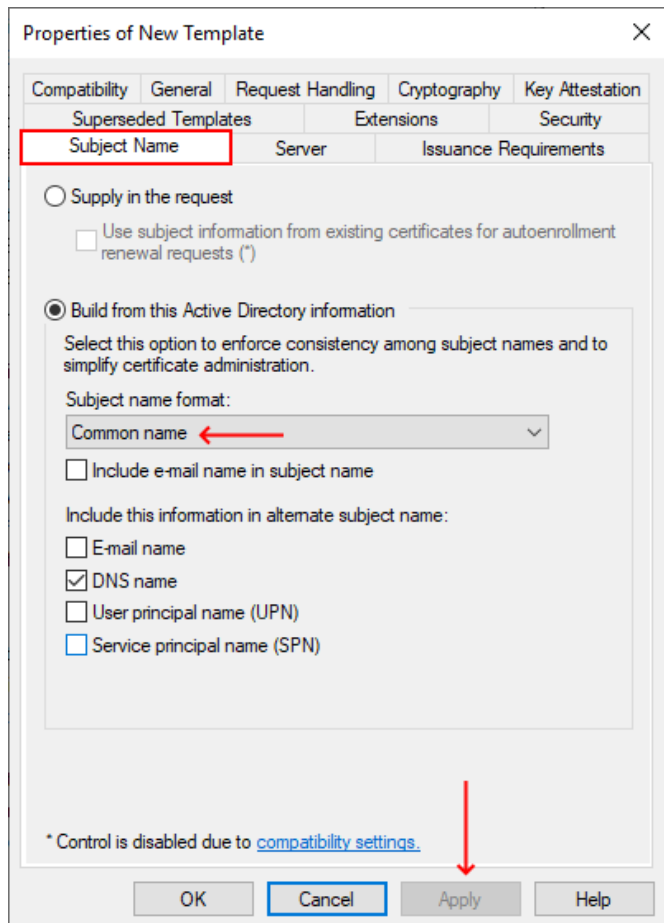
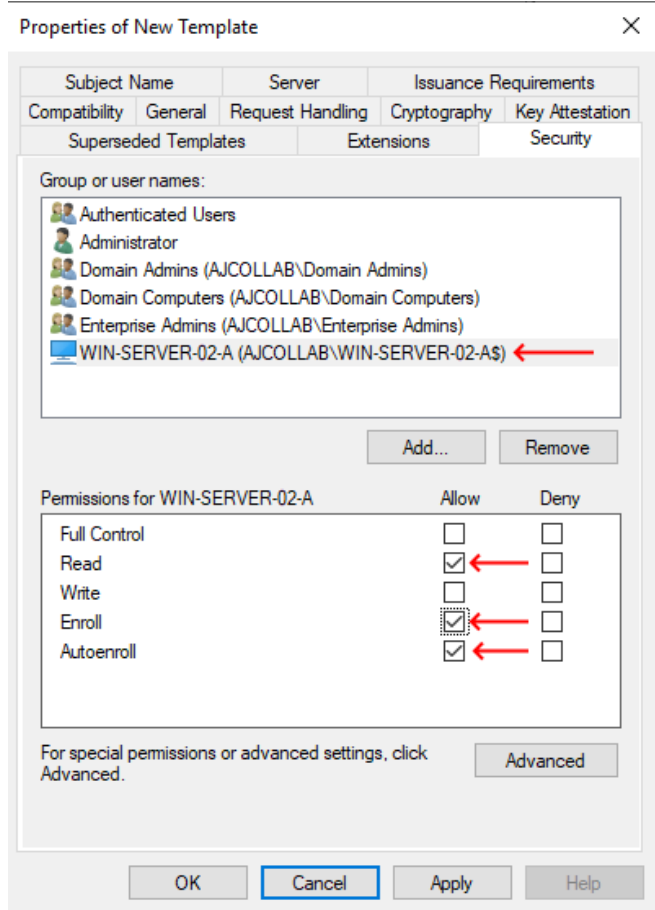
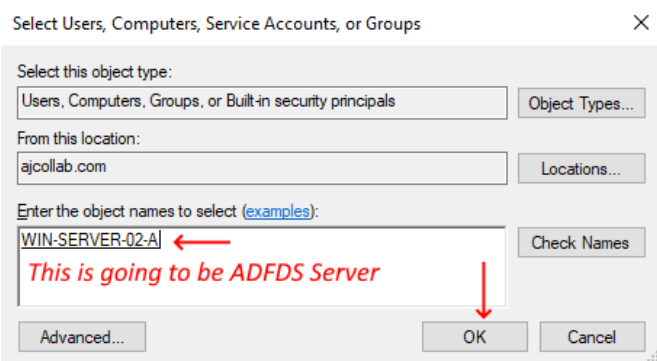
Object Types

Select the types of objects you want to find.

Object types:

- ☒ Built-in security principals
- ☐ Service Accounts
- ☒ Computers
- ☒ Groups
- ☒ Users

OK Cancel



## Enable Certificate Templates



Select one Certificate Template to enable on this Certification Authority.

Note: If a certificate template that was recently created does not appear on this list, you may need to wait until information about this template has been replicated to all domain controllers.

All of the certificate templates in the organization may not be available to your CA.

For more information, see [Certificate Template Concepts](#).

| Name                                        | Intended Purpose                             |
|---------------------------------------------|----------------------------------------------|
| ADFS Certificate Template                   | Server Authentication, Client Authentication |
| Authenticated Session                       | Client Authentication                        |
| CA Exchange                                 | Private Key Archival                         |
| CEP Encryption                              | Certificate Request Agent                    |
| Code Signing                                | Code Signing                                 |
| Cross Certification Authority               | <All>                                        |
| Enrollment Agent                            | Certificate Request Agent                    |
| Enrollment Agent (Computer)                 | Certificate Request Agent                    |
| Exchange Enrollment Agent (Offline request) | Certificate Request Agent                    |
| Exchange Signature Only                     | Secure Email                                 |

OK

Cancel

mRemoteNG - confConsol - win-server-02-adfs.192.168.11.2

File View Tools Help

Connect: RDP

Connections

- Connections
- Windows-external-client.192.168.11.3
- win-server-02-adfs.192.168.11.2

win-server-02-adfs.192.168.11.2

Console1 - (Console Root)

File Action View Favorites Window Help

Console Root

Name

There are no items to show in this view.

Actions

- Console Root
- More Actions

Run

Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.

Open: cmd

This task will be created with administrative privileges.

OK Cancel Browse...

Display

Name win-server-02-adfs.192.168.11.2

Description mRemoteNG

Icon General

Panel

Connection

Hostname/IP 192.168.11.2

Username Administrator

Password \*\*\*\*\*

Domain

Protocol

Protocol RDP

Port 3389

Use Console Sess No

Server Authentication Always connect, even

Minutes to idle 0

Load Balance Info

Use CredSSP Yes

Gateway

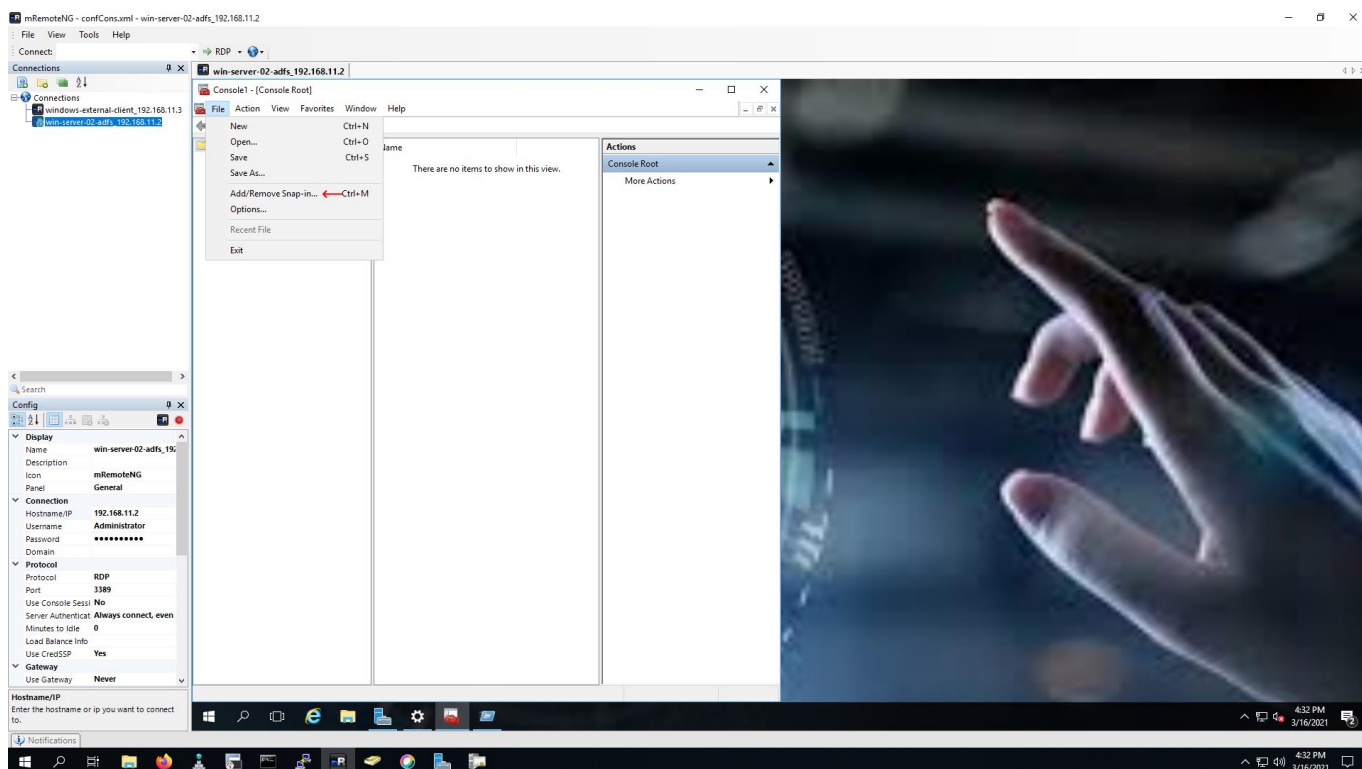
Use Gateway Never

Hostname/IP

Enter the hostname or ip you want to connect to.

Notifications

4:31 PM 3/16/2021



## Add or Remove Snap-ins



You can select snap-ins for this console from those available on your computer and configure the selected set of snap-ins. For extensible snap-ins, you can configure which extensions are enabled.

### Available snap-ins:

| Snap-in                 | Vendor           |
|-------------------------|------------------|
| ActiveX Control         | Microsoft Cor... |
| Authorization Manager   | Microsoft Cor... |
| Certificates            | Microsoft Cor... |
| Component Services      | Microsoft Cor... |
| Computer Managem...     | Microsoft Cor... |
| Device Manager          | Microsoft Cor... |
| Disk Management         | Microsoft and... |
| Event Viewer            | Microsoft Cor... |
| Folder                  | Microsoft Cor... |
| Group Policy Object ... | Microsoft Cor... |
| IP Security Monitor     | Microsoft Cor... |
| IP Security Policy M... | Microsoft Cor... |
| Link to Web Address     | Microsoft Cor... |

### Selected snap-ins:

|              |
|--------------|
| Console Root |
|--------------|

Edit Extensions...

Remove

Move Up

Move Down

Advanced...

Add >

### Description:

The Certificates snap-in allows you to browse the contents of the certificate stores for yourself, a service, or a computer.

OK

Cancel

### Certificates snap-in

This snap-in will always manage certificates for:

☐ My user account  
☐ Service account  
☒ Computer account

< Back   **Next >**   Cancel

### Select Computer

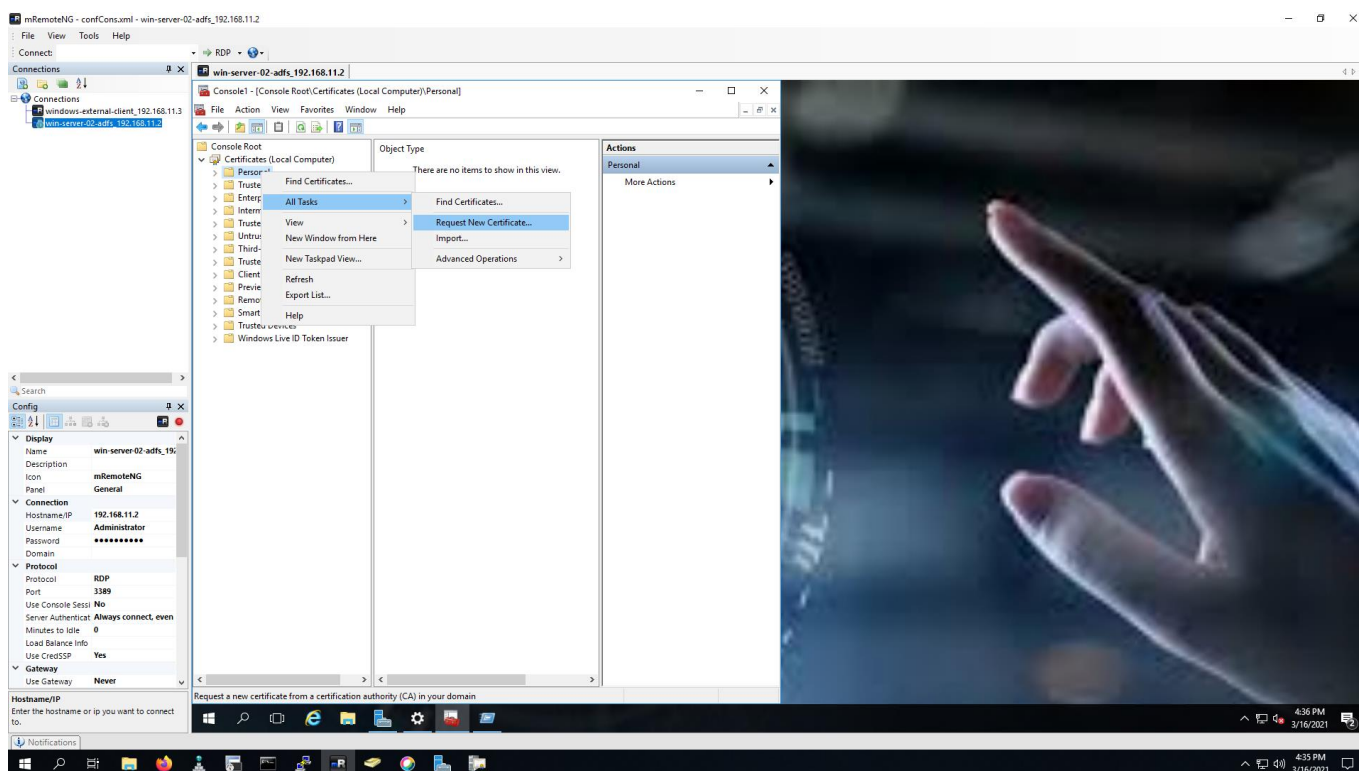
Select the computer you want this snap-in to manage.

This snap-in will always manage:

☒ Local computer: (the computer this console is running on)  
☐ Another computer:  Browse...

☐ Allow the selected computer to be changed when launching from the command line. This only applies if you save the console.

< Back   **Finish**   Cancel



### Certificate Enrollment

#### Before You Begin

The following steps will help you install certificates, which are digital credentials used to connect to wireless networks, protect content, establish identity, and do other security-related tasks.

Before requesting a certificate, verify the following:

- Your computer is connected to the network
- You have credentials that can be used to verify your right to obtain the certificate

**Next**   Cancel

### Certificate Enrollment

#### Select Certificate Enrollment Policy

Certificate enrollment policy enables enrollment for certificates based on predefined certificate templates. Certificate enrollment policy may already be configured for you.

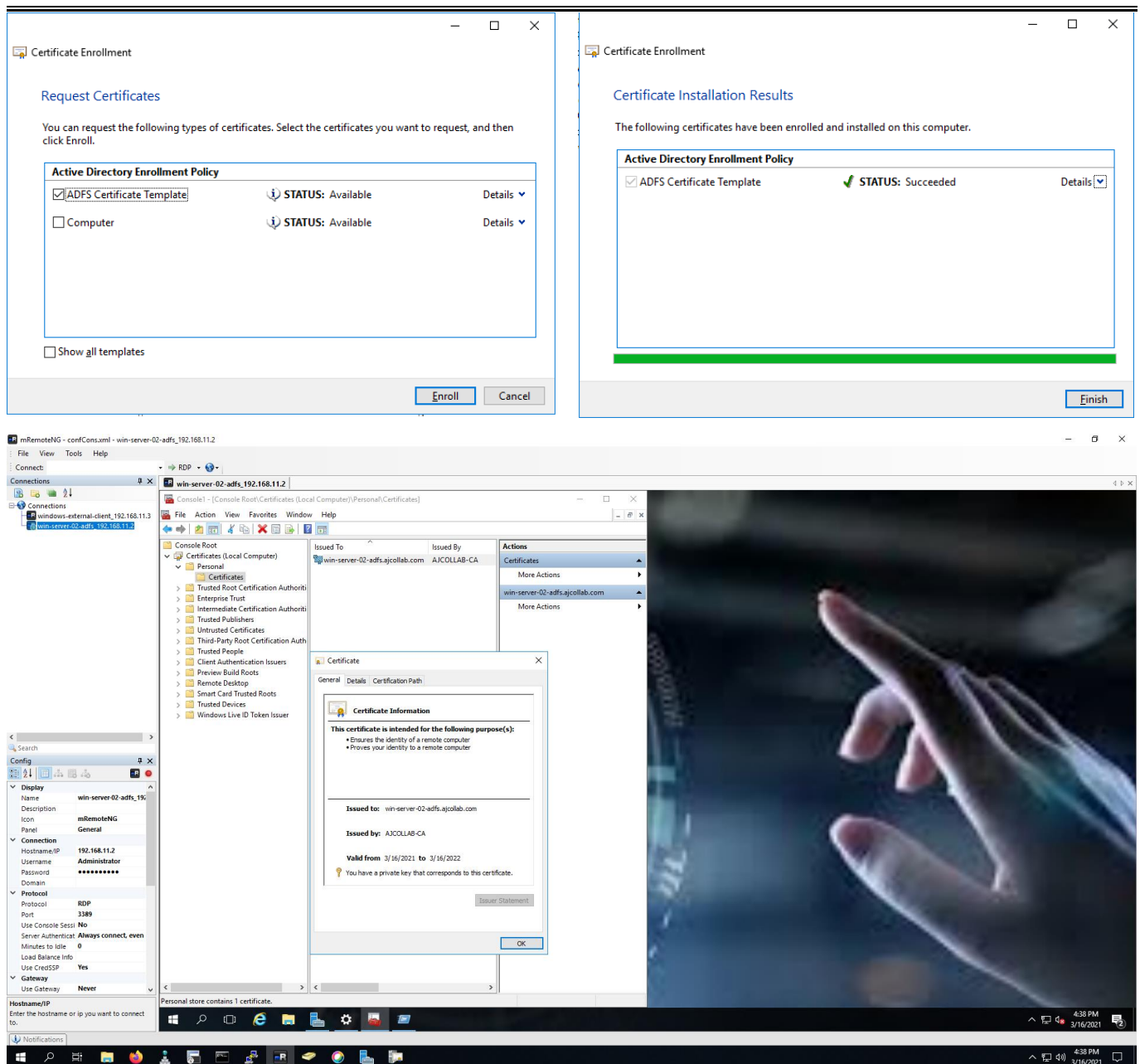
**Configured by your administrator**

Active Directory Enrollment Policy

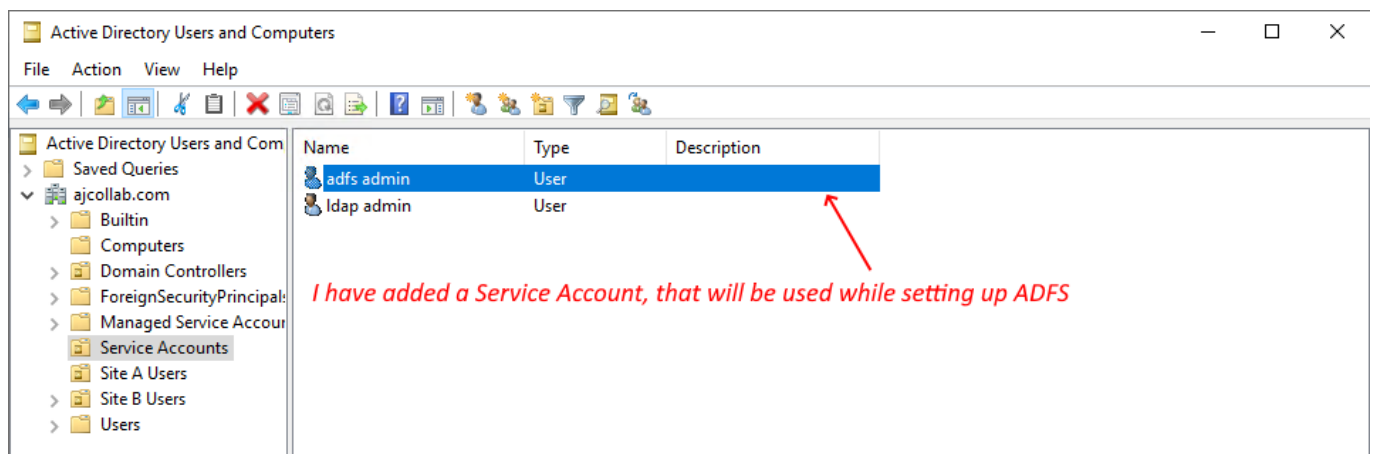
**Configured by you**   [Add New](#)

**Next**   Cancel





## Add a Service Account in AD



## Add ADFS Feature

win-server-02-adfs\_192.168.11.2

Server Manager

Dashboard

WELCOME TO SERVER MANAGER

1 Configure this local server

2 Add roles and features ←

3 Add other servers to manage

4 Create a server group

5 Connect this server to cloud services

QUICK START

WHAT'S NEW

LEARN MORE

Hide

ROLES AND SERVER GROUPS

Roles: 1 | Server groups: 1 | Servers total: 1

File and Storage Services 1

Manageability

Events

Performance

BPA results

Local Server 1

Manageability

Events

1 Services

Performance

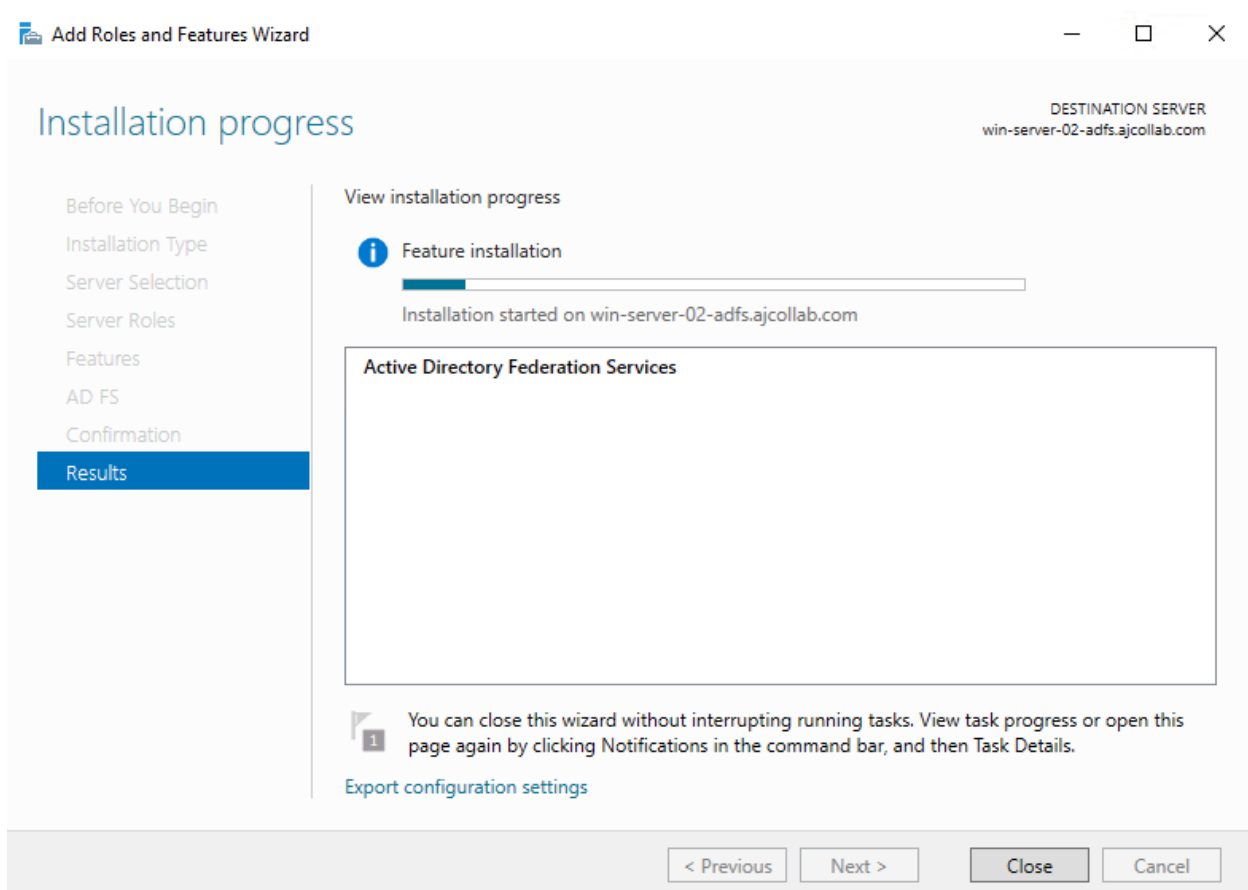
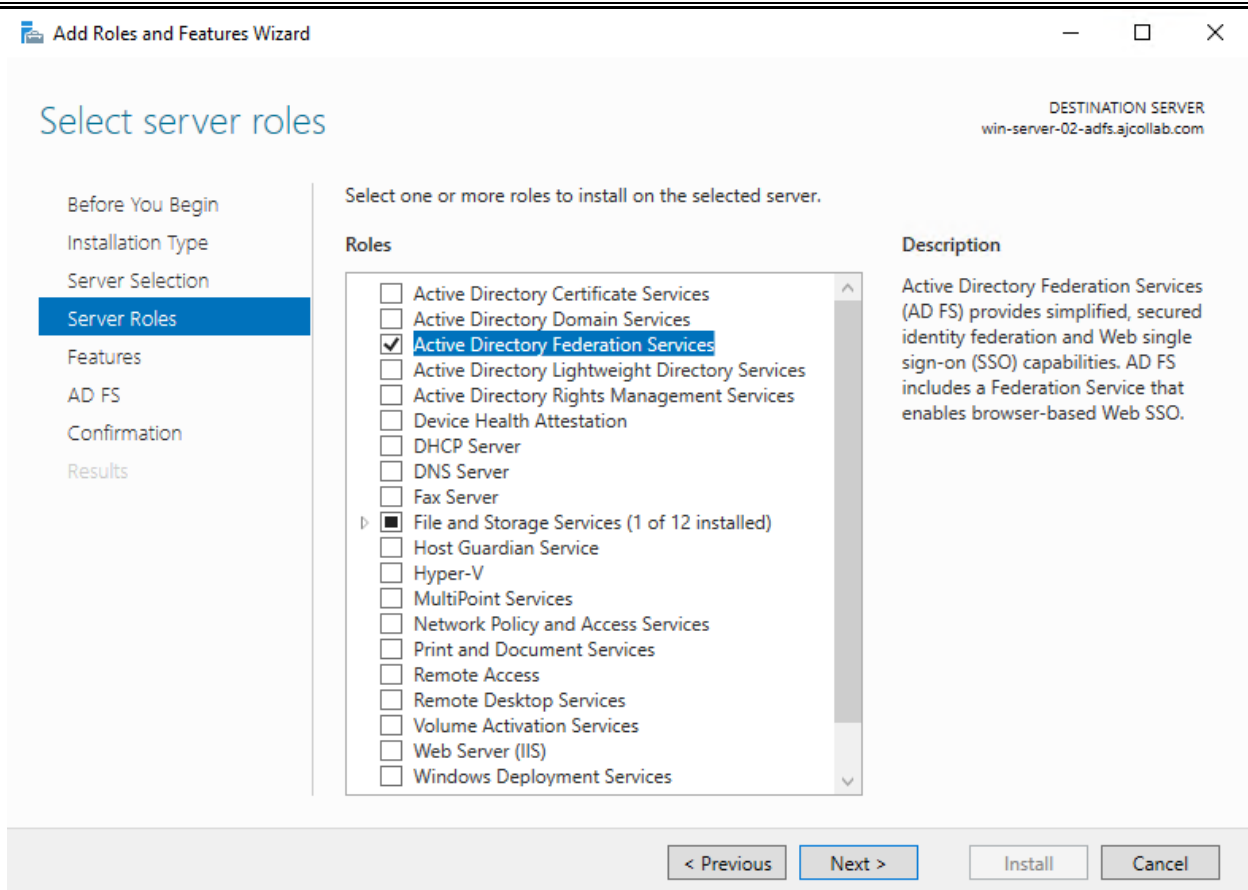
BPA results

3/16/2021 4:29 PM

All Servers 1

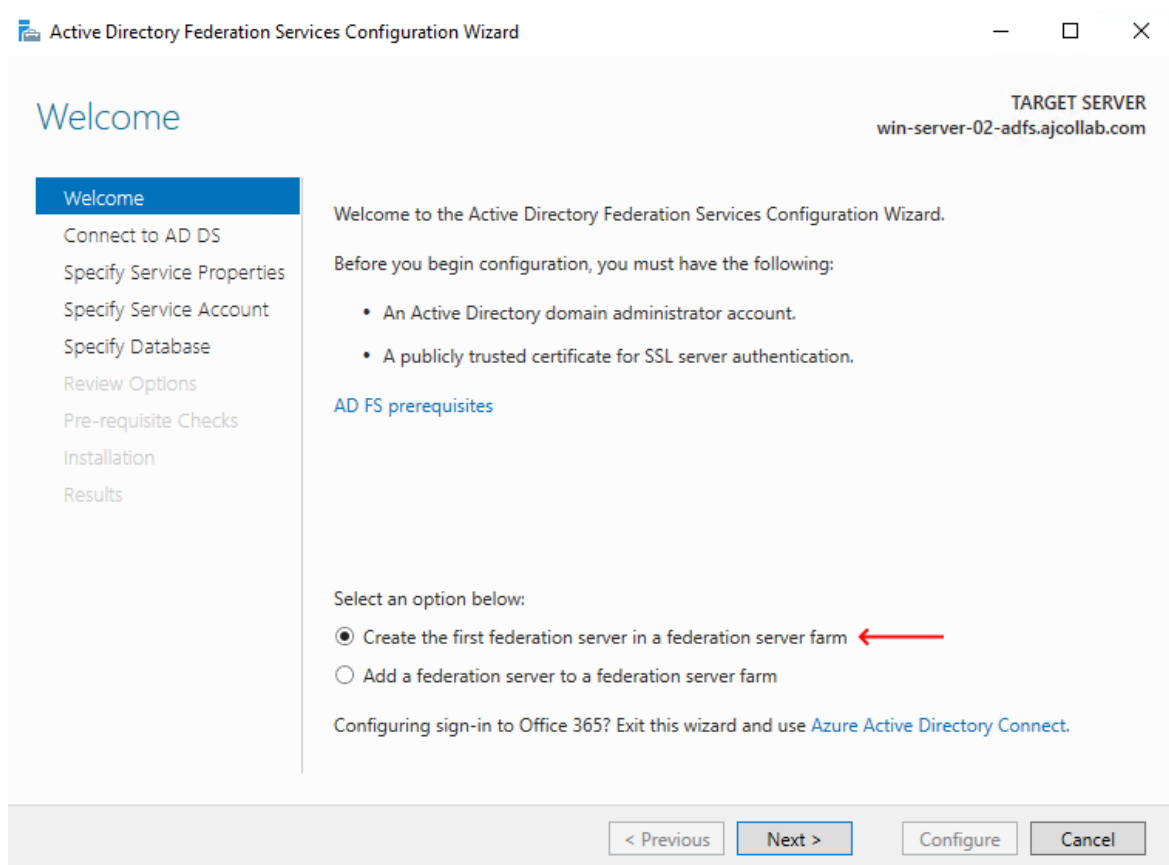
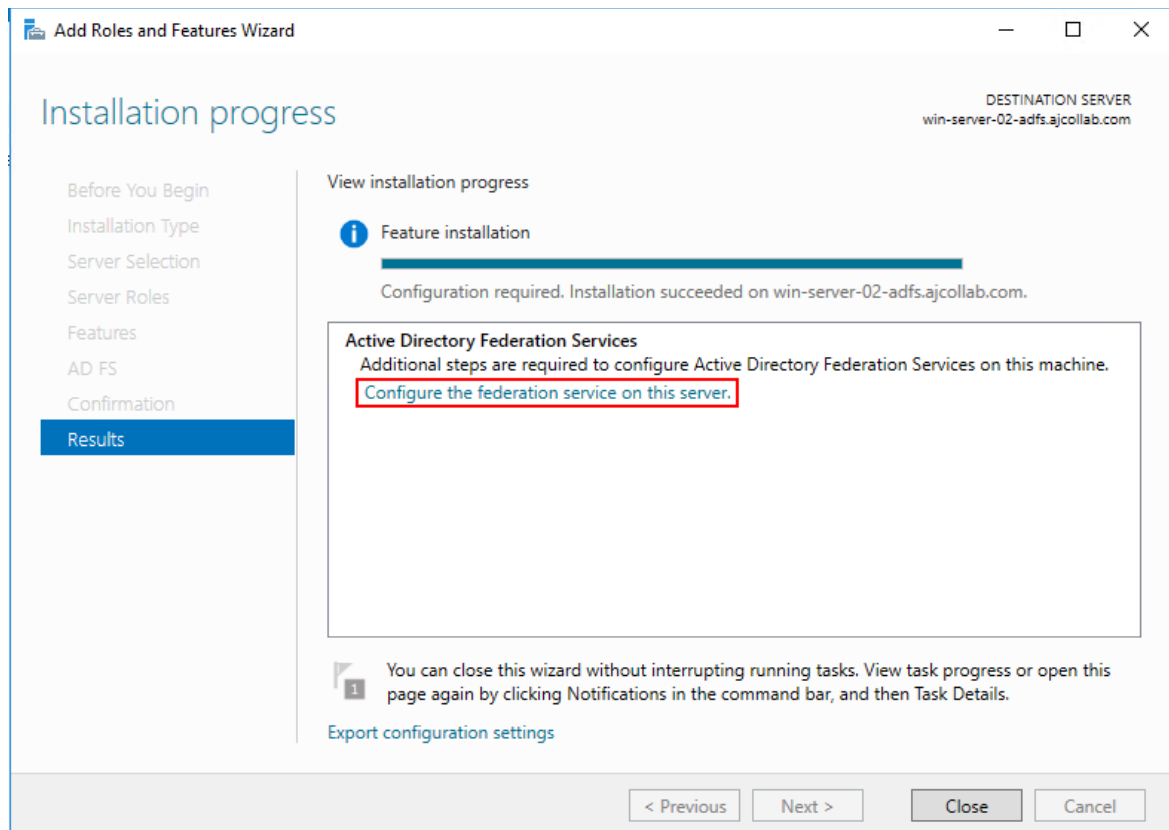
Manageability

Events





- Configure ADFS



Active Directory Federation Services Configuration Wizard

## Connect to Active Directory Domain Services

TARGET SERVER  
win-server-02-adfs.ajcollab.com

Welcome

**Connect to AD DS**

Specify Service Properties

Specify Service Account

Specify Database

Review Options

Pre-requisite Checks

Installation

Results

Specify an account with Active Directory domain administrator permissions to perform the federation service configuration.

AJCOLLAB\Administrator (Current user)

Change...

< Previous Next > Configure Cancel

Active Directory Federation Services Configuration Wizard

## Specify Service Properties

TARGET SERVER  
win-server-02-adfs.ajcollab.com

Welcome

Connect to AD DS

**Specify Service Properties**

Specify Service Account

Specify Database

Review Options

Pre-requisite Checks

Installation

Results

SSL Certificate: win-server-02-adfs.ajcollab.com Import...

View

Federation Service Name: win-server-02-adfs.ajcollab.com  
Example: fs.contoso.com

Federation Service Display Name: AJCOLLAB - ADFS  
Users will see the display name at sign in.  
Example: Contoso Corporation

< Previous Next > Configure Cancel

Active Directory Federation Services Configuration Wizard

Specify Service Account

TARGET SERVER  
win-server-02-adfs.ajcollab.com

Group Managed Service Accounts are not available because the KDS Root Key has not been set. Use the foll... Show more X

Welcome  
Connect to AD DS  
Specify Service Properties  
Specify Service Account  
Specify Database  
Review Options  
Pre-requisite Checks  
Installation  
Results

Specify a domain user account or group Managed Service Account.

☐ Create a Group Managed Service Account

Account Name: AJCOLLAB\

☒ Use an existing domain user account or group Managed Service Account

Account Name: AJCOLLAB\adfs.ad... Clear Select...

Account Password: .....

< Previous Next > Configure Cancel

Active Directory Federation Services Configuration Wizard

Specify Configuration Database

TARGET SERVER  
win-server-02-adfs.ajcollab.com

Welcome  
Connect to AD DS  
Specify Service Properties  
Specify Service Account  
Specify Database  
Review Options  
Pre-requisite Checks  
Installation  
Results

Specify a database to store the Active Directory Federation Service configuration data.

☒ Create a database on this server using Windows Internal Database. ←

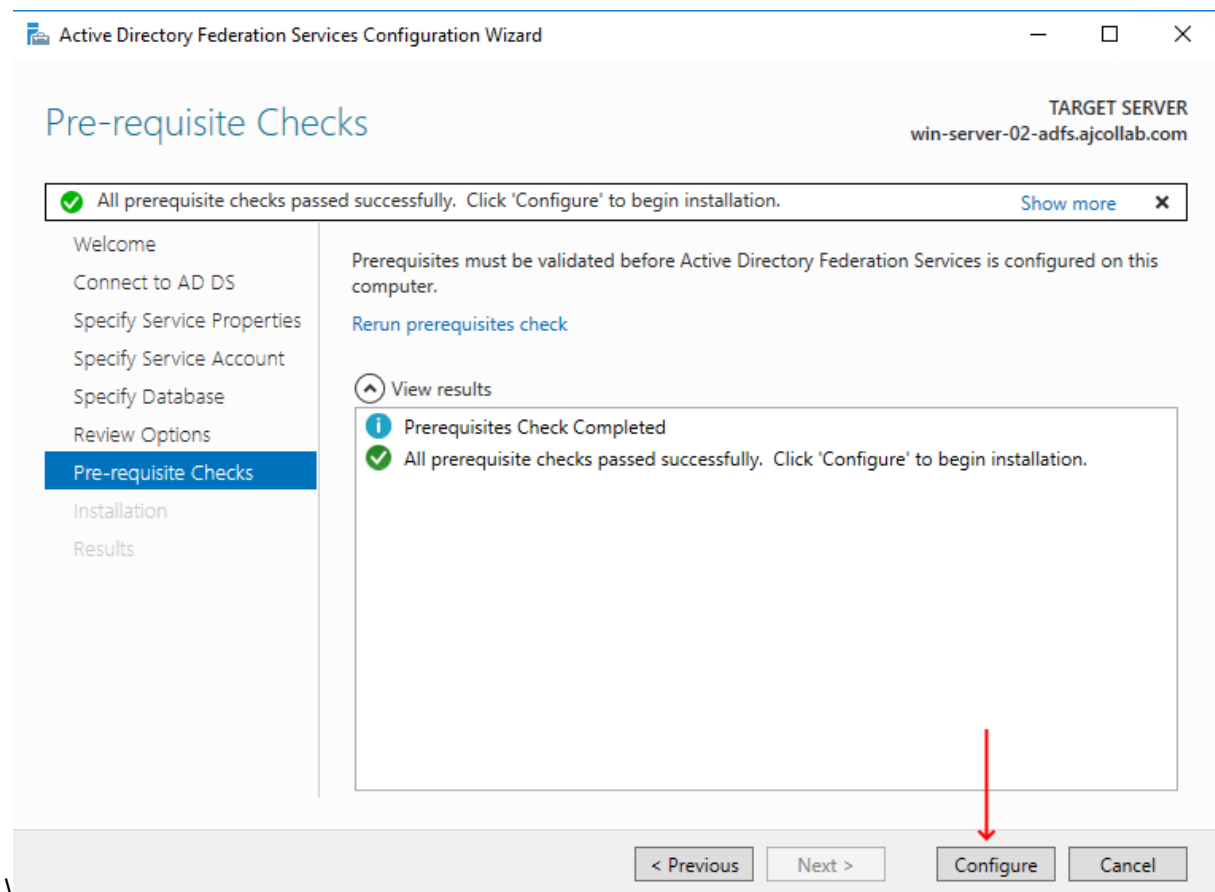
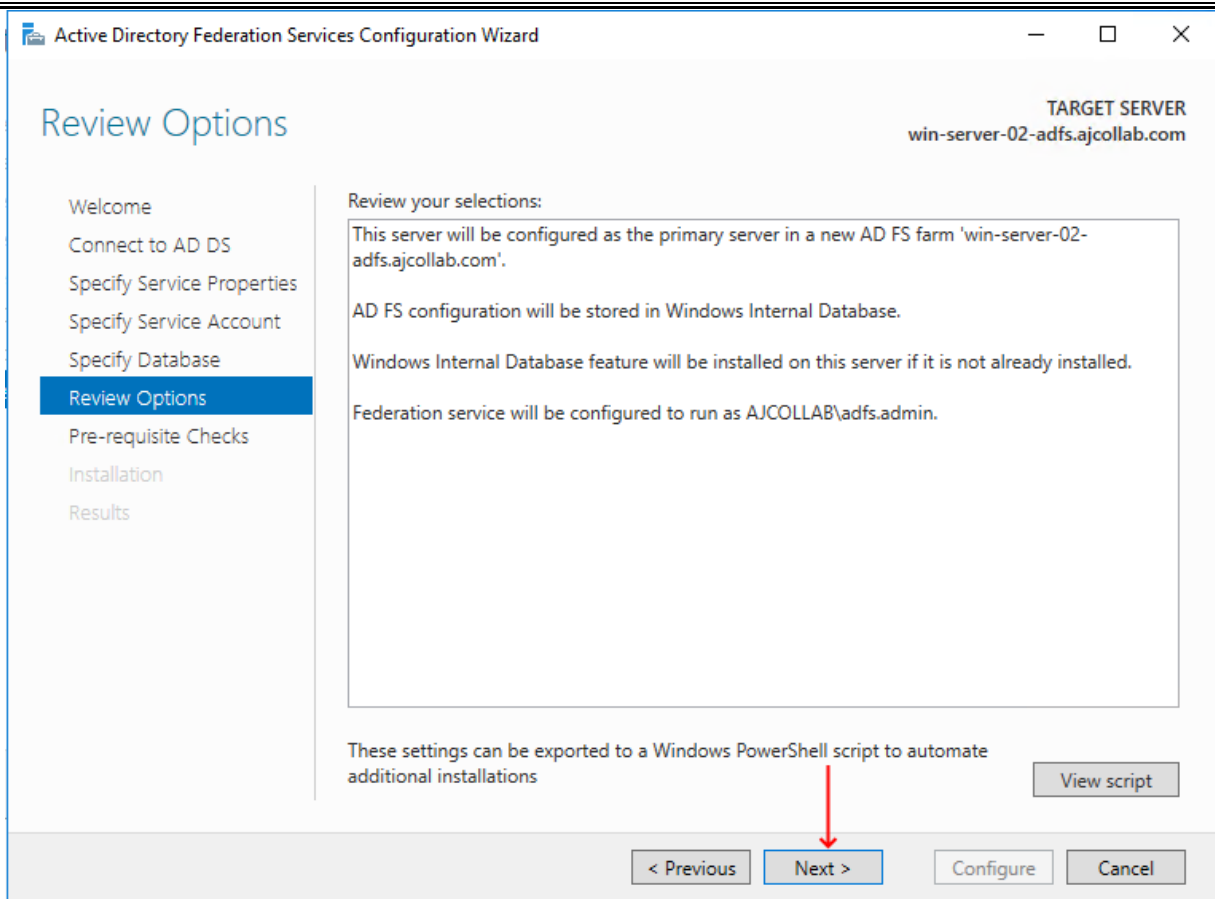
☐ Specify the location of a SQL Server database.

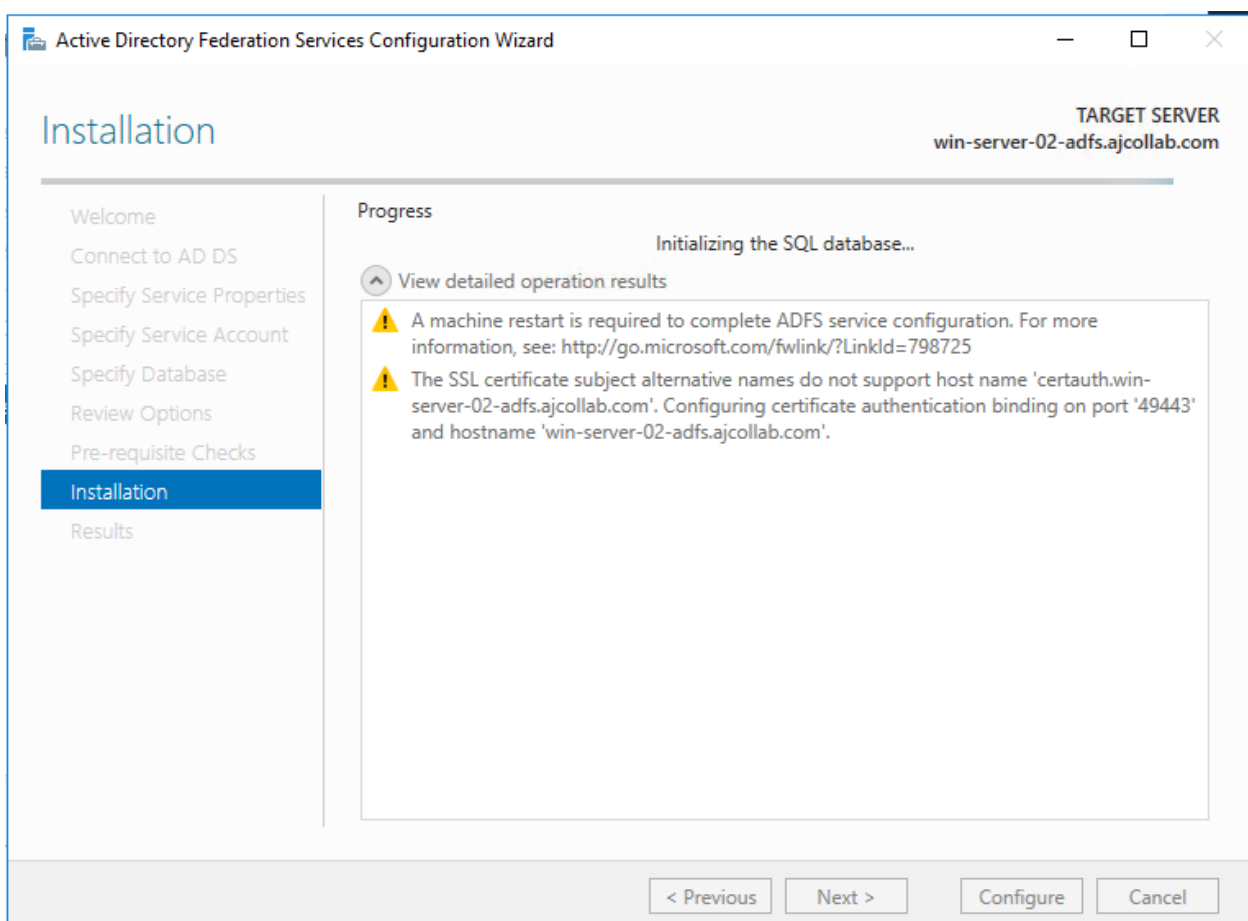
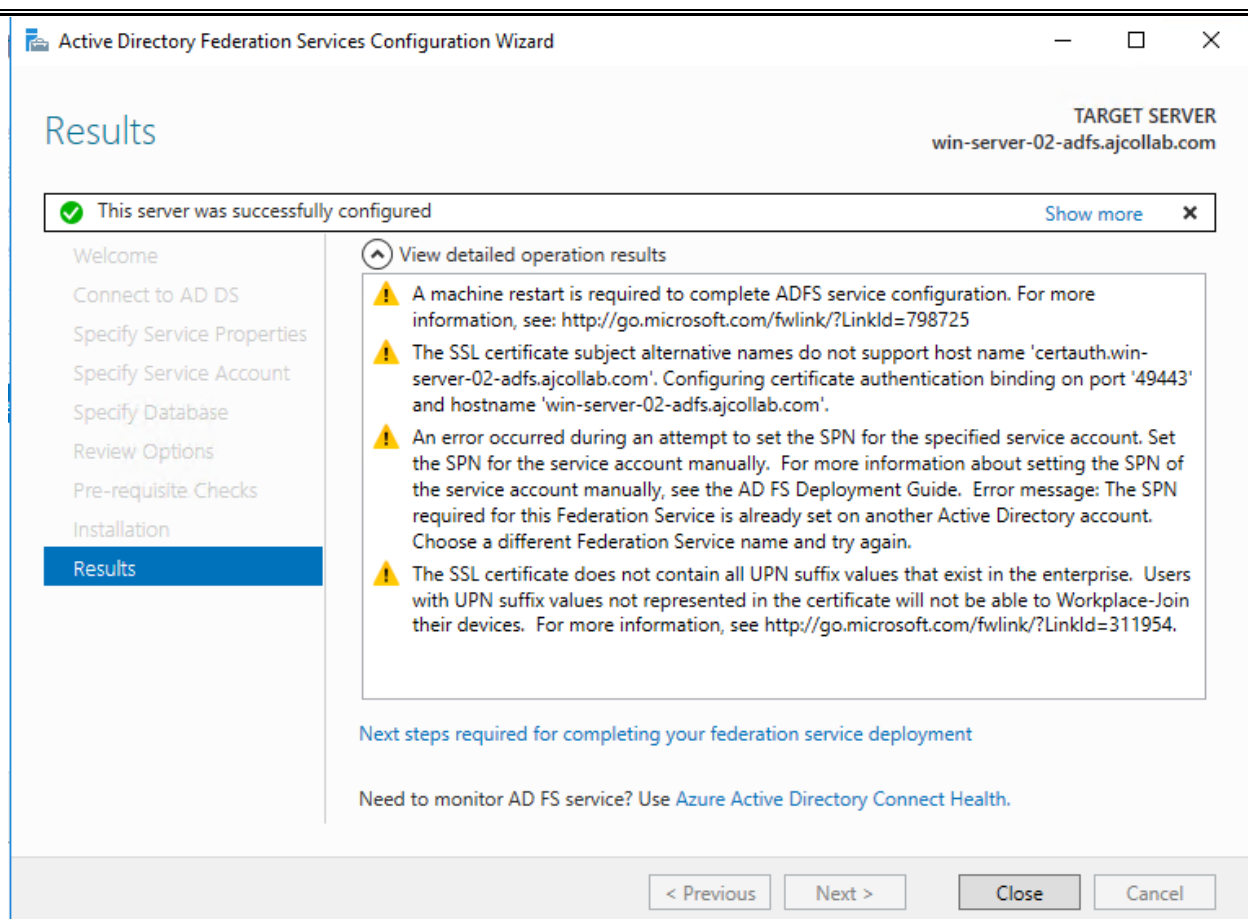
Database Host Name:

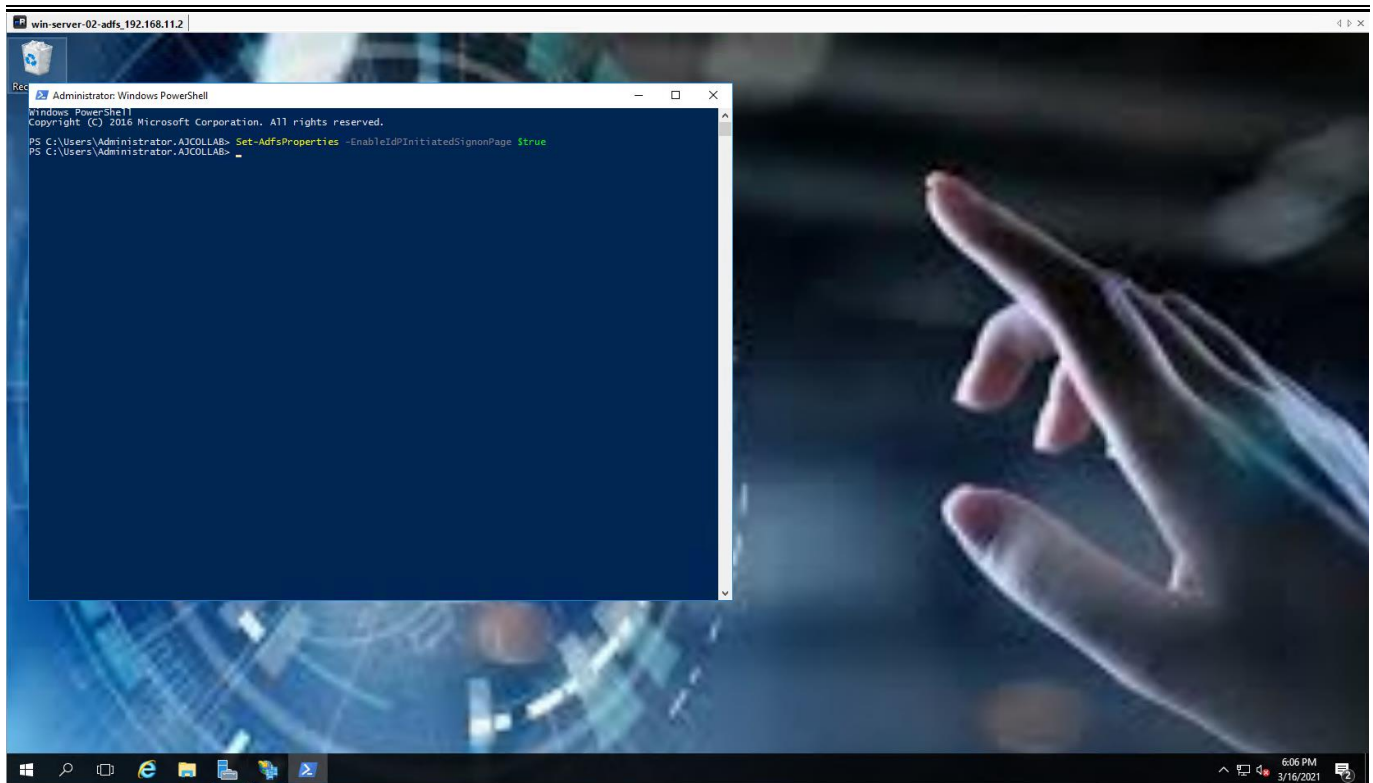
Database Instance:

To use the default instance, leave this field blank.

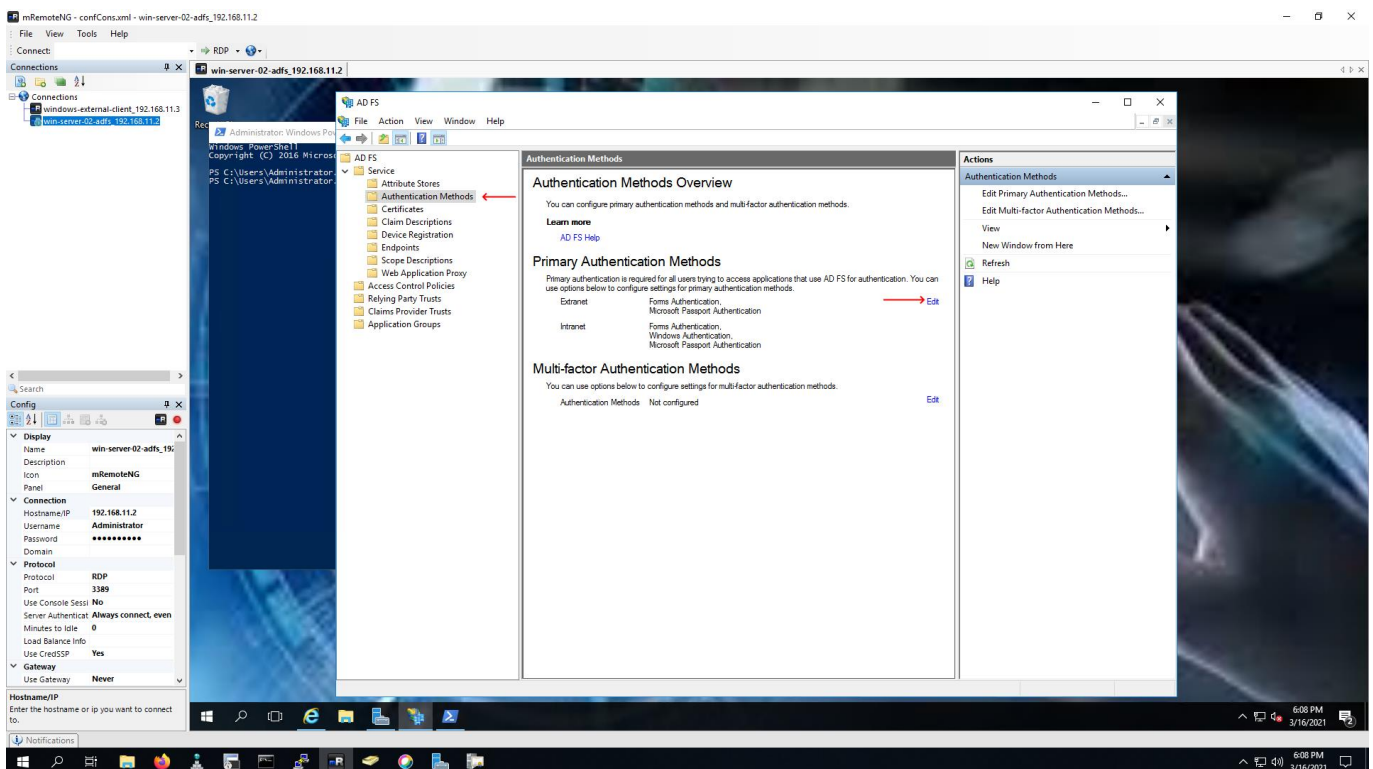
< Previous Next > Configure Cancel

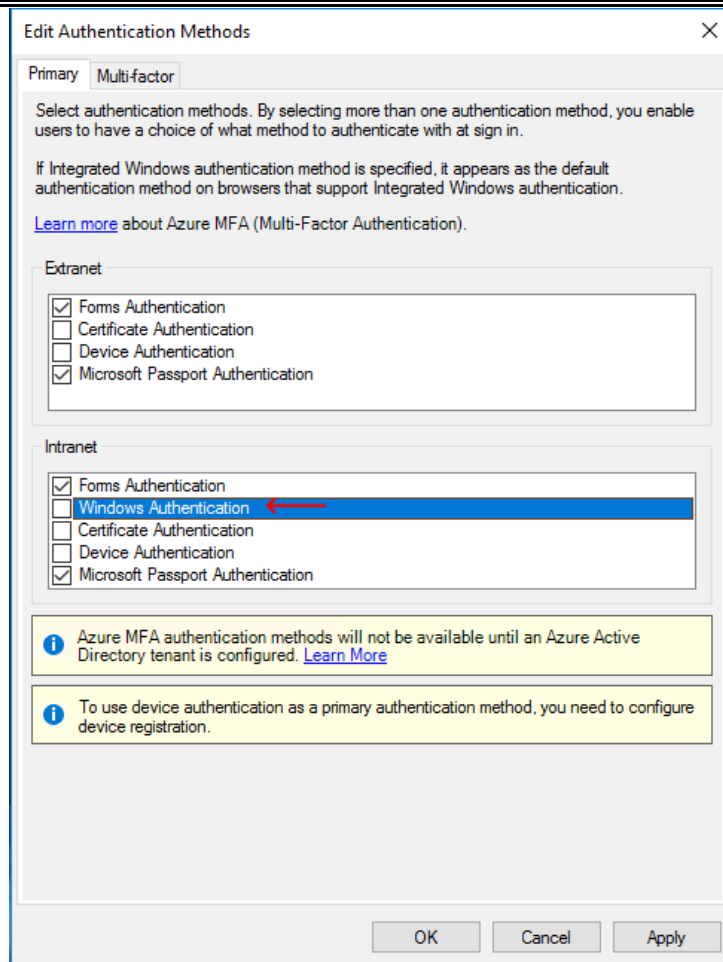




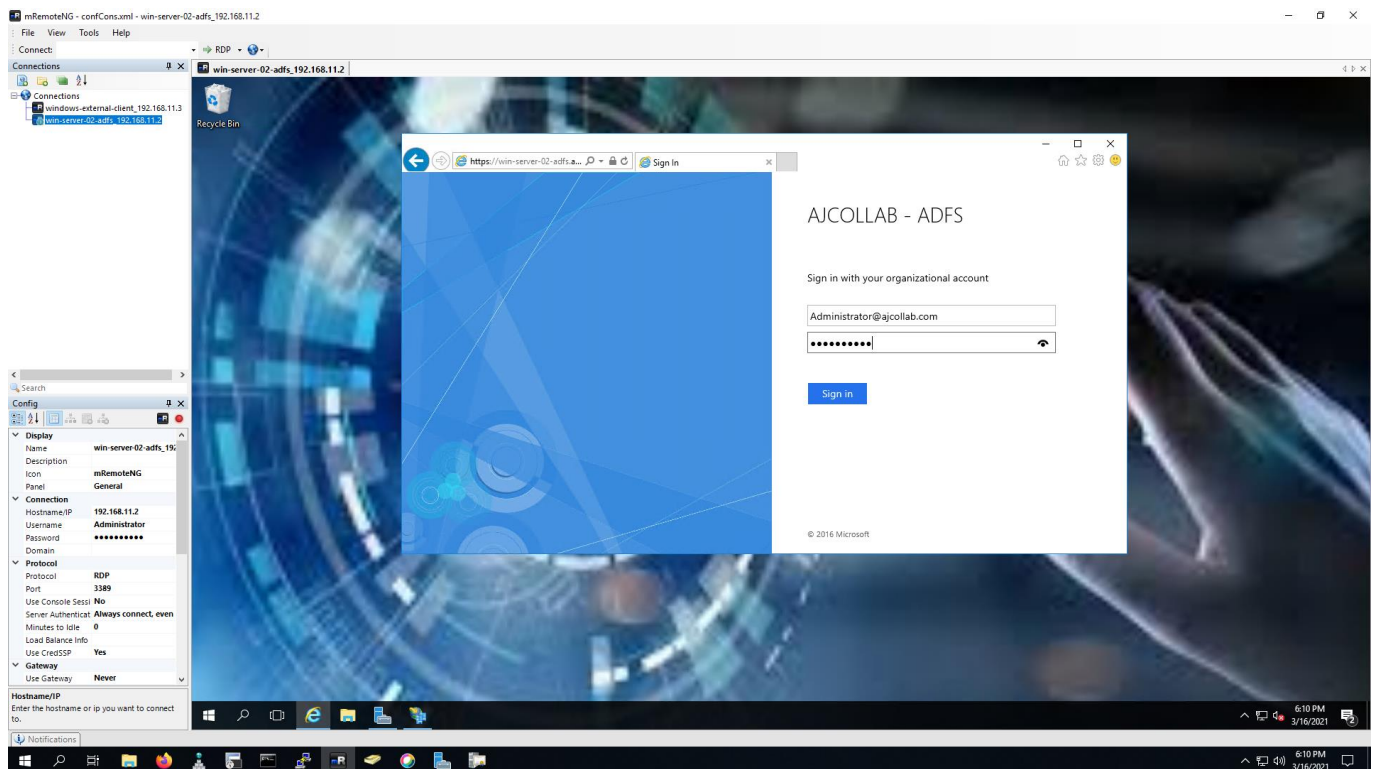


- Run below commands,
- `Set-AdfsProperties -EnableIdPInitiatedSignonPage $true`
- `Enable-AdfsEndpoint -TargetAddressPath "/adfs/services/trust/13/windowstransport"`

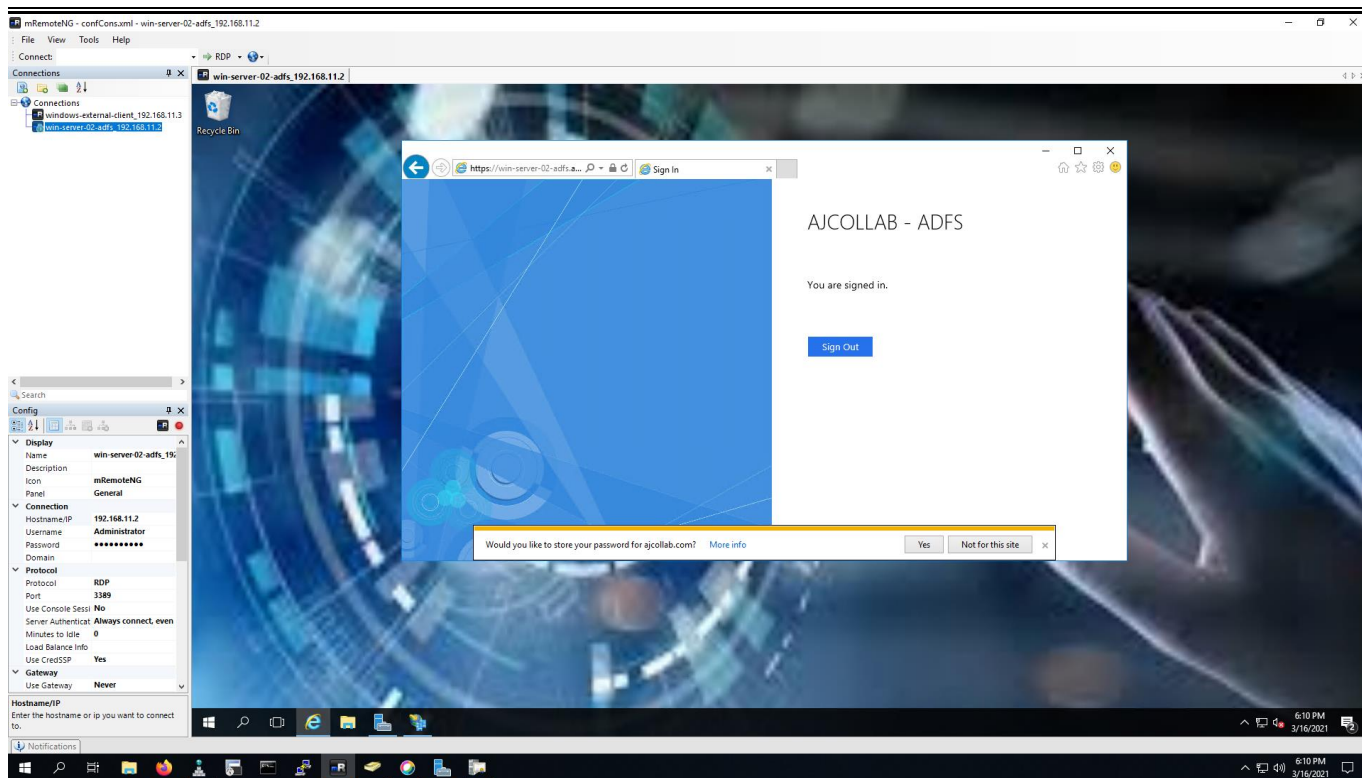




- Access the sample SSO login page
- <https://win-server-02-adfs.ajcollab.com/adfs/ls/idpinitiatedsignon.aspx>









## [Lab] Configure SSO in CUCM

- Provide Standard CCM Super Users role to any LDAP synced user in CUCM, this account will be used to test SSO

The screenshot shows the Cisco Unified CM Administration web interface. The browser address bar displays the URL: <https://cucm-pub.ajcollab.com:8443/ccmadmin/userEdit.do?key=d4e1>. The page title is "End User Configuration".

**Navigation:** Cisco Unified CM Administration | Go | Search Documentation | About | Logout

**System:** Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

**End User Configuration** | Related Links: Back to Find List Users | Go

**Actions:** Save | Delete | Add New

**Mobile Voice Access:**

- ☐ Enable Mobile Voice Access
- Maximum Wait Time for Desk Pickup\*: 10000
- Remote Destination Limit\*: 4
- Remote Destination Profiles: [Empty list] | View Details

**Multilevel Precedence and Preemption Authorization:**

- MLPP User Identification Number: [Empty field]
- MLPP Password: [Empty field]
- Confirm MLPP Password: [Empty field]
- MLPP Precedence Authorization Level: Default

**CAPF Information:**

- Associated CAPF Profiles: [Empty list] | View Details

**Permissions Information:**

- Groups:** Standard CCM End Users, **Standard CCM Super Users** (highlighted), Standard CTI Allow Control of Phones supporting C, Standard CTI Allow Control of Phones supporting R, Standard CTI Enabled | View Details
- Roles:** Standard AXL API Access, Standard Admin Rep Tool Admin, Standard CCM Admin Users, Standard CCM End Users, Standard CCMADMIN Administration | View Details
- Buttons:** Add to Access Control Group, Remove from Access Control Group

**Conference Now Information:**

- ☐ Enable End User to Host Conference Now
- Meeting Number: [Empty field]
- Attendees Access Code: [Empty field]

**Footer:** Save | Delete | Add New

**Info:** \*- indicates required item.

- System >> SAML Single Sign-On

SAML Single Sign-On

← → ↻ 🏠 🔒 https://192.168.21.1/ccmadmin/samlSingleSignOn.do ... ☆ 📄 🖨️ ☰

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

SAML Single Sign-On

SSO Mode  
☒ Cluster wide (One metadata file per cluster. Requires multi-server Tomcat certificate)  
☐ Per node (One metadata file per node)

✔ Enable SAML SSO 📄 Export All Metadata 🔄 Update IdP Metadata File 🛠 Fix All Disabled Servers

Status  
📘 RTMT is enabled for SSO. You can change SSO for RTMT [here](#).  
📘 SAML SSO disabled

| SAML Single Sign-On (1 - 5 of 5) |            |                    |                      |                 |                      |                          | Rows per Page 50 ▾ |
|----------------------------------|------------|--------------------|----------------------|-----------------|----------------------|--------------------------|--------------------|
| Server Name                      | SSO Status | Re-Import Metadata | Last Metadata Import | Export Metadata | Last Metadata Export | SSO Test                 |                    |
| cucm-pub.ajcollab.com            | Disabled   | N/A                | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |
| cucm-sub01.ajcollab.com          | Disabled   | 📶 IdP              | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |
| cucm-sub02.ajcollab.com          | Disabled   | 📶 IdP              | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |
| imp-pub.ajcollab.com             | Disabled   | 📶 IdP              | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |
| imp-sub.ajcollab.com             | Disabled   | 📶 IdP              | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |

Enable SAML SSO **Export All Metadata** Update IdP Metadata File Fix All Disabled Servers

📘 \*- indicates required item.

SAML Single Sign-On

← → ↻ 🏠 🔒 https://192.168.21.1/ccmadmin/samlSingleSignOn.do ... ☆ 📄 🖨️ ☰

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

SAML Single Sign-On

SSO Mode  
☒ Cluster wide (One metadata file per cluster. Requires multi-server Tomcat certificate)  
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✔ Enable SAML SSO 📄 Export All Metadata 🔄 Update IdP Metadata File 🛠 Fix All Disabled Servers

Status  
📘 RTMT is enabled for SSO. You can change SSO for RTMT [here](#).  
📘 SAML SSO disabled

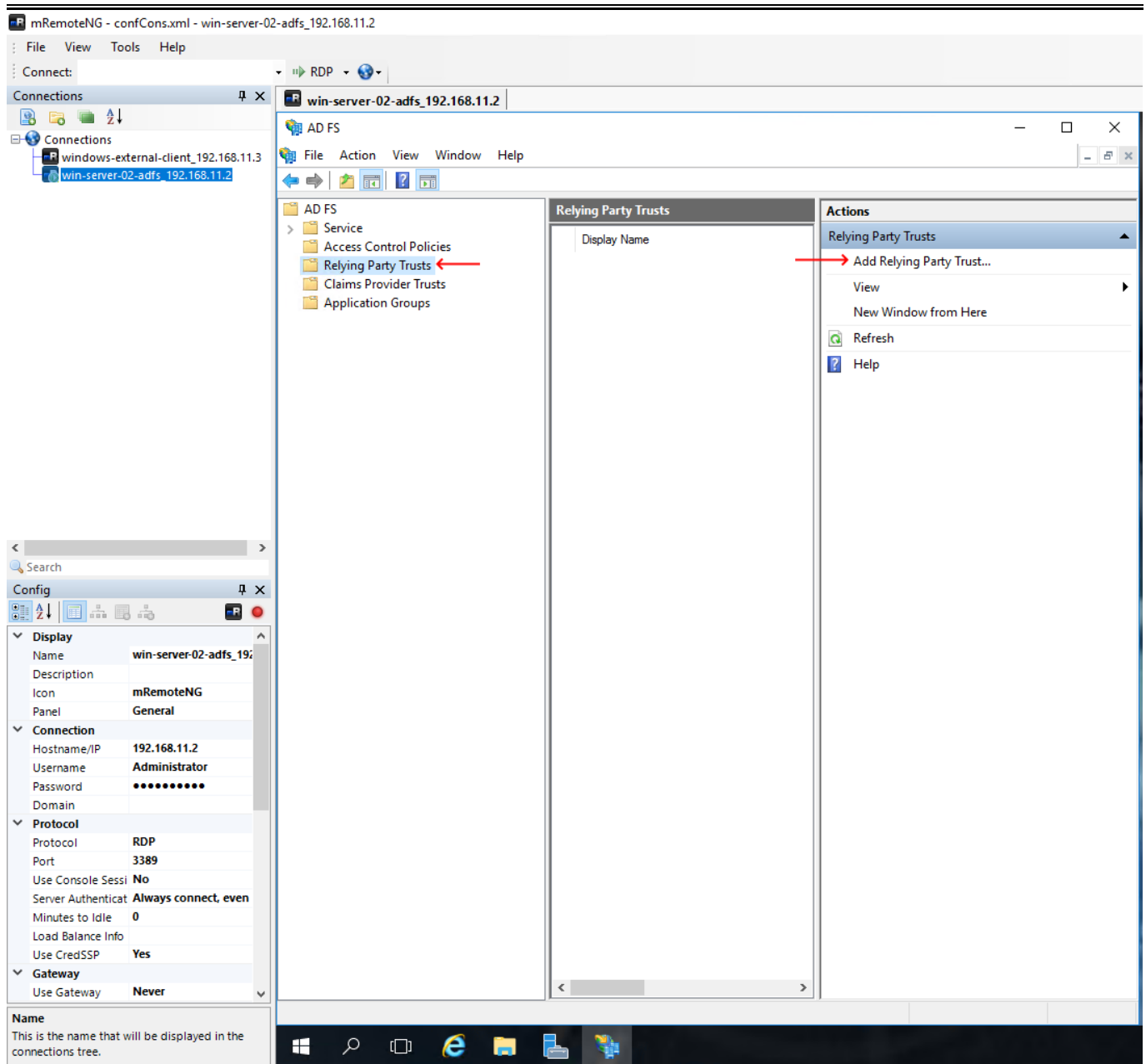
| SAML Single Sign-On (1 - 5 of 5) |            |                    |                      |                 |                      |                          | Rows per Page 50 ▾ |
|----------------------------------|------------|--------------------|----------------------|-----------------|----------------------|--------------------------|--------------------|
| Server Name                      | SSO Status | Re-Import Metadata | Last Metadata Import | Export Metadata | Last Metadata Export | SSO Test                 |                    |
| cucm-pub.ajcollab.com            | Disabled   | N/A                | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |
| cucm-sub01.ajcollab.com          | Disabled   | 📶 IdP              | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |
| cucm-sub02.ajcollab.com          | Disabled   | 📶 IdP              | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |
| imp-pub.ajcollab.com             | Disabled   | 📶 IdP              | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |
| imp-sub.ajcollab.com             | Disabled   | 📶 IdP              | Never                | 📄 File          | Never                | Never<br>Run SSO Test... |                    |

Enable SAML SSO **Export All Metadata** Update IdP Metadata File Fix All Disabled Servers

📘 \*- indicates required item.

C:\Users\Administrator\Downloads\cucm-pub.ajcollab.com-single-agreement.xml - Notepad++ [Administrator]

<?xml version="1.0" encoding="UTF-8" standalone="no"?><EntityDescriptor xmlns="urn:oasis:names:tc:SAML:2.0:metadata" id="cucm-pub.ajcollab.com" entityCategory="other" entityID="cucm-pub.ajcollab.com"><EntityID>cucm-pub.ajcollab.com</EntityID><EntityIDFormat>uri</EntityIDFormat><EntityName>cucm-pub.ajcollab.com</EntityName><EntityNameFormat>uri</EntityNameFormat><EntityDescription>cucm-pub.ajcollab.com</EntityDescription><EntityContact></EntityContact><EntityLogo></EntityLogo><EntityIcon></EntityIcon><EntityBanner></EntityBanner><EntitySPSSODescriptor></EntitySPSSODescriptor><EntitySSODescriptor></EntitySSODescriptor></EntityDescriptor>



**Welcome****Steps**

- Welcome
- Select Data Source
- Choose Access Control Policy
- Ready to Add Trust
- Finish

**Welcome to the Add Relying Party Trust Wizard**

Claims-aware applications consume claims in security tokens to make authentication and authorization decisions. Non-claims-aware applications are web-based and use Windows Integrated Authentication in the internal network and can be published through Web Application Proxy for extranet access. [Learn more](#)

- ☒ Claims aware
- ☐ Non claims aware

&lt; Previous

Start

Cancel

**Select Data Source****Steps**

- Welcome
- Select Data Source
- Choose Access Control Policy
- Ready to Add Trust
- Finish

Select an option that this wizard will use to obtain data about this relying party:

- ☐ Import data about the relying party published online or on a local network
- Use this option to import the necessary data and certificates from a relying party organization that publishes its federation metadata online or on a local network.
- Federation metadata address (host name or URL):
- 
- Example: fs.contoso.com or https://www.contoso.com/app
- ☒ Import data about the relying party from a file
- Use this option to import the necessary data and certificates from a relying party organization that has exported its federation metadata to a file. Ensure that this file is from a trusted source. This wizard will not validate the source of the file.
- Federation metadata file location:
- Browse...
- ☐ Enter data about the relying party manually
- Use this option to manually input the necessary data about this relying party organization.

&lt; Previous

Next &gt;

Cancel

Add Relying Party Trust Wizard

### Specify Display Name

**Steps**

- Welcome
- Select Data Source
- Specify Display Name
- Choose Access Control Policy
- Ready to Add Trust
- Finish

Enter the display name and any optional notes for this relying party.

Display name:

Notes:

CUCM-CLUSTER-SSO

< Previous

Next >

Cancel

Add Relying Party Trust Wizard

### Choose Access Control Policy

**Steps**

- Welcome
- Select Data Source
- Specify Display Name
- Choose Access Control Policy
- Ready to Add Trust
- Finish

Choose an access control policy:

| Name                                                                 | Description                                                                    |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Permit everyone                                                      | Grant access to everyone.                                                      |
| Permit everyone and require MFA                                      | Grant access to everyone and require MFA.                                      |
| Permit everyone and require MFA for specific group                   | Grant access to everyone and require MFA for specific group.                   |
| Permit everyone and require MFA from extranet access                 | Grant access to the intranet users and require MFA from extranet access.       |
| Permit everyone and require MFA from unauthenticated devices         | Grant access to everyone and require MFA from unauthenticated devices.         |
| Permit everyone and require MFA, allow automatic device registration | Grant access to everyone and require MFA, allow automatic device registration. |
| Permit everyone for intranet access                                  | Grant access to the intranet users.                                            |
| Permit specific group                                                | Grant access to users of one or more groups.                                   |

Policy

Permit everyone

☐ I do not want to configure access control policies at this time. No user will be permitted access for this application.

< Previous

Next >

Cancel

Add Relying Party Trust Wizard

Ready to Add Trust

**Steps**

- Welcome
- Select Data Source
- Specify Display Name
- Choose Access Control Policy
- Ready to Add Trust
- Finish

The relying party trust has been configured. Review the following settings, and then click Next to add the relying party trust to the AD FS configuration database.

Encryption

Signature

Accepted Claims

Organization

Endpoints

Notes

Advanced

Specify the encryption certificate for this relying party trust.

Encryption certificate:

Issuer: CN=AJCOLLAB-CA, DC=ajcollab, DC=com

Subject: CN=cucm-pub.ajcollab.com, OU=Collab, O=Aj Collab, L=Bangalore, S=Kamataka, C=IN

Effective date: 3/11/2021 1:09:45 PM

Expiration date: 3/11/2023 1:09:45 PM

View...

< Previous

Next >

Cancel

Add Relying Party Trust Wizard

Finish

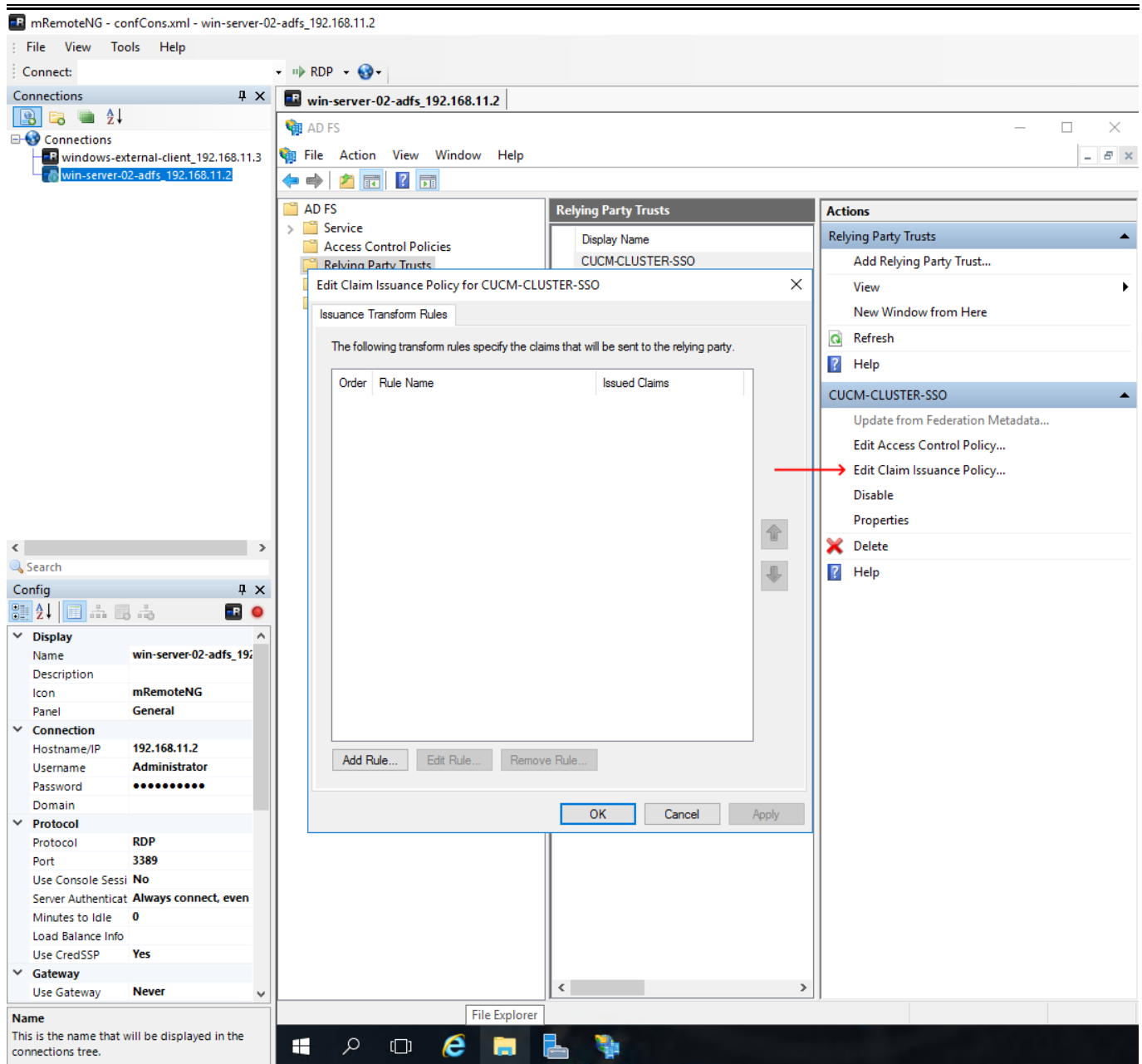
**Steps**

- Welcome
- Select Data Source
- Specify Display Name
- Choose Access Control Policy
- Ready to Add Trust
- Finish

The relying party trust was successfully added.

☒ Configure claims issuance policy for this application

Close



Add Transform Claim Rule Wizard

### Select Rule Template

**Steps**

- Choose Rule Type
- Configure Claim Rule

Select the template for the claim rule that you want to create from the following list. The description provides details about each claim rule template.

Claim rule template:

Send LDAP Attributes as Claims

Claim rule template description:

Using the Send LDAP Attribute as Claims rule template you can select attributes from an LDAP attribute store such as Active Directory to send as claims to the relying party. Multiple attributes may be sent as multiple claims from a single rule using this rule type. For example, you can use this rule template to create a rule that will extract attribute values for authenticated users from the displayName and telephoneNumber Active Directory attributes and then send those values as two different outgoing claims. This rule may also be used to send all of the user's group memberships. If you want to only send individual group memberships, use the Send Group Membership as a Claim rule template.

< Previous

Next >

Cancel

Add Transform Claim Rule Wizard

### Configure Rule

**Steps**

- Choose Rule Type
- Configure Claim Rule

You can configure this rule to send the values of LDAP attributes as claims. Select an attribute store from which to extract LDAP attributes. Specify how the attributes will map to the outgoing claim types that will be issued from the rule.

Claim rule name:

NameID

Rule template: Send LDAP Attributes as Claims

Attribute store:

Active Directory

Mapping of LDAP attributes to outgoing claim types:

|    | LDAP Attribute (Select or type to add more) | Outgoing Claim Type (Select or type to add more) |
|----|---------------------------------------------|--------------------------------------------------|
|    | SAM-Account-Name                            | uid <i>Type this</i>                             |
| »» |                                             |                                                  |

< Previous

Finish

Cancel



Edit Claim Issuance Policy for CUCM-CLUSTER-SSO

Issuance Transform Rules

The following transform rules specify the claims that will be sent to the relying party.

| Order | Rule Name | Issued Claims |
|-------|-----------|---------------|
| 1     | NameID    | uid           |

Add Rule... Edit Rule... Remove Rule...

OK Cancel Apply

Add Transform Claim Rule Wizard

### Select Rule Template

**Steps**

- Choose Rule Type
- Configure Claim Rule

Select the template for the claim rule that you want to create from the following list. The description provides details about each claim rule template.

Claim rule template:

Send Claims Using a Custom Rule

Claim rule template description:

Using a custom rule, you can create rules that can't be created with a rule template. Custom rules are written in the AD FS claim rule language. Capabilities that require custom rules include:

- Sending claims from a SQL attribute store
- Sending claims from an LDAP attribute store using a custom LDAP filter
- Sending claims from a custom attribute store
- Sending claims only when 2 or more incoming claims are present
- Sending claims only when an incoming claim value matches a complex pattern
- Sending claims with complex changes to an incoming claim value
- Creating claims for use only in later rules

< Previous Next > Cancel

Edit Rule - CUCM-CLUSTER-SSO-RULE

You can configure a custom claim rule, such as a rule that requires multiple incoming claims or that extracts claims from a SQL attribute store. To configure a custom rule, type one or more optional conditions and an issuance statement using the AD FS claim rule language.

Claim rule name:

Rule template: Send Claims Using a Custom Rule

Custom rule:

```

name"]
=> issue(Type =
"http://schemas.xmlsoap.org/ws/2005/05/identity/claims/nameidentifier",
Issuer = c.Issuer, OriginalIssuer = c.OriginalIssuer, Value = c.Value,
ValueType = c.ValueType, Properties
["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/format"] = "urn:oasis:names:tc:SAML:2.0:nameid-format:transient", Properties
["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/namequalifier"] = "win-server-02-
adfs.ajcollab.com/adfs/com/adfs/service/trust", Properties
["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/spnamequalifier"] = "cucm-pub.ajcollab.com");

```

OK
Cancel

```

c:[Type ==
"http://schemas.microsoft.com/ws/2008/06/identity/claims/windowsaccountname"]
=> issue(Type =
"http://schemas.xmlsoap.org/ws/2005/05/identity/claims/nameidentifier", Issuer =
c.Issuer, OriginalIssuer = c.OriginalIssuer, Value = c.Value, ValueType =
c.ValueType,
Properties["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/forma
t"] = "urn:oasis:names:tc:SAML:2.0:nameid-format:transient",
Properties["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/nameq
ualifier"] = "https://ADFS-SERVER-FQDN/adfs/com/adfs/service/trust",
Properties["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/spnam
equalifier"] = "CUCM-PUB-FQDN");

```

- Download ADFS Metadata by following this link from Mozilla or Google Chrome browser
- <https://ADFS-SERVER-FQDN/FederationMetadata/2007-06/FederationMetadata.xml>

SAML Single Sign-On

Service Unavailable

https://192.168.21.1/ccmadmin/samlSingleSignOn.do

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

### SAML Single Sign-On

SSO Mode

☒ Cluster wide (One metadata file per cluster. Requires multi-server Tomcat certificate)

☐ Per node (One metadata file per node)

Enable SAML SSO Export All Metadata Update IdP Metadata File Fix All Disabled Servers

**Status**

RTMT is enabled for SSO. You can change SSO for RTMT [here](#).

SAML SSO disabled

| SAML Single Sign-On (1 - 5 of 5) |            |                    |                      |                 |                               |                                          | Rows per Page 50 |
|----------------------------------|------------|--------------------|----------------------|-----------------|-------------------------------|------------------------------------------|------------------|
| Server Name                      | SSO Status | Re-Import Metadata | Last Metadata Import | Export Metadata | Last Metadata Export          | SSO Test                                 |                  |
| cucm-pub.ajcollab.com            | Disabled   | N/A                | Never                | File            | March 22, 2021 5:30:09 PM IST | Never<br><a href="#">Run SSO Test...</a> |                  |
| cucm-sub01.ajcollab.com          | Disabled   | IdP                | Never                | File            | March 22, 2021 5:30:10 PM IST | Never<br><a href="#">Run SSO Test...</a> |                  |
| cucm-sub02.ajcollab.com          | Disabled   | IdP                | Never                | File            | March 22, 2021 5:30:10 PM IST | Never<br><a href="#">Run SSO Test...</a> |                  |
| imp-pub.ajcollab.com             | Disabled   | IdP                | Never                | File            | March 22, 2021 5:30:10 PM IST | Never<br><a href="#">Run SSO Test...</a> |                  |
| imp-sub.ajcollab.com             | Disabled   | IdP                | Never                | File            | March 22, 2021 5:30:10 PM IST | Never<br><a href="#">Run SSO Test...</a> |                  |

Enable SAML SSO Export All Metadata Update IdP Metadata File Fix All Disabled Servers

\*- indicates required item.

Reset Warning — Mozilla Firefox

https://192.168.21.1/ccmadmin/genericDialogWindow.do?windowtitlekey=genericdi

**Web server connections will be restarted**

Enabling SSO and importing the metadata will cause web services to restart upon completion of the wizard. All affected web applications will drop their connection momentarily and need to be logged into again.

**Click "Export All Metadata" button**

If the server metadata has not already been uploaded to the IdP, it can be done before running the wizard. You can obtain the server metadata by clicking the "Export All Metadata" button on the main page. Then go to the IdP and upload the file.

If IDP is provisioned with cluster-wide SP metadata, you need to enable cluster-wide SAML SSO. If IDP is provisioned with per-node SP metadata, you need to enable per-node SAML SSO.

[Continue](#) [Cancel](#)

192.168.21.1/ccmadmin/samlSi X Service Unavailable

https://192.168.21.1/ccmadmin/samlSingleSignOnMultiServerCertV

## Cisco Unified CM Administration

For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

### SAML Single Sign-On Configuration

Next

**Status**

Status: Ready

**Test for Multi-Server tomcat certificate**

The criteria for enabling clusterwide SSO is that you must have a multiserver tomcat certificate already deployed. If you have not done this already please follow the below steps:

- 1) Login to Cisco Unified OS Administration Page and Navigate to Certificate Management under Security Menu
- 2) Click on Generate CSR
- 3) Select Certificate Purpose as Tomcat
- 4) Select Distribution as "Multi-Server"
- 5) Click Generate
- 6) Download the CSR and get it signed from the CA of your choice
- 7) Once the certificate is issued by the CA, upload it via the "Upload Certificate/ Certificate chain" option on the Certificate Management page
- 8) Restart Tomcat service on all the nodes in the cluster
- 9) Restart TFTP service on all the TFTP nodes in the cluster

If the above steps have been completed, click Test below which will confirm if the multi-server tomcat certificate is deployed before proceeding to the next stage

**Test for Multi-Server tomcat certificate**

Next Cancel

Loading, please wait.

SAML Single Sign-On Configur X Service Unavailable

https://192.168.21.1/ccmadmin/samlSingleSignOnMultiServerCertV

## Cisco Unified CM Administration

For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go

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### SAML Single Sign-On Configuration

Next

**Status**

Status: Ready

✓ All nodes have Multi Server Certificate

**Test for Multi-Server tomcat certificate**

The criteria for enabling clusterwide SSO is that you must have a multiserver tomcat certificate already deployed. If you have not done this already please follow the below steps:

- 1) Login to Cisco Unified OS Administration Page and Navigate to Certificate Management under Security Menu
- 2) Click on Generate CSR
- 3) Select Certificate Purpose as Tomcat
- 4) Select Distribution as "Multi-Server"
- 5) Click Generate
- 6) Download the CSR and get it signed from the CA of your choice
- 7) Once the certificate is issued by the CA, upload it via the "Upload Certificate/ Certificate chain" option on the Certificate Management page
- 8) Restart Tomcat service on all the nodes in the cluster
- 9) Restart TFTP service on all the TFTP nodes in the cluster

If the above steps have been completed, click Test below which will confirm if the multi-server tomcat certificate is deployed before proceeding to the next stage

**Test for Multi-Server tomcat certificate**

Next Cancel

SAML Single Sign-On Configuration Service Unavailable

https://192.168.21.1/ccmadmin/samlSingleSignOnConfigurationWi...

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

### SAML Single Sign-On Configuration

Next

**Status**  
Status: Ready

**Download Identity provider(IdP) Metadata Trust File**

To configure the trust relationship between the IdP and your devices, you must first obtain trust metadata from your IdP and import it to your servers. You will need to manually obtain the file from the IdP before you can upload it to your Collaboration servers.

**!** This is a manual step!

1) Log in to your IdP and download the metadata trust file to your local server.  
2) Click Next once you have this file available locally.

Next Cancel

↑

SAML Single Sign-On Configuration Service Unavailable

https://192.168.21.1/ccmadmin/samlSingleSignOnConfigurationWi...

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

### SAML Single Sign-On Configuration

Next

**Status**  
Status: Ready  
Ready to import Identity Provider metadata trust file to cluster servers

**Import the IdP Metadata Trust File**

This step uploads the file acquired from the IdP in the previous manual step to the Collaboration servers.

1) Select the IdP Metadata Trust File

Browse... FederationMetadata.xml

2) Import this file to the Collaboration servers  
This action must be successful for at least the Publisher before moving on to the next task in this wizard.

Import IdP Metadata

Next Cancel

SAML Single Sign-On Configuration | Service Unavailable

https://192.168.21.1/ccmadmin/samlSingleSignOnConfigurationWi...

**Cisco Unified CM Administration**  
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Navigation: Cisco Unified CM Administration | Go  
admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

### SAML Single Sign-On Configuration

Next

**Status**

- Status: Ready
- Import succeeded for all servers

**Import the IdP Metadata Trust File**

This step uploads the file acquired from the IdP in the previous manual step to the Collaboration servers.

1) Select the IdP Metadata Trust File

Browse... No file selected.

2) Import this file to the Collaboration servers

This action must be successful for at least the Publisher before moving on to the next task in this wizard.

**Import IdP Metadata** Import succeeded for all servers

Next Cancel

SAML Single Sign-On Configuration | Service Unavailable

https://192.168.21.1/ccmadmin/samlSingleSignOnConfigurationWi...

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | Go  
admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

### SAML Single Sign-On Configuration

Back Next

**Status**

- Status: Ready
- If Admin has already uploaded the server metadata to IdP then skip the steps below and click Next. Otherwise follow the steps below to upload the server metadata to IdP
- IdP Metadata has been imported to servers in this cluster

**Download Server Metadata and install on the IdP**

Download the metadata trust file from Collaboration servers and manually install it on the IdP server to complete SSO setup.

1) Download the server metadata trust files to local storage

**Download Trust Metadata File** *We have done this already!*

**This is a manual step!**

2) Log in to your IdP and upload the server metadata trust file.

3) Click Next once you have installed the server metadata on the IdP.

Back Next Cancel

SAML Single Sign-On Configuration

Back

**Status**

The server metadata file must be installed on the IdP before this test is run.

**Test SSO Setup**

This test verifies that the metadata files are correctly configured and will allow SSO to start up on the servers. This test can be run on any server for troubleshooting once SSO has been enabled. SSO setup cannot be completed unless this test is successful.

1) Pick a valid username to use for this test

You must already know the password for the selected username.  
This user must have administrator rights and also exist in the IdP.

Please use one of the Usernames shown below. Using any other Username to log into the IdP may result in administrator lockout.

Valid administrator Usernames

abdul.jaseem

2) Launch SSO test page

Run SSO Test...

Back Cancel

SAML Single Sign-On Configuration

Back Finish

**Status**

SSO Metadata Test Successful

**Ready to Enable SSO**

Clicking "Finish" will complete enabling SSO on all the servers in this cluster. There will be a short delay while the applications are being updated.

To verify the SSO status of each server, check the main SSO Configuration page.  
Additional testing and manual uploads may be performed from the main page if necessary.

Back Finish Cancel

Test SAML — Mozilla Firefox

https://cucm-pub.ajcollab.com:8443/ssosp/pages/TestSSO.jsp

**SSO Test Succeeded!**

Congratulations on a successful SAML SSO configuration test. Please close this window and click "Finish" on the SAML configuration wizard to complete the setup.

Close

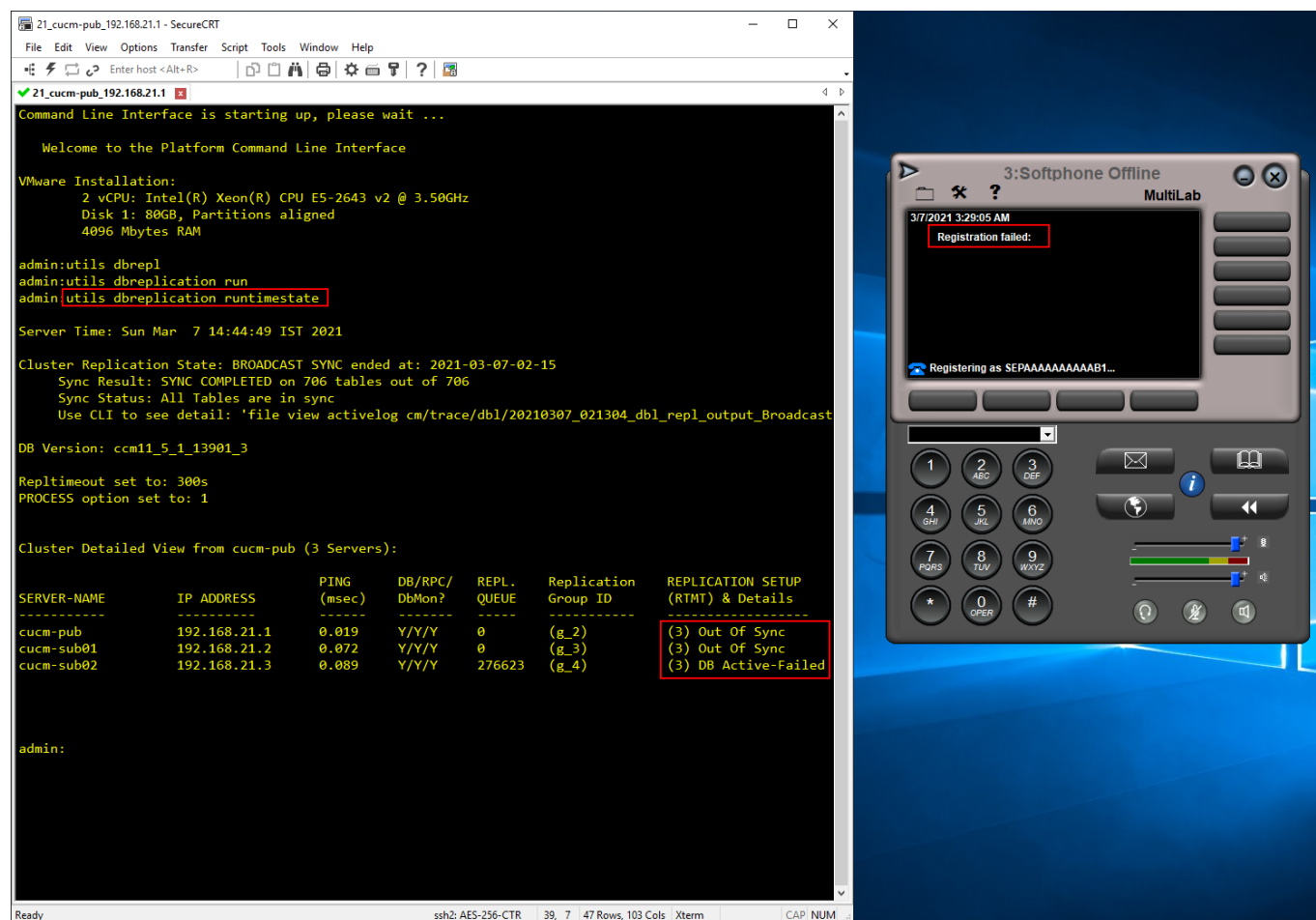




## CUCM DB Replication

- When DB Replication failed between nodes, so many weird issues will happen like Phone Registration Issues, Call Routing Issues, and other service-related issues

### Step 1: Verify the Database Replication



- Below table shows the meaning of Replication states

| Value | Meaning                               | Description                                                                                                                                      |
|-------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 0     | Initialization State                  | Replication is in the process of setting up. A setup failure might have occurred if replication is in this state for more than an hour.          |
| 1     | The Number of replicates is incorrect | Set up is still in progress. This state is rarely seen                                                                                           |
| 2     | Replication is good                   | Logical connections are established, and the tables are matched with the other servers on the cluster.                                           |
| 3     | Mismatched tables                     | Logical connections are established but there is an unsurety whether the tables match                                                            |
| 4     | Setup Failed/Dropped                  | Server no longer has an active logical connection in order to receive any database table across the network. No replication occurs in this state |

## Step 2: Generate Unified CM Database Status Report

The screenshot displays the Cisco Unified Reporting web interface. The browser address bar shows the URL `https://192.168.21.1/cucreports/generateReport.do?isStandard=true&name=Unified CM Database Status`. The page header includes the Cisco logo, the title "Cisco Unified Reporting", and navigation links for "admin", "Search Documentation", "About", and "Logout". A sidebar on the left lists various report categories, with "Unified CM Database Status" highlighted in red. The main content area shows a success message: "OK: Report generated successfully." Below this, the report title "Unified CM Database Status" is displayed with a download icon. The report description states: "Provides a snapshot of the Unified CM database health. This report can be useful to monitor periodically, and should be used to ensure the database is healthy before an upgrade. Created on Sun Mar 07 15:05:52 IST 2021". The report is organized into several sections: "Unified CM Cluster Name" (showing Cluster Name: StandAloneCluster, Publisher Name/IP: cucm-pub), "Unified CM Database Access" (showing Local and publisher databases accessible), "Unified CM Database Status" (containing RTMT Counter Information, replication status, and CLI commands), "Unified CM Hosts" (showing equivalent host files), "Unified CM Rhhosts" (showing equivalent rhhosts files), and "Unified CM Sqlhosts" (partially visible at the bottom).

System Reports   Help ▾

System Reports

Report Descriptions

- Unified CM Cluster Overview
- Unified CM Data Summary
- Unified CM Database Replication Debug
- Unified CM Database Status**
- Unified CM Device Counts Summary
- Unified CM Device Distribution Summary
- Unified CM Directory URI and GDPR Duplicates
- Unified CM Extension Mobility
- Unified CM GeoLocation Policy
- Unified CM GeoLocation Policy with Filter
- Unified CM Lines Without Phones
- Unified CM Multi-Line Devices
- Unified CM Phone Category
- Unified CM Phone Feature List
- Unified CM Phone Locale Installers
- Unified CM Phones With Mismatched Load
- Unified CM Phones Without Lines
- Unified CM Shared Lines
- Unified CM Table Count Summary
- Unified CM User Device Count
- Unified CM Users Sharing Primary Extensions
- Unified CM VG2XX Gateway
- Unified CM Voice Mail
- Unified Confidential Access Level Matrix

Navigation: Cisco Unified Reporting Go

admin | Search Documentation | About | Logout

OK: Report generated successfully.

### Unified CM Database Status

Provides a snapshot of the Unified CM database health. This report can be useful to monitor periodically, and should be used to ensure the database is healthy before an upgrade.  
Created on Sun Mar 07 15:05:52 IST 2021

**Unified CM Cluster Name**

| Cluster Name      | Publisher Name/IP |
|-------------------|-------------------|
| StandAloneCluster | cucm-pub          |

**Unified CM Database Access**

Local and publisher databases accessible.  
[View Details](#)

**Unified CM Database Status**

RTMT Counter Information

- All servers have a replication count of 706.
- Not all servers have a good replication status. See the details.  
[View Details](#)
- See also Database Summary Screen in RTMT.
- Run CLI command (show tech dbstateinfo) for more detail.
- Replication Server List (cdr list serv) from every server for debugging purposes only.  
[View Details](#)
- Replication Server Template (cdr list template) from every server for debugging purposes only.  
[View Details](#)
- Database Prefs File  
[View Details](#)

**Unified CM Hosts**

All servers have equivalent host files.  
[View Details](#)

**Unified CM Rhhosts**

- All servers have equivalent rhhosts files.
- All servers have equivalent rhhosts files.  
[View Details](#)

**Unified CM Sqlhosts**

`https://192.168.21.1/cucreports/showReport.do?isStandard=true&name=Unified Confidential Access Level Matrix`

- Download the report for future reference

### Step 3: Review the Unified CM Database Report any component flagged as an error

The screenshot shows the Cisco Unified Reporting interface. The left sidebar contains a list of report categories, including 'Unified CM Database Status'. The main content area displays the 'Unified CM Database Status' report, which includes a table of database access status and a table of replication status. A red box highlights the replication status table, showing that all three servers (cucm-pub, cucm-sub01, and cucm-sub02) have a replication status of '3 - bad'.

**Unified CM Database Status**

Provides a snapshot of the Unified CM database health. This report can be useful to monitor periodically, and should be used to ensure the database is healthy before an upgrade.  
Created on Sun Mar 07 15:05:52 IST 2021

**Unified CM Cluster Name**

| Cluster Name      | Publisher Name/IP |
|-------------------|-------------------|
| StandAloneCluster | cucm-pub          |

**Unified CM Database Access**

Local and publisher databases accessible.

| Server     | Publisher DB Reachable | Local DB Reachable |
|------------|------------------------|--------------------|
| cucm-pub   | true                   | true               |
| cucm-sub01 | true                   | true               |
| cucm-sub02 | true                   | true               |

**Unified CM Database Status**

RTMT Counter Information

All servers have a replication count of 706.

Not all servers have a good replication status. See the details.

| Server     | Number of Replicates Created | Replicate_State |
|------------|------------------------------|-----------------|
| cucm-pub   | 706                          | 3 - bad         |
| cucm-sub01 | 706                          | 3 - bad         |
| cucm-sub02 | 706                          | 3 - bad         |

See also Database Summary Screen in RTMT.

Run CLI command (show tech dbstateinfo) for more detail.

Replication Server List (cdr list serv) from every server for debugging purposes only.

Replication Server Template (cdr list template) from every server for debugging purposes only.

Database Prefs File

**Unified CM Hosts**

- Ensure the Local and the Publisher databases are accessible
- Verify Unified CM Database Status
- In case of an error, check for the network connectivity between the nodes. Verify if the A Cisco DB service is running from the CLI of the node using the `utils service list` command

## Step 4: Check Network Connectivity to other nodes from Publisher

```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:utils network connectivity cucm-sub01

This command can take up to 3 minutes to complete.
Continue (y/n)?y
Running test, please wait ...
.....
Network connectivity test with cucm-sub01 completed successfully.
admin:
admin:
admin:utils network connectivity cucm-sub02

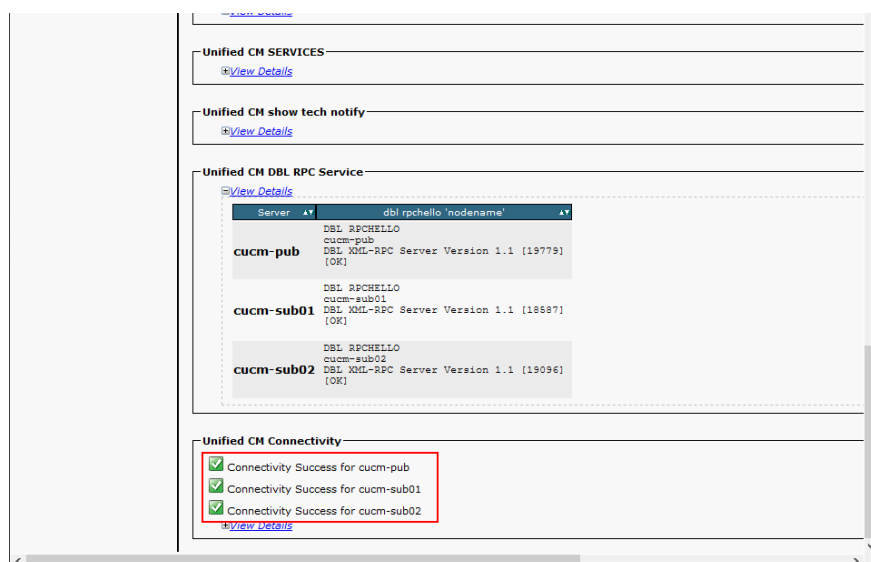
This command can take up to 3 minutes to complete.
Continue (y/n)?y
Running test, please wait ...
.....
Network connectivity test with cucm-sub02 completed successfully.
admin:
admin:
admin:
```

```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

imp-pub
imp-sub
admin:show network cluster
192.168.21.6 imp-pub.ajcollab.com imp-pub Subscriber cups DBPub not authenticated - INITIATOR since Sun Mar 7 13:15:47 2021
192.168.21.2 cucm-sub01.ajcollab.com cucm-sub01 Subscriber callmanager DBSub authenticated using TCP since Sun Mar 7 15:44:27 2021
192.168.21.3 cucm-sub02.ajcollab.com cucm-sub02 Subscriber callmanager DBSub authenticated using TCP since Sun Mar 7 15:44:54 2021
192.168.21.7 imp-sub.ajcollab.com imp-sub Subscriber cups DBSub not authenticated - INITIATOR since Sun Mar 7 13:15:47 2021
192.168.21.1 cucm-pub.ajcollab.com cucm-pub Publisher callmanager DBPub authenticated

Server Table (processnode) Entries

cucm-pub
cucm-sub01
cucm-sub02
imp-pub
imp-sub
admin:
admin:
```



## Step 5: Verify DB Services are Started in the Problematic Nodes

```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt-R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:
admin:show myself
Machine Name : cucm-pub
account name : admin
privilege level : 4
command count : disabled
logging setting : disabled
admin:
admin:utils service list

Requesting service status, please wait...
System SSH [STARTED]
Cluster Manager [STARTED]
Name Service Cache [STARTED]
Entropy Monitoring Daemon [STARTED]
Cisco SCSI Watchdog [STARTED]
Service Manager [STARTED]
HTTPS Configuration Download [STARTED]
Service Manager is running
Getting list of all services
>> Return code = 0
A Cisco DB[STARTED]
A Cisco DB Replicator[STARTED]
Cisco AMC Service[STARTED]
Cisco AXL Web Service[STARTED]
Cisco Audit Event Service[STARTED]
Cisco CAR DB[STARTED]
Cisco CAR Scheduler[STARTED]
Cisco CDP[STARTED]
Cisco CDP Agent[STARTED]
Cisco CDR Agent[STARTED]
Cisco CDR Repository Manager[STARTED]
Cisco CallManager Admin[STARTED]
Cisco CallManager Serviceability[STARTED]
Cisco CallManager Serviceability RTMT[STARTED]
Cisco Certificate Change Notification[STARTED]
Cisco Certificate Expiry Monitor[STARTED]
Cisco Change Credential Application[STARTED]
Cisco DRF Local[STARTED]
Cisco DRF Master[STARTED]
Cisco Database Layer Monitor[STARTED]
Cisco Dialed Number Analyzer[STARTED]
Cisco Dialed Number Analyzer Server[STARTED]
Cisco DirSync[STARTED]
Cisco E911[STARTED]
Cisco ELM Client Service[STARTED]
```

```
22_cucm-sub01_192.168.21.2 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt-R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:show myself
Machine Name : cucm-sub01
account name : admin
privilege level : 4
command count : disabled
logging setting : disabled
admin:
admin:utils service list

Requesting service status, please wait...
System SSH [STARTED]
Cluster Manager [STARTED]
Name Service Cache [STARTED]
Entropy Monitoring Daemon [STARTED]
Cisco SCSI Watchdog [STARTED]
Service Manager [STARTED]
HTTPS Configuration Download [STARTED]
Service Manager is running
Getting list of all services
>> Return code = 0
A Cisco DB[STARTED]
A Cisco DB Replicator[STARTED]
Cisco AMC Service[STARTED]
Cisco AXL Web Service[STARTED]
Cisco Audit Event Service[STARTED]
Cisco CAR DB[STOPPED] Commanded Out of Service
Cisco CAR Scheduler[STOPPED] Commanded Out of Service
Cisco CDP[STARTED]
Cisco CDP Agent[STARTED]
Cisco CDR Agent[STARTED]
Cisco CDR Repository Manager[STOPPED] Commanded Out of Service
Cisco CTIManager[STARTED]
Cisco CallManager[STARTED]
Cisco CallManager Admin[STARTED]
Cisco CallManager Serviceability[STARTED]
Cisco CallManager Serviceability RTMT[STARTED]
Cisco Certificate Change Notification[STARTED]
Cisco Certificate Expiry Monitor[STARTED]
Cisco Change Credential Application[STARTED]
Cisco DRF Local[STARTED]
Cisco DRF Master[STOPPED] Commanded Out of Service
Cisco Database Layer Monitor[STARTED]
Cisco Dialed Number Analyzer[STARTED]
Cisco Dialed Number Analyzer Server[STARTED]
Cisco E911[STARTED]
Cisco ELM Client Service[STARTED]
```

- If A Cisco DB and A Cisco DB Replicator are in stopped state, try to restart from CLI
- `utils service restart A Cisco DB`
- `utils service restart A Cisco DB Replicator`

The screenshot shows a SecureCRT terminal window with the title '23\_cucm-sub02\_192.168.21.3 - SecureCRT'. The terminal displays the following commands and their outputs:

```

admin:show myself
Machine Name : cucm-sub02
account name : admin
privilege level : 4
command count : disabled
logging setting : disabled
admin:
admin:utils service list

Requesting service status, please wait...
System SSH [STARTED]
Cluster Manager [STARTED]
Name Service Cache [STARTED]
Entropy Monitoring Daemon [STARTED]
Cisco SCSI Watchdog [STARTED]
Service Manager [STARTED]
HTTPS Configuration Download [STARTED]
Service Manager is running
Getting list of all services
>> Return code = 0
A Cisco DB[STARTED]
A Cisco DB Replicator[STARTED]
Cisco AMC Service[STARTED]
Cisco AXL Web Service[STARTED]
Cisco Audit Event Service[STARTED]
Cisco CAR DB[STOPPED] Commanded Out of Service
Cisco CAR Scheduler[STOPPED] Commanded Out of Service
Cisco CDP[STARTED]
Cisco CDP Agent[STARTED]
Cisco CDR Agent[STARTED]
Cisco CDR Repository Manager[STOPPED] Commanded Out of Service
Cisco CallManager[STARTED]
Cisco CallManager Admin[STARTED]
Cisco CallManager Serviceability[STARTED]
Cisco CallManager Serviceability RTMT[STARTED]
Cisco Certificate Change Notification[STARTED]
Cisco Certificate Expiry Monitor[STARTED]
Cisco Change Credential Application[STARTED]
Cisco DRF Local[STARTED]
Cisco DRF Master[STOPPED] Commanded Out of Service
Cisco Database Layer Monitor[STARTED]
Cisco E911[STARTED]
Cisco ELM Client Service[STARTED]
Cisco Extension Mobility Application[STARTED]
Cisco License Manager[STOPPED] Commanded Out of Service
Cisco Log Partition Monitoring Tool[STARTED]

```

Red arrows in the original image point to 'show myself', 'cucm-sub02', and 'utils service list'. A red box highlights the lines 'A Cisco DB[STARTED]' and 'A Cisco DB Replicator[STARTED]'.

The status bar at the bottom indicates 'Ready', 'ssh2: AES-256-CTR', '47, 7', '47 Rows, 103 Cols', 'Xterm', and 'CAP NUM'.

## Step 6: Ensure Replication Server List (cdr list serv) is populated for all the nodes

System Reports

←

→

↺

🏠

🔒

https://192.168.21.1/cucreports/showReport.do?isStandard=

...

🔖

☆

⬇

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📄

👤

☰

CISCO

Cisco Unified Reporting

For Cisco Unified Communications Solutions

Navigation

Cisco Unified Reporting

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Logout

System Reports Help

System Reports

Unified CM Phone Feature List

Unified CM Phone Locale Installers

Unified CM Phones With Mismatched Load

Unified CM Phones Without Lines

Unified CM Shared Lines

Unified CM Table Count Summary

Unified CM User Device Count

Unified CM Users Sharing Primary Extensions

Unified CM VG2XX Gateway

Unified CM Voice Mail

Unified Confidential Access Level Matrix

RTMT Counter Information

✓

All servers have a replication count of 706.

✗

Not all servers have a good replication status. See the details.

View Details

| Server     | Number of Replicates Created | Replicate State |
|------------|------------------------------|-----------------|
| cucm-pub   | 706                          | 3 - bad         |
| cucm-sub01 | 706                          | 3 - bad         |
| cucm-sub02 | 706                          | 3 - bad         |

⚠

See also Database Summary Screen in RTMT.

⚠

Run CLI command (show tech dbstateinfo) for more detail.

Replication Server List (cdr list serv) from every server for debugging purposes only.

View Details

| Server     | cdr list serv         |    |        |           |        |                    |
|------------|-----------------------|----|--------|-----------|--------|--------------------|
|            | SERVER                | ID | STATE  | STATUS    | QUEUE  | CONNECTION CHANGED |
| cucm-pub   | g_2_ccml1_5_1_13901_3 | 2  | Active | Local     | 0      |                    |
|            | g_3_ccml1_5_1_13901_3 | 3  | Active | Connected | 148    | Mar 7 13:17:42     |
|            | g_4_ccml1_5_1_13901_3 | 4  | Active | Failed    | 291967 | Mar 7 15:05:51     |
| cucm-sub01 | g_2_ccml1_5_1_13901_3 | 2  | Active | Connected | 0      | Mar 7 13:17:42     |
|            | g_3_ccml1_5_1_13901_3 | 3  | Active | Local     | 0      |                    |
|            | g_4_ccml1_5_1_13901_3 | 4  | Active | Failed    | 13957  | Mar 7 15:04:40     |
| cucm-sub02 | g_2_ccml1_5_1_13901_3 | 2  | Active | Failed    | 15147  | Mar 7 17:15:27     |
|            | g_3_ccml1_5_1_13901_3 | 3  | Active | Failed    | 15147  | Mar 7 17:15:27     |
|            | g_4_ccml1_5_1_13901_3 | 4  | Active | Local     | 0      |                    |

Replication Server Template (cdr list template) from every server for debugging purposes only.

View Details

Database Prefs File

View Details

Unified CM Hosts

✓

All servers have equivalent host files

View Details

Unified CM Rhhosts

✓

All servers have equivalent rhhosts files.

✓

All servers have equivalent rhhosts files.

View Details

Unified CM Sqlhosts

383

## Step 7: Verify CM Hosts, CM Rhosts and CM Sqlhosts are in Sync

The screenshot displays the Cisco Unified Reporting interface for System Reports. The page is titled "System Reports" and includes a navigation bar with "Cisco Unified Reporting" and "Go" button. The main content area shows two sections: "Unified CM Hosts" and "Unified CM Rhosts".

**Unified CM Hosts**

- ✓ All servers have equivalent host files
- [View Details](#)

The details for Unified CM Hosts show the following content:

```
192.168.21.1 cucm-pub.ajcollab.com cucm-pub

#This file was generated by the /etc/hosts cluster manager.
#It is automatically updated as nodes are added, changed, removed from the cluster.

127.0.0.1 localhost
::1 localhost
cucm-sub01 192.168.21.2 cucm-sub01.ajcollab.com cucm-sub01
192.168.21.3 cucm-sub02.ajcollab.com cucm-sub02
192.168.21.6 imp-pub.ajcollab.com imp-pub
192.168.21.7 imp-sub.ajcollab.com imp-sub
192.168.21.1 cucm-pub.ajcollab.com cucm-pub

#This file was generated by the /etc/hosts cluster manager.
#It is automatically updated as nodes are added, changed, removed from the cluster.

127.0.0.1 localhost
::1 localhost
cucm-sub02 192.168.21.3 cucm-sub02.ajcollab.com cucm-sub02
192.168.21.2 cucm-sub01.ajcollab.com cucm-sub01
192.168.21.6 imp-pub.ajcollab.com imp-pub
192.168.21.7 imp-sub.ajcollab.com imp-sub
192.168.21.1 cucm-pub.ajcollab.com cucm-pub
```

**Unified CM Rhosts**

- ✓ All servers have equivalent rhosts files.
- ✓ All servers have equivalent rhosts files.
- [View Details](#)

The details for Unified CM Rhosts show the following content:

```
IDS END - DO NOT REMOVE

IDS BEGIN - DO NOT REMOVE
localhost
cucm-sub02
cucm-sub02.ajcollab.com
cucm-sub01
cucm-sub01.ajcollab.com
cucm-pub
cucm-pub.ajcollab.com

IDS END - DO NOT REMOVE

IDS BEGIN - DO NOT REMOVE
localhost
cucm-sub02
cucm-sub02.ajcollab.com
cucm-pub
cucm-pub.ajcollab.com
cucm-sub01
cucm-sub01.ajcollab.com

IDS END - DO NOT REMOVE
```



System Reports

https://192.168.21.1/cucereports/showReport.do?isStandard=

Cisco Unified Reporting  
For Cisco Unified Communications Solutions

Navigation Cisco Unified Reporting Go

admin | Search Documentation | About | Logout

System Reports Help

System Reports

### IDS END - DO NOT REMOVE

**Unified CM Sqlhosts**

✓ All servers have equivalent sqlhosts files.  
✓ All servers have equivalent sqlhosts files.  
[View Details](#)

| Server            | sqlhosts File                                                                      |                                              |
|-------------------|------------------------------------------------------------------------------------|----------------------------------------------|
| <b>cucm-pub</b>   | g_hdr group - - i=1                                                                |                                              |
|                   | LOCAL onsectcp 127.0.0.1 - -                                                       | cucm_pub_ccml1_5_1_13901_3 b=32767,rtc=300   |
|                   | g_2_ccml1_5_1_13901_3 group - - i=2                                                |                                              |
|                   | cucm_pub_ccml1_5_1_13901_3 onsectcp - -                                            | 192.168.21.1 cucm_pub_ccml1_5_1_1390         |
|                   | g_3_ccml1_5_1_13901_3 group - - i=3                                                |                                              |
|                   | cucm_sub01_ccml1_5_1_13901_3 onsectcp - -                                          | 192.168.21.2 cucm_sub01_ccml1_5_1_13         |
|                   | g_4_ccml1_5_1_13901_3 group - - i=4                                                |                                              |
|                   | cucm_sub02_ccml1_5_1_13901_3 onsectcp - -                                          | 192.168.21.3 cucm_sub02_ccml1_5_1_13         |
|                   | ###NOTE: Need to use ipv4 address in host column of sqlhosts file and not hostname |                                              |
|                   | cucm_pub_car11_5_1_13901_3 onsectcp                                                | 192.168.21.1 cucm_pub_car11_5_1_1390         |
| <b>cucm-sub01</b> | g_hdr group - - i=1                                                                |                                              |
|                   | LOCAL onsectcp 127.0.0.1 - -                                                       | cucm_sub01_ccml1_5_1_13901_3 b=32767,rtc=300 |
|                   | g_2_ccml1_5_1_13901_3 group - - i=2                                                |                                              |
|                   | cucm_pub_ccml1_5_1_13901_3 onsectcp - -                                            | 192.168.21.1 cucm_pub_ccml1_5_1_1390         |
|                   | g_3_ccml1_5_1_13901_3 group - - i=3                                                |                                              |
|                   | cucm_sub01_ccml1_5_1_13901_3 onsectcp - -                                          | 192.168.21.2 cucm_sub01_ccml1_5_1_13         |
|                   | g_4_ccml1_5_1_13901_3 group - - i=4                                                |                                              |
|                   | cucm_sub02_ccml1_5_1_13901_3 onsectcp                                              | 192.168.21.3 cucm_sub02_ccml1_5_1_13         |

**Unified CM ODBC.INI**  
[View Details](#)

**Unified CM ODBCINST.INI**  
[View Details](#)

**Unified CM ONCONFIG.CCM**  
[View Details](#)

**Unified CM SERVICES**  
[View Details](#)

**Unified CM show tech notify**  
[View Details](#)

**Unified CM DBL RPC Service**

- If you find any mismatch, there is a possibility of an incorrect activity when an IP address changes or updates to the Hostname on the server
- Restart the following services from the CLI of the publisher server and check if the mismatch is cleared Generate a new report every time you make a change on the GUI/CLI to check if the changes are included
  - `utils service restart Cluster Manager`
  - `utils service restart A Cisco DB`

## Step 8: Ensure that the Database Layer Remote Procedural Call (DBL RPC) hello is successful

The screenshot shows the Cisco Unified Reporting interface. The left sidebar contains 'System Reports' and 'Help'. The main content area displays a list of reports. The 'Unified CM DBL RPC Service' report is highlighted with a red box. This report shows a table with columns 'Server' and 'db1 rpchello 'nodename''. The table lists three servers: 'cucm-pub', 'cucm-sub01', and 'cucm-sub02'. Each server entry shows the output of the 'db1 rpchello' command, indicating successful connectivity. Below the table, the 'Unified CM Connectivity' section shows three green checkmarks, confirming connectivity success for all three servers.

System Reports

Cisco Unified Reporting  
For Cisco Unified Communications Solutions

Navigation Cisco Unified Reporting Go  
admin | Search Documentation | About | Logout

System Reports Help

System Reports

Unified CM ODBC.INI  
[View Details](#)

Unified CM ODBCINST.INI  
[View Details](#)

Unified CM ONCONFIG.CCM  
[View Details](#)

Unified CM SERVICES  
[View Details](#)

Unified CM show tech notify  
[View Details](#)

**Unified CM DBL RPC Service**  
[View Details](#)

| Server     | db1 rpchello 'nodename'                                                      |
|------------|------------------------------------------------------------------------------|
| cucm-pub   | DBL RPCHELLO<br>cucm-pub<br>DBL XML-RPC Server Version 1.1 [19779]<br>[OK]   |
| cucm-sub01 | DBL RPCHELLO<br>cucm-sub01<br>DBL XML-RPC Server Version 1.1 [18587]<br>[OK] |
| cucm-sub02 | DBL RPCHELLO<br>cucm-sub02<br>DBL XML-RPC Server Version 1.1 [19096]<br>[OK] |

Unified CM Connectivity

- ✓ Connectivity Success for cucm-pub
- ✓ Connectivity Success for cucm-sub01
- ✓ Connectivity Success for cucm-sub02

[View Details](#)

## Step 9: Diagnose Test and NTP Status

```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:utils diagnose test

Log file: platform/log/diag1.log

Starting diagnostic test(s)
=====
test - disk_space : Passed (available: 996 MB, used: 12685 MB)
skip - disk_files : This module must be run directly and off hours
test - service_manager : Passed
test - tomcat : Passed
test - tomcat_deadlocks : Passed
test - tomcat_keystore : Passed
test - tomcat_connectors : Passed
test - tomcat_threads : Passed
test - tomcat_memory : Passed
test - tomcat_sessions : Passed
skip - tomcat_heapdump : This module must be run directly and off hours
test - validate_network : Error, intra-cluster communication is broken, unable to connect to [192.168.21.6]
communication is broken, unable to connect to [192.168.21.7] Leave this since these are my IMP Nodes
test - raid : Passed
test - system_info : Passed (Collected system information in diagnostic log)
test - ntp_reachability : Warning
The NTP service is restarting, it can take about 5 minutes.

test - ntp_clock_drift : Warning
The local clock is not synchronised.
None of the designated NTP servers are reachable/functioning or legitimate.

test - ntp_stratum : Warning
The local clock is not synchronised.
None of the designated NTP servers are reachable/functioning or legitimate.

skip - sdl_fragmentation : This module must be run directly and off hours
skip - sdi_fragmentation : This module must be run directly and off hours

Diagnostics Completed

The final output will be in Log file: platform/log/diag1.log

Please use 'file view activelog platform/log/diag1.log' command to see the output

admin:
```

```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:utils ntp status
ntpd (pid 6475) is running...

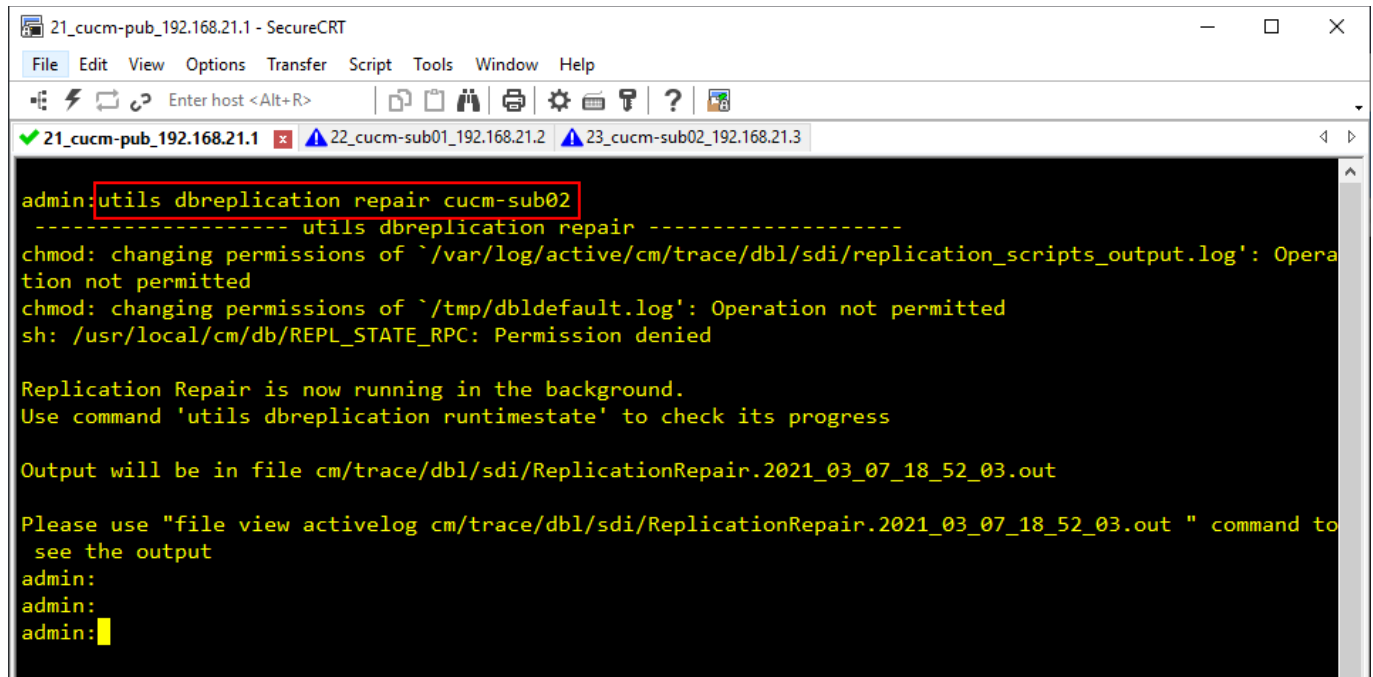
 remote refid st t when poll reach delay offset jitter
=====
192.168.31.1 .INIT. 16 u - 1024 0 0.000 0.000 0.000

unsynchronised
polling server every 8 s

Current time in UTC is : Sun Mar 7 10:39:55 UTC 2021
Current time in Asia/Kolkata is : Sun Mar 7 16:09:55 IST 2021
admin:
```

## Step 10: DB Repair Node

- If the `utils dbreplication runtimestate` command shows that there are error/mismatched tables, run the command
  - `utils dbreplication repair NODE`



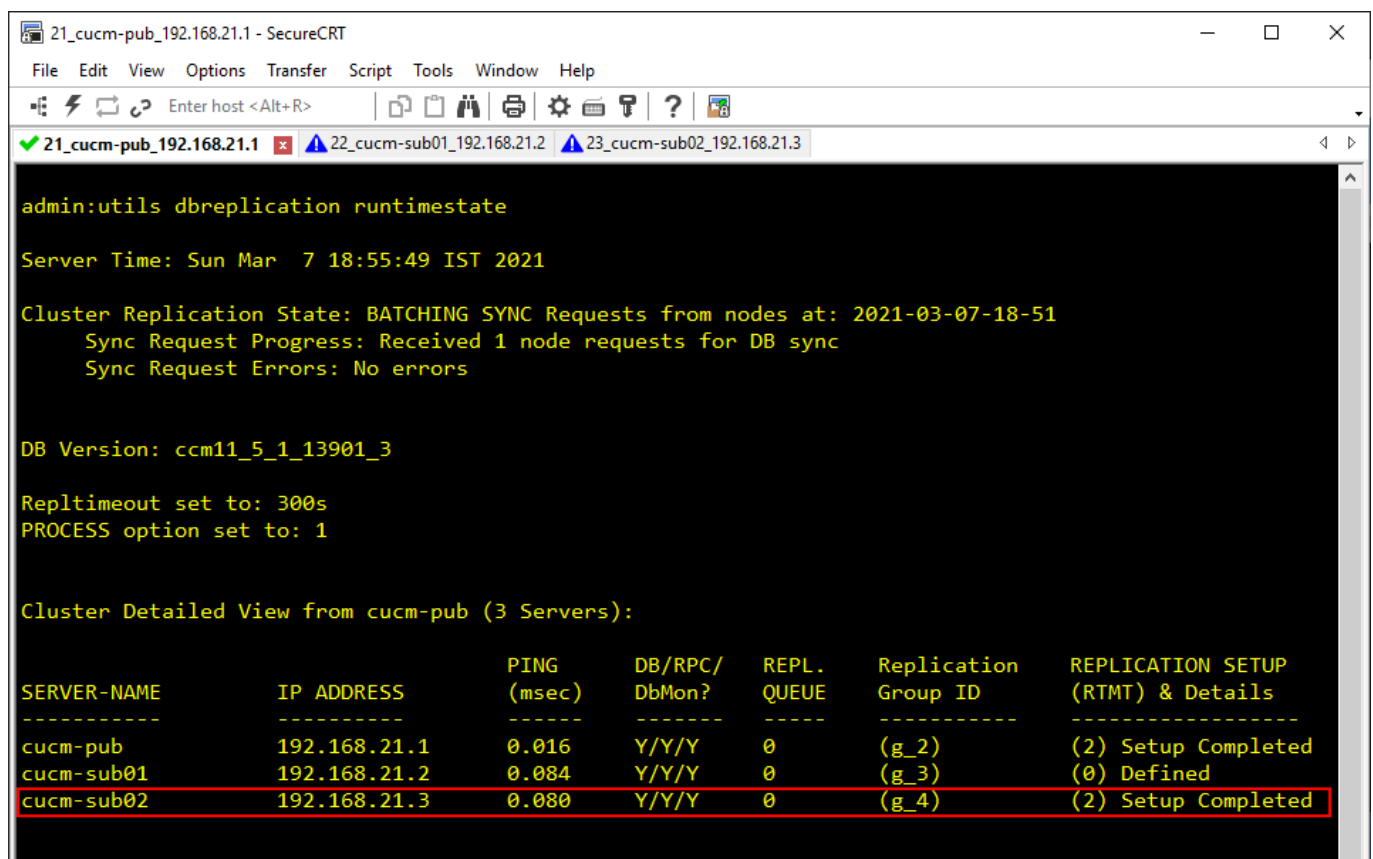
```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3
admin:utils dbreplication repair cucm-sub02
----- utils dbreplication repair -----
chmod: changing permissions of `/var/log/active/cm/trace/dbl/sdi/replication_scripts_output.log': Operation not permitted
chmod: changing permissions of `/tmp/dbldefault.log': Operation not permitted
sh: /usr/local/cm/db/REPL_STATE_RPC: Permission denied

Replication Repair is now running in the background.
Use command 'utils dbreplication runtimestate' to check its progress

Output will be in file cm/trace/dbl/sdi/ReplicationRepair.2021_03_07_18_52_03.out

Please use "file view activelog cm/trace/dbl/sdi/ReplicationRepair.2021_03_07_18_52_03.out " command to see the output
admin:
admin:
admin:
```

- Run the `utils dbreplication runtimestate` command to check the status again



```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3
admin:utils dbreplication runtimestate

Server Time: Sun Mar 7 18:55:49 IST 2021

Cluster Replication State: BATCHING SYNC Requests from nodes at: 2021-03-07-18-51
 Sync Request Progress: Received 1 node requests for DB sync
 Sync Request Errors: No errors

DB Version: ccm11_5_1_13901_3

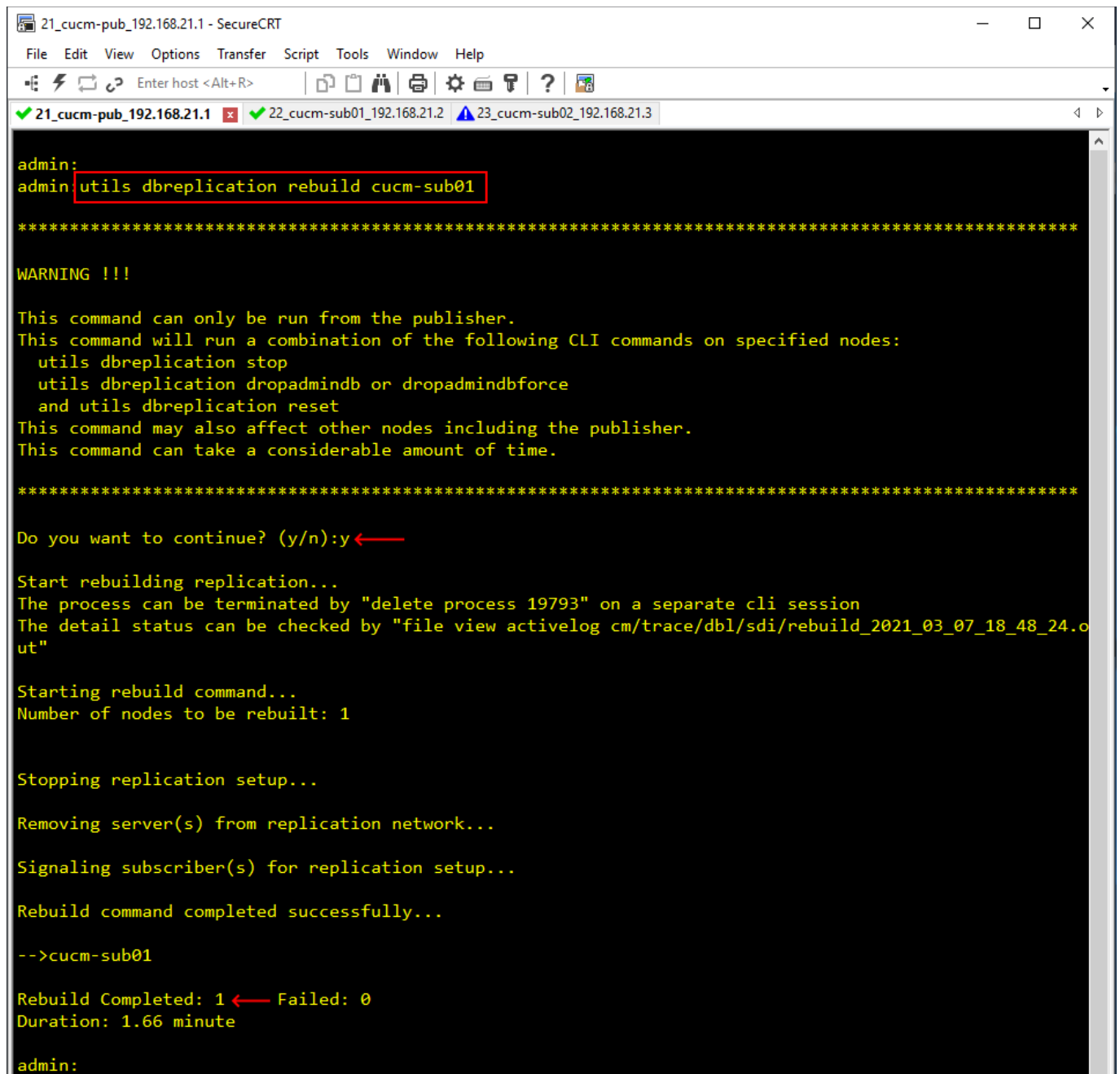
Repltimeout set to: 300s
PROCESS option set to: 1

Cluster Detailed View from cucm-pub (3 Servers):

SERVER-NAME IP ADDRESS PING DB/RPC/ REPL. Replication REPLICATION SETUP
----- ----- ----- ----- ----- ----- -----
cucm-pub 192.168.21.1 0.016 Y/Y/Y 0 (g_2) (2) Setup Completed
cucm-sub01 192.168.21.2 0.084 Y/Y/Y 0 (g_3) (0) Defined
cucm-sub02 192.168.21.3 0.080 Y/Y/Y 0 (g_4) (2) Setup Completed
```

## Step 11: Reset Database using Rebuild Command

- This will re-initiate the DB Replication on CUCM-SUB01 from scratch
- This is a time-consuming process
- DB of SUB01 will re-sync with CUCM PUB



```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:
admin: utils dbreplication rebuild cucm-sub01

WARNING !!!

This command can only be run from the publisher.
This command will run a combination of the following CLI commands on specified nodes:
 utils dbreplication stop
 utils dbreplication dropadmindb or dropadmindbforce
 and utils dbreplication reset
This command may also affect other nodes including the publisher.
This command can take a considerable amount of time.

Do you want to continue? (y/n):y

Start rebuilding replication...
The process can be terminated by "delete process 19793" on a separate cli session
The detail status can be checked by "file view activelog cm/trace/dbl/sdi/rebuild_2021_03_07_18_48_24.0
ut"

Starting rebuild command...
Number of nodes to be rebuilt: 1

Stopping replication setup...

Removing server(s) from replication network...

Signaling subscriber(s) for replication setup...

Rebuild command completed successfully...

-->cucm-sub01

Rebuild Completed: 1 Failed: 0
Duration: 1.66 minute

admin:
```

```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:utils dbreplication runtimestate

Server Time: Sun Mar 7 18:55:49 IST 2021

Cluster Replication State: BATCHING SYNC Requests from nodes at: 2021-03-07-18-51
 Sync Request Progress: Received 1 node requests for DB sync
 Sync Request Errors: No errors

DB Version: ccm11_5_1_13901_3

Repltimeout set to: 300s
PROCESS option set to: 1

Cluster Detailed View from cucm-pub (3 Servers):

SERVER-NAME IP ADDRESS PING DB/RPC/ REPL. Replication REPLICATION SETUP
----- ----- ---- -
cucm-pub 192.168.21.1 0.016 Y/Y/Y 0 (g_2) (2) Setup Completed
cucm-sub01 192.168.21.2 0.084 Y/Y/Y 0 (g_3) (0) Defined
cucm-sub02 192.168.21.3 0.080 Y/Y/Y 0 (g_4) (2) Setup Completed
```

```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:
admin:utils dbreplication runtimestate

Server Time: Sun Mar 7 19:01:36 IST 2021

Cluster Replication State: BROADCAST SYNC ended at: 2021-03-07-18-58
 Sync Result: SYNC COMPLETED on 706 tables out of 706
 Sync Status: All Tables are in sync
 Use CLI to see detail: 'file view activelog cm/trace/dbl/20210307_185730_dbl_repl_output_Broadcast.log'

DB Version: ccm11_5_1_13901_3

Repltimeout set to: 300s
PROCESS option set to: 1

Cluster Detailed View from cucm-pub (3 Servers):

SERVER-NAME IP ADDRESS PING DB/RPC/ REPL. Replication REPLICATION SETUP
----- ----- ---- -
cucm-pub 192.168.21.1 0.014 Y/Y/Y 0 (g_2) (2) Setup Completed
cucm-sub01 192.168.21.2 0.083 Y/Y/Y 0 (g_3) (2) Setup Completed
cucm-sub02 192.168.21.3 0.095 Y/Y/Y 0 (g_4) (2) Setup Completed
```

---

## Step 12: DBreplication Setprocess

- If CUCM Nodes are Spread Across WAN, ensure that the nodes have network connectivity well under 80 ms (Round Trip Time)
- Changing this parameter improves the replication setup performance, but consumes additional system resources
  - `utils dbreplication setprocess <1-40>`

## Step 13: Replication Timeout

- The replication timeout (Default: 300 Seconds) is the time that the publisher waits for all the subscribers in order to send their defined messages
- Calculate the replication timeout based on the number of nodes in the cluster
  - Server 1-5 = 1 Minute Per Server Servers
  - Server 6-10 = 2 Minutes Per Server
  - Servers >10 = 3 Minutes Per Server

Example:

Example: 12 Servers in Cluster:

Server 1-5 x 1 min = 5x1 = 5 min

Server 6-10 x 2 min = 5x2 = 10 min

Server 11-12 x 3 min = 2x3 = 6 min

Repltimeout should be set to 21 Minutes

- `show tech repltimeout` (To check the current replication timeout value)
- `utils dbreplication setrepltimeout` (To set the replication timeout)

```
21_cucm-pub_192.168.21.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
21_cucm-pub_192.168.21.1 22_cucm-sub01_192.168.21.2 23_cucm-sub02_192.168.21.3

admin:
admin: utils dbreplication runtimestate

Server Time: Sun Mar 7 19:01:36 IST 2021

Cluster Replication State: BROADCAST SYNC ended at: 2021-03-07-18-58
 Sync Result: SYNC COMPLETED on 706 tables out of 706
 Sync Status: All Tables are in sync
 Use CLI to see detail: 'file view activelog cm/trace/dbl/20210307_185730_dbl_repl_output_Broadcast.log'

DB Version: ccm11_5_1_13901_3

Repltimeout set to: 300s
PROCESS option set to: 1

Cluster Detailed View from cucm-pub (3 Servers):

SERVER-NAME IP ADDRESS PING DB/RPC/ REPL. Replication REPLICATION SETUP
----- ----- ---- -
cucm-pub 192.168.21.1 0.014 Y/Y/Y 0 (g_2) (2) Setup Completed
cucm-sub01 192.168.21.2 0.083 Y/Y/Y 0 (g_3) (2) Setup Completed
cucm-sub02 192.168.21.3 0.095 Y/Y/Y 0 (g_4) (2) Setup Completed
```

---

#### Step 14: Contact Cisco TAC

- If none of the above steps are not helping to fix the DB replication, please contact Cisco TAC
- While contacting TAC, make sure you collect the below details

You may also interested to refer [Support Forum Document](#)



---

## **Chapter 1 Module 3 - CUC**

### **Cisco On-Premise Collaboration Solution**

### **Cisco Unity Connection (CUC)**



---

## Cisco Unity Connection - CUC

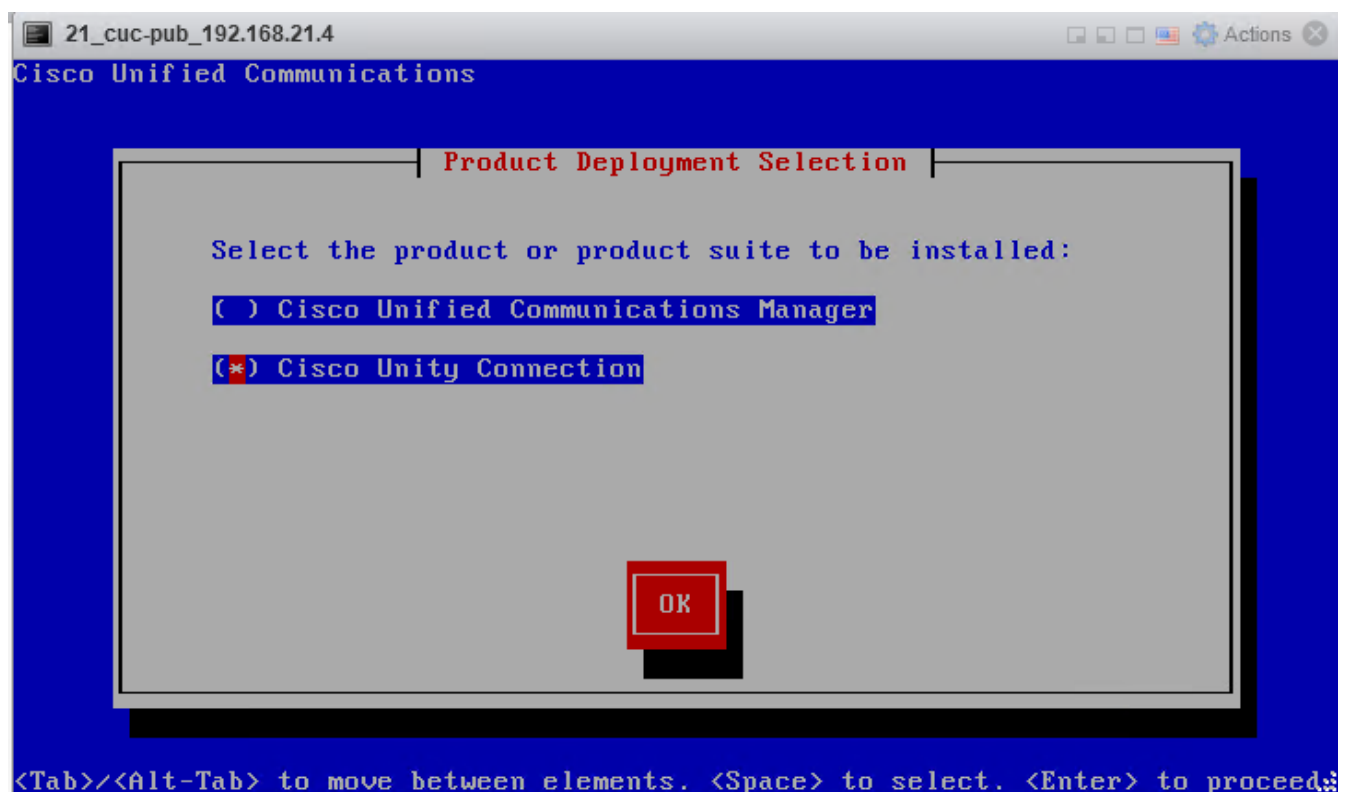
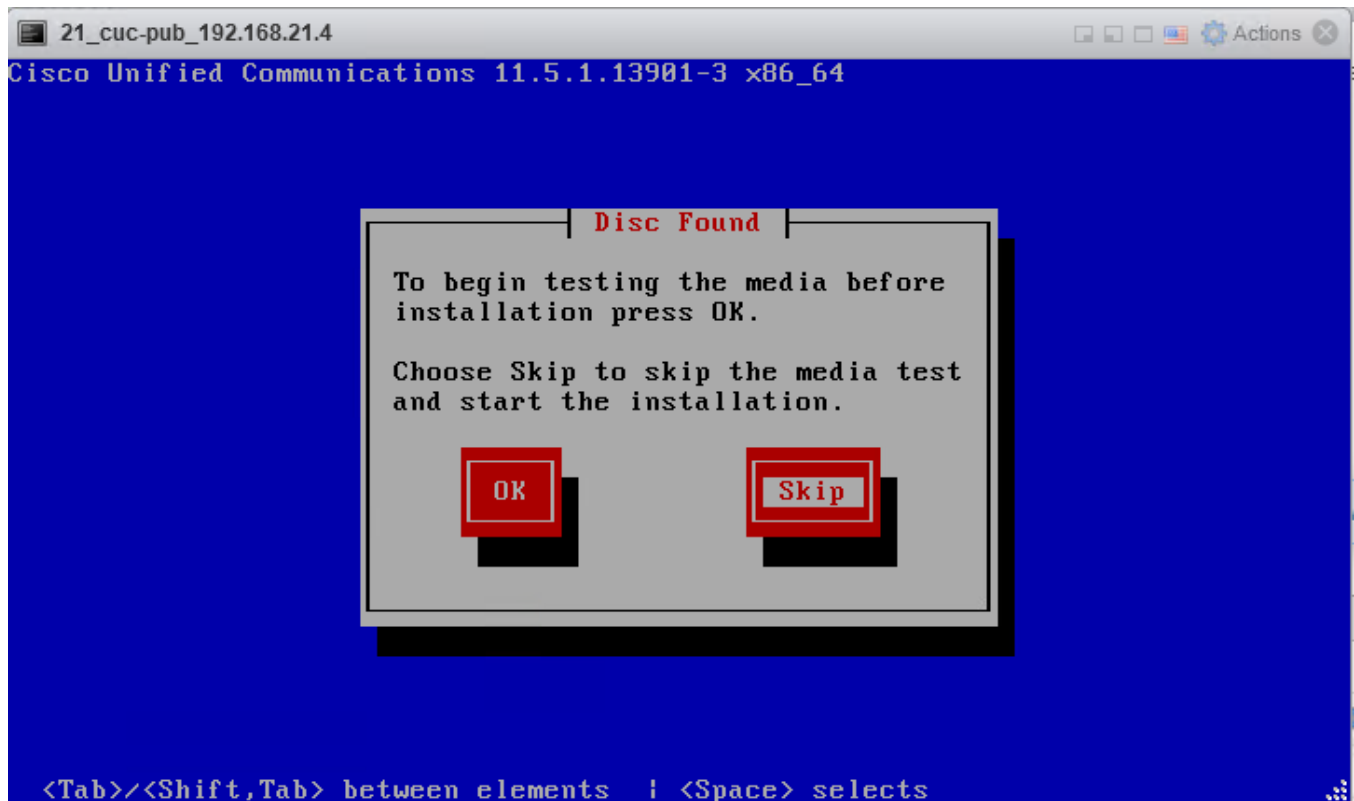


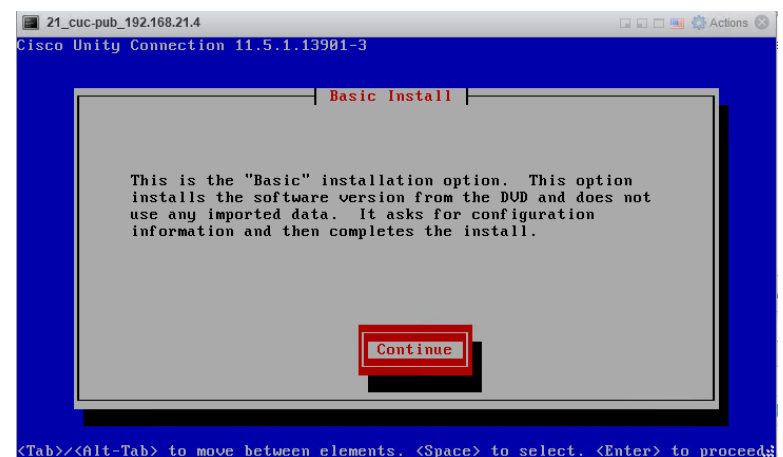
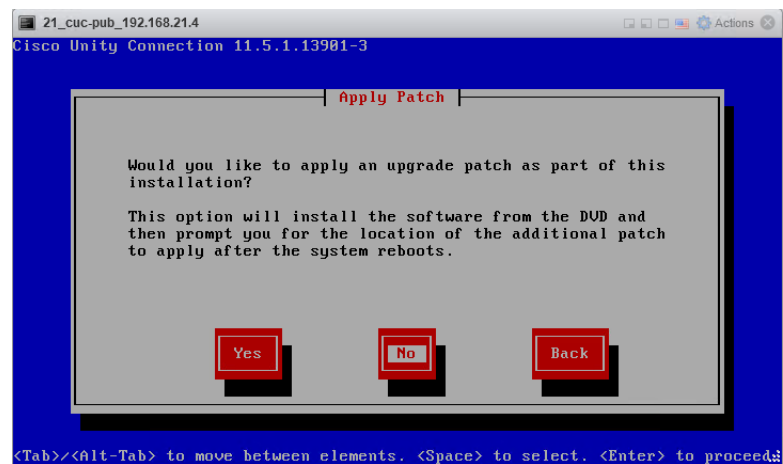
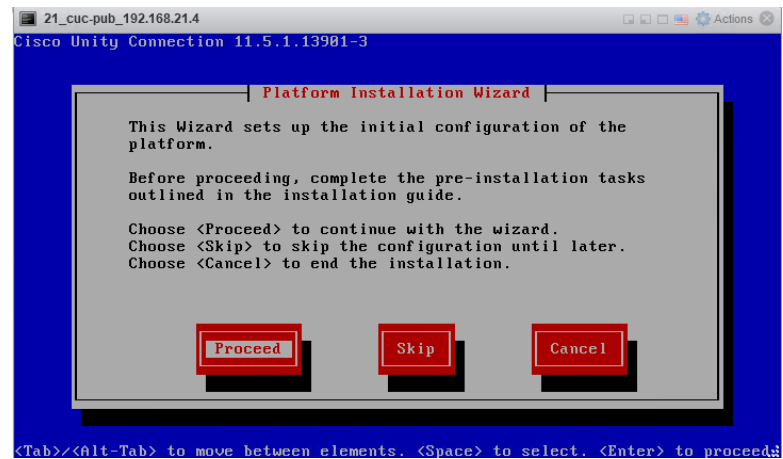
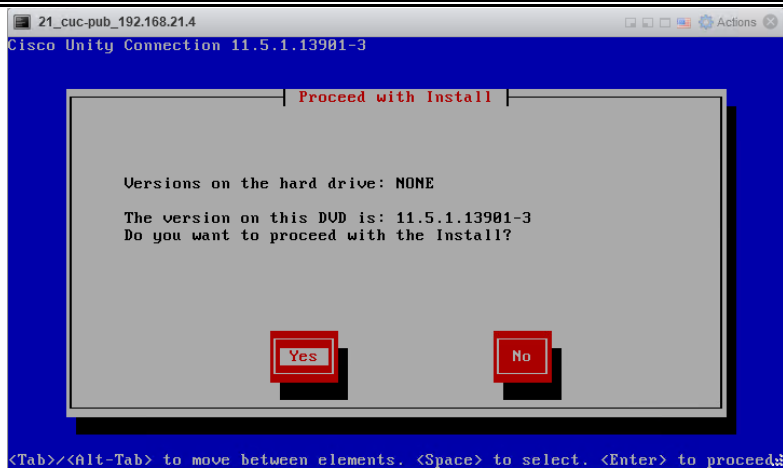
- Unified Voice Messaging and basic IVR solution system integrated to CUCM
- CUCM can't offer any voice mail solution natively, hence we integrate CUC with CUCM
- CUC can also be used for basic IVR auto attend functionality called Call Handlers. It provides greetings for external callers *"Thank you for calling AJ Labs, Please Press 1 for enquiries, 2 for upcoming courses, 3 for other helps, etc."*
- Cisco Unity Connection is deployed as one Publisher and one Subscriber Active-Active nodes. Only 2 nodes will be in the cluster

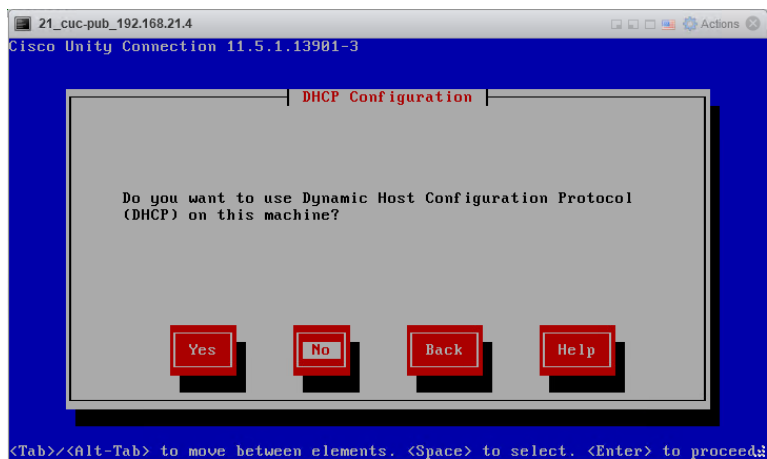
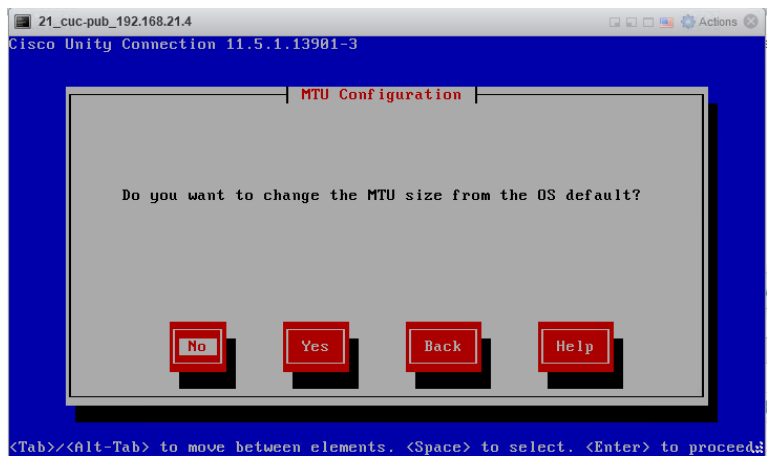
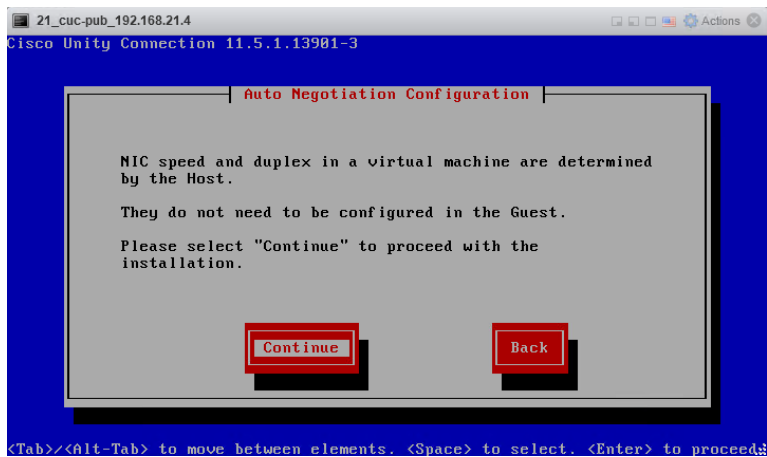
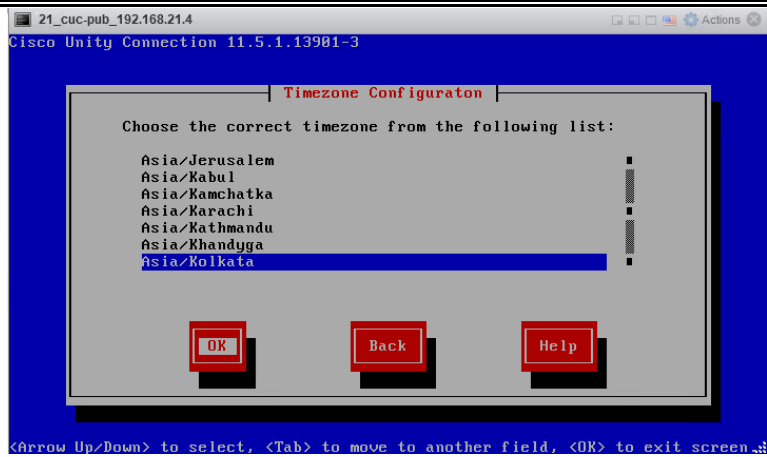
---

## [Lab] Installation PUB and SUB

- The installation of Cisco Unity Connection is exactly like CUCM, in fact we use same ISO file to install CUCM and CUC
- The only difference is the virtual hardware requirement, the OVA of CUC is different, you can download the CUC 11.5 OVA from Cisco







21\_cuc-pub\_192.168.21.4 Cisco Unity Connection 11.5.1.13901-3

**Static Network Configuration**

Host Name cuc-pub  
IP Address 192.168.21.4  
IP Mask 255.255.128.0  
GW Address 192.168.0.1

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-pub\_192.168.21.4 Cisco Unity Connection 11.5.1.13901-3

**DNS Client Configuration**

Do you want to enable Domain Name System (DNS) Client on this machine?

Yes No Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-pub\_192.168.21.4 Cisco Unity Connection 11.5.1.13901-3

**DNS Client Configuration**

Primary DNS 192.168.11.1  
Secondary DNS (optional)  
Domain ajcollab.com

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-pub\_192.168.21.4 Cisco Unity Connection 11.5.1.13901-3

**Administrator Login Configuration**

Enter the Platform administration username and password. Choose Help for username and password guidelines.

Administrator ID admin  
Password \*\*\*\*\*  
Confirm Password \*\*\*\*\*

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-pub\_192.168.21.4 Cisco Unity Connection 11.5.1.13981-3

### Certificate Information

Enter information about your organization. This is used to generate security certificates for this node.

Organization AJ Collab

Unit Collab

Location Bangalore

State Karnataka

Country India  
Indonesia  
Iran

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-pub\_192.168.21.4 Cisco Unity Connection 11.5.1.13981-3

### First Node Configuration

Is this server the First Node in the cluster?

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-pub\_192.168.21.4 Cisco Unity Connection 11.5.1.13981-3

### Network Time Protocol Client Configuration

NTP Server 1 192.168.31.1

NTP Server 2

NTP Server 3

NTP Server 4

NTP Server 5

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-pub\_192.168.21.4 Cisco Unity Connection 11.5.1.13981-3

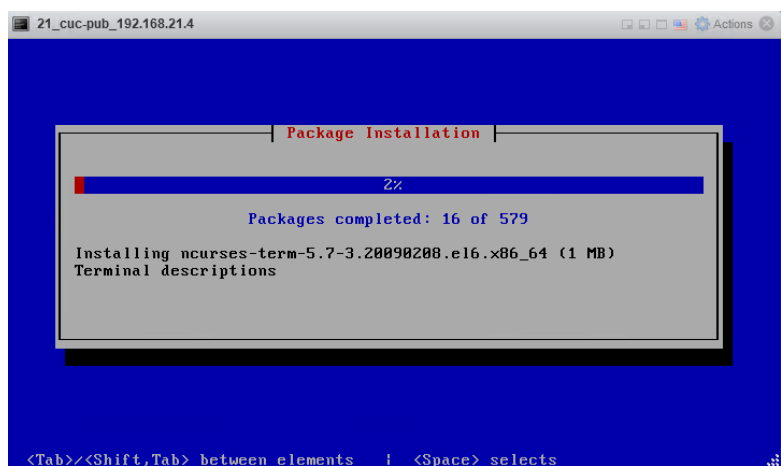
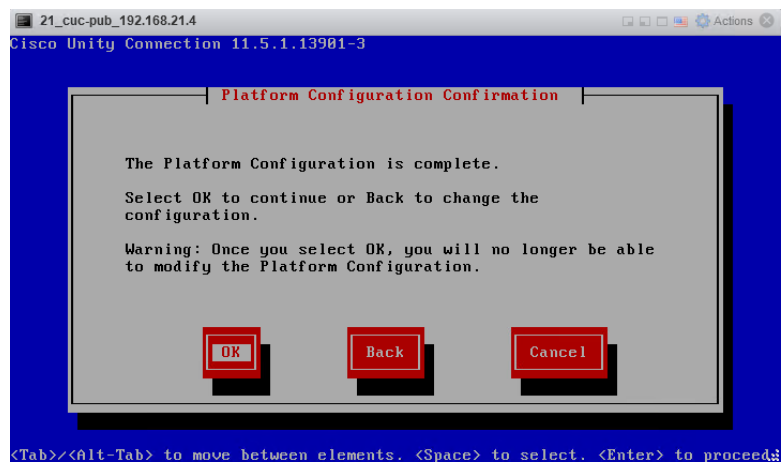
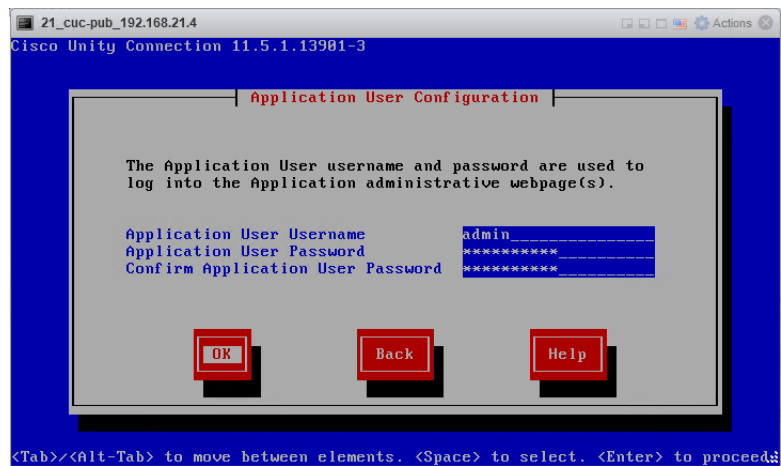
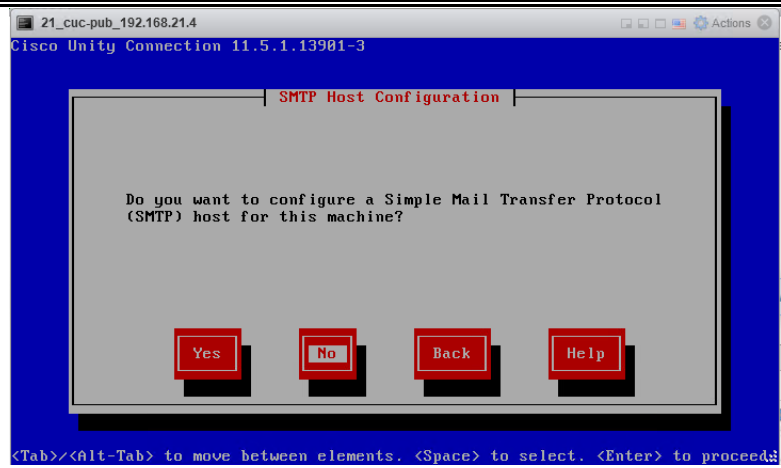
### Security Configuration

Enter the system security password. This password is used to secure communication between cluster nodes and will also be used by DRS for encryption of backup tar files. Choose Help for username and password guidelines.

Security Password \*\*\*\*\*

Confirm Password \*\*\*\*\*

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.





- Install CUC SUB

**Cisco Unity Connection Administration**  
For Cisco Unified Communications Solutions

**Cisco Unity Connection**

- Mailbox Stores Membership
  - Mailbox Quotas
  - Message Aging
- Networking
  - Legacy Links
  - Branch Management
  - HTTP(S) Links
  - Locations
  - VPIM
  - Connection Location Passwords
- Unified Messaging
  - Unified Messaging Services
  - Unified Messaging Accounts Status
  - SpeechView Transcription
- Video
  - Video Services
  - Video Services Accounts Status
- Dial Plan
  - Partitions
  - Search Spaces
- System Settings
  - General Configuration
  - Cluster**
  - Authentication Rules
  - Roles
  - Restriction Tables

**Find and List Servers**

Find and List Servers Refresh Help

**Status**

1 records found

**Servers (1 - 1 of 1)**

Find Servers where Host Name/IP Address begins with Find

|                          | Host Name/IP Address |
|--------------------------|----------------------|
| <input type="checkbox"/> | cuc-pub              |

Add New Select All Clear All Delete Selected

**Cisco Unity Connection Administration**  
For Cisco Unified Communications Solutions

**Cisco Unity Connection**

- Mailbox Stores Membership
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  - Video Services
  - Video Services Accounts Status
- Dial Plan
  - Partitions
  - Search Spaces
- System Settings
  - General Configuration
  - Cluster**
  - Authentication Rules
  - Roles
  - Restriction Tables

**Server Configuration**

Server Configuration Refresh Help

**Status**

Status: Ready

**Server Information**

Server Type Unity Connection Server

Host Name/IP Address\* cuc-sub

IPv6 Address (for dual IPv4/IPv6)

MAC Address

Description cuc-sub

**Location Bandwidth Management Information**

LBM Intercluster Replication Group < None > View Detail

Save

CX-VLAB Cisco Unity Connection Admin CFME: Virtual Machines

https://192.168.21.4/cuadmin/home.do

## Cisco Unity Connection Administration

For Cisco Unified Communications Solutions

- ▼ Cisco Unity Connection
  - Mailbox Stores Membership
  - Mailbox Quotas
  - Message Aging
  - Networking
    - Legacy Links
    - Branch Management
      - HTTP(S) Links
      - Locations
      - VPIM
    - Connection Location Passwords
  - Unified Messaging
    - Unified Messaging Services
    - Unified Messaging Accounts Status
    - SpeechView Transcription
  - Video
    - Video Services
    - Video Services Accounts Status
  - Dial Plan
    - Partitions
    - Search Spaces
  - System Settings
    - General Configuration
    - Cluster**
    - Authentication Rules
    - Roles
    - Restriction Tables
    - Licenses

### Find and List Servers

Find and List Servers Refresh Help

**Status**

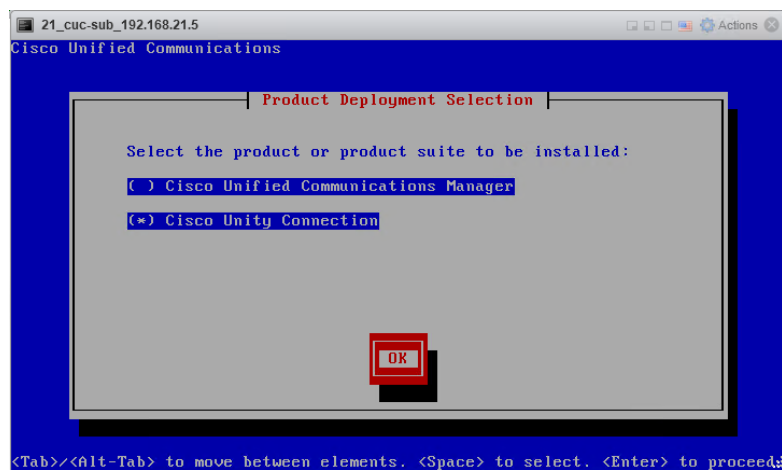
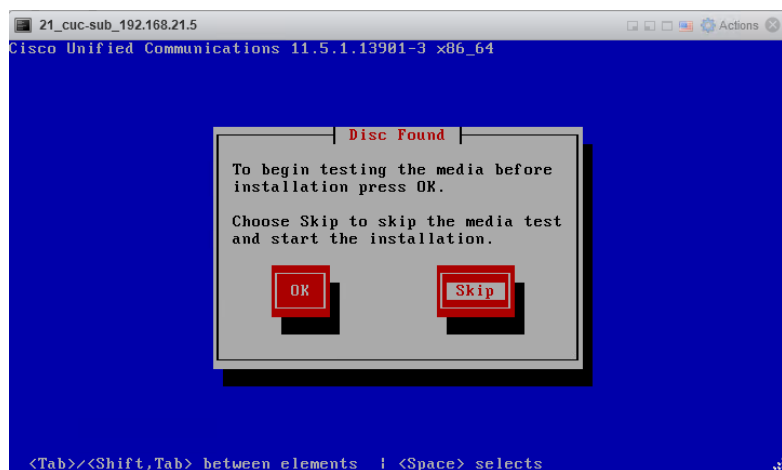
2 records found

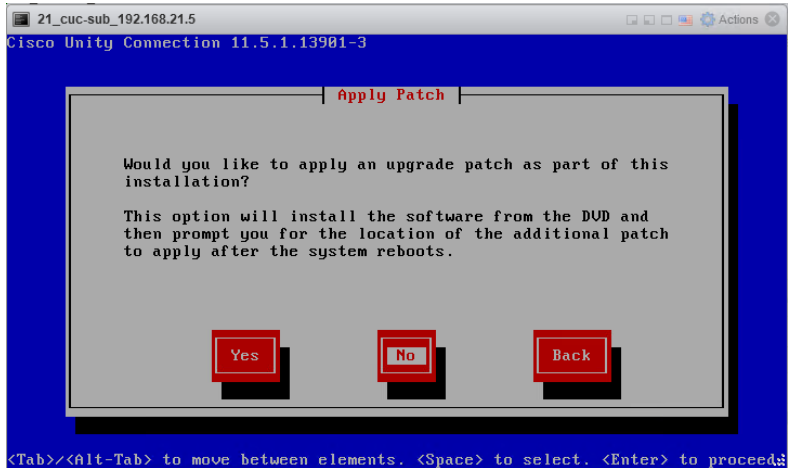
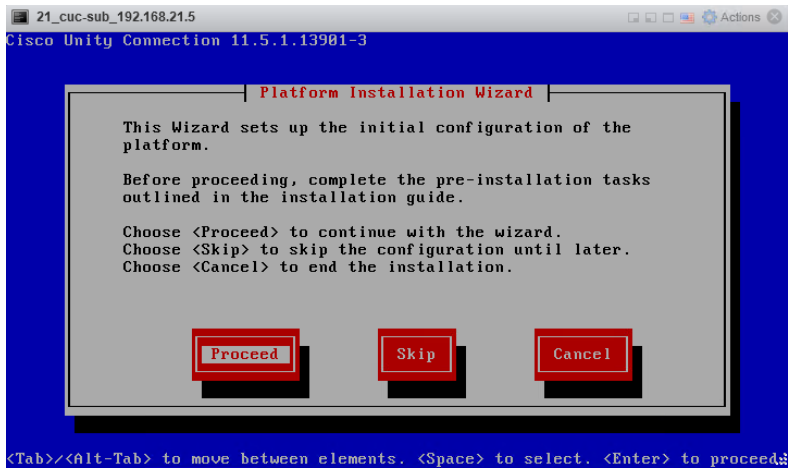
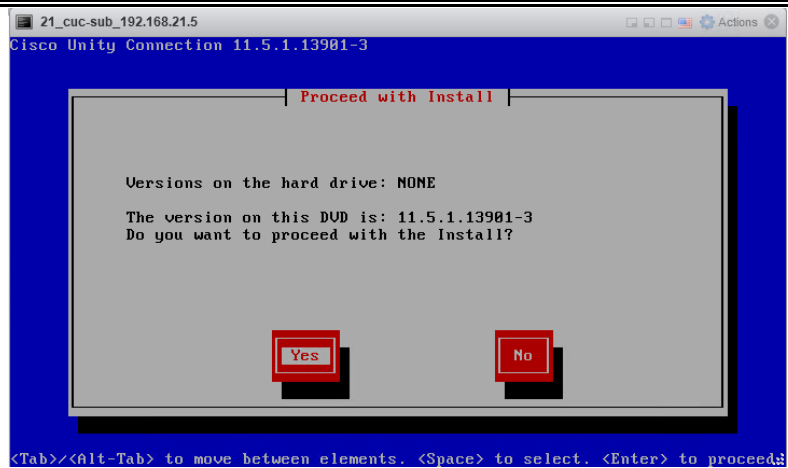
**Servers (1 - 2 of 2)**

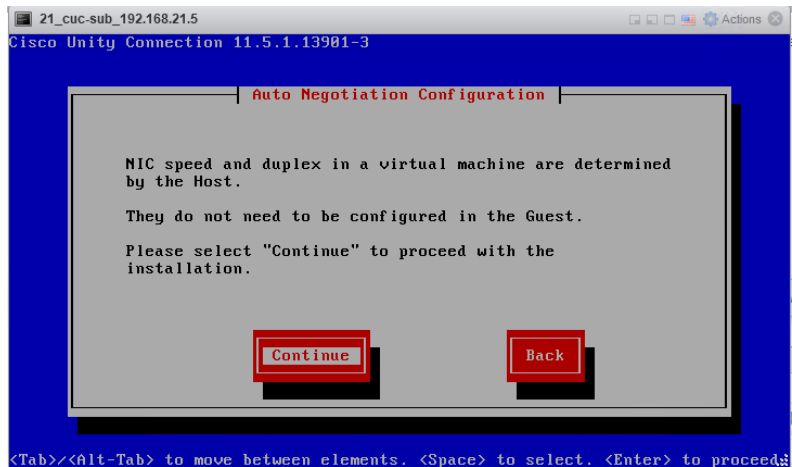
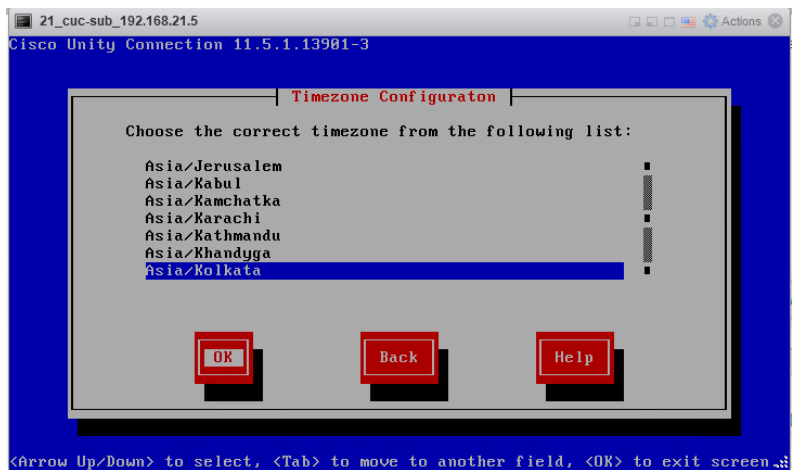
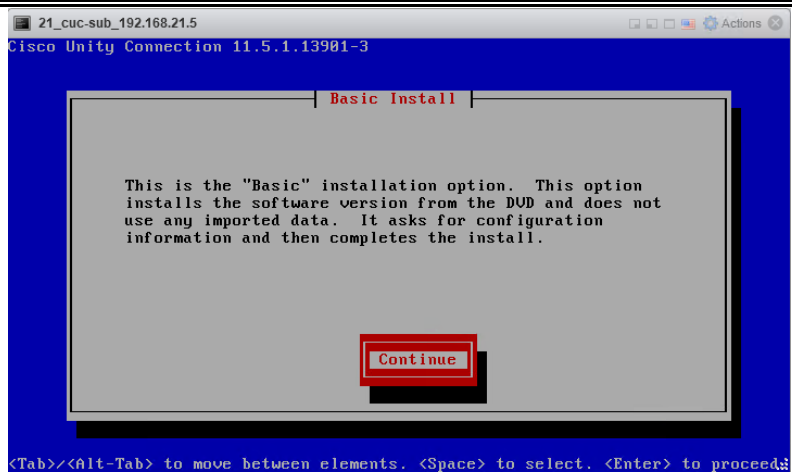
Find Servers where Host Name/IP Address begins with Find

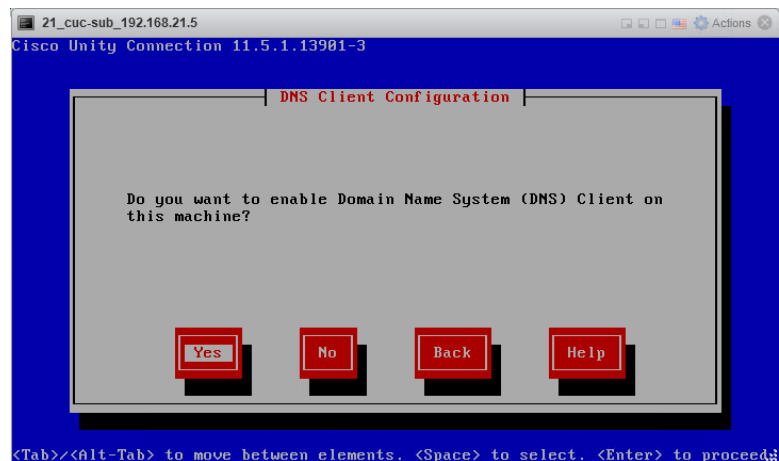
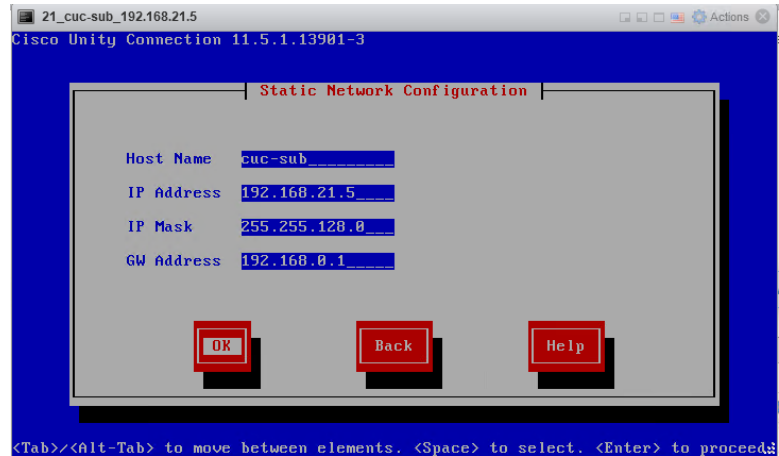
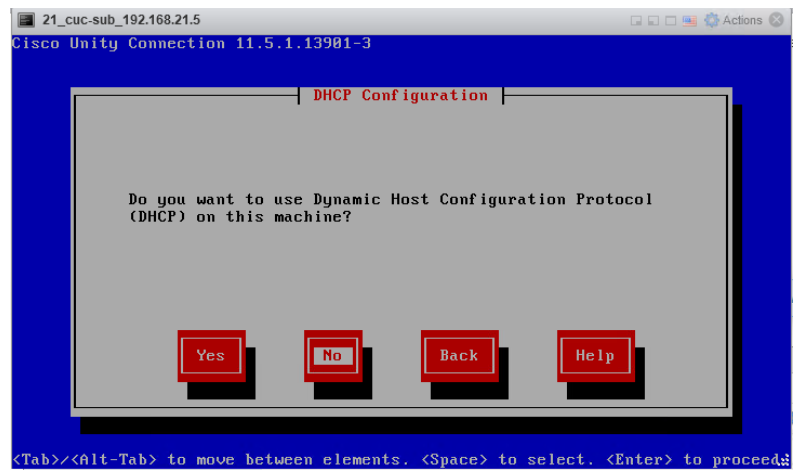
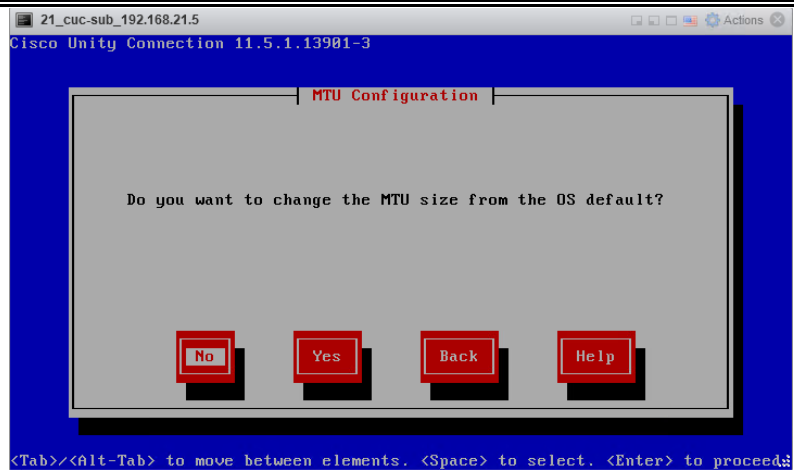
|                          | Host Name/IP Address ^ |
|--------------------------|------------------------|
| <input type="checkbox"/> | cuc-pub                |
| <input type="checkbox"/> | cuc-sub                |

Add New Select All Clear All Delete Selected









21\_cuc-sub\_192.168.21.5 Cisco Unity Connection 11.5.1.13901-3

**DNS Client Configuration**

Primary DNS 192.168.11.1

Secondary DNS (optional)

Domain ajcollab.com

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-sub\_192.168.21.5 Cisco Unity Connection 11.5.1.13901-3

**Administrator Login Configuration**

Enter the Platform administration username and password. Choose Help for username and password guidelines.

Administrator ID admin

Password \*\*\*\*\*

Confirm Password \*\*\*\*\*

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

21\_cuc-sub\_192.168.21.5 Cisco Unity Connection 11.5.1.13901-3

**Certificate Information**

Enter information about your organization. This is used to generate security certificates for this node.

Organization AJ Collab

Unit Collab

Location Bangalore

State Karnataka

Country India  
Indonesia  
Iran

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

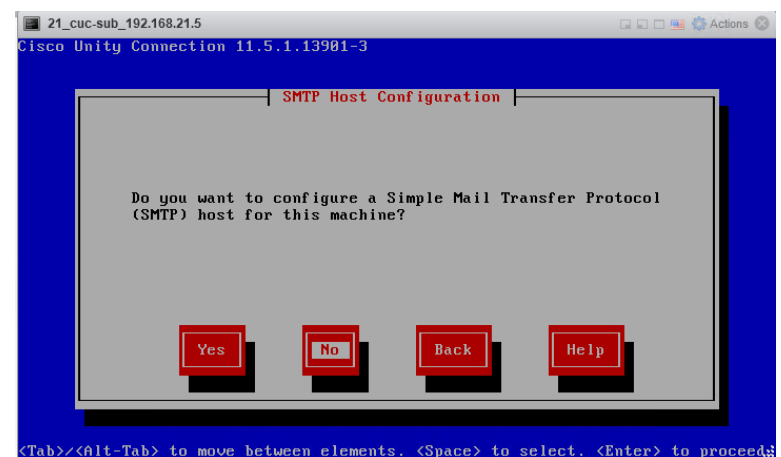
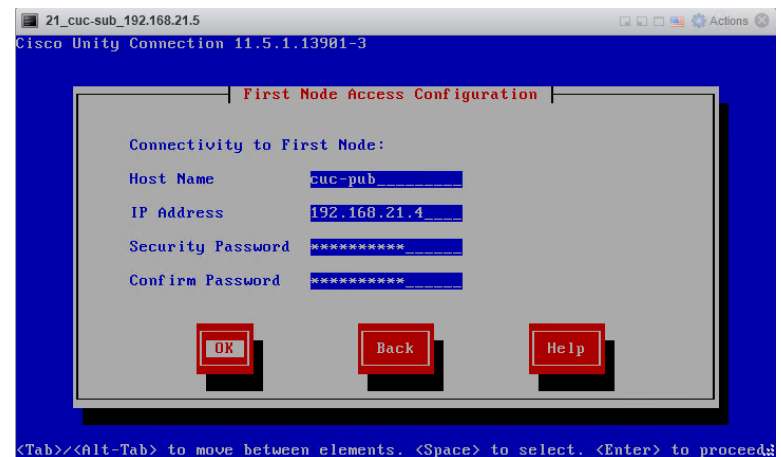
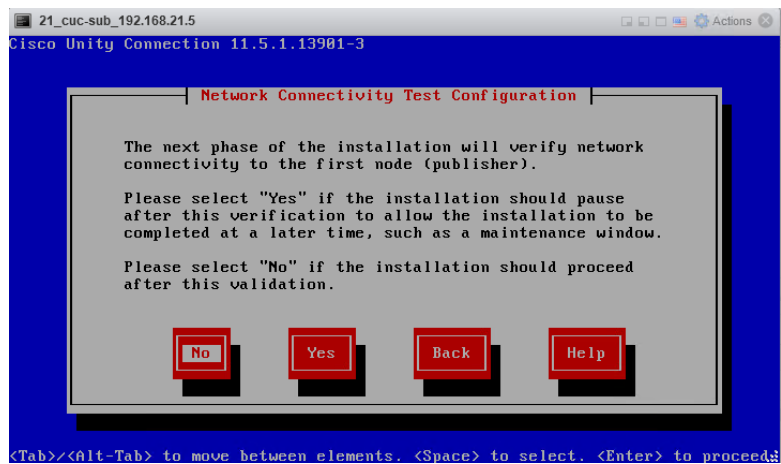
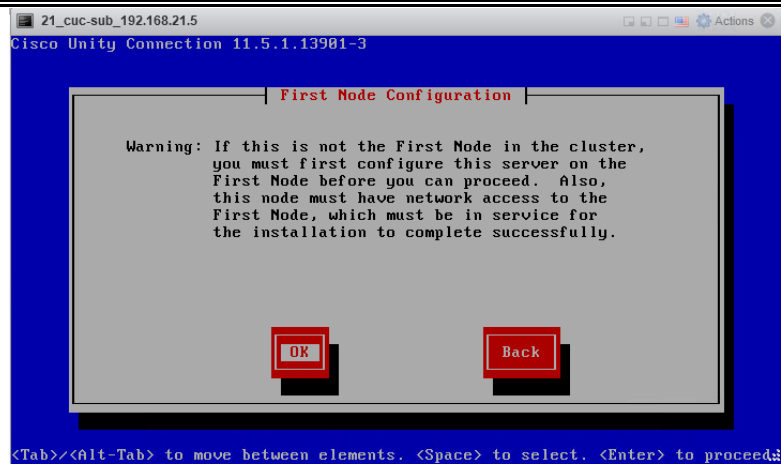
21\_cuc-sub\_192.168.21.5 Cisco Unity Connection 11.5.1.13901-3

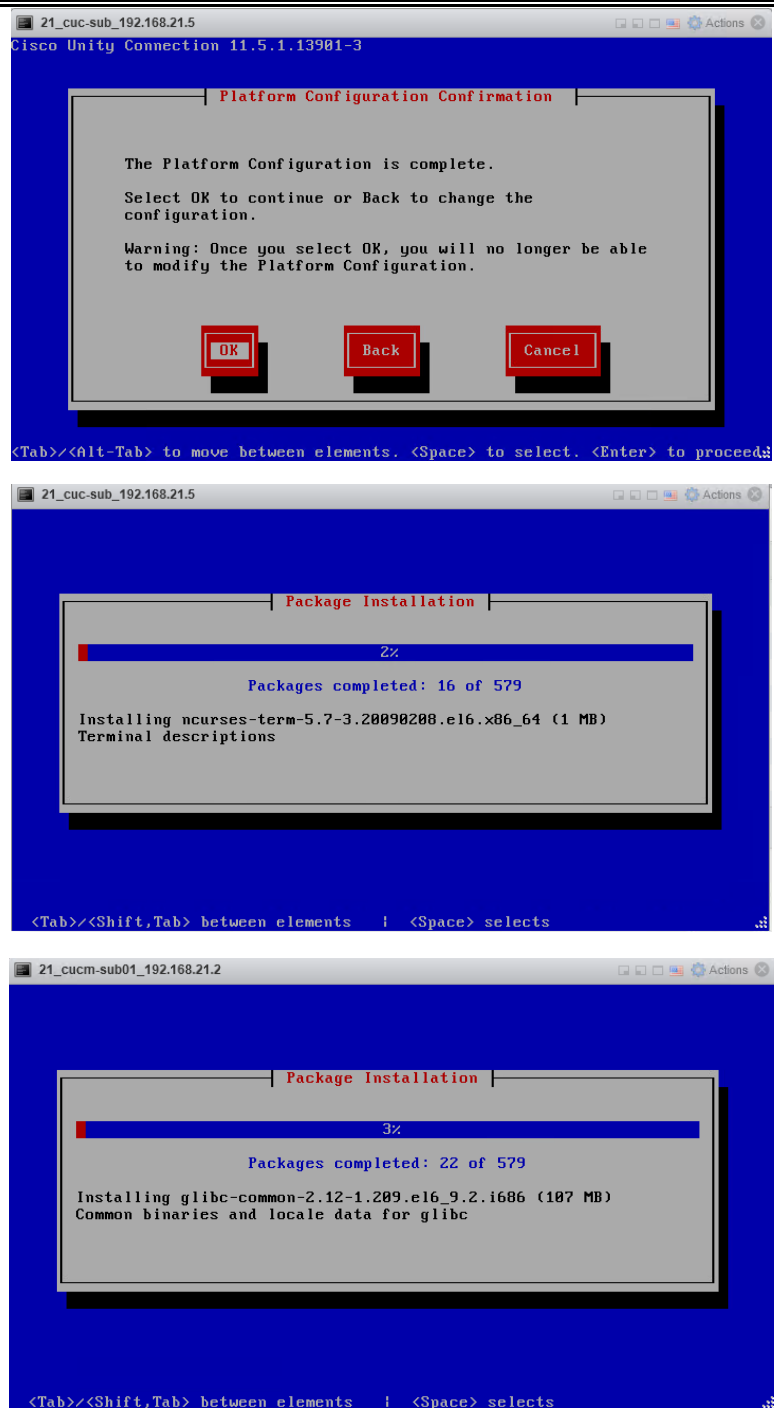
**First Node Configuration**

Is this server the First Node in the cluster?

Yes No Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

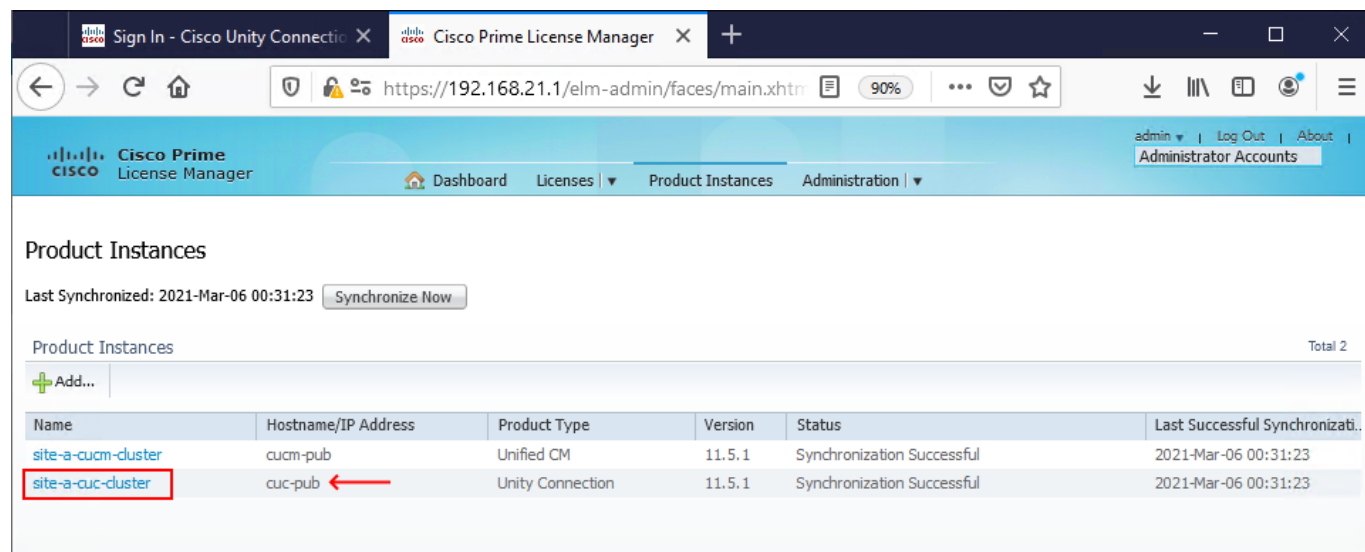






## [Lab] CUC Licensing

- Licensing of Cisco Unity Connection is exactly similar to CUCM
- You just need to add the product instance to Prime License Manager and Sync
- You must install user licenses that support voicemail



The screenshot shows the Cisco Prime License Manager web interface. The browser address bar indicates the URL is `https://192.168.21.1/elm-admin/faces/main.xhtml`. The interface has a top navigation bar with the Cisco Prime License Manager logo and a menu with options: Dashboard, Licenses, Product Instances (selected), and Administration. A user menu in the top right shows 'admin' with options for Log Out and About. Below the navigation bar, the 'Product Instances' section is active, displaying a table of instances. The table has columns for Name, Hostname/IP Address, Product Type, Version, Status, and Last Successful Synchronization. Two instances are listed: 'site-a-cucm-cluster' (Unified CM) and 'site-a-cuc-cluster' (Unity Connection). The 'site-a-cuc-cluster' row is highlighted with a red box, and a red arrow points to its 'cuc-pub' hostname. A 'Synchronize Now' button is located above the table. The total number of instances is 2.

Product Instances

Last Synchronized: 2021-Mar-06 00:31:23 [Synchronize Now](#)

Product Instances Total 2

[+ Add...](#)

| Name                                | Hostname/IP Address | Product Type     | Version | Status                     | Last Successful Synchronizati.. |
|-------------------------------------|---------------------|------------------|---------|----------------------------|---------------------------------|
| <a href="#">site-a-cucm-cluster</a> | cucm-pub            | Unified CM       | 11.5.1  | Synchronization Successful | 2021-Mar-06 00:31:23            |
| <a href="#">site-a-cuc-cluster</a>  | cuc-pub             | Unity Connection | 11.5.1  | Synchronization Successful | 2021-Mar-06 00:31:23            |

## [Lab] Basic Health check in CUC

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 1 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 160GB, Partitions aligned
 4096 Mbytes RAM

admin:show myself
Machine Name : cuc-pub
account name : admin
privilege level : 4
command count : disabled
logging setting : disabled
admin:
admin:
admin:show status

Host Name : cuc-pub
Date : Mon Mar 8, 2021 20:31:15
Time Zone : India Standard Time (Asia/Kolkata)
Locale : en_US.UTF-8
Product Ver : 11.5.1.13901-3
Unified OS Version : 6.0.0.0-2

Uptime:
 20:31:16 up 2:40, 1 user, load average: 0.37, 0.22, 0.14

CPU Idle: 65.00% System: 07.00% User: 28.00%
IOWAIT: 00.00% IRQ: 00.00% Soft: 00.00%

Memory Total: 3925628K
Free: 136848K
Used: 3788780K
Cached: 885952K
Shared: 559628K
Buffers: 50324K

Disk/active Total Free Used
Disk/active 29223916K 19377956K 9547732K (34%)
Disk/inactive 29223916K 27687740K 45028K (1%)
Disk/logging 102005088K 73843136K 22973704K (24%)

admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>

24_cuc-pub_192.168.21.4 x

admin:
admin:utils ntp status
ntpd (pid 30512) is running...

 remote refid st t when poll reach delay offset jitter
=====
*192.168.31.1 .LOCL. 1 u 251 256 377 0.709 0.095 0.321

synchronised to NTP server (192.168.31.1) at stratum 2
time correct to within 20 ms
polling server every 256 s

Current time in UTC is : Mon Mar 8 15:02:19 UTC 2021
Current time in Asia/Kolkata is : Mon Mar 8 20:32:19 IST 2021
admin:
admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>

24_cuc-pub_192.168.21.4 x

admin:
admin:show network eth0
Ethernet 0
DHCP : disabled Status : up
IP Address : 192.168.21.4 IP Mask : 255.255.128.000
Link Detected: yes Mode : Auto disabled, Full, 10000 Mbits/s
Duplicate IP : no

DNS
Primary : 192.168.11.1 Secondary : Not Configured
Options : timeout:5 attempts:2
Domain : ajcollab.com
Gateway : 192.168.0.1 on Ethernet 0

admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>

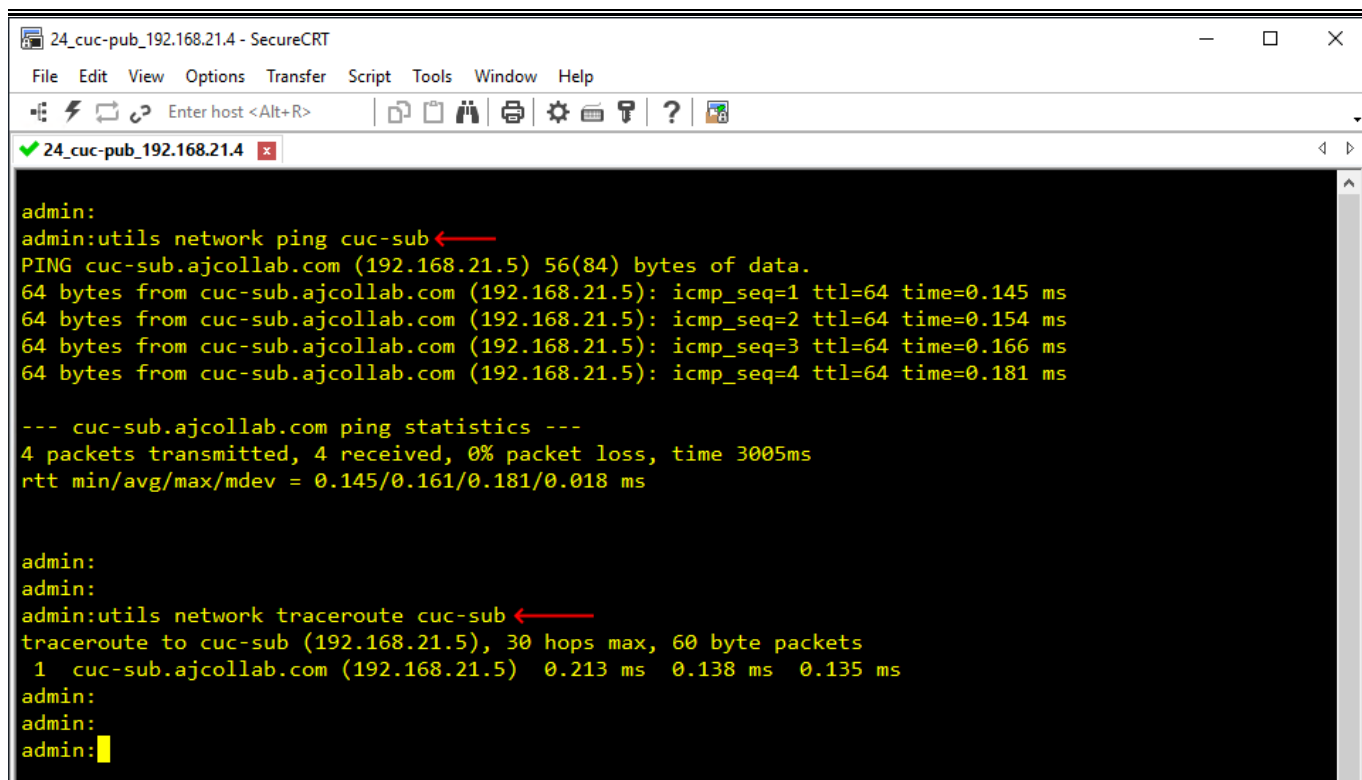
24_cuc-pub_192.168.21.4 x

admin:
admin:show network cluster
192.168.21.5 cuc-sub.ajcollab.com cuc-sub Subscriber connection DBSub authenticated using TCP since Mon Mar 8 17:52:17 2021
192.168.21.4 cuc-pub.ajcollab.com cuc-pub Publisher callmanager DBPub authenticated

Server Table (processnode) Entries

cuc-pub
cuc-sub
admin:
admin:run sql select * from processnode
pkid name mac systemnode description isactive nodeid tknodeusage ipv6name fklbmhubgroup tkprocessnoderole tkssomode

00000000-1111-0000-0000-000000000000 EnterpriseWideData t 1 1 NULL 1 0
a10cab01-4701-4bc6-905b-0a2b02faef3a cuc-pub f 2 0 NULL 1 0
f00fa7a4-a2f8-2b32-53a4-34b18e558992 cuc-sub f 3 1 NULL 1 0
admin:
admin:
admin:
```



The image shows a SecureCRT terminal window titled "24\_cuc-pub\_192.168.21.4 - SecureCRT". The window has a menu bar (File, Edit, View, Options, Transfer, Script, Tools, Window, Help) and a toolbar with icons for host, search, copy, paste, settings, and help. The terminal session is with a user named "admin" on a host named "24\_cuc-pub\_192.168.21.4".

```
admin:
admin:utils network ping cuc-sub
PING cuc-sub.ajcollab.com (192.168.21.5) 56(84) bytes of data.
64 bytes from cuc-sub.ajcollab.com (192.168.21.5): icmp_seq=1 ttl=64 time=0.145 ms
64 bytes from cuc-sub.ajcollab.com (192.168.21.5): icmp_seq=2 ttl=64 time=0.154 ms
64 bytes from cuc-sub.ajcollab.com (192.168.21.5): icmp_seq=3 ttl=64 time=0.166 ms
64 bytes from cuc-sub.ajcollab.com (192.168.21.5): icmp_seq=4 ttl=64 time=0.181 ms

--- cuc-sub.ajcollab.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 0.145/0.161/0.181/0.018 ms

admin:
admin:
admin:utils network traceroute cuc-sub
traceroute to cuc-sub (192.168.21.5), 30 hops max, 60 byte packets
 1 cuc-sub.ajcollab.com (192.168.21.5) 0.213 ms 0.138 ms 0.135 ms
admin:
admin:
admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4 x
admin:
admin:show web-security
[
 Version: V3
 Serial Number: 5BDBC7E3D110AD3FF02D7B168DCBA011
 SignatureAlgorithm: SHA256withRSA (1.2.840.113549.1.1.11)
 Issuer Name: L=Bangalore, ST=Karnataka, CN=cuc-pub.ajcollab.com, OU=Collab, O=AJ Collab, C=IN
 Validity From: Sun Mar 07 01:17:14 IST 2021
 To: Fri Mar 06 01:17:13 IST 2026
 Subject Name: L=Bangalore, ST=Karnataka, CN=cuc-pub.ajcollab.com, OU=Collab, O=AJ Collab, C=IN
 Key: RSA (1.2.840.113549.1.1.1)
 Key value: 3082010a0282010100ef5fdb65eed6e53488b9128371163ca5359d65c5a37102ebddb0e643ab178893b232
064b9e0afd051c8949b37dba94201a05f9d6a5b3496b9ea63f0a02c74928d18efaabd856d32b025f1f5306ed3fba90478846d4f
d130fa8dfb3c462be396f084ad78679ab95a48e479fe6286ba8dc3423215fc34fbd62fd49d30a21facc5bed73d74dbdd4e3b4
2e46786725b41934d803c6912799f091266d3de4e131757af6f46c7112f7a4ac54d5061297ad257faea93cf2ad3d78f6ad46170
1e134e55aa89252d6a1642e48a18a9ebc101b4eead6a97f19194d6d45a4da1ea540c90c4c4f16b5037d7a5d1986e2a82dd3901
728dc9a8d8d52104b8865cf246b39f0203010001
 Extensions: 4 present
 [
 Extension: KeyUsage (OID.2.5.29.15)
 Critical: false
 Usages: digitalSignature, keyEncipherment, dataEncipherment, keyCertSign,
]
 [
 Extension: ExtKeyUsageSyntax (OID.2.5.29.37)
 Critical: false
 Usage oids: 1.3.6.1.5.5.7.3.1, 1.3.6.1.5.5.7.3.2,
]
 [
 Extension: SubjectKeyIdentifier (OID.2.5.29.14)
 Critical: false
 keyID: 7f35e641e8e2e2c6ba1c6efab3338eae00251710
]
 [
 Extension: BasicConstraints (OID.2.5.29.19)
 Critical: true
 cA: true
 pathLenConstraint: 0
]
 Signature:
 0000: c4 14 40 0b cf 60 15 ef 85 43 cf cf a2 f9 3c da [..@..`...C....<.]
 0010: 3e bf ae 74 9a 8e d3 9d 80 ff 6a e9 6c 2f 50 56 [>...t.....j.l/PV]
 0020: 5e c0 b2 8d b2 b7 c5 8e 0b 85 b0 52 2f a2 74 e9 [^.....R/.t.]
 0030: 34 ab 39 42 3c 72 09 21 12 67 77 92 0b 40 f1 d7 [4.9B<r.!.gw..@..]
 0040: 26 ec c1 4c 7f 26 ed b8 33 d9 88 93 49 9e 2e b4 [&...L.&...3...I...]
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4 x
admin:
admin:utils network connectivity cuc-sub
This command can take up to 3 minutes to complete.
Continue (y/n)?y
Running test, please wait ...
.
Network connectivity test with cuc-sub completed successfully.
admin:
admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4 x
admin:
admin:show process load
top - 20:37:19 up 2:46, 1 user, load average: 0.08, 0.25, 0.19
Tasks: 252 total, 1 running, 251 sleeping, 0 stopped, 0 zombie
Cpu(s): 12.4%us, 6.9%sy, 0.3%ni, 77.5%id, 3.0%wa, 0.0%hi, 0.0%si, 0.0%st
Mem: 3925628k total, 3767788k used, 157840k free, 49348k buffers
Swap: 4095996k total, 802548k used, 3293448k free, 873212k cached
 PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
 2193 ccmservi 20 0 761m 90m 6264 S 5.9 2.4 0:28.20 amc
 2208 ccmservi 20 0 748m 50m 6496 S 2.0 1.3 0:08.78 tracecollection
21674 root -61 0 315m 11m 2328 S 2.0 0.3 1:00.21 CuMixer
23014 cumta 20 0 654m 74m 7436 S 2.0 1.9 0:12.33 CuMta
28861 database 20 0 576m 11m 7320 S 2.0 0.3 0:25.95 dbmon
 1 root 20 0 19596 1472 1020 S 0.0 0.0 0:01.28 init
 2 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kthreadd
 3 root RT 0 0 0 0 S 0.0 0.0 0:00.00 migration/0
 4 root 20 0 0 0 0 S 0.0 0.0 0:00.85 ksoftirqd/0
 5 root RT 0 0 0 0 S 0.0 0.0 0:00.00 stopper/0
admin:
admin:
admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4 x

admin:
admin:utils service list ←

Requesting service status, please wait...
System SSH [STARTED]
Cluster Manager [STARTED]
Name Service Cache [STOPPED] Service Not Activated
Entropy Monitoring Daemon [STARTED]
Cisco SCSI Watchdog [STARTED]
Service Manager [STARTED]
Service Manager is running
Getting list of all services
>> Return code = 0
A Cisco DB[STARTED]
A Cisco DB Replicator[STARTED]
Cisco AMC Service[STARTED]
Cisco Audit Event Service[STARTED]
Cisco CDP[STARTED]
Cisco CDP Agent[STARTED]
Cisco CallManager Admin[STARTED]
Cisco CallManager Serviceability[STARTED]
Cisco CallManager Serviceability RTMT[STARTED]
Cisco Certificate Change Notification[STARTED]
Cisco Certificate Expiry Monitor[STARTED]
Cisco DRF Local[STARTED]
Cisco DRF Master[STARTED]
Cisco Database Layer Monitor[STARTED]
Cisco ELM Client Service[STARTED]
Cisco Log Partition Monitoring Tool[STARTED]
Cisco Prime LM Admin[STARTED]
Cisco Prime LM DB[STARTED]
Cisco Prime LM Server[STARTED]
Cisco RIS Data Collector[STARTED]
Cisco RTMT Reporter Servlet[STARTED]
Cisco Syslog Agent[STARTED]
Cisco Tomcat[STARTED]
Cisco Tomcat Stats Servlet[STARTED]
Cisco Trace Collection Service[STARTED]
Cisco Trace Collection Servlet[STARTED]
Connection Access Layer[STARTED]
Connection Administration[STARTED]
Connection Branch Sync Service[STARTED]
Connection CM Database Event Listener[STARTED]
Connection Conversation Manager[STARTED]
Connection DB[STARTED]
Connection DB Event Publisher[STARTED]

Ready ssh2: AES-256-CTR 47, 7 47 Rows, 103 Cols Xterm CAP NUM
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4 x

admin:
admin:show process using-most cpu ←
PCPU PID CPU NICE STATE CPUTIME ARGS
%CPU PID CPU NI S TIME COMMAND
 8.2 29982 - 0 S 00:13:28 /home/tomcat/tomcat -user tomcat -home /usr/local/thirdparty/java/j2sdk -
pidfile /usr/local/thirdparty/jakarta-tomcat/conf/tomcat.pid -procname /home/tomcat/tomcat -outfile /us
r/local/thirdparty/jakarta-tomcat/logs/catalina.out -errfile &1 -Djava.library.path=/opt/cisco/connecti
on/lib:/usr/local/cm/db/informix/lib:/usr/local/cm/db/informix/lib/esql:/usr/local/cm/db/informix/lib/c
li:/opt/cisco/connection/lib:/usr/local/lib:/usr/local/thirdparty/java/j2sdk/jre/lib/i386:/usr/local/th
irdparty/java/j2sdk/jre/lib/i386/server:/usr/lib/pgsql:/usr/lib:/usr/local/cm/lib:/opt/cisco/connection
/lib:/usr/local/Nuance/Recognizer_Service/amd64/lib:/usr/local/Nuance/OAM/x86/lib:/usr/local/Nuance/Com
mon/x86/lib:/usr/local/Nuance/Common/amd64/lib:/usr/local/platform/lib:/usr/local/Nuance/Recognizer/lib
-Djavax.net.ssl.trustStore=/usr/local/platform/.security/tomcat/trust-certs/tomcat-trust.keystore -Dja
vax.net.ssl.trustStorePassword=-XX:+UseParallelGC -XX:GCTimeRatio=10 -XX:ErrorFile=/usr/local/thirdpar
ty/jakarta-tomcat/logs/diagnostic-info.jvm-crash.%p.tomcat.txt -Dsun.zip.disableMemoryMapping=true -XX:
OnOutOfMemoryError=/home/tomcat/tomcat_diagnostics.sh -XX:OnError=/home/tomcat/tomcat_diagnostics.sh -D
net.sf.ehcache.skipUpdateCheck=true -XX:-UseSplitVerifier -Djava.util.logging.manager=org.apache.juli.C
lassLoaderLogManager -Djava.util.logging.config.file=/usr/local/thirdparty/jakarta-tomcat/conf/logging.
properties -server -Xmx1216m -Xms256m -XX:MaxPermSize=448m -Djava.endorsed.dirs=/usr/local/thirdparty/j
akarta-tomcat/endorsed -cp :/common/download:/usr/local/platform/application_locale/platform-api:/usr/l
ocal/platform/application_locale/cmplatform:/usr/local/platform/application_locale:/opt/cisco/connectio
n/lib/jmf.jar:/opt/cisco/connection/share:/usr/local/cm/application_locale/cmsservices:/usr/local/cm/app
lication_locale/car:/usr/local/cm/application_locale/ccmadmin:/usr/local/cm/application_locale/ucmuser:/
usr/local/cm/application_locale:/etc/opt/cisco/elm/server/resource:/usr/local/thirdparty/jakarta-tomca
t/bin/bootstrap.jar:/usr/local/thirdparty/jakarta-tomcat/bin/tomcat-juli.jar -Djava.security.policy==/
usr/local/thirdparty/jakarta-tomcat/conf/catalina.policy -Dcatalina.base=/usr/local/thirdparty/jakarta-
tomcat -Dcatalina.home=/usr/local/thirdparty/jakarta-tomcat -Djava.io.tmpdir=/usr/local/thirdparty/jaka
rta-tomcat/temp org.apache.catalina.startup.Bootstrap start
 1.1 2172 - 0 S 00:01:48 /usr/local/cm/bin/RisDC
 0.7 9910 -10 S 00:01:13 /usr/local/cm/bin/cmoninit -w
 0.6 21674 - - S 00:01:00 /opt/cisco/connection/bin/CuMixer
 0.5 32231 - 10 S 00:00:02 java -DConsoleRows=48 -DConsoleColumns=181 -DCommonFileSystem="disk_full=
false,inode_full=false,no_write=false,internal_error=false" -DJvmStartTime=1615215630 -XX:-UseSplitVeri
fier sdMain name=admin priv=4 master

admin:
admin:
```



```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4 x

admin:show process using-most memory ←
MEM(K) PID ARGS
93076 2193 /usr/local/cm/bin/afc /usr/local/cm/conf/afc/afcCfg.xml
131544 24690 /home/jetty/jetty /home/jetty/jetty1launcherConfig.xml -Xmx1024m -Xms256m -XX:MaxPermSize=256m
153492 24507 nuance-server -servlet nrs -port 8200 -nthreads 24
365136 12008 /opt/cisco/connection/bin/unityoninit -w
1316220 29982 /home/tomcat/tomcat -user tomcat -home /usr/local/thirdparty/java/j2sdk -pidfile /usr/local/thirdparty/jakarta-tomcat/conf/tomcat.pid -procname /home/tomcat/tomcat -outfile /usr/local/thirdparty/jakarta-tomcat/logs/catalina.out -errfile &1 -Djava.library.path=/opt/cisco/connection/lib:/usr/local/cm/db/informix/lib:/usr/local/cm/db/informix/lib/esql:/usr/local/cm/db/informix/lib/cli:/opt/cisco/connection/lib:/usr/local/lib:/usr/local/thirdparty/java/j2sdk/jre/lib/i386:/usr/local/thirdparty/java/j2sdk/jre/lib/i386/server:/usr/lib/pgsql:/usr/lib:/usr/local/cm/lib:/opt/cisco/connection/lib:/usr/local/Nuance/Recognizer_Service/amd64/lib:/usr/local/Nuance/OAM/x86/lib:/usr/local/Nuance/Common/x86/lib:/usr/local/Nuance/Common/amd64/lib:/usr/local/platform/lib:/usr/local/Nuance/Recognizer/lib -Djavax.net.ssl.trustStore=/usr/local/platform/.security/tomcat/trust-certs/tomcat-trust.keystore -Djavax.net.ssl.trustStorePassword= -XX:+UseParallelGC -XX:GCTimeRatio=10 -XX:ErrorFile=/usr/local/thirdparty/jakarta-tomcat/logs/diagnostic-info.jvm-crash.%p.tomcat.txt -Dsun.zip.disableMemoryMapping=true -XX:OnOutOfMemoryError=/home/tomcat/tomcat_diagnostics.sh -XX:OnError=/home/tomcat/tomcat_diagnostics.sh -Dnet.sf.ehcache.skipUpdateCheck=true -XX:-UseSplitVerifier -Djava.util.logging.manager=org.apache.juli.ClassLoaderLogManager -Djava.util.logging.config.file=/usr/local/thirdparty/jakarta-tomcat/conf/logging.properties -server -Xmx1216m -Xms256m -XX:MaxPermSize=448m -Djava.endorsed.dirs=/usr/local/thirdparty/jakarta-tomcat/endorsed -cp ./common/download:/usr/local/platform/application_locale/platform-api:/usr/local/platform/application_locale/cmplatform:/usr/local/platform/application_locale:/opt/cisco/connection/lib/jmf.jar:/opt/cisco/connection/share:/usr/local/cm/application_locale/cmservices:/usr/local/cm/application_locale/car:/usr/local/cm/application_locale/ccadmin:/usr/local/cm/application_locale/ucmuser:/usr/local/cm/application_locale:/etc/opt/cisco/elm/server/resource:/usr/local/thirdparty/jakarta-tomcat/bin/bootstrap.jar:/usr/local/thirdparty/jakarta-tomcat/bin/tomcat-juli.jar -Djava.security.policy=/usr/local/thirdparty/jakarta-tomcat/conf/catalina.policy -Dcatalina.base=/usr/local/thirdparty/jakarta-tomcat -Dcatalina.home=/usr/local/thirdparty/jakarta-tomcat -Djava.io.tmpdir=/usr/local/thirdparty/jakarta-tomcat/temp org.apache.catalina.startup.Bootstrap start

admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4
admin:
admin:utils dbreplication runtimestate
Server Time: Mon Mar 8 20:44:40 IST 2021
Cluster Replication State: BROADCAST SYNC ended at: 2021-03-07-03-08
 Sync Result: SYNC COMPLETED on 706 tables out of 706
 Sync Status: All Tables are in sync
 Use CLI to see detail: 'file view activelog cm/trace/dbl/20210307_030653_dbl_repl_output_Broadcast.log'
DB Version: ccm11_5_1_13901_3
Repltimeout set to: 300s
PROCESS option set to: 1
Cluster Detailed View from cuc-pub (2 Servers):
SERVER-NAME IP ADDRESS PING DB/RPC/ REPL. Replication REPLICATION SETUP
----- ----- (msec) DbMon? QUEUE Group ID (RTMT) & Details
cuc-pub 192.168.21.4 0.014 Y/Y/Y 0 (g_2) (2) Setup Completed
cuc-sub 192.168.21.5 0.076 Y/Y/Y 0 (g_3) (2) Setup Completed
admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4
admin:
admin:utils diagnose test
Log file: platform/log/diag1.log

Starting diagnostic test(s)
=====
test - disk_space : Passed (available: 18924 MB, used: 9324 MB)
skip - disk_files : This module must be run directly and off hours
test - service_manager : Passed
test - tomcat : Passed
test - tomcat_deadlocks : Passed
test - tomcat_keystore : Passed
test - tomcat_connectors : Passed
test - tomcat_threads : Passed
test - tomcat_memory : Passed
test - tomcat_sessions : Passed
skip - tomcat_heapdump : This module must be run directly and off hours
test - validate_network : Passed
test - raid : Passed
test - system_info : Passed (Collected system information in diagnostic log)
test - ntp_reachability : Passed
test - ntp_clock_drift : Passed
test - ntp_stratum : Passed
skip - sdl_fragmentation : This module must be run directly and off hours
skip - sdi_fragmentation : This module must be run directly and off hours

Diagnostics Completed

The final output will be in Log file: platform/log/diag1.log

Please use 'file view activelog platform/log/diag1.log' command to see the output

admin:
admin:
```

```
24_cuc-pub_192.168.21.4 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
24_cuc-pub_192.168.21.4 x

admin:
admin:show cuc cluster status

Server Name Member ID Server State Internal State Reason

cuc-pub 0 Primary Pri Active Normal
cuc-sub 1 Secondary Sec Active Normal

SERVER ID STATE STATUS QUEUE CONNECTION CHANGED

g_ciscounity_pub 100 Active Local 0
g_ciscounity_sub1 101 Active Connected 0 Mar 8 17:54:55

SERVERS
Server Peer ID State Status Queue Connection Changed

g_ciscounity_pub g_ciscounity_pub 100 Active Local 0
g_ciscounity_sub1 g_ciscounity_sub1 101 Active Connected 0 Mar 8 17:54:55
g_ciscounity_sub1 g_ciscounity_pub 100 Active Connected 0 Mar 8 17:54:55
g_ciscounity_sub1 g_ciscounity_sub1 101 Active Local 0

STATE
Source ER Capture Network Apply
State State State State State

g_ciscounity_pub Active Running Running Running
g_ciscounity_sub1 Active Running Running Running

admin:
```

Cisco Unity Connection Service X

← → ↻ 🏠 🔒 https://192.168.21.4/cuservice/srmcontrolcenter.do?op=read 🔍 📄 ⋮ 📌 ⚙

Cisco Unity Connection Serviceability

Navigation Cisco Unity Connection Serviceability Go

admin | About | Sign Out

Alarm Trace Tools Help

Cluster Management

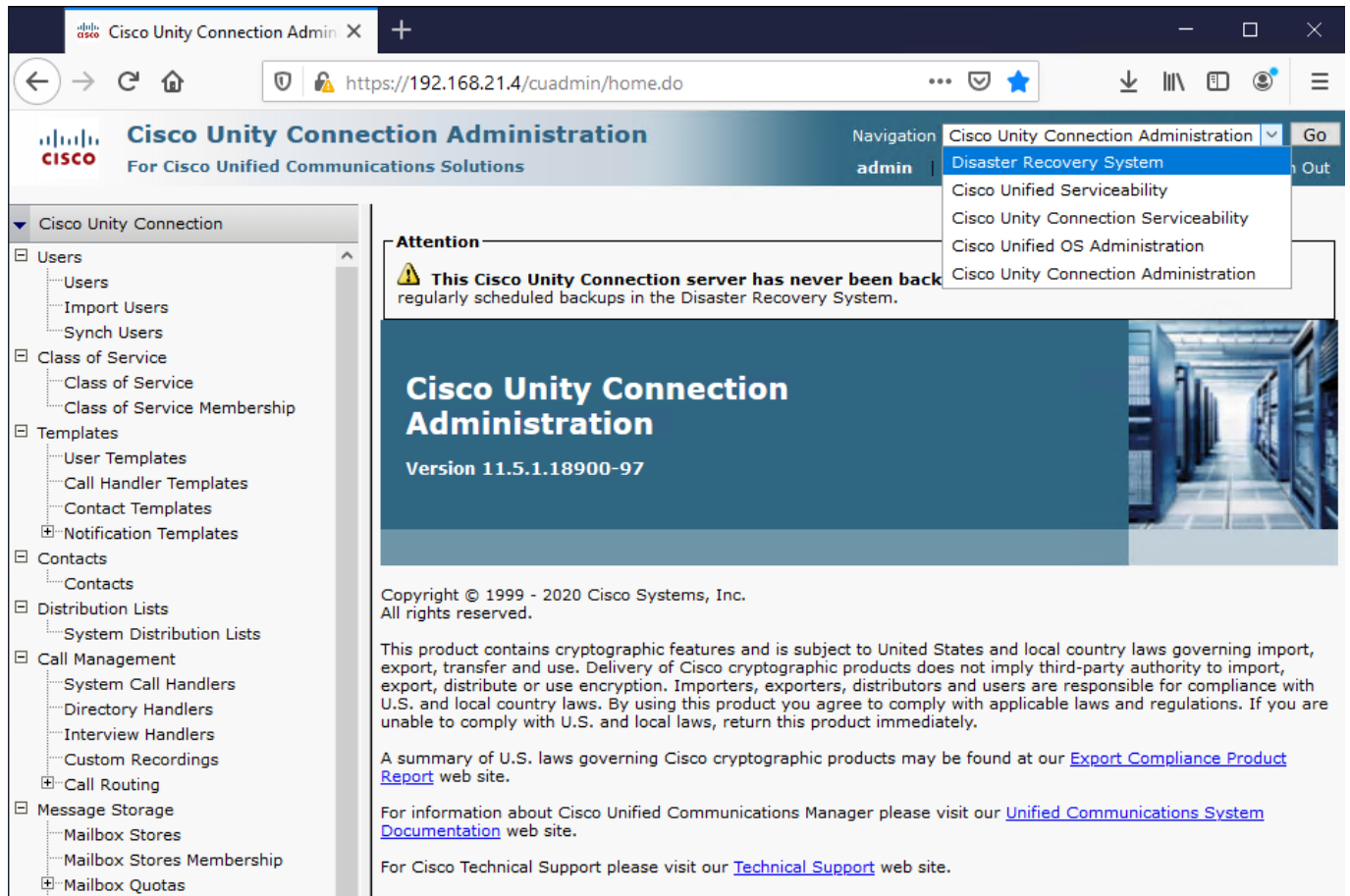
Server Manager

| Server Name         | Server Status | Change Server Status |            | Pending Change | Last Change Request             |
|---------------------|---------------|----------------------|------------|----------------|---------------------------------|
| cuc-pub (Publisher) | Primary       | Make Primary         | Deactivate |                |                                 |
| cuc-sub             | Secondary     | Make Primary         | Deactivate |                | <a href="#">Srm.MakePrimary</a> |

Port Manager

| Server Name         | Total Ports | Ports In Service | Change Port Status |
|---------------------|-------------|------------------|--------------------|
| cuc-pub (Publisher) | 10          | 10               | Stop Taking Calls  |
| cuc-sub             | 10          | 10               | Stop Taking Calls  |

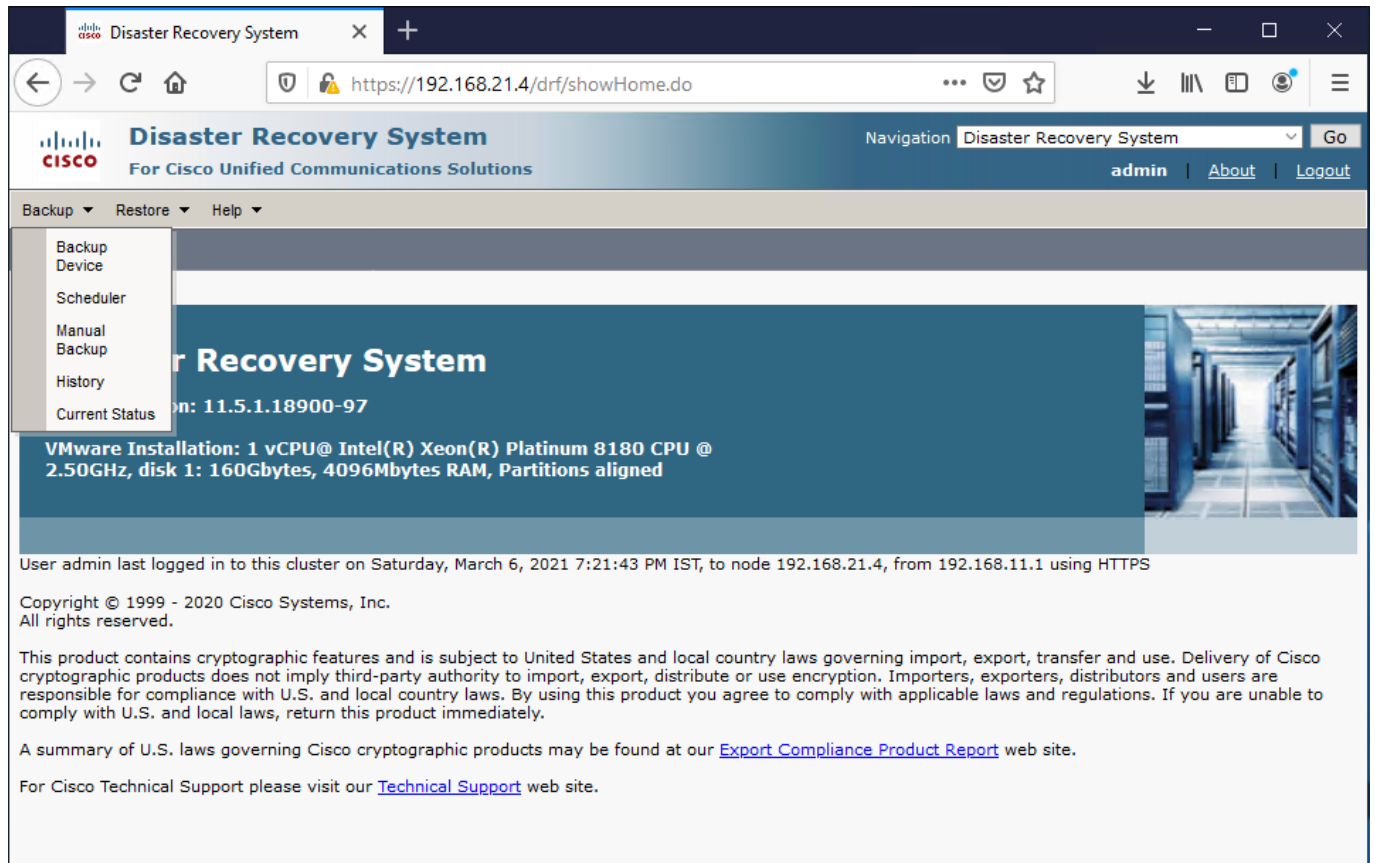
## Web GUI and Five Consoles in CUC



- There are 5 different web consoles available in CUC to administrate
- We usually browse the IP Address or FQDN of CUC PUB to get access to the web interface
- Cisco Tomcat Service is responsible for delivering the web interface over HTTPS
- Both the CUC nodes will have the web interface but all of them connects to the DB of CUC PUB if PUB is running
- The only time the CUC SUB talks to its own DB via HTTPS web GUI, when the CUC PUB is down
- During such scenario, we will not be able to change any configuration on the cluster, we just can see the things (read only mode) since CUC PUB is the read write copy of DB
- Unlike CUCM, here CUC works as Active-Active pair (Primary and Secondary). CUC-PUB is also participating in the voicemail / IVR functionality

---

## Disaster Recovery System



- Used to configure backup-device and perform manual and scheduled auto backup of the CUC cluster
- Also used to restore the DB in case of major database corruption or failures
- Cluster backup is stored to SFTP server as flat files
- It is not recommended to use the vmware native backup option like vmware Snapshot for CUC VM as gives bad performance and IO delay
- vmware image backup solutions like Veem is also not recommended to take CUC backup
- Also, it is not recommended to enable vmware vmotion and HA for CUC nodes
- The only recommended backup is via SFTP server
- We use **Platform User Credentials** (OS Admin credentials) to login to Cisco Unified Disaster Recovery System interface

## Cisco Unified Serviceability

The screenshot shows the Cisco Unified Serviceability web interface. The browser address bar displays the URL `https://192.168.21.4/ccmservice/MainServlet.class`. The page header includes the Cisco logo, the title "Cisco Unified Serviceability For Cisco Unified Communications Solutions", and navigation links for "admin", "About", and "Logout". A "Service Activation" dropdown menu is open, showing options like "Control Center - Feature Services", "Control Center - Network Services", "Serviceability Reports Archive", "Audit Log Configuration", and "Locations". The main content area displays several service categories: CM Services, CTI Services, Database and Admin Services, Performance and Monitoring Services, Directory Services, and Location based Tracking Services. Each category has a table with "Service Name" and "Activation Status". For example, under "Performance and Monitoring Services", "Cisco Serviceability Reporter" is "Deactivated". At the bottom, there are buttons for "Save", "Set to Default", and "Refresh".

- There are only 2 feature services in CUC and that can be activated, started, stopped, and restarted from here. Most of the services are moved to different console called 'Cisco Unity Connection Serviceability'
- We use **Application User Credentials** to login to Cisco Unified Service Ability interface

---

## Cisco Unity Connection Serviceability

The screenshot shows the Cisco Unity Connection Serviceability web interface. The browser address bar displays the URL `https://192.168.21.4/cusevice/controlcenter.do?op=read`. The page header includes the Cisco logo and the title "Cisco Unity Connection Serviceability For Cisco Unified Communications Solutions". The navigation bar contains links for "Alarm", "Trace", "Tools", and "Help". The "Tools" menu is expanded, showing options like "Cluster Management", "Service Management", "Reports", and "Voice Network Map". Below the menu is a "Select Server" dropdown with "cuc-pub" selected and a "Go" button. The main content area displays four tables: "Status Only Services", "Critical Services", "Base Services", and "Optional Services". Each table lists service names, running times, activate statuses, and service statuses, with buttons to stop or deactivate services.

| Service Name                       | Running Time | Activate Status | Service Status |
|------------------------------------|--------------|-----------------|----------------|
| Connection DB                      | 389:36:28    | Activated       | Started        |
| Connection License Manager: Server | 389:35:56    | Activated       | Started        |
| Connection Server Role Manager     | 389:35:58    | Activated       | Started        |
| Connection Serviceability          | 389:23:02    | Activated       | Started        |

| Service Name                      | Running Time | Activate Status | Service Status | Change Service Status |
|-----------------------------------|--------------|-----------------|----------------|-----------------------|
| Connection Conversation Manager   | 389:28:52    | Activated       | Started        | Stop                  |
| Connection Mailbox Sync           | 308:32:29    | Activated       | Started        | Stop                  |
| Connection Message Transfer Agent | 308:32:29    | Activated       | Started        | Stop                  |
| Connection Mixer                  | 389:28:52    | Activated       | Started        | Stop                  |
| Connection Notifier               | 308:32:29    | Activated       | Started        | Stop                  |

| Service Name                  | Running Time | Activate Status | Service Status | Change Service Status |
|-------------------------------|--------------|-----------------|----------------|-----------------------|
| Connection Administration     | 389:23:04    | Activated       | Started        | Stop                  |
| Connection DB Event Publisher | 389:35:59    | Activated       | Started        | Stop                  |
| Connection SNMP Agent         | 389:35:57    | Activated       | Started        | Stop                  |

| Service Name            | Running Time | Activate Status | Change Activate Status | Service Status | Change Service Status |
|-------------------------|--------------|-----------------|------------------------|----------------|-----------------------|
| Connection Access Layer | 389:22:50    | Activated       | Deactivate             | Started        | Stop                  |

- Most of the services are moved to this console
- **Connection Conversation Manager:** Enables Unity Connection to handle calls. Disabling this service degrades the ability of Unity Connection to function. It runs in both primary and secondary CUC servers
- **Connection Mailbox Sync:** Synchronizes messages between Unity Connection and Exchange server. It runs only on CUC Primary
- **Connection Message Transfer Agent:** Enables the delivery of messages to the message store. It runs only on CUC Primary
- **Connection Mixer:** Enables the audio (media stream) for calls, recorded messages, and Text-to-Speech (TTS). It runs in both primary and secondary CUC servers
- **Connection Notifier:** This service enables notification of messages, such as turning message waiting indicators (MWIs) on and off. It runs only on CUC Primary
- Connection Mailbox Sync, Connection Message Transfer Agent and Connection Notifier runs on the CUC primary server, when it goes to secondary, these services switches between nodes
- We don't usually activate any services in CUC manually other than DirSync service for LDAP. Rest all services are by default activated
- We use **Application User Credentials** to login to Cisco Unified Service Ability interface



Cisco Unity Connection Serviceability

Navigation Cisco Unity Connection Serviceability Go

admin | About | Sign Out

Alarm Trace Tools Help

Control Center - Feature Services

Refresh

Select Server

Server\* blr-cuc-pub Go

Status Only Services

| Service Name                      | Running Time | Activate Status | Service Status |
|-----------------------------------|--------------|-----------------|----------------|
| Connection DB                     | 03:06:51     | Activated       | Started        |
| Connection License Manager Server | 03:04:56     | Activated       | Started        |
| Connection Server Role Manager    | 03:04:59     | Activated       | Started        |
| Connection Serviceability         | 02:12:37     | Activated       | Started        |

Critical Services

| Service Name                      | Running Time | Activate Status | Service Status | Change Service Status |
|-----------------------------------|--------------|-----------------|----------------|-----------------------|
| Connection Conversation Manager   | 02:46:55     | Activated       | Started        | Stop                  |
| Connection Mailbox Sync           | 00:23:45     | Activated       | Started        | Stop                  |
| Connection Message Transfer Agent | 00:23:45     | Activated       | Started        | Stop                  |
| Connection Mixer                  | 02:47:23     | Activated       | Started        | Stop                  |
| Connection Notifier               | 00:23:43     | Activated       | Started        | Stop                  |

Cisco Unity Connection Serviceability

Navigation Cisco Unity Connection Serviceability Go

admin | About | Sign Out

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Control Center - Feature Services

Refresh

Select Server

Server\* blr-cuc-sub Go

Status Only Services

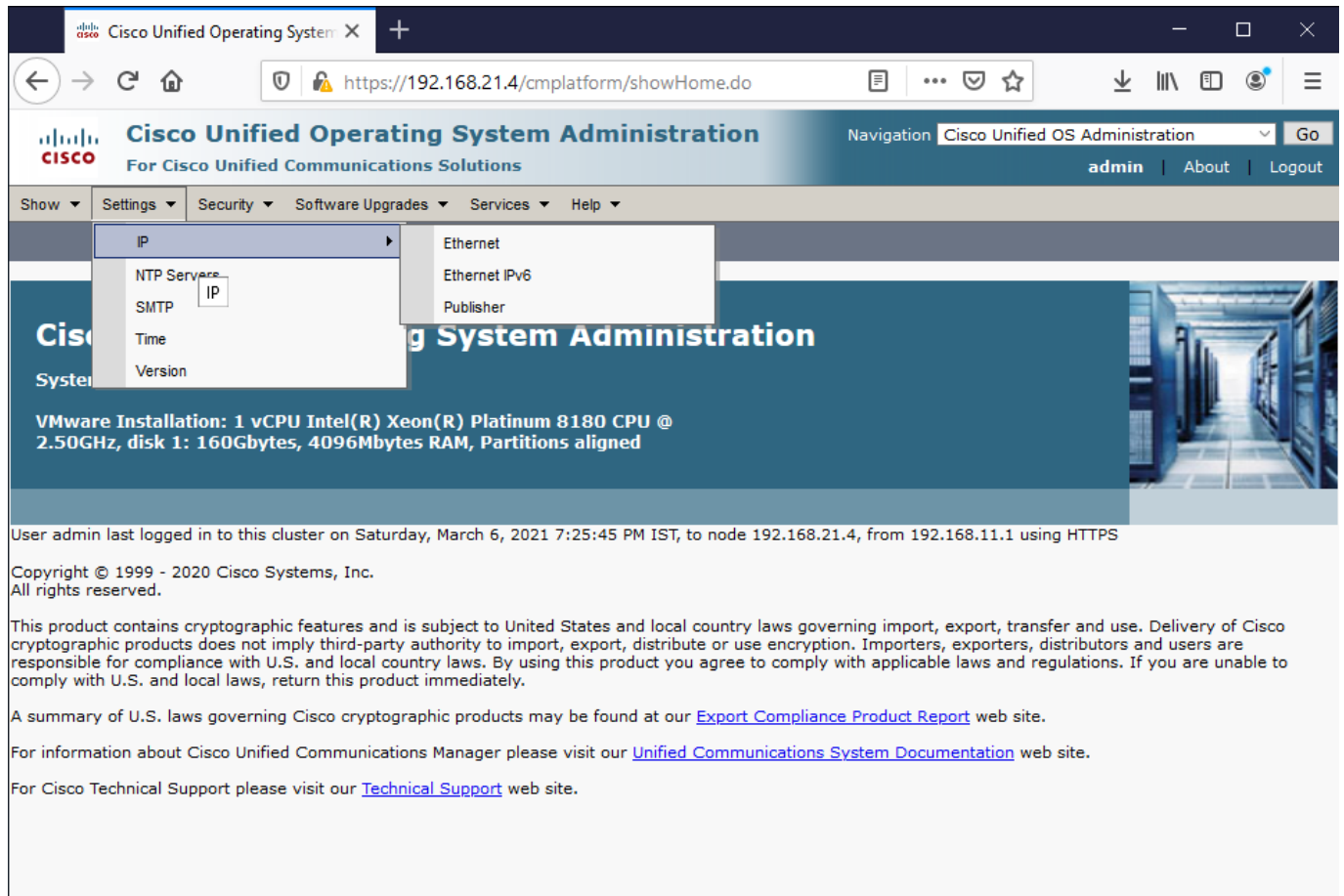
| Service Name                      | Running Time | Activate Status | Service Status |
|-----------------------------------|--------------|-----------------|----------------|
| Connection DB                     | 00:36:53     | Activated       | Started        |
| Connection License Manager Server | 00:36:02     | Activated       | Started        |
| Connection Server Role Manager    | 00:36:04     | Activated       | Started        |
| Connection Serviceability         | 00:09:06     | Activated       | Started        |

Critical Services

| Service Name                      | Running Time | Activate Status | Service Status | Change Service Status |
|-----------------------------------|--------------|-----------------|----------------|-----------------------|
| Connection Conversation Manager   | 00:27:52     | Activated       | Started        | Stop                  |
| Connection Mailbox Sync           | 00:00:00     | Deactivated     | Stopped        | Not Activated         |
| Connection Message Transfer Agent | 00:00:00     | Deactivated     | Stopped        | Not Activated         |
| Connection Mixer                  | 00:27:52     | Activated       | Started        | Stop                  |
| Connection Notifier               | 00:00:00     | Deactivated     | Stopped        | Not Activated         |

---

## Cisco Unified OS Administration



- Here we can interact to the Linux OS of CUC like configuring IP Address, Changing DNS hostnames, Rebooting the node, Ping and much more
- CUC Node can be upgraded using this interface
- Some system status can be verified from here
- This is the same interface we access via SSH CLI
- We use **Platform User Credentials** (OS Admin credentials) to login to Cisco Unified OS Administration interface

## Cisco Unity Connection Administration

Cisco Unity Connection Administration

For Cisco Unified Communications Solutions

Navigation Cisco Unity Connection Administration Go

admin | Search Documentation | About | Sign Out

Cisco Unity Connection

- Users
  - Users
  - Import Users
  - Synch Users
- Class of Service
  - Class of Service
  - Class of Service Membership
- Templates
  - User Templates
  - Call Handler Templates
  - Contact Templates
  - Notification Templates
- Contacts
  - Contacts
- Distribution Lists
  - System Distribution Lists
- Call Management
  - System Call Handlers
  - Directory Handlers
  - Interview Handlers
  - Custom Recordings
  - Call Routing
- Message Storage
  - Mailbox Stores
  - Mailbox Stores Membership
  - Mailbox Quotas
  - Message Aging
- Networking

**Attention**

**This Cisco Unity Connection server has never been backed up.** We recommend that you configure regularly scheduled backups in the Disaster Recovery System.

### Cisco Unity Connection Administration

Version 11.5.1.18900-97

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A summary of U.S. laws governing Cisco cryptographic products may be found at our [Export Compliance Product Report](#) web site.

For information about Cisco Unified Communications Manager please visit our [Unified Communications System Documentation](#) web site.

For Cisco Technical Support please visit our [Technical Support](#) web site.

- This is the heart of CUC Administration
- Core day to day configurations like Adding Users, Deleting Users, Call Handler Configurations, etc. are done from Cisco Unity Connection Administration interface
- We will be here most of the time while dealing with CUC
- We use **Application User Credentials** to login to Cisco Unified CM Administration interface

## [Lab] Cisco Unity Connection SIP Integration with CUCM

- CUC and CUCM can be integrated with each other either via SIP or SCCP protocol. SCCP is obsolete now hence we will be focusing on SIP integration
- In CUCM side we are creating 2 SIP Trunks and 1 Route Pattern, hence we need to complete all the configurations for Trunks and Route Pattern
- When we have CUC PUB and SUB, it is recommended to have 2 SIP Trunks pointing to each CUC IPs
- I have configured CUC-SIP-PROFILE, CUC-SIP-SEC-PROFILE by copying the defaults, just like we did on CUBE integration section. I have not added those configurations here

The screenshot displays the 'SIP Profile Configuration' page in the Cisco Unified CM Administration interface. The browser address bar shows the URL: <https://192.168.21.1/ccmadmin/sipProfileEdit.do?clone=1&key=fcbc758>. The page title is 'SIP Profile Configuration'. The configuration is for a profile named 'CUC-SIP-TRUNK-SIP-PROFILE'.

**Configuration Fields:**

- Name\*: CUC-SIP-TRUNK-SIP-PROFILE
- Description: Default SIP Profile
- Default MTP Telephony Event Payload Type\*: 101
- Early Offer for G.Clear Calls\*: Disabled
- User-Agent and Server header information\*: Send Unified CM Version Information as User-Agent
- Version in User Agent and Server Header\*: Major And Minor
- Dial String Interpretation\*: Phone number consists of characters 0-9, \*, #, and
- Confidential Access Level Headers\*: Disabled
- ☐ Redirect by Application
- ☐ Disable Early Media on 180
- ☐ Outgoing T.38 INVITE include audio mline
- ☐ Offer valid IP and Send/Receive mode only for T.38 Fax Relay
- ☐ Use Fully Qualified Domain Name in SIP Requests
- ☐ Assured Services SIP conformance
- ☐ Enable External QoS\*\*

**SDP Information:**

- SDP Session-level Bandwidth Modifier for Early Offer and Re-invites\*: TIAS and AS
- SDP Transparency Profile: < None >
- Accept Audio Codec Preferences in Received Offer\*: Default
- ☐ Require SDP Inactive Exchange for Mid-Call Media Change
- ☐ Allow RR/RS bandwidth modifier (RFC 3556)

**Parameters used in Phone:**

- Timer Invite Expires (seconds)\*: 180
- Timer Register Delta (seconds)\*: 5
- Timer Register Expires (seconds)\*: 3600
- Timer T1 (msec)\*: 500
- Timer T2 (msec)\*: 4000
- Retry INVITE\*: 6
- Retry Non-INVITE\*: 10
- Media Port Ranges: ☒ Common Port Range for Audio and Video
- Start Media Port\*: 16384
- Stop Media Port\*: 32766
- DSCP for Audio Calls: Use System Default
- DSCP for Video Calls: Use System Default

SIP Profile Configuration

[Cisco Unified CM Administration](#)
[admin](#)
[Search Documentation](#)
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System
Call Routing
Media Resources
Advanced Features
Device
Application
User Management
Bulk Administration
Help

SIP Profile Configuration
Related Links: [Back To Find/List](#)

Save
Delete
Copy
Reset
Apply Config
Add New

Caller ID DN
Caller Name

**Trunk Specific Configuration**

Reroute Incoming Request to new Trunk based on\*
Never

Resource Priority Namespace List
< None >

SIP Rel1XX Options\*
Disabled

Video Call Traffic Class\*
Mixed

Calling Line Identification Presentation\*
Default

Session Refresh Method\*
Invite

Early Offer support for voice and video calls\*
Disabled (Default value)

☐ Enable ANAT

☐ Deliver Conference Bridge Identifier

☐ Allow Passthrough of Configured Line Device Caller Information

☐ Reject Anonymous Incoming Calls

☐ Reject Anonymous Outgoing Calls

☐ Send ILS Learned Destination Route String

☐ Connect Inbound Call before Playing Queuing Announcement

**SIP OPTIONS Ping**

☒ Enable OPTIONS Ping to monitor destination status for Trunks with Service Type "None (Default)"

Ping Interval for In-service and Partially In-service Trunks (seconds)\*
60

Ping Interval for Out-of-service Trunks (seconds)\*
120

Ping Retry Timer (milliseconds)\*
500

Ping Retry Count\*
6

**SDP Information**

☐ Send send-receive SDP in mid-call INVITE

☐ Allow Presentation Sharing using BFCP

☐ Allow iX Application Media

☐ Allow multiple codecs in answer SDP

Save
Delete
Copy
Reset
Apply Config
Add New

*Info* \*- indicates required item.

*Info* \*\*, setting only takes effect if the External QoS Enabled Service Parameter is set to true.

SIP Trunk Security Profile Configuration

[Cisco Unified CM Administration](#)
[admin](#)
[Search Documentation](#)
[About](#)
[Logout](#)

System
Call Routing
Media Resources
Advanced Features
Device
Application
User Management
Bulk Administration
Help

SIP Trunk Security Profile Configuration
Related Links: [Back To Find/List](#)

Save
Delete
Copy
Reset
Apply Config
Add New

**Status**

*Info* Status: Ready

**SIP Trunk Security Profile Information**

Name\*
CUC-SIP-TRUNK-SIP-SEC-PROFILE

Description
Non Secure SIP Trunk Profile authenticated by null String

Device Security Mode
Non Secure

Incoming Transport Type\*
TCP+UDP

Outgoing Transport Type
TCP

☐ Enable Digest Authentication

Nonce Validity Time (mins)\*
600

X.509 Subject Name

Incoming Port\*
5060

☐ Enable Application level authorization

☐ Accept presence subscription

☒ Accept out-of-dialog refer\*\*

☒ Accept unsolicited notification

☒ Accept replaces header

☐ Transmit security status

☐ Allow charging header

SIP V.150 Outbound SDP Offer Filtering\*
Use Default Filter

Save
Delete
Copy
Reset
Apply Config
Add New

*Info* \*- indicates required item.

*Info* \*\*If this profile is associated with an EMCC SIP trunk, Accept Out-of-Dialog REFER is enabled regardless of the setting on this page

Cisco Unified CM Group Config

<https://192.168.21.1/ccmadmin/ccmGroupEdit.do?key=d73248f5-a110-...>

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Cisco Unified CM Group Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**  
Add successful

**Cisco Unified Communications Manager Group Information**  
Cisco Unified Communications Manager Group: SUB01-SUB02-CUCM-GROUP (used by 0 devices)

**Cisco Unified Communications Manager Group Settings**  
Name\* SUB01-SUB02-CUCM-GROUP  
☐ Auto-registration Cisco Unified Communications Manager Group

**Cisco Unified Communications Manager Group Members**  
Available Cisco Unified Communications Managers  
Selected Cisco Unified Communications Managers\*  
CM\_cucm-sub01  
CM\_cucm-sub02

Save Delete Copy Reset Apply Config Add New

Region Configuration

<https://192.168.21.1/ccmadmin/regionEdit.do?key=33fb820e-80%...>

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Region Configuration Related Links: Back To Find/List Go

Save Delete Reset Apply Config Add New

**Status**  
Update successful  
Click on the Reset button to have the changes take effect.

**Region Information**  
Name\* CUC-SIP-TRUNK-REGION

**Region Relationships**

| Region                  | Audio Codec Preference List                   | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|-------------------------|-----------------------------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| BANGALORE-PHONES-REGION | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| CUC-SIP-TRUNK-REGION    | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| TEXAS-PHONES-REGION     | Use System Default (Factory Default low loss) | 8 kbps (G.729)         | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |

CUC located in Bangalore DC, Texas is a Remote site hence configured 8kbps

NOTE: Regions not displayed

**Modify Relationship to other Regions**

| Regions                 | Audio Codec Preference List | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|-------------------------|-----------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| BANGALORE-PHONES-REGION | Keep Current Setting        | Keep Current Setting   | Keep Current Setting                     | Keep Current Setting                               |
| CUC-SIP-TRUNK-REGION    |                             |                        | Use System Default                       | Use System Default                                 |
| Default                 |                             |                        | None                                     | None                                               |
| TEXAS-PHONES-REGION     |                             |                        | None                                     | None                                               |

Save Delete Reset Apply Config Add New

Device Pool Configuration

https://192.168.21.1/ccmadmin/devicePoolEdit.do

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**Device Pool Configuration** Related Links: Back To Find/List Go

Save

**Device Pool Settings**

Device Pool Name\* CUC-SIP-TRUNK-DEVICE-POOL

Cisco Unified Communications Manager Group\* SUB01-SUB02-CUCM-GROUP

Calling Search Space for Auto-registration < None >

Adjunct CSS < None >

Reverted Call Focus Priority Default

Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**

Date/Time Group\* IST-DATE-TIME-GROUP

Region\* CUC-SIP-TRUNK-REGION

Media Resource Group List < None >

Location < None >

Network Locale < None >

SRST Reference\* Disable

Connection Monitor Duration\*\*\*

Single Button Barge\* Default

Join Across Lines\* Default

Physical Location < None >

Device Mobility Group < None >

Wireless LAN Profile Group < None > [View Details](#)

Calling Search Space Configuration

https://192.168.21.1/ccmadmin/cssEdit.do?key=a9a7e5b4-0fbf-2313-5f...

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**Calling Search Space Configuration** Related Links: Back To Find/List Go

Save Delete Copy Add New

**Status**  
Add successful

**Calling Search Space Information**

Name\* CUC-SIP-TRUNK-INBOUND-CSS

Description CUC-SIP-TRUNK-INBOUND-CSS

**Route Partitions for this Calling Search Space**

Available Partitions\*\*  
BANGALORE-NATIONAL-PT  
Directory URI  
Global Learned E164 Numbers  
Global Learned E164 Patterns  
Global Learned Enterprise Numbers

Selected Partitions  
BANGALORE-INTERNAL-PT  
TEXAS-INTERNAL-PT

Save Delete Copy Add New



Find and List Partitions

Cisco Unified CM Administration

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Find and List Partitions

+ Add New | Select All | Clear All | Delete Selected

Status

10 records found

Partition (1 - 10 of 10) Rows per Page 50

Find Partition where Name begins with Find Clear Filter

| Partition Name                     | Description                 |
|------------------------------------|-----------------------------|
| BANGALORE-INTERNAL-PT              | BANGALORE-INTERNAL-PT       |
| BANGALORE-NATIONAL-PT              | BANGALORE-NATIONAL-PT       |
| Directory URI                      |                             |
| Global Learned E164 Numbers        | Created 2021-03-07 02:39:51 |
| Global Learned E164 Patterns       | Created 2021-03-07 02:39:51 |
| Global Learned Enterprise Numbers  | Created 2021-03-07 02:39:51 |
| Global Learned Enterprise Patterns | Created 2021-03-07 02:39:51 |
| TEXAS-INTERNAL-PT                  | TEXAS-INTERNAL-PT           |
| TEXAS-NATIONAL-PT                  | TEXAS-NATIONAL-PT           |
| VM-PT                              | VM-PT                       |

Add New | Select All | Clear All | Delete Selected

Trunk Configuration

Cisco Unified CM Administration

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Trunk Configuration

Related Links: Back To Find/List Go

Save

Device Information

Product: SIP Trunk

Device Protocol: SIP

Trunk Service Type: None(Default)

Device Name\*: CUC-PUB-SIP-TRUNK

Description: CUC-PUB-SIP-TRUNK

Device Pool\*: CUC-SIP-TRUNK-DEVICE-POOL

Common Device Configuration: < None >

Call Classification\*: OnNet

Media Resource Group List: < None >

Location\*: Hub\_None

AAR Group: < None >

Tunneled Protocol\*: None

QSIG Variant\*: No Changes

ASN.1 ROSE OID Encoding\*: No Changes

Packet Capture Mode\*: None

Packet Capture Duration: 0

☐ Media Termination Point Required

☒ Retry Video Call as Audio

☐ Path Replacement Support

☐ Transmit UTF-8 for Calling Party Name

☐ Transmit UTF-8 Names in QSIG APDU

☐ Unattended Port

☐ SRTP Allowed - When this flag is checked, Encrypted TLS needs to be configured in the network to provide end to end security. Failure to do so will expose keys and other information.

Consider Traffic on This Trunk Secure\*: When using both sRTP and TLS

Route Class Signaling Enabled\*: Default

Use Trusted Relay Point\*: Default

☐ PSTN Access

☒ Run On All Active Unified CM Nodes

Intercompany Media Engine (IME)

E.164 Transformation Profile: < None >

MLPP and Confidential Access Level Information

MLPP Domain: < None >

Confidential Access Mode: < None >

Confidential Access Level: < None >

Call Routing Information

☒ Remote-Party-Id



Trunk Configuration

[Trunk Configuration](#)

[Save](#)
[Delete](#)
[Reset](#)
[Add New](#)

### Call Routing Information

☒ Remote-Party-Id  
☒ Asserted-Identity  
Asserted-Type\*   
SIP Privacy\*

### Inbound Calls

Significant Digits\*   
Connected Line ID Presentation\*   
Connected Name Presentation\*   
Calling Search Space   
AAR Calling Search Space   
Prefix DN   
☒ Redirecting Diversion Header Delivery - Inbound

### Incoming Calling Party Settings

If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

[Clear Prefix Settings](#)
[Default Prefix Settings](#)

| Number Type     | Prefix  | Strip Digits | Calling Search Space | Use Device Pool CSS                 |
|-----------------|---------|--------------|----------------------|-------------------------------------|
| Incoming Number | Default | 0            | < None >             | <input checked="" type="checkbox"/> |

### Incoming Called Party Settings

If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

[Clear Prefix Settings](#)
[Default Prefix Settings](#)

| Number Type     | Prefix  | Strip Digits | Calling Search Space | Use Device Pool CSS                 |
|-----------------|---------|--------------|----------------------|-------------------------------------|
| Incoming Number | Default | 0            | < None >             | <input checked="" type="checkbox"/> |

### Connected Party Settings

Connected Party Transformation CSS   
☒ Use Device Pool Connected Party Transformation CSS

### Outbound Calls

Called Party Transformation CSS   
☒ Use Device Pool Called Party Transformation CSS  
Calling Party Transformation CSS   
☒ Use Device Pool Calling Party Transformation CSS  
Calling Party Selection\*   
Calling Line ID Presentation\*

Trunk Configuration

[Trunk Configuration](#)

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[Delete](#)
[Reset](#)
[Add New](#)

### Outbound Calls

☒ Use Device Pool Calling Party Transformation CSS  
Calling Party Selection\*   
Calling Line ID Presentation\*   
Calling Name Presentation\*   
Calling and Connected Party Info Format\*   
☒ Redirecting Diversion Header Delivery - Outbound  
Redirecting Party Transformation CSS   
☒ Use Device Pool Redirecting Party Transformation CSS

### Caller Information

Caller ID DN   
Caller Name   
☐ Maintain Original Caller ID DN and Caller Name in Identity Headers

### SIP Information

#### Destination

☐ Destination Address is an SRV

| Destination Address | Destination Address IPv6 | Destination Port |
|---------------------|--------------------------|------------------|
| * 192.168.21.5      |                          | 5060             |

MTP Preferred Originating Codec\*   
BLF Presence Group\*   
SIP Trunk Security Profile\*   
Rerouting Calling Search Space   
Out-Of-Dialog Refer Calling Search Space   
SUBSCRIBE Calling Search Space   
SIP Profile\*  [View Details](#)  
DTMF Signaling Method\*

#### Normalization Script

Normalization Script   
☐ Enable Trace

| Parameter Name | Parameter Value |
|----------------|-----------------|
| 1              |                 |

#### Recording Information

☒ None

Trunk Configuration

<https://192.168.21.1/ccmadmin/trunkEdit.do?key=186b4f06-1>

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Trunk Configuration

Related Links: Back To Find/List

Save
Delete
Reset
Add New

Device Information

Product: SIP Trunk  
Device Protocol: SIP  
Trunk Service Type: None(Default)  
Device Name\*: CUC-SUB-SIP-TRUNK  
Description: CUC-SUB-SIP-TRUNK  
Device Pool\*: CUC-SIP-TRUNK-DEVICE-POOL  
Common Device Configuration: < None >  
Call Classification\*: OnNet  
Media Resource Group List: < None >  
Location\*: Hub\_None  
AAR Group: < None >  
Tunneled Protocol\*: None  
QSIG Variant\*: No Changes  
ASN.1 ROSE OID Encoding\*: No Changes  
Packet Capture Mode\*: None  
Packet Capture Duration: 0  
☐ Media Termination Point Required  
☒ Retry Video Call as Audio  
☐ Path Replacement Support  
☐ Transmit UTF-8 for Calling Party Name  
☐ Transmit UTF-8 Names in QSIG APDU  
☐ Unattended Port  
☐ SRTP Allowed - When this flag is checked, Encrypted TLS needs to be configured in the network to provide end to end security. Failure to do so will expose keys and other information.  
Consider Traffic on This Trunk Secure\*: When using both sRTP and TLS  
Route Class Signaling Enabled\*: Default  
Use Trusted Relay Point\*: Default  
☐ PSTN Access  
☒ Run On All Active Unified CM Nodes

Intercompany Media Engine (IME)

E.164 Transformation Profile: < None >

MLPP and Confidential Access Level Information

MLPP Domain: < None >  
Confidential Access Mode: < None >  
Confidential Access Level: < None >

Call Routing Information

☒ Remote-Party-Id

Find and List Trunks

<https://192.168.21.1/ccmadmin/trunkFindList.do?recCnt=2&c>

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Find and List Trunks

Add New
Select All
Clear All
Delete Selected
Reset Selected

Status

2 records found

Trunks (1 - 2 of 2)

Rows per Page 50

Find Trunks where Device Name begins with

Find
Clear Filter

Select item or enter search text

|                          | Name              | Description       | Calling Search Space      | Device Pool               | Route Pattern | Partition | Route Group | Priority | Trunk Type | SIP Trunk Status | SIP Trunk Duration                              | SIP Trunk Security Profile    |
|--------------------------|-------------------|-------------------|---------------------------|---------------------------|---------------|-----------|-------------|----------|------------|------------------|-------------------------------------------------|-------------------------------|
| <input type="checkbox"/> | CUC-PUB-SIP-TRUNK | CUC-PUB-SIP-TRUNK | CUC-SIP-TRUNK-INBOUND-CSS | CUC-SIP-TRUNK-DEVICE-POOL |               |           |             |          | SIP Trunk  | No Service       | Time not in Full Service: 0 day 0 hour 0 minute | CUC-SIP-TRUNK-SIP-SEC-PROFILE |
| <input type="checkbox"/> | CUC-SUB-SIP-TRUNK | CUC-SUB-SIP-TRUNK | CUC-SIP-TRUNK-INBOUND-CSS | CUC-SIP-TRUNK-DEVICE-POOL |               |           |             |          | SIP Trunk  | No Service       | Time not in Full Service: 0 day 0 hour 0 minute | CUC-SIP-TRUNK-SIP-SEC-PROFILE |

Add New
Select All
Clear All
Delete Selected
Reset Selected

vSphere - colpod2\_blr-cuc-sul
Route Group Configuration

https://192.168.21.1/ccmadmin/routeGroupEdit.do?key=98a7da91-e05e

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Route Group Configuration Related Links: Back To Find/List Go

Save Delete Add New

Status  
Add successful

Route Group Information  
Route Group Name\* CUC-SIP-TRUNK-RG  
Distribution Algorithm\* Circular

Route Group Member Information  
Find Devices to Add to Route Group  
Device Name contains Find  
Available Devices\*\* CUC-PUB-SIP-TRUNK  
CUC-SUB-SIP-TRUNK  
Port(s) None Available  
Add to Route Group  
Current Route Group Members  
Selected Devices (ordered by priority)\* CUC-PUB-SIP-TRUNK (All Ports)  
CUC-SUB-SIP-TRUNK (All Ports)  
Reverse Order of Selected Devices  
Removed Devices\*\*\*

Route Group Members  
SIP CUC-PUB-SIP-TRUNK  
SIP CUC-SUB-SIP-TRUNK  
Save Delete Add New  
\*- indicates required item.  
\*\*Select device, select port, and click Add to Route Group

Route List Configuration

https://192.168.21.1/ccmadmin/routeListTwoEdit.do?key=b017e017-88

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Route List Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

Status  
Update successful

Route List Information  
Registration: Registered with Cisco Unified Communications Manager cucm-sub01  
IPv4 Address: 192.168.21.2  
Device is trusted  
Name\* CUC-PUB-SIP-TRUNK-RL  
Description CUC-PUB-SIP-TRUNK-RL  
Cisco Unified Communications Manager Group\* SUB01-SUB02-CUCM-GROUP  
Enable this Route List (change effective on Save; no reset required)  
Run On All Active Unified CM Nodes

Route List Member Information  
Selected Groups\*\* CUC-PUB-SIP-TRUNK-RG  
CUC-SUB-SIP-TRUNK-RG  
Add Route Group  
Removed Groups\*\*\*

Route List Details  
CUC-PUB-SIP-TRUNK-RG  
CUC-SUB-SIP-TRUNK-RG  
Save Delete Copy Reset Apply Config Add New  
\*- indicates required item.  
\*\*Ordered by highest priority  
\*\*\*Will be removed from Route List when you click Save

Route Pattern Configuration
+

https://192.168.21.1/ccmadmin/routePattern2Edit.do

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Route Pattern Configuration Related Links: Back To Find/List Go

Save

**Pattern Definition**  
Route Pattern\* 10001  
Route Partition VM-PT  
Description CUC VOICE MAIL PILOT  
Numbering Plan -- Not Selected --  
Route Filter < None >  
MLPP Precedence\* Default  
☐ Apply Call Blocking Percentage  
Resource Priority Namespace Network Domain < None >  
Route Class\* Default  
Gateway/Route List\* CUC-PUB-SIP-TRUNK-RL (Edit)  
Route Option  
☒ Route this pattern  
☐ Block this pattern No Error  
Call Classification\* OnNet  
External Call Control Profile < None >  
☐ Allow Device Override ☐ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority  
☐ Require Forced Authorization Code  
Authorization Level\* 0  
☐ Require Client Matter Code

**Calling Party Transformations**  
☐ Use Calling Party's External Phone Number Mask  
Calling Party Transform Mask  
Prefix Digits (Outgoing Calls)  
Calling Line ID Presentation\* Default  
Calling Name Presentation\* Default  
Calling Party Number Type\* Cisco CallManager  
Calling Party Numbering Plan\* Cisco CallManager

**Connected Party Transformations**  
Connected Line ID Presentation\* Default  
Connected Name Presentation\* Default

**Called Party Transformations**  
Discard Digits < None >  
Calling Party Transform Mask  
Prefix Digits (Outgoing Calls)

Calling Search Space Configuration
+

https://192.168.21.1/ccmadmin/cssEdit.do?key=0fb65383-6ab6-bc16-5

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Calling Search Space Configuration Related Links: Back To Find/List Go

Save Delete Copy Add New

**Status**  
Add successful

**Calling Search Space Information**  
Name\* VM-PILOT-CSS  
Description VM-PILOT-CSS

**Route Partitions for this Calling Search Space**  
Available Partitions\*\*  
BANGALORE-INTERNAL-PT  
BANGALORE-NATIONAL-PT  
Directory URI  
Global Learned E164 Numbers  
Global Learned E164 Patterns  
Selected Partitions  
VM-PT

Save Delete Copy Add New

Calling Search Space Configuration

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Calling Search Space Configuration

Related Links: Back To Find/List

Save Delete Copy Add New

Status

Update successful

Calling Search Space Information

Name\* BANGALORE-PHONE-CSS

Description BANGALORE-PHONE-CSS

Route Partitions for this Calling Search Space

Available Partitions\*\*

- Directory URI
- Global Learned E164 Numbers
- Global Learned E164 Patterns
- Global Learned Enterprise Numbers
- Global Learned Enterprise Patterns

Selected Partitions

- BANGALORE-INTERNAL-PT
- BANGALORE-NATIONAL-PT
- TEXAS-INTERNAL-PT
- VM-PT

Save Delete Copy Add New

Voice Mail Pilot Configuration

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Voice Mail Pilot Configuration

Related Links: Back To Find/List

Save

Status

Status: Ready

Voice Mail Pilot Information

Voice Mail Pilot Number 10001

Calling Search Space VM-PILOT-CSS

Description CUC-VM-PILOT

☐ Make this the default Voice Mail Pilot for this Calling Search Space

Save

\*- indicates required item.

Voice Mail

- Cisco Voice Mail Port
- Cisco Voice Mail Port Wizard
- Message Waiting
- Voice Mail Pilot
- Voice Mail Profile

Voice Mail Profile Configuration

Navigation: Cisco Unified CM Administration

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Voice Mail Profile Configuration

Related Links: Back To Find/List

Save

Status

Status: Ready

Voice Mail Profile Information

Voice Mail Profile Name\* CUC-VM-PROFILE

Description CUC-VM-PROFILE

Voice Mail Pilot\*\* 10001/VM-PILOT

Voice Mail Box Mask

☐ Make this the default Voice Mail Profile for this Calling Search Space

Save

\*- indicates required item.

\*\* The Voice Mail Pilot is comprised of the Voice Mail Pilot Number and it's corresponding Calling Search Space Name (< Voice Mail Pilot Number >/< Calling Search Space >).

Voice Mail

- Cisco Voice Mail Port
- Cisco Voice Mail Port Wizard
- Message Waiting
- Voice Mail Pilot
- Voice Mail Profile

Find and List Trunks Cisco Unity Connection Admin X

https://192.168.21.4/cuadmin/home.do

Cisco Unity Connection Administration  
For Cisco Unified Communications Solutions

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  - Unified Messaging Services
  - Unified Messaging Accounts Status
  - SpeechView Transcription
- Video
  - Video Services
  - Video Services Accounts Status
- Dial Plan
  - Partitions
  - Search Spaces
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  - General Configuration
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    - Roles
    - Restriction Tables
    - Licenses
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    - Holiday Schedules
    - Global Nicknames
    - Subject Line Formats
    - Attachment Descriptions
    - Enterprise Parameters
    - Service Parameters
    - Plugins
  - Fax Server
  - LDAP
    - SAML Single Sign on
    - Authz Servers
    - Cross-Origin Resource Sharing (CORS)
  - SMTP Configuration
    - Advanced
- Telephony Integrations
  - Phone System**
  - Port Group
  - Port
  - Speech Connect Port
  - Trunk
  - Security
- Tools
  - Task Management
  - Bulk Administration Tool
  - Custom Keypad Mapping
  - Migration Utilities
  - Grammar Statistics
  - SMTP Address Search
  - Show Dependencies

**Phone System Basics (PhoneSystem)**

Search Phone Systems Phone System Basics (PhoneSystem)  
Related Links Add Port Group Go

Phone System Edit Refresh Help

Save Delete Previous Next

**Status**

The phone system cannot take calls until a port group is set. Use the Related Links to add a port group.

**Phone System**

Phone System Name\* PhoneSystem We can use the default Phone System

☒ Default TRAP Phone System

**Message Waiting Indicators**

☐ Send Message Counts

☐ Use Same Port for Enabling and Disabling MWIs

☐ Force All MWIs Off for this Phone System

Run Synchronize All MWIs on This Phone System

**Call Loop Detection by Using DTMF**

☐ Enable for Supervised Transfers

☐ Enable for Forwarded Message Notification Calls (by Using DTMF)

DTMF Tone To Use A

Guard Time 2500 milliseconds

**Call Loop Detection by Using Extension**

☒ Enable for Forwarded Message Notification Calls (by Using Extension)

**Phone View Settings**

☐ Enable Phone View

CTI Phone Access Username

CTI Phone Access Password

**Outgoing Call Restrictions**

☒ Enable outgoing calls

☐ Disable all outgoing calls immediately

☐ Disable all outgoing calls between

Beginning Time: 12 00 AM

Ending Time: 12 00 AM

Save Delete Previous Next

Fields marked with an asterisk (\*) are required.

Find and List Trunks Cisco Unity Connection Admin X

https://192.168.21.4/cuadmin/home.do

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**Cisco Unity Connection**

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  - Unified Messaging Services
  - Unified Messaging Accounts Status
  - SpeechView Transcription
- Video
  - Video Services
  - Video Services Accounts Status
- Dial Plan
  - Partitions
  - Search Spaces
- System Settings
  - General Configuration
    - Cluster
    - Authentication Rules
    - Roles
    - Restriction Tables
    - Licenses
    - Schedules
    - Holiday Schedules
    - Global Nicknames
    - Subject Line Formats
    - Attachment Descriptions
    - Enterprise Parameters
    - Service Parameters
    - Plugins
  - Fax Server
  - LDAP
    - SAML Single Sign on
    - Authz Servers
    - Cross-Origin Resource Sharing (CORS)
  - SMTP Configuration
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  - Port Group**
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  - Speech Connect Port
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  - Bulk Administration Tool
  - Custom Keypad Mapping
  - Migration Utilities
  - Grammar Statistics
  - SMTP Address Search
  - Show Dependencies

**New Port Group**

Search Port Groups New Port Group  
Related Links Check Telephony Configuration Go

Port Group Reset Help

Save

**New Port Group**

Phone System PhoneSystem

Create From ☒ Port Group Type SIP

☐ Port Group

**Port Group Description**

Display Name\* CUCM-PORT-GROUP

☐ Authenticate with SIP Server

Authentication Username

Authentication Password

Contact Line Name

SIP Security Profile 5060

SIP Transport Protocol TCP

**Primary Server Settings**

IPv4 Address or Host Name 192.168.21.2 Add 1 CUCM Subscriber now, then add remaining.

IPv6 Address or Host Name

Port 5060

Save

Fields marked with an asterisk (\*) are required.

Find and List Trunks Cisco Unity Connection Admin

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**Cisco Unity Connection**

- Unified Messaging
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  - Unified Messaging Accounts Status
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- Video
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  - Phone System
    - Port Group**
    - Port
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- Tools
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  - Migration Utilities
  - Grammar Statistics
  - SMTP Address Search
  - Show Dependencies

**Port Group Basics (CUCM-PORT-GROUP)**

Search Port Groups Port Group Basics (CUCM-PORT-GROUP) Go

Related Links Add Ports

Port Group Edit Refresh Help

Save Port Group Basics

Status

The phone is not registered. If it has no ports, use the Related Links to add ports.

Port Group

Display Name\* CUCM-PORT-GROUP

Integration Method SIP

Reset Status Reset Not Required Reset

**Session Initiation Protocol (SIP) Settings**

☐ Register with SIP Server

☐ Authenticate with SIP Server

Authentication Username

Authentication Password

Contact Line Name

SIP Security Profile 5060

SIP Transport Protocol TCP

**Advertised Codec Settings**

Change Advertising

| Display Name | Packet Size |
|--------------|-------------|
| G.711 mu-law | 20          |
| G.729        | 20          |

Change Advertising

**Message Waiting Indicator Settings**

☒ Enable Message Waiting Indicators

Delay between Requests 0 milliseconds

Maximum Concurrent Requests 0

Retries After Successful Attempt 0

Retry Interval After Successful Attempt 5 milliseconds

Save Delete Previous Next

Fields marked with an asterisk (\*) are required.

https://192.168.21.4/cuadmin/media-port-group-remote-service.do?op=read&objectId=52ae8044-1a05-47f3-a236-4358c9fa038a

Find and List Trunks Cisco Unity Connection Admin

https://192.168.21.4/cuadmin/home.do

**Cisco Unity Connection Administration**  
For Cisco Unified Communications Solutions

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admin Search Documentation About Sign Out

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**Edit Servers**

Search Port Groups Port Group Basics (CUCM-PORT-GROUP) Edit Servers

Related Links Check Telephony Configuration Go

Port Group Edit Refresh Help

Status

One or more port groups need to be reset.  
Created Server(s)

Save

**SIP Servers**

Delete Selected Add

| Order | IPv4 Address or Host Name | IPv6 Address or Host Name | Port | TLS Port |
|-------|---------------------------|---------------------------|------|----------|
| 0     | 192.168.21.2              |                           | 5060 | 5061     |
| 1     | 192.168.21.3              |                           | 5060 | 5061     |
| 2     | 192.168.21.1              |                           | 5060 | 5061     |

Delete Selected Add

**TFTP Servers**

Delete Selected Add

| Order | IPv4 Address or Host Name | IPv6 Address or Host Name |
|-------|---------------------------|---------------------------|
|       |                           |                           |

Delete Selected Add

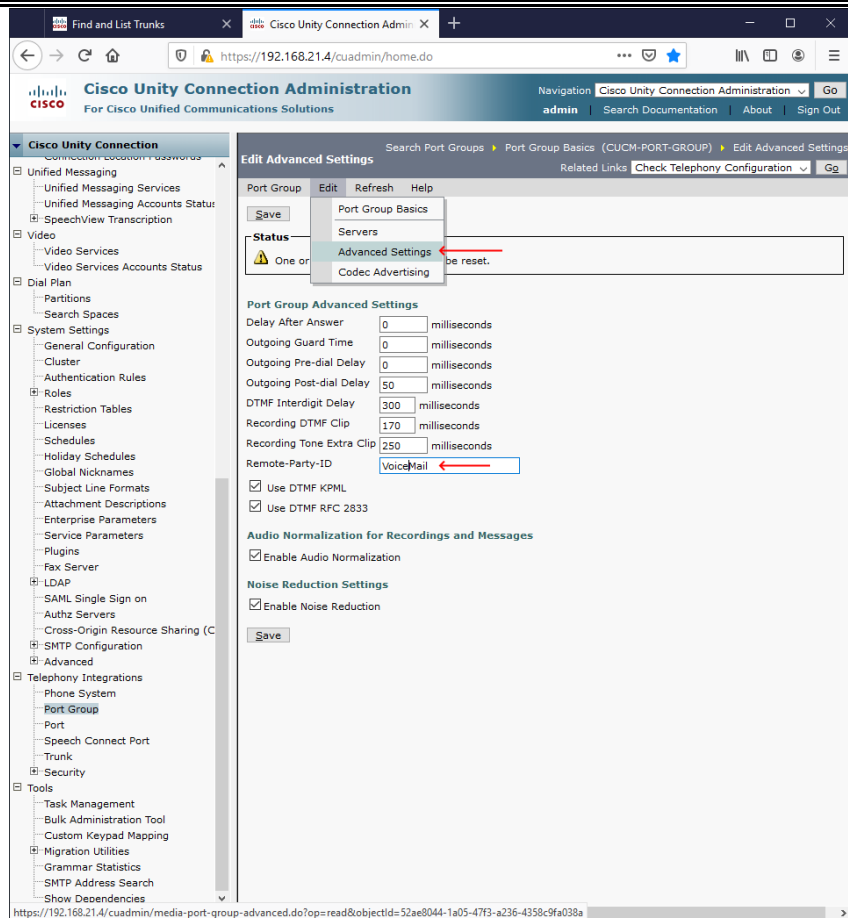
**IPv6 Addressing Mode**

Preference for Signaling IPv4

Preference for Media IPv4

Save







Cisco Unity Connection Administration

Navigation: Cisco Unity Connection Administration | Go

admin | Search Documentation | About | Sign Out

Cisco Unity Connection

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Port Group Basics (CUCM-PORT-GROUP)

Port Group: [Port Group Basics] | Edit | Refresh | Help

Save | Port Group Basics | Servers | Advanced Settings | Codec Advertising

Port Group: [Port Group Basics] | Display Name: [Port Group Basics] | Integration Method: [Port Group Basics] | Reset Status: [Reset Not Required] | Reset

Session Initiation Protocol (SIP) Settings

☐ Register with SIP Server

☐ Authenticate with SIP Server

Authentication Username: [Authentication Username] | Authentication Password: [Authentication Password] | Contact Line Name: [Contact Line Name]

SIP Security Profile: [SIP Security Profile] | SIP Transport Protocol: [SIP Transport Protocol]

Advertised Codec Settings

Change Advertising

| Display Name | Packet Size |
|--------------|-------------|
| G.711 mu-law | 20          |
| G.729        | 20          |

Change Advertising

Message Waiting Indicator Settings

☒ Enable Message Waiting Indicators

Delay between Requests: [Delay between Requests] milliseconds

Maximum Concurrent Requests: [Maximum Concurrent Requests]

Retries After Successful Attempt: [Retries After Successful Attempt]

Retry Interval After Successful Attempt: [Retry Interval After Successful Attempt] milliseconds

Save | Delete | Previous | Next

Fields marked with an asterisk (\*) are required.

Cisco System - Error report | Cisco Unity Connection Admin

Navigation: Cisco Unity Connection Administration | Go

admin | Search Documentation | About | Sign Out

Cisco Unity Connection

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  - Show Dependencies

Edit Codec Advertising

Port Group: [Port Group Basics] | Edit | Refresh | Help

Save | Check Telephony Configuration | Go

Status

The phone system cannot take calls if it has no ports. Use the Related Links to add ports. One or more port groups need to be reset.

Audio Codec Advertising

Advertised Codecs: [G.711 mu-law] | [G.729]

Unadvertised Codecs: [G.711 a-law] | [G.722] | [iLBC]

Video Quality Parameters

Video Codec: [H.264] | Video Resolution: [360p]

Save

Fields marked with an asterisk (\*) are required.

Cisco Unified CM Console x Cisco Unity Connection Admin x

https://192.168.214/cuadmin/home.do

**Cisco Unity Connection Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unity Connection Administration Go  
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**New Port** Search Ports New Port

Port Reset Help

**Status**

One or more port groups need to be reset.

Save

**New Phone System Port**

☒ Enabled

Number of Ports 10

Phone System PhoneSystem

Port Group CUCM-PORT-GROUP

Server cuc-pub.ajcollab.com

**Port Behavior**

☒ Answer Calls

☒ Perform Message Notification

☒ Send MWI Requests (may also be disabled by the port group)

☒ Allow TRAP Connections

Save

javascript:cueInvokeDrawerURL('cutree',/cuadmin/search-file-extension-description.do','parent.content','cutree\_74')

Cisco Unified CM Console x Cisco Unity Connection Admin x

https://192.168.214/cuadmin/home.do

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  - SMTP Address Search
  - Show Dependencies

**New Port** Search Ports New Port

Port Reset Help

**Status**

One or more port groups need to be reset.

Save

**New Phone System Port**

☒ Enabled

Number of Ports 10

Phone System PhoneSystem

Port Group CUCM-PORT-GROUP

Server cuc-sub.ajcollab.com

**Port Behavior**

☒ Answer Calls

☒ Perform Message Notification

☒ Send MWI Requests (may also be disabled by the port group)

☒ Allow TRAP Connections

Save

Cisco Unified CM Console x Cisco Unity Connection Admin x

https://192.168.21.4/cuadmin/home.do

**Cisco Unity Connection Administration**  
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**Cisco Unity Connection**

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**Port Group Basics (CUCM-PORT-GROUP)**

Search Port Groups | Port Group Basics (CUCM-PORT-GROUP)  
Related Links | Add Ports | Go

Port Group | Edit | Refresh | Help

Save | Delete | Previous | Next

**Status**

One or more port groups need to be reset.

**Port Group**

Display Name\* | CUCM-PORT-GROUP

Integration Method | SIP

Reset Status | Reset Required | Reset

**Session Initiation Protocol (SIP) Settings**

☐ Register with SIP Server

☐ Authenticate with SIP Server

Authentication Username |

Authentication Password |

Contact Line Name |

SIP Security Profile | 5060

SIP Transport Protocol | TCP

**Advertised Codec Settings**

Change Advertising

| Display Name | Packet Size |
|--------------|-------------|
| G.711 mu-law | 20          |
| G.729        | 20          |

Change Advertising

**Message Waiting Indicator Settings**

☒ Enable Message Waiting Indicators

Delay between Requests | 0 | milliseconds

Maximum Concurrent Requests | 0

Retries After Successful Attempt | 0

Retry Interval After Successful Attempt | 5 | milliseconds

Save | Delete | Previous | Next

Fields marked with an asterisk (\*) are required.

Directory Number Configuration | Cisco Unity Connection Admin | <https://192.168.21.1/cmadmin/directoryNumberEdit.do?key=96dae060>

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation | Cisco Unified CM Administration | Go  
admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

**Directory Number Configuration** | Related Links: [Configure Device \(CIPC-JASEEM\)](#) | Go

Save | Delete | Reset | Apply Config | Add New

**Status**  
Status: Ready

**Directory Number Information**

Directory Number\* 11002 ☐ Urgent Priority  
Route Partition BANGALORE-INTERNAL-PT  
Description 11002 - Abdul Jaseem  
Alerting Name 11002 - Abdul Jaseem  
ASCII Alerting Name 11002 - Abdul Jaseem  
External Call Control Profile < None >  
☒ Allow Control of Device from CTI  
Associated Devices CIPC-JASEEM  
Dissociate Devices

[Edit Device](#)  
[Edit Line Appearance](#)

**Directory Number Settings**

Voice Mail Profile CUC-VM-PROFILE (Choose <None> to use system default)  
Calling Search Space < None >  
BLF Presence Group\* Standard Presence group  
User Hold MOH Audio Source < None >  
Network Hold MOH Audio Source < None >  
Auto Answer\* Auto Answer Off  
☐ Reject Anonymous Calls

**Enterprise Alternate Number**  
[Add Enterprise Alternate Number](#)

**+E.164 Alternate Number**  
[Add +E.164 Alternate Number](#)

**Directory URIs**

| Primary | URI | Partition | Advertise Globally via ILS | Rem |
|---------|-----|-----------|----------------------------|-----|
|---------|-----|-----------|----------------------------|-----|



- 
- When you press the VM button on the phone and if you are able to hear “Hello, Cisco Unity Connection Messaging System, from a touch tone telephone you may dial an extension at any time” greetings, then you are done with integration

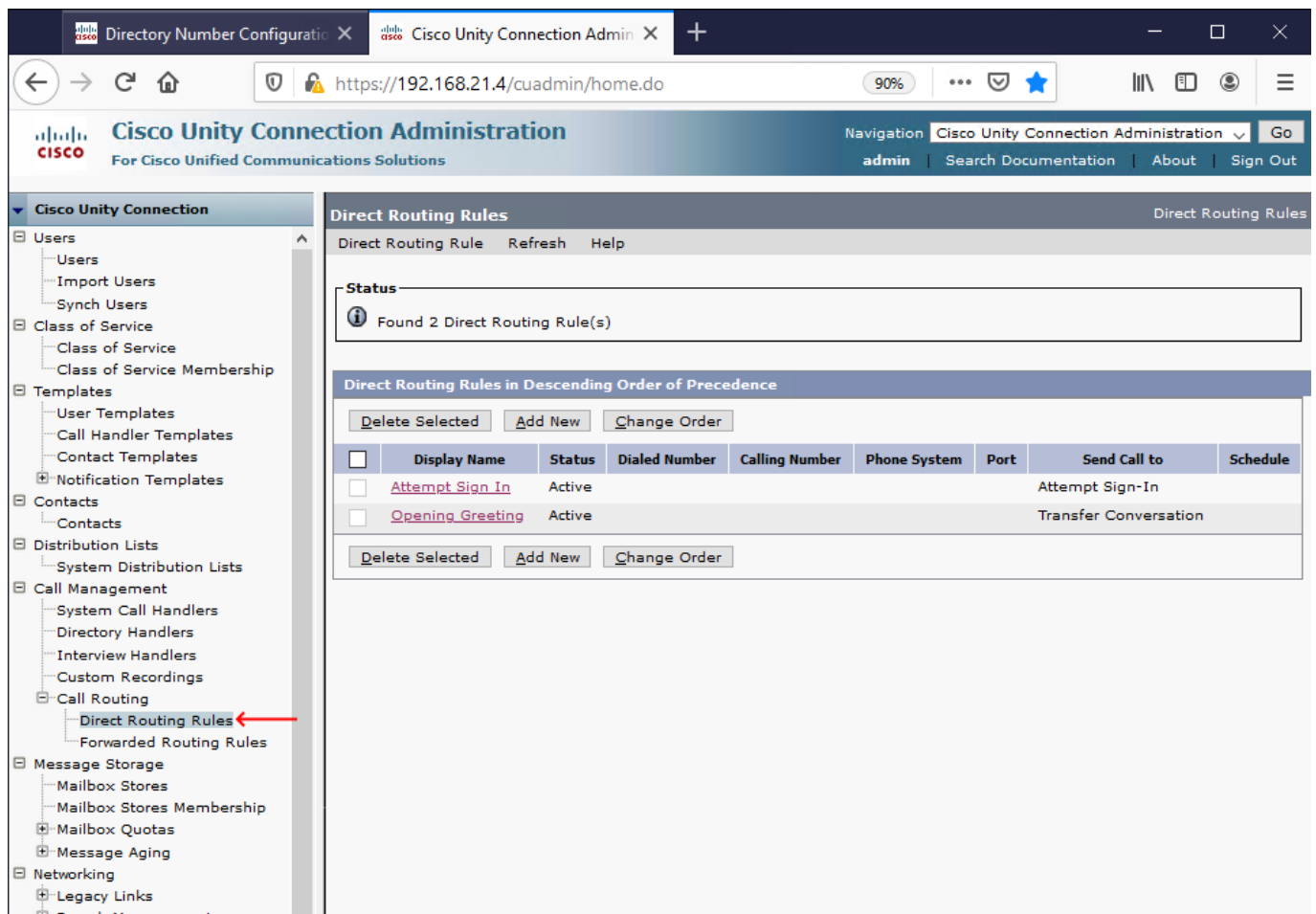
---

## Understanding Call Routing Rules in Cisco Unity Connection

- When we make any call, there are 4 key parameters, Calling Number, Called Number, First Redirecting Number, Last Redirecting Number
- Once we route the call to CUC, Routing Rule decides how to treat the call
- CUC most of the time considers the Redirecting Number (only in forwarded call)

### Direct Call

- When you hit voice message button on the phone or dial voicemail pilot directly
- Here we do not have any redirecting number since the user directly calling the pilot number
- This call is handled in 2 different ways in CUC
- If the Calling Number is not available in CUC Database, we hear the opening greetings “Hello, Cisco Unity Connection Messaging System, from a touch tone telephone you may dial an extension at any time”. Now you might have understood why we got that greetings after the integration 😊
- If the Calling Number is available in CUC database, it will ask for Attempt Sign In option, here we can use Voicemail PIN to authenticate and access our voicemails



The screenshot displays the Cisco Unity Connection Administration web interface. The left sidebar shows the navigation tree with 'Direct Routing Rules' highlighted under 'Call Routing'. The main content area shows the 'Direct Routing Rules' page with a status message 'Found 2 Direct Routing Rule(s)' and a table listing two rules: 'Attempt Sign In' and 'Opening Greeting'.

|                          | Display Name     | Status | Dialed Number | Calling Number | Phone System | Port | Send Call to          | Schedule |
|--------------------------|------------------|--------|---------------|----------------|--------------|------|-----------------------|----------|
| <input type="checkbox"/> | Attempt Sign In  | Active |               |                |              |      | Attempt Sign-In       |          |
| <input type="checkbox"/> | Opening Greeting | Active |               |                |              |      | Transfer Conversation |          |

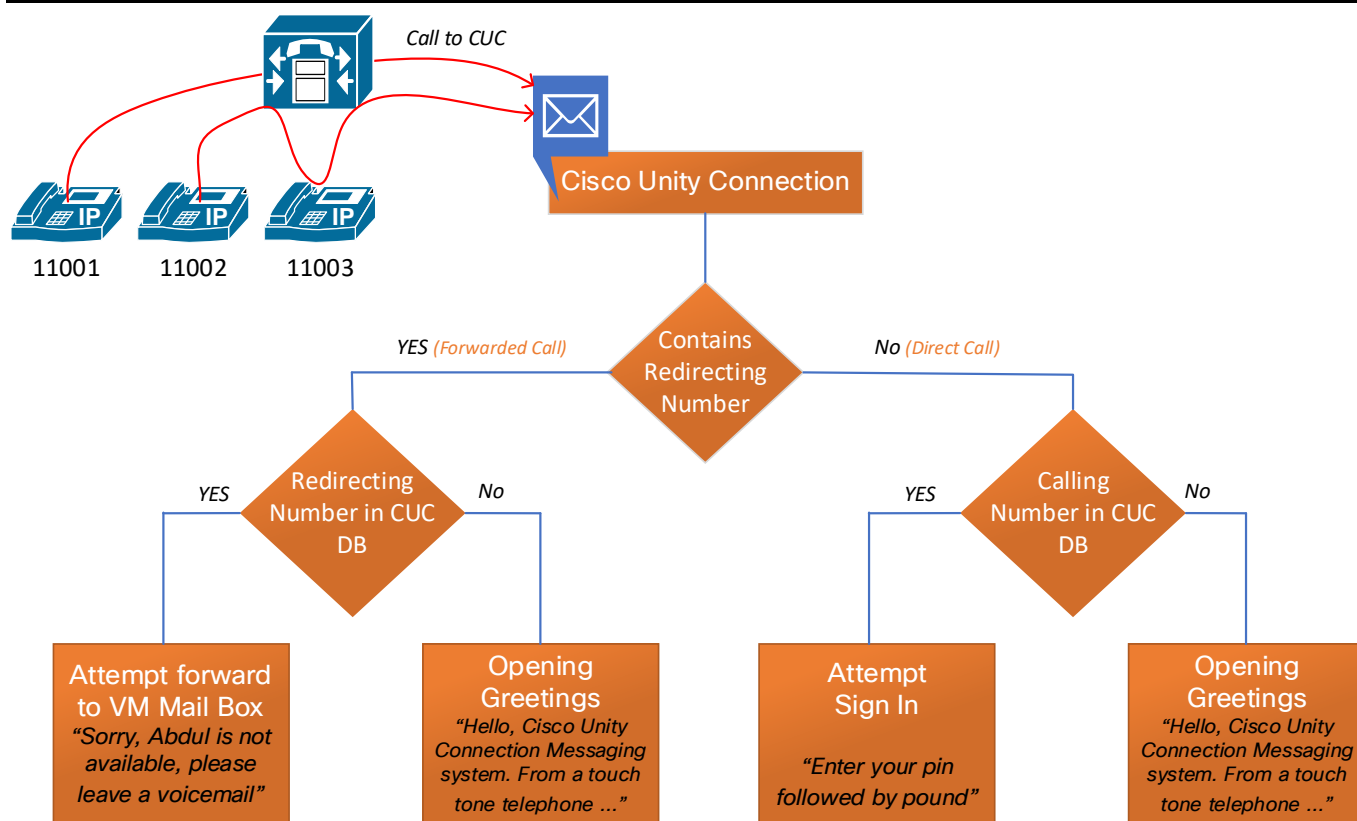
## Forwarded Call

- When you forward your calls to Voicemail and someone calls you, this call will be a forwarded call to CUC and here we have the 'First Redirecting Number'
- This case CUC will always focus on the Redirecting Number and route the call
- If the redirecting number is available in the CUC database, then call will be forwarded to its voicemail box or call handler greetings
- If the Redirected Number is not available in the CUC database, it then goes to Opening Greetings

The screenshot shows the Cisco Unity Connection Administration web interface. The left sidebar contains a navigation tree with categories like Users, Class of Service, Templates, Contacts, Distribution Lists, Call Management, and Message Storage. The 'Forwarded Routing Rules' option under Call Management is highlighted with a red box. The main content area is titled 'Forwarded Routing Rules' and includes a status box indicating 'Found 2 Forwarded Routing Rule(s)'. Below this is a table titled 'Forwarded Routing Rules in Descending Order of Precedence' with columns for Display Name, Status, Dialed Number, Calling Number, Forwarding Station, Phone System, Port, Send Call to, and Schedule. Two rules are listed: 'Attempt Forward' and 'Opening Greeting'. The interface also includes buttons for 'Delete Selected', 'Add New', and 'Change Order'.

|                          | Display Name     | Status | Dialed Number | Calling Number | Forwarding Station | Phone System | Port | Send Call to          | Schedule |
|--------------------------|------------------|--------|---------------|----------------|--------------------|--------------|------|-----------------------|----------|
| <input type="checkbox"/> | Attempt Forward  | Active |               |                |                    |              |      | Attempt Forward       |          |
| <input type="checkbox"/> | Opening Greeting | Active |               |                |                    |              |      | Transfer Conversation |          |

- These are the default call routing treatment in CUC, we could add our own routing rules if we wanted to modify some specific call rather than the default behavior





## [Lab] Changing Authentication Rule

- Authentication rules are the password policy for voicemail user
- Let us disable 'Trivial Passwords' so that we can use simple password

The screenshot shows the Cisco Unity Connection Administration console. The left sidebar is expanded to 'Authentication Rules', which is highlighted with a red arrow. The main content area is titled 'Search Authentication Rules' and shows a search results table. The table has two rows: 'Recommended Voice Mail Authentication Rule' and 'Recommended Web Application Authentication Rule'. A red arrow points to the first rule. The table has columns for 'Display Name' and 'Rows per Page' (set to 25). Below the table are buttons for 'Delete Selected' and 'Add New'.

The screenshot shows the 'Edit Authentication Rule' page for the 'Recommended Voice Mail Authentication Rule'. The left sidebar is expanded to 'Authentication Rules', which is highlighted with a red arrow. The main content area is titled 'Edit Authentication Rule (Recommended Voice Mail Authentication Rule)'. It contains various configuration fields for the authentication rule, including 'Display Name\*', 'Failed Sign-In', 'Reset Every Failed Sign-In Attempts', 'Lockout Duration', 'Minimum Duration between Credential Changes', 'Credential Expires After', 'Expiration Warning Days', 'Minimum Credential Length', 'Minimum Number of Character Changes between Successive Credentials (Web Passwords Only)', and 'Stored Number of Previous Credentials'. The 'Check for Trivial Passwords' checkbox is unchecked, and the text 'Uncheck this' is displayed next to it. A red box highlights the 'Check for Trivial Passwords' checkbox and the text 'Uncheck this'. Below the fields are buttons for 'Save', 'Delete', 'Previous', and 'Next'.

Cisco Unified CM Console x Cisco Unity Connection Admin x +

https://192.168.21.4/cuadmin/home.do

**Cisco Unity Connection Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unity Connection Administration Go  
admin Search Documentation About Sign Out

**Cisco Unity Connection**

- Legacy Links
- Branch Management
  - HTTP(S) Links
  - Locations
  - VPIM
  - Connection Location Passwords
- Unified Messaging
  - Unified Messaging Services
  - Unified Messaging Accounts Status
- SpeechView Transcription
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  - Schedules
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  - Global Nicknames
  - Subject Line Formats
  - Attachment Descriptions
  - Enterprise Parameters

**Edit Authentication Rule (Recommended Web Application Authentication Rule)**

Search Authentication Rules  
Edit Authentication Rule  
(Recommended Web Application Authentication Rule)

Authentication Rule Refresh Help

Save Delete Previous Next

**Edit Authentication Rule**

Display Name\* Recommended Web Application Authentic

Failed Sign-In 7 Attempts ☐ No Limit for Failed Sign-Ins

Reset Every Failed Sign-In Attempts 30 Minutes

Lockout Duration 30 Minutes ☐ Administrator Must Unlock

Minimum Duration between Credential Changes 1440 Minutes

Credential Expires After 120 Days ☐ Never Expires

Expiration Warning Days 15 Days

Minimum Credential Length 8

Minimum Number of Character Changes between Successive Credentials (Web Passwords Only) 1

Stored Number of Previous Credentials 5

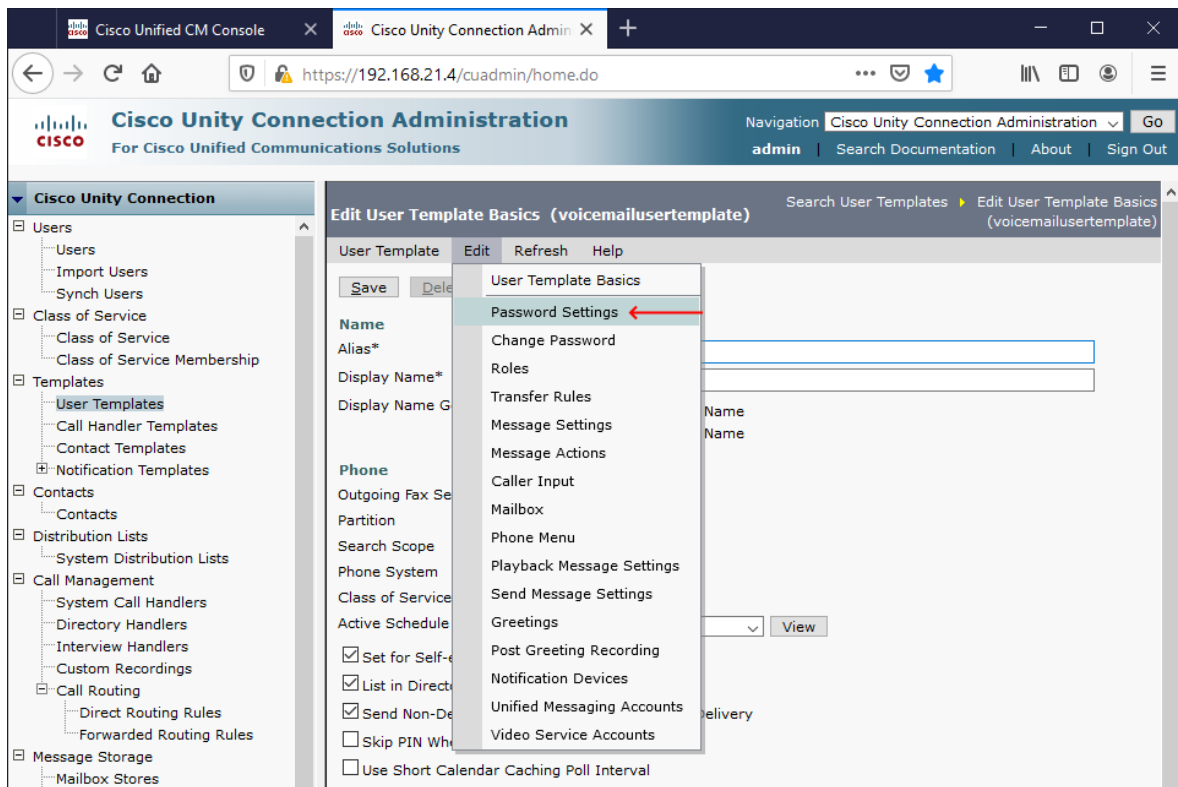
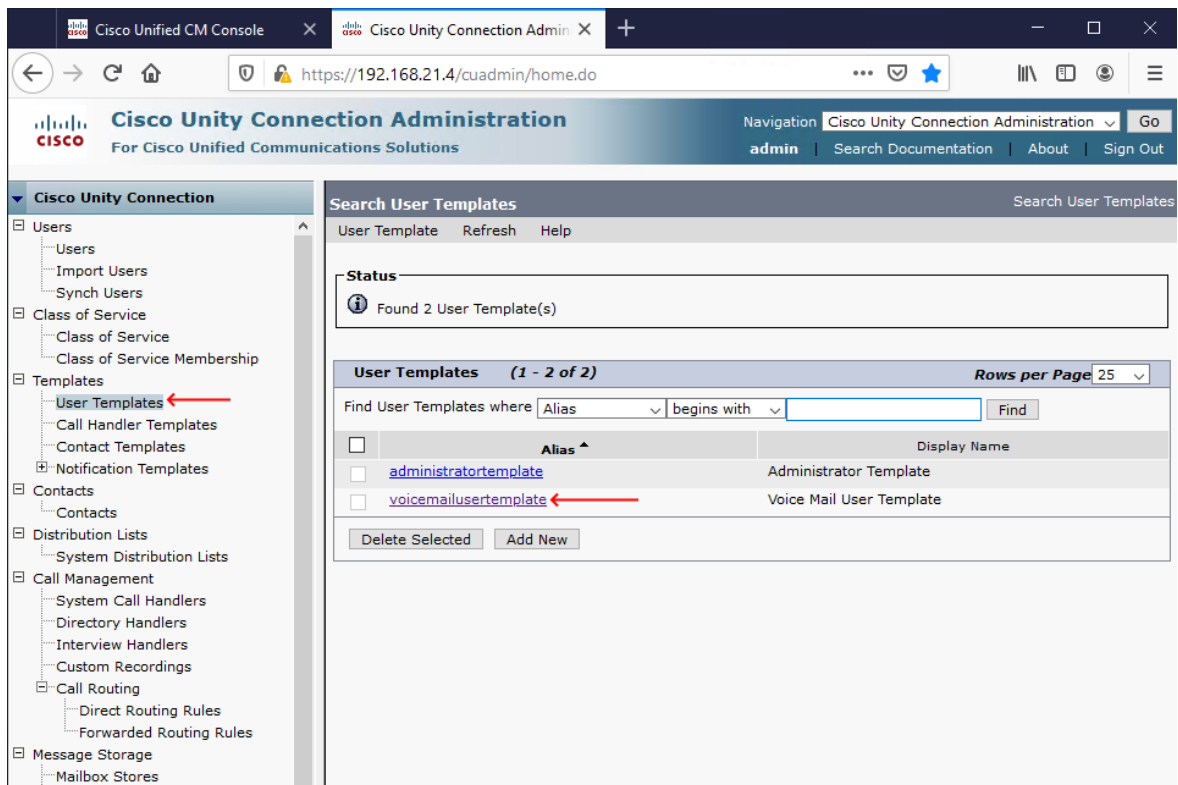
☐ Check for Trivial Passwords *Uncheck this*

Save Delete Previous Next

Fields marked with an asterisk (\*) are required.

## [Lab] Edit Voicemail Template

- Adding users in CUC is always based on voicemail template, hence edit the default 'voicemailusertemplate'
- We can set the default voicemail pin and web inbox password here
- Web inbox is a web GUI where we can manage the voicemails



Cisco Unified CM Console x Cisco Unity Connection Admin x +

https://192.168.21.4/cuadmin/home.do

Cisco Unity Connection Administration  
For Cisco Unified Communications Solutions

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**Cisco Unity Connection**

- Users
  - Users
  - Import Users
  - Synch Users
- Class of Service
  - Class of Service
  - Class of Service Membership
- Templates
  - User Templates
  - Call Handler Templates
  - Contact Templates
  - Notification Templates
- Contacts
  - Contacts
- Distribution Lists
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- Call Management
  - System Call Handlers
  - Directory Handlers
  - Interview Handlers
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  - Call Routing
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    - Forwarded Routing Rules
- Message Storage
  - Mailbox Stores

**Edit Password Settings (Voicemail)** Search User Templates Edit User Template Basics (voicemailusertemplate) Edit Password Settings (Voicemail)

User Template Edit Refresh Help

**Choose PIN**  
Voicemail

Save

**Voicemail PIN Settings**

- ☐ Locked by Administrator
- ☐ User Cannot Change
- ☐ User Must Change at Next Sign-In *Uncheck this*
- ☐ Does Not Expire

Authentication Rule Recommended Voice Mail Authentication Rule

Save

Cisco Unified CM Console x Cisco Unity Connection Admin x +

https://192.168.21.4/cuadmin/home.do

Cisco Unity Connection Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unity Connection Administration Go  
admin Search Documentation About Sign Out

**Cisco Unity Connection**

- Users
  - Users
  - Import Users
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  - Class of Service Membership
- Templates
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- Distribution Lists
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  - System Call Handlers
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- Message Storage
  - Mailbox Stores

**Edit Password Settings (Web Application)** Search User Templates Edit User Template Basics (voicemailusertemplate) Edit Password Settings (Web Application)

User Template Edit Refresh Help

**Choose Password**  
Web Application

Save

**Web Applications Password Settings**

- ☐ Locked by Administrator
- ☐ User Cannot Change
- ☐ User Must Change at Next Sign-In *Uncheck this*
- ☐ Does Not Expire

Authentication Rule Recommended Web Application Authentication Rule

Save

Cisco Unified CM Console x Cisco Unity Connection Admin x

https://192.168.21.4/cuadmin/home.do

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For Cisco Unified Communications Solutions

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  - Call Handler Templates
  - Contact Templates
  - Notification Templates
- Contacts
  - Contacts
- Distribution Lists
  - System Distribution Lists
- Call Management
  - System Call Handlers
  - Directory Handlers
  - Interview Handlers
  - Custom Recordings
- Call Routing
  - Direct Routing Rules
  - Forwarded Routing Rules
- Message Storage
  - Mailbox Stores

**Edit Password Settings (Web Application)**

Search User Templates Edit User Template Basics (voicemailusertemplate) Edit Password Settings (Web Application)

User Template Edit Refresh Help

**Status**

Updated Password

**Choose Password**

Web Application

Save

**Web Application**

☐ Locked by Admin

☐ User Cannot Change Password

☐ User Must Change Password

☐ Does Not Expire

Authentication Rule

Save

Authentication Rule

User Template Basics

Password Settings

Change Password

Roles

Transfer Rules

Message Settings

Message Actions

Caller Input

Mailbox

Phone Menu

Playback Message Settings

Send Message Settings

Greetings

Post Greeting Recording

Notification Devices

Unified Messaging Accounts

Video Service Accounts

Cisco Unified CM Console x Cisco Unity Connection Admin x

https://192.168.21.4/cuadmin/home.do

**Cisco Unity Connection Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unity Connection Administration Go  
admin | Search Documentation | About | Sign Out

**Cisco Unity Connection**

- Users
  - Users
  - Import Users
  - Synch Users
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  - Class of Service
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**Change Password (Voicemail)**

Search User Templates Edit User Template Basics (voicemailusertemplate) Change Password (Voicemail)

User Template Edit Refresh Help

**Choose PIN**

Voicemail

Save

**Voicemail PIN**

PIN

Confirm PIN

Save

Cisco Unified CM Console Cisco Unity Connection Admin

https://192.168.21.4/cuadmin/home.do

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    - Forwarded Routing Rules
- Message Storage
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**Change Password (Web Application)**

Search User Templates Edit User Template Basics  
(voicemailusertemplate) Change Password (Web Application)

User Template Edit Refresh Help

**Choose Password**

Web Application

Save

**Web Applications Password**

Password

Confirm Password

Save

## [Lab] Creating Voicemailbox User

The screenshot shows the Cisco Unity Connection Administration console. The left sidebar displays the navigation tree with 'Users' selected. The main content area shows the 'Search Users' page. A red arrow points to the 'Users' link in the sidebar. Another red arrow points to the 'Add New' button at the bottom of the user list.

**Search Users**

Found 5 User(s)

Search Limits  
Limit search to: All

**Users (1 - 5 of 5)** Rows per Page: 25

|                          | Alias                        | Extension | First Name             | Last Name        | Display Name                            |
|--------------------------|------------------------------|-----------|------------------------|------------------|-----------------------------------------|
| <input type="checkbox"/> | admin                        |           |                        |                  | admin                                   |
| <input type="checkbox"/> | operator                     | 99990     |                        |                  | Operator                                |
| <input type="checkbox"/> | Replication                  |           | Replication            | Agent            | Replication Agent (cuc-pub)             |
| <input type="checkbox"/> | undeliverablemessagesmailbox | 99999     |                        |                  | Undeliverable Messages                  |
| <input type="checkbox"/> | UnityConnection              |           | Cisco Unity Connection | Messaging System | Cisco Unity Connection Messaging System |

Buttons: Delete Selected, Add New, Bulk Edit, Show Dependencies

Key:  
Local User  
Remote User  
Cisco Unity User

The screenshot shows the 'New User' form in the Cisco Unity Connection Administration console. The left sidebar shows the navigation tree with 'Users' selected. The main content area shows the 'New User' form. Red arrows point to the 'User With Mailbox' dropdown, the 'voicemailusertemplate' dropdown, the 'Alias\*' field, and the 'Extension\*' field.

**New User**

Save

New User from Template

User Type: User With Mailbox

Based on Template\*: voicemailusertemplate

**Name**

Alias\*: abdul.jaseem

First Name: Abdul

Last Name: Jaseem

Display Name: Abdul Jaseem

SMTP Address: @cuc-pub.ajcollab.com

**Mailbox Store**

Mailbox Store: Unity Messaging Database -1

**Phone**

Extension\*: 11002

Cross-Server Transfer Extension or URI:

Outgoing Fax Number:

Corporate Email Address:

Save

Fields marked with an asterisk (\*) are required.



Cisco Unified CM Console Cisco Unity Connection Admin

https://192.168.21.4/cuadmin/home.do

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For Cisco Unified Communications Solutions

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admin Search Documentation About Sign Out

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  - Branch Management
  - HTTP(S) Links
  - Locations
  - VPIM
  - Connection Location Passwords
- Unified Messaging
  - Unified Messaging Services
  - Unified Messaging Accounts Status
  - SpeechView Transcription
- Video
  - Video Services
  - Video Services Accounts Status
- Dial Plan
  - Partitions
  - Search Spaces
- System Settings

**Edit User Basics (abdul.jaseem)**

Search Users Edit User Basics (abdul.jaseem)  
Related Links Bulk Edit By CSV Go

Save Delete Previous Next

**Status**  
Created User(s)

**Name**

Alias\* abdul.jaseem  
First Name Abdul  
Last Name Jaseem  
Display Name Abdul Jaseem  
SMTP Address abdul.jaseem@cuc-pub.ajcollab.com  
Initials  
Title  
Employee ID

**LDAP Integration Status**

☐ Integrate with LDAP Directory  
☒ Do Not Integrate with LDAP Directory

**Phone**

Extension\* 11002  
Cross-Server Transfer Extension or URI  
Outgoing Fax Number  
Outgoing Fax Server --- Not Selected ---  
Partition cuc-pub Partition  
Search Scope cuc-pub Search Space  
Phone System PhoneSystem  
Class of Service Voice Mail User COS  
Active Schedule Weekdays View

☐ Set for Self-enrollment at Next Sign-In *Uncheck this*  
☒ List in Directory  
☒ Send Non-Delivery Receipts on Failed Message Delivery  
☐ Skip PIN When Calling From a Known Extension  
☐ Use Short Calendar Caching Poll Interval

**Recorded Name**

javascript:cueInvokeDrawerURL('cutree','/cuadmin/search-external-service-account.do','parent.content','cutree\_51')



- Now you can hear “Enter your pin followed by pound” greetings since we created user and extension in CUC
- You can forward calls to voicemail and try to send a message from any other phone



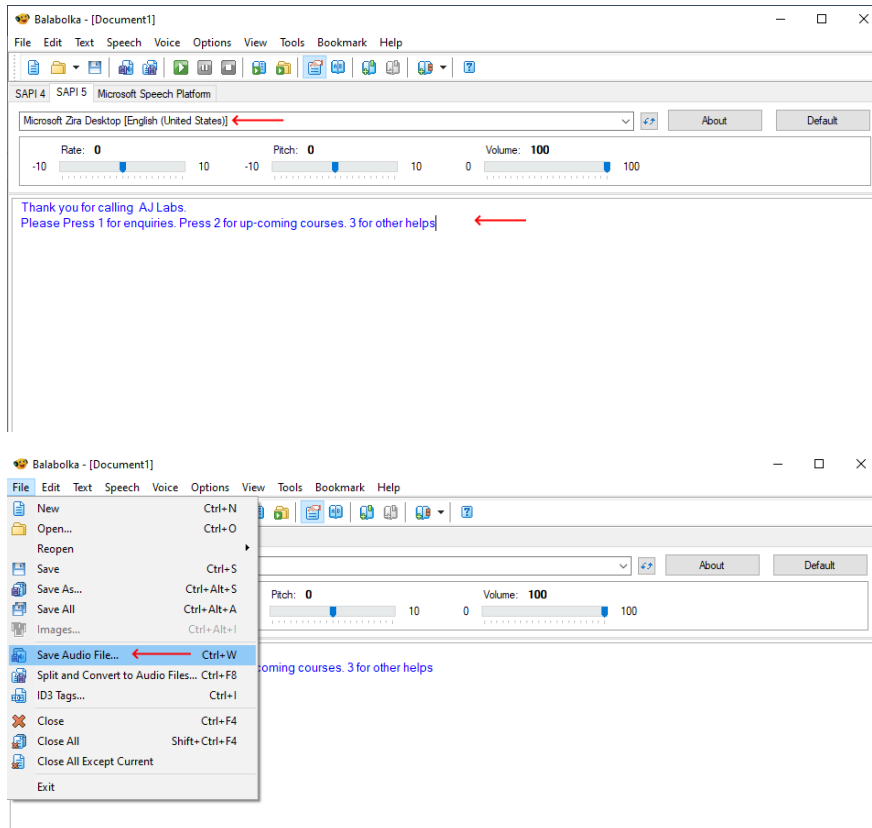


The image shows a Cisco IP Phone interface. At the top, the Cisco logo and 'CISCO IP PHONE' are visible. The screen displays the time '2 18a 08-03-21' and the number '8056311002'. Below this, it says '11002 - Abdul Jaseem' with a small envelope icon. A red arrow points to this icon. The screen also shows 'Forwarded to Voicemail' and three buttons: 'Redial', 'New Call', and 'CFwdALL'. The phone has a standard numeric keypad, a central navigation pad, and several function buttons on the right side, including a question mark button and a redial button.

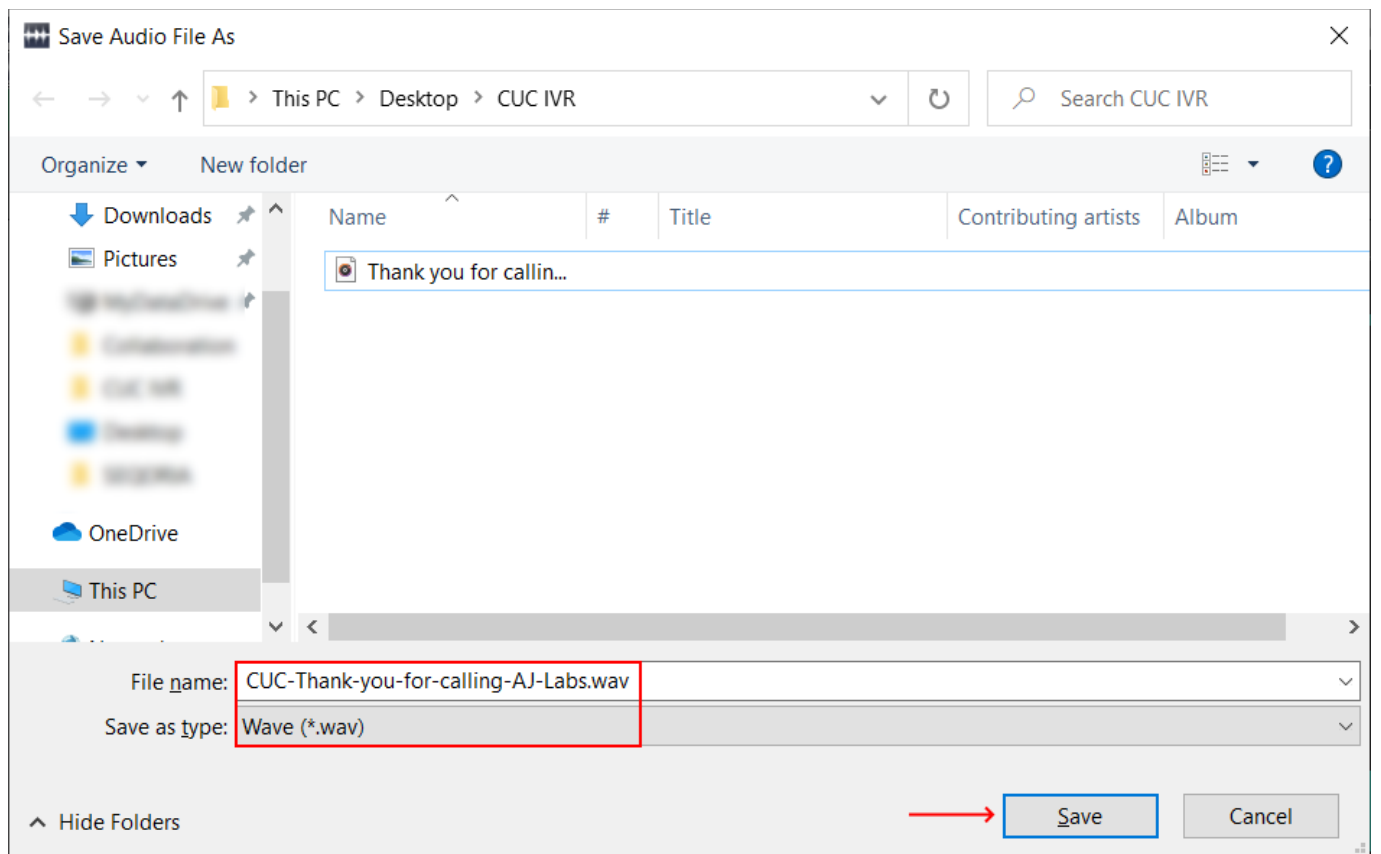
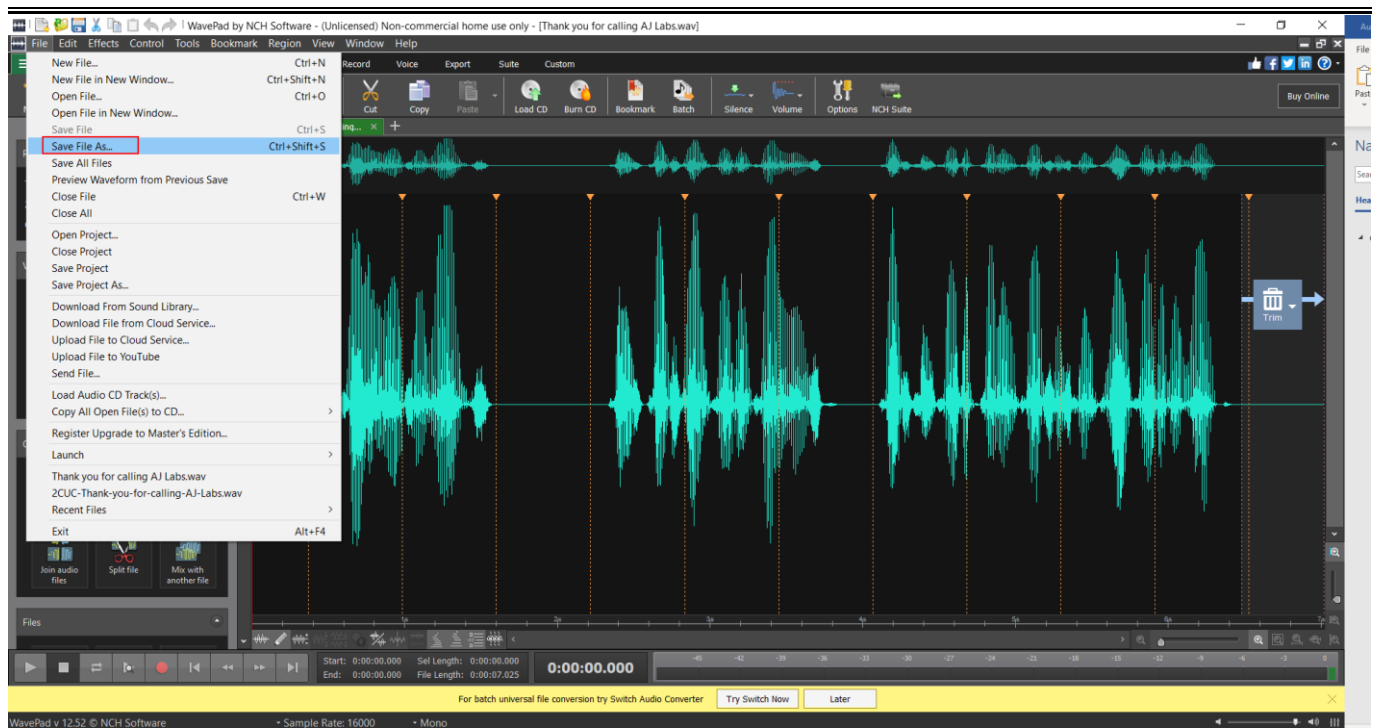
---

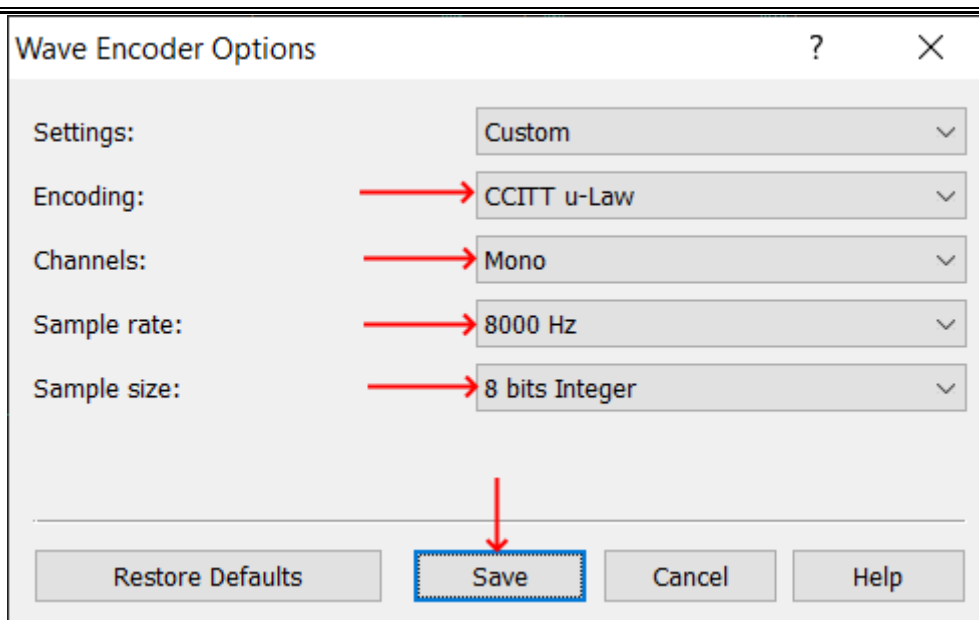
## [Lab] Call Handler with Auto Attendant IVR

- Now let us design an IVR solution. First step we need to have a greeting file
- I have used 'Balabolka' software to create Text to Speech file, you may feel free to record your greetings file



- Once you have the Audio file, whether recorded or TTS, you need to use 'Audacity' or 'WavePad Sound Editor' software to adjust the format and bitrate





## Create a Dummy CTI Route Point AJ-LABS-IVR

The screenshot shows the Cisco Unified CM Administration console. The browser address bar displays `https://192.168.21.1/ccmadmin/showHome.do`. The page header includes the Cisco logo and navigation links. A warning message states: "The system is operating on demo licenses. Manager and install sufficient licenses to provision users and devices." Below this, the system version is listed as 11.5.1.13901-3, and the VMware installation details are provided: 2 vCPU Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz, disk 1: 80Gbytes, 4096Mbytes RAM, Partitions aligned. A dropdown menu is open under the 'Device' tab, showing options: CTI Route Point, Gatekeeper, Gateway, Phone, Trunk, Remote Destination, and Device Settings. The 'CTI Route Point' option is highlighted.

The screenshot shows the Cisco Unified CM Administration console with the 'CTI Route Point Configuration' page. The browser address bar displays `https://192.168.21.1/ccmadmin/ctiRoutePointEdit.do?key=1e444f72-ad5...`. The page header includes the Cisco logo and navigation links. A 'Status' section indicates 'Update successful'. The 'Device Information' section contains the following fields:

|                                                       |                              |
|-------------------------------------------------------|------------------------------|
| Registration:                                         | Unknown                      |
| IPv4 Address:                                         | None                         |
| <input checked="" type="checkbox"/> Device is trusted |                              |
| Device Name*                                          | AJ-LABS-IVR                  |
| Description                                           | AJ-LABS-IVR                  |
| Device Pool*                                          | BANGALORE-PHONES-DEVICE-POOL |
| Common Device Configuration                           | < None >                     |
| Calling Search Space                                  | < None >                     |
| Location*                                             | Hub_None                     |
| User Locale                                           | < None >                     |
| Media Resource Group List                             | < None >                     |
| Network Hold MOH Audio Source                         | < None >                     |
| User Hold MOH Audio Source                            | < None >                     |
| Use Trusted Relay Point*                              | Default                      |
| Calling Party Transformation CSS                      | < None >                     |
| Geolocation                                           | < None >                     |

The 'Use Device Pool Calling Party Transformation CSS' checkbox is checked. The 'Association' section shows a link to 'Line [1] - Add a new DN'. The page footer includes buttons for Save, Delete, Copy, Reset, Apply Config, and Add New.

Directory Number Configuration
Cisco Unity Connection Admin
https://192.168.21.1/ccadmin/directoryNumberEdit.do?key=1559d19c...
Cisco Unified CM Administration
Navigation Cisco Unified CM Administration
Go
admin Search Documentation About Logout
System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help
Directory Number Configuration
Related Links: Configure Device (AJ-LABS-IVR) Go
Save Delete Reset Apply Config Add New
Status
Add successful
Directory Number Information
Directory Number\* 10002
Route Partition BANGALORE-INTERNAL-PT
Description 10002 - AJ-LABS-IVR
Alerting Name 10002 - AJ-LABS-IVR
ASCII Alerting Name 10002 - AJ-LABS-IVR
External Call Control Profile < None >
Associated Devices AJ-LABS-IVR
Dissociate Devices
Urgent Priority
Edit Device
Edit Line Appearance
Directory Number Settings
Voice Mail Profile CUC-VM-PROFILE
Calling Search Space < None >
BLF Presence Group\* Standard Presence group
User Hold MOH Audio Source < None >
Network Hold MOH Audio Source < None >
Reject Anonymous Calls
Enterprise Alternate Number
Add Enterprise Alternate Number
+E.164 Alternate Number
Add +E.164 Alternate Number
Directory URIs
Primary URI Partition Advertise Globally via ILS
Add Row

Directory Number Configuration
Cisco Unity Connection Admin
https://192.168.21.1/ccadmin/directoryNumberEdit.do?key=1559d19c...
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System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help
Directory Number Configuration
Related Links: Configure Device (AJ-LABS-IVR) Go
Save Delete Reset Apply Config Add New
via ILS
Add Row
PSTN Failover for Enterprise Alternate Number, +E.164 Alternate Number, and URI Dialing
Advertised Failover Number < None >
AAR Settings
Voice Mail AAR Destination Mask AAR Group
AAR or
Retain this destination in the call forwarding history
Call Forward and Call Pickup Settings
Voice Mail Destination Calling Search Space
Calling Search Space Activation Policy Use System Default
Forward All or
Secondary Calling Search Space for Forward All < None >
Forward Busy Internal or < None >
Forward Busy External or < None >
Forward No Answer Internal or < None >
Forward No Answer External or < None >
Forward No Coverage Internal or < None >
Forward No Coverage External or < None >
Forward on CTI Failure or < None >
Forward Unregistered Internal or < None >
Forward Unregistered External or < None >

Directory Number Configuratio
Cisco Unity Connection Admin

https://192.168.21.1/ccmadmin/directoryNumberEdit.do?key=1559d19c

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go  
admin Search Documentation About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Directory Number Configuration Related Links: Configure Device (AJ-LABS-IVR) Go

Save Delete Reset Apply Config Add New

Communication Access Level  
Call Control Agent Profile < None >

Line Settings for All Devices  
Hold Reversion Ring Duration (seconds) Setting the Hold Reversion Ring Duration to zero will disable the feature  
Hold Reversion Notification Interval (seconds) Setting the Hold Reversion Notification Interval to zero will disable the feature  
Party Entrance Tone\* Default

Line 1 on Device AJ-LABS-IVR  
Display (Caller ID) 10002 - AJ-LABS-IVR Display text for a line appearance is intended for displaying text such as a name instead of a directory number for calls. If you specify a number, the person receiving a call may not see the proper identity of the caller.  
ASCII Display (Caller ID) 10002 - AJ-LABS-IVR  
External Phone Number Mask

Multiple Call/Call Waiting Settings on Device AJ-LABS-IVR  
Note: The range to select the Max Number of calls is: 1-10000  
Maximum Number of Calls\* 5000  
Busy Trigger\* 4500 (Less than or equal to Max. Calls)

Forwarded Call Information Display on Device AJ-LABS-IVR  
☐ Caller Name  
☐ Caller Number  
☐ Redirected Number  
☐ Dialed Number

Users Associated with Line  
Associate End Users

Save Delete Reset Apply Config Add New

\*- indicates required item.  
\*\*- Changes to Line or Directory Number settings require restart.

Find and List CTI Route Points
Cisco Unity Connection Admin

https://192.168.21.4/cuadmin/home.do

Cisco Unity Connection Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unity Connection Administration Go  
admin Search Documentation About Sign Out

Cisco Unity Connection

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Synch Users  
Class of Service  
Class of Service Membership  
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Call Handler Templates  
Contact Templates  
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System Distribution Lists  
Call Management  
System Call Handlers  
Directory Handlers  
Interview Handlers  
Custom Recordings  
Call Routing  
Direct Routing Rules  
Forwarded Routing Rules  
Message Storage

Search Call Handlers  
Call Handler Refresh Help

Status  
Found 3 System Call Handler(s)

Search Limits  
Limit search to All

System Call Handlers (1 - 3 of 3) Rows per Page 25

Find System Call Handlers where Display Name begins with Find

Display Name Extension  
Goodbye  
Opening Greeting  
Operator 0

Delete Selected Add New Bulk Edit Show Dependencies



Find and List CTI Route Points x Cisco Unity Connection Admin x

https://192.168.21.4/cuadmin/home.do

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For Cisco Unified Communications Solutions

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    - Locations
    - VPIM
    - Connection Location Passwords
- Unified Messaging
  - Unified Messaging Services
  - Unified Messaging Accounts Status
  - SpeechView Transcription
- Video
  - Video Services
  - Video Services Accounts Status
- Dial Plan
  - Partitions
  - Search Spaces
- System Settings

**New Call Handler** Search Call Handlers New Call Handler

Call Handler Reset Help

Save

**Call Handler**

Display Name\* AJ-LABS-IVR

Extension 10002

Call Handler Template System Call Handler Template

Save

Fields marked with an asterisk (\*) are required.



Find and List CTI Route Points

Cisco Unity Connection Admin

<https://192.168.21.4/cuadmin/home.do>

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  - Video Services
  - Video Services Accounts Status
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- System Settings

Greetings

Search Call Handlers | Edit Call Handler Basics (A3-LABS-IVR) | Greetings

Call Handler | Edit | Refresh | Help

Save

| Greetings                           |                           |             |              |              |  |
|-------------------------------------|---------------------------|-------------|--------------|--------------|--|
| Enabled                             | Greeting                  | End Date    | Audio Source | Video Source |  |
| <input type="checkbox"/>            | <a href="#">Alternate</a> | --          | System       | Blank        |  |
| <input type="checkbox"/>            | <a href="#">Busy</a>      | --          | System       | Blank        |  |
| <input checked="" type="checkbox"/> | <a href="#">Error</a>     | No End Date | System       | Blank        |  |
| <input type="checkbox"/>            | <a href="#">Internal</a>  | --          | System       | Blank        |  |
| <input type="checkbox"/>            | <a href="#">Closed</a>    | --          | System       | Blank        |  |
| <input checked="" type="checkbox"/> | <a href="#">Standard</a>  | No End Date | System       | Blank        |  |
| <input type="checkbox"/>            | <a href="#">Holiday</a>   | --          | System       | Blank        |  |

Save

All dates and times displayed in (GMT+05:30) Calcutta, Chennai, Mumbai, New Delhi



Find and List CTI Route Points Cisco Unity Connection Admin

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**Callers Hear**

☐ System Default Greeting

☒ **My Personal Recording**

☐ Nothing

☒ Play the "Record Your Message at the Tone" Prompt

**Callers See**

☐ My Personal Recording

☐ Play the "Record Your Message at the Tone" Prompt

**During Greeting**

☐ Ignore Caller Input

☐ Allow Transfers to Numbers Not Associated with Users or Call Handlers

Times to Re-prompt Caller

Delay between Re-prompts\*  seconds

**After Greeting**

☒ **Call Action** Restart Greeting

☐ Call Handler AJ-LABS-IVR

☒ Attempt Transfer

☐ Go Directly to Greetings

☐ Interview Handler

☐ Directory Handler System Directory Handler

☐ Conversation Broadcast Message Administrator

☐ User with Mailbox abdul.jaseem

☒ Attempt Transfer

☐ Go Directly to Greetings

**Recordings**

Recorded Languages: English(United States)

Select Language English(United States)

Upload the Audio file here

10002 Number or URI

Volume 1x Speed

Save

All dates and times displayed in (GMT+05:30) Calcutta, Chennai, Mumbai, New Delhi

Fields marked with an asterisk (\*) are required.

Find and List CTI Route Points Cisco Unity Connection Admin

https://192.168.21.4/cuadmin/home.do

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    - Forwarded Routing Rules
- Message Storage
  - Mailbox Stores
  - Mailbox Stores Membership
  - Mailbox Quotas
  - Message Aging
- Networking

**Greetings**

Search Call Handlers Edit Call Handler Basics (AJ-LABS-IVR) Greetings

Call Handler Edit Refresh Help

Save

**Greetings**

☐ Alt

☐ Bu

☒ En

☐ In

☐ Closed

☒ Standard

☐ Holiday

**Call Handler Basics**

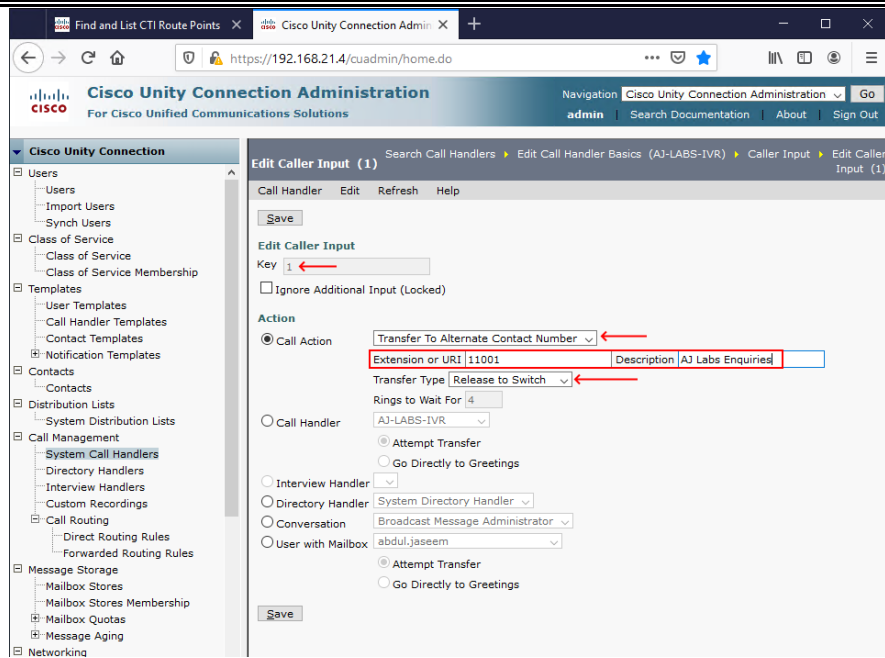
Transfer Rules

Caller Input

| Date        | Audio Source | Video Source |
|-------------|--------------|--------------|
|             | System       | Blank        |
|             | System       | Blank        |
|             | System       | Blank        |
|             | System       | Blank        |
|             | System       | Blank        |
| No End Date | Recording    | Blank        |
| --          | System       | Blank        |

Save

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## Cisco Unity Connection Web Inbox

**Cisco Unity Connection Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unity Connection Administration Go  
admin | Search Documentation | About | Sign Out

**Class of Service (Voice Mail User COS)**

Class of Service Refresh Help

Save Delete Previous Next

**Edit Class of Service**

Display Name\* Voice Mail User COS

**Recorded Name**

☒ Allow User to Record Name  
Maximum Length 30 Seconds

**Directory Listing**

☒ Allow Users to Choose to Be Listed in the Directory

**Greetings**

Maximum Length 90 Seconds

**Licensed Features**

☐ Allow Users to Access Voicemail Using an IMAP Client and/or Single Inbox

☐ Allow IMAP Users to Access Message Bodies

☒ Allow IMAP Users to Access Message Bodies Except on Private Messages

☐ Allow IMAP Users to Access Message Headers Only

☒ Allow Users to Use the Web Inbox and RSS Feeds

☐ Allow Access to Advanced Features

☐ Allow Access to Exchange Email by Using Text to Speech (TTS)

Unity Connection

https://192.168.21.4/inbox/

**Cisco Unity Connection Web Inbox**

abdul.jaseem Sign Out

Messages Settings

Inbox Deleted Sent

New message Refresh

| From             | Subject                               | Received | Duration |
|------------------|---------------------------------------|----------|----------|
| Deepika Padukone | Message from Deepika Padukone (11002) | 3:22 PM  | 2.1s     |

1 - 1 of 1

Phone Computer

---

## **Chapter 1 Module 4 - IMP**

### **Cisco On-Premise Collaboration Solution**

### **Cisco Unified IM and Presence (IMP)**





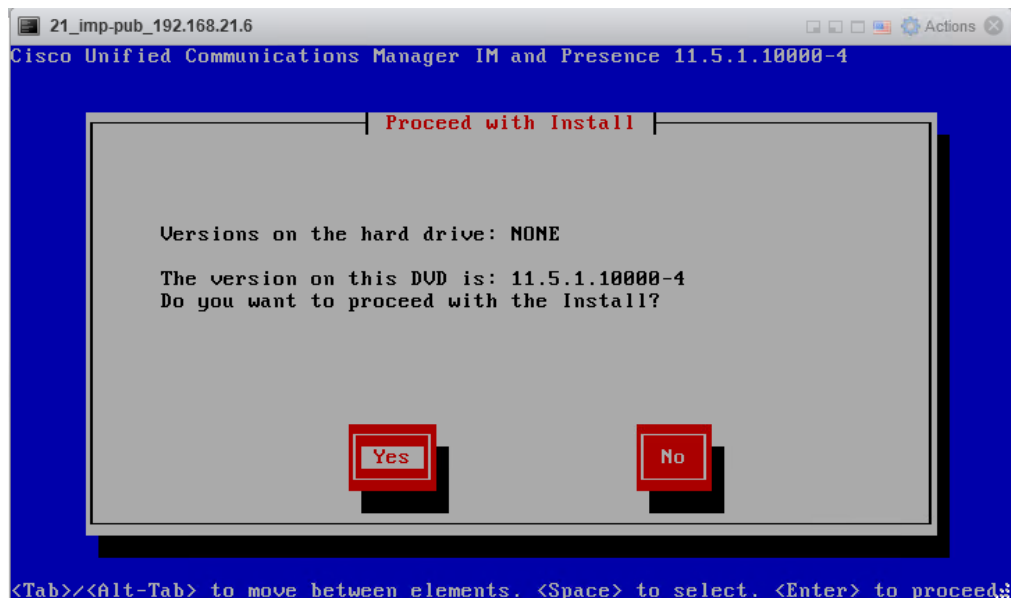
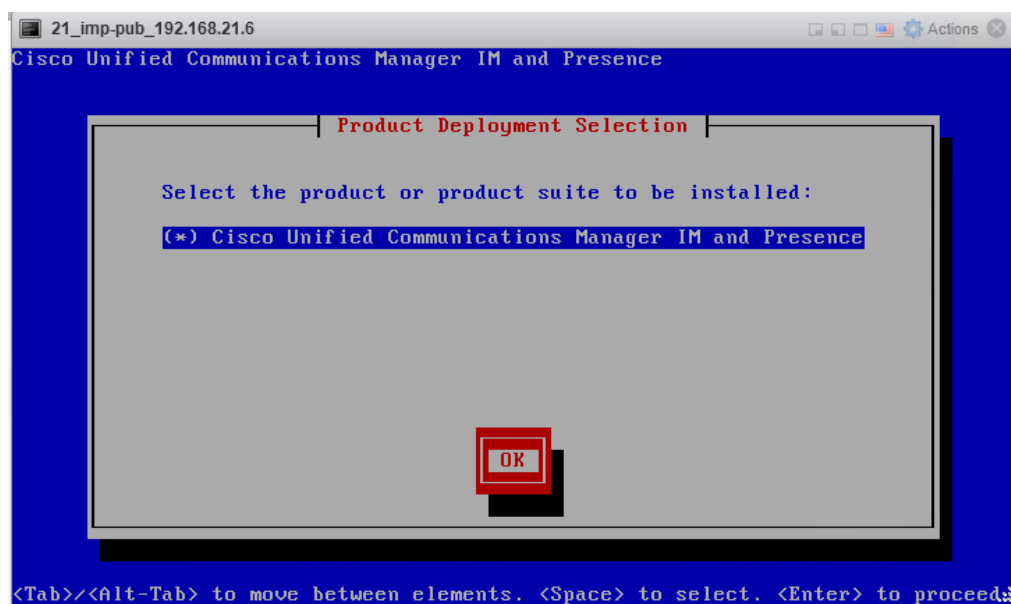
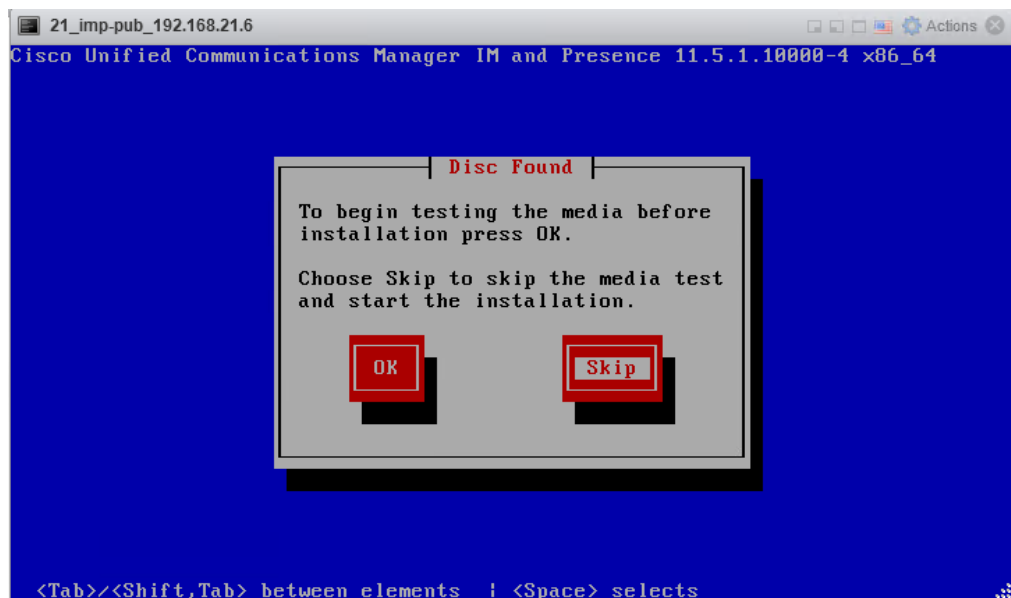
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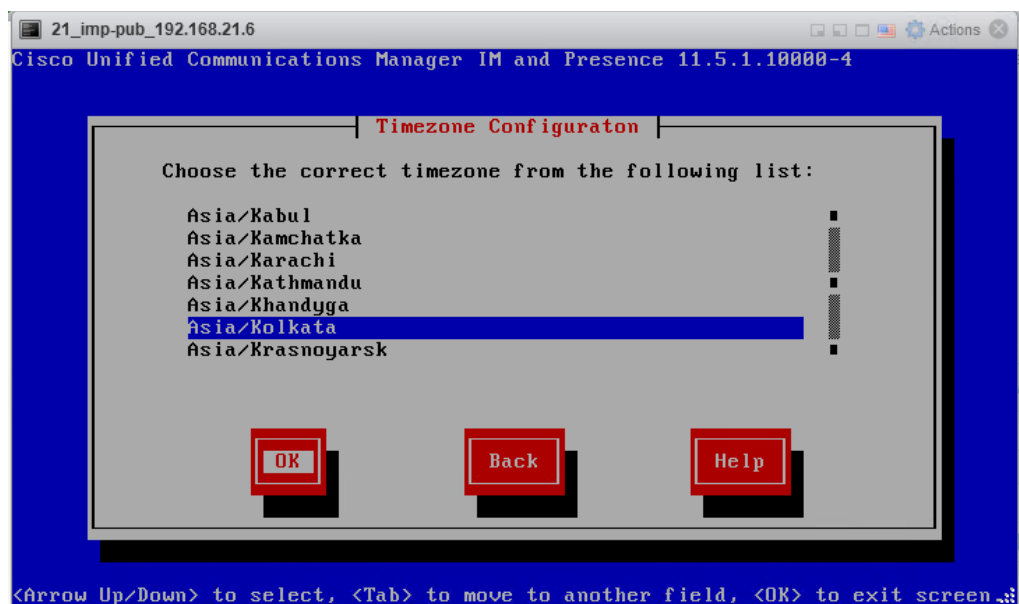
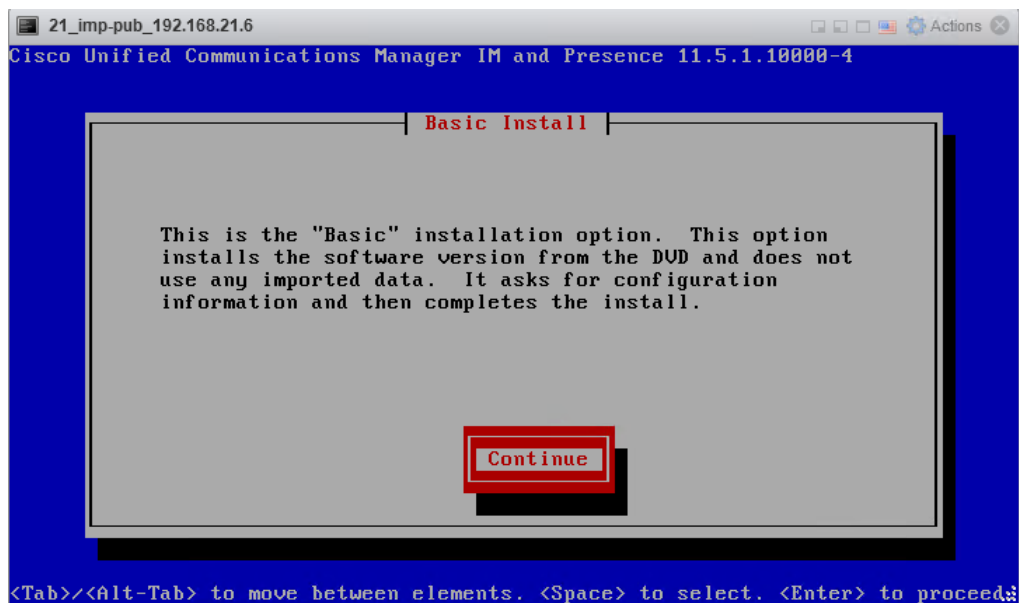
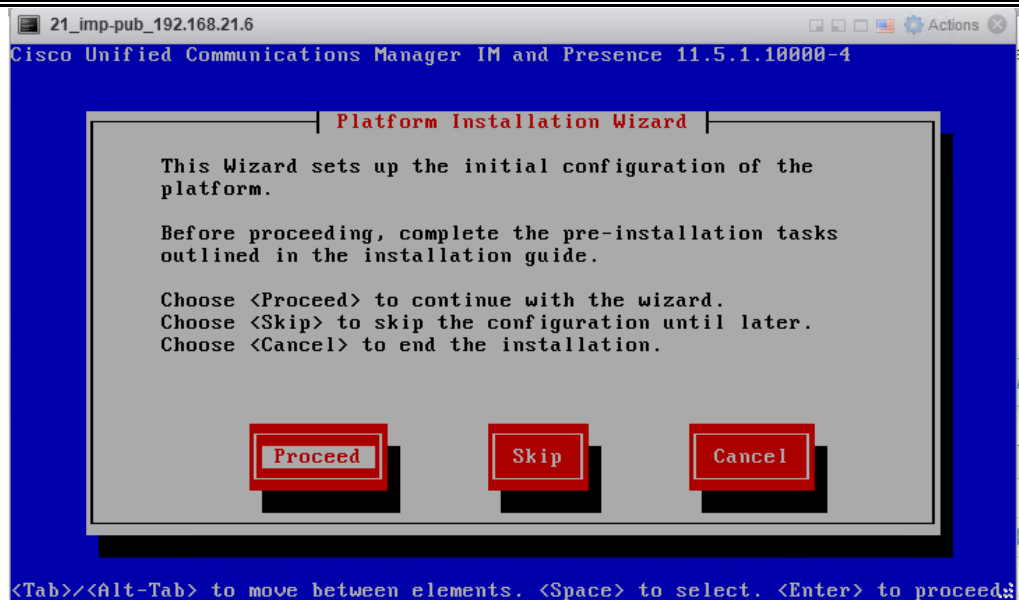
## IM and Presence (IMP) Server

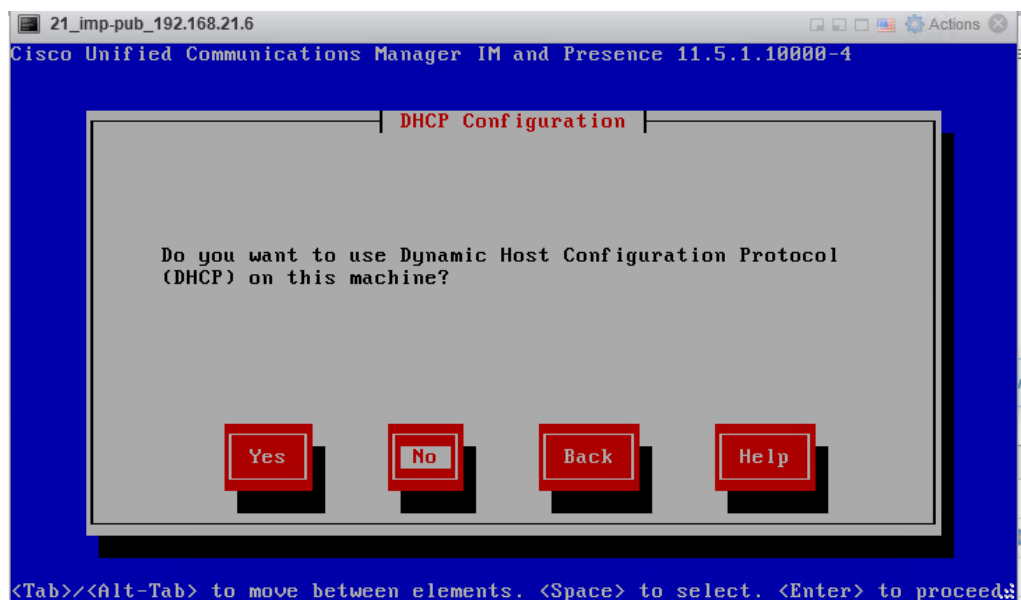
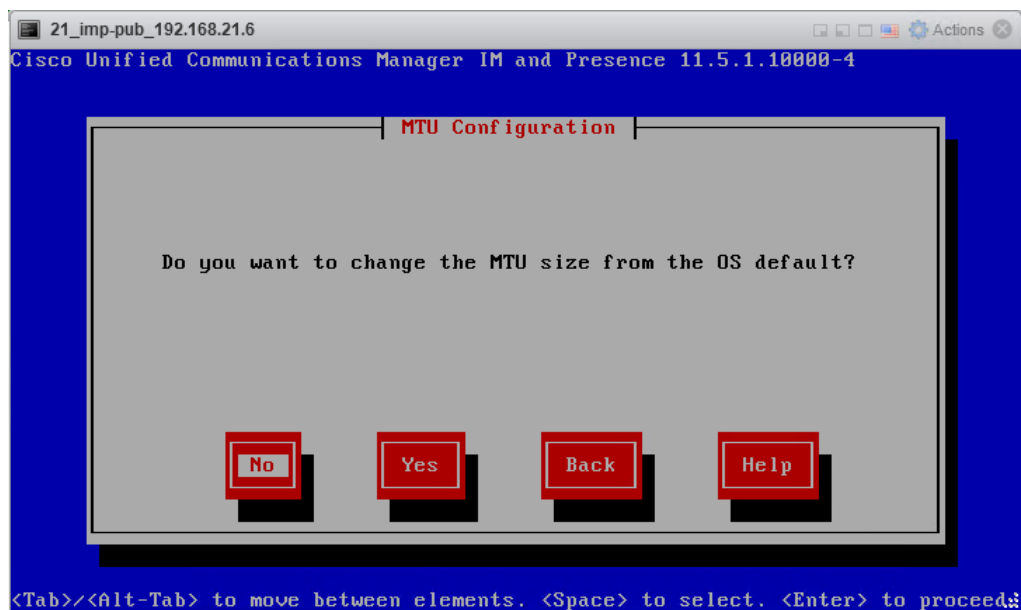
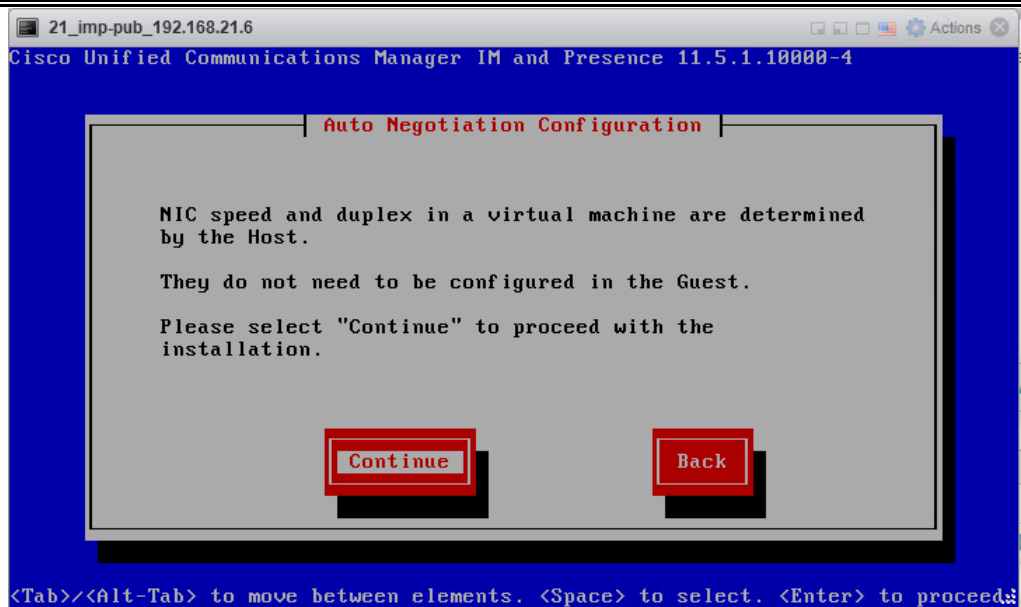


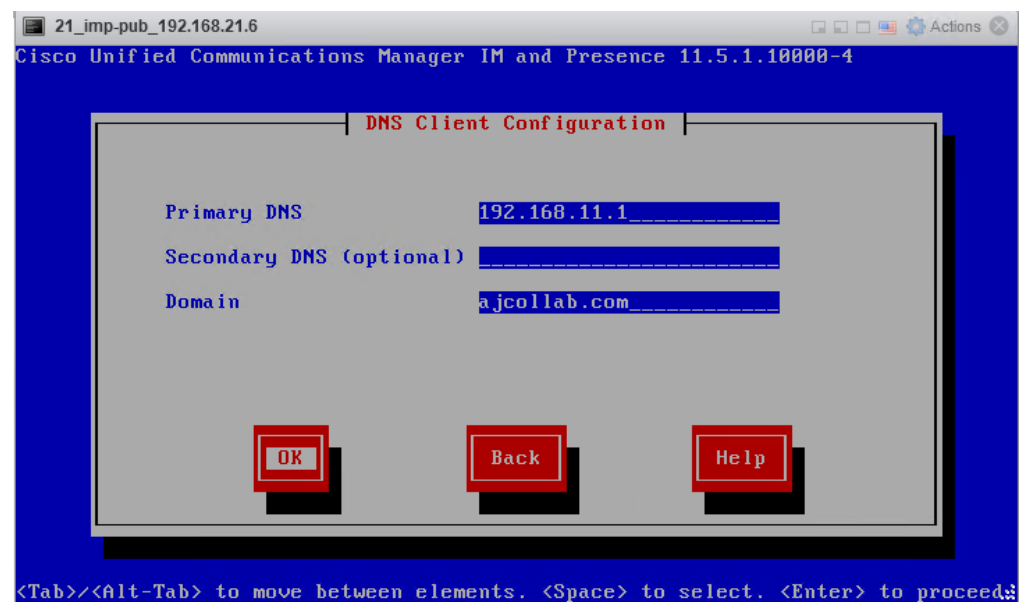
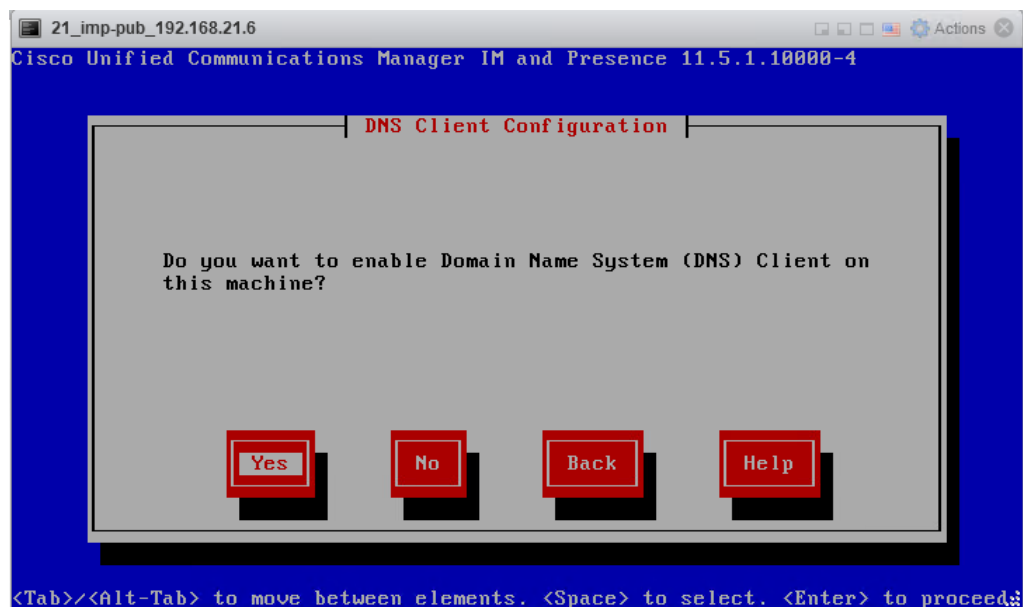
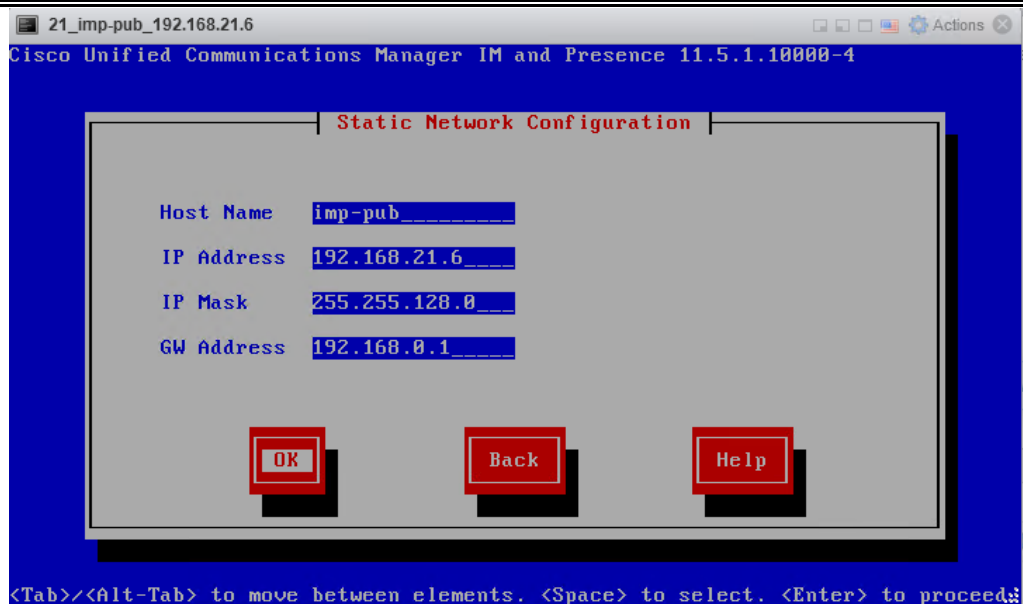
- The Instant Messaging & Presence (IM&P) service is an extensive messaging and presence collaboration service
- Provide Jaber Chat facility and presence (availability) service
- IM and Presence Servers are a part of the CUCM Cluster and installed as a Subscriber node to CUCM Publisher
- The first installed IM&P becomes IM and Presence Database Publisher and remaining are IM and Presence database subscribers
- IMP Publisher maintains the IMP database though IM&Ps are Subscriber to CUCM Publisher. That means the IMP Database replication is managed by IMP Publisher not CUCM Publisher

## [Lab] IMP Installation









21\_imp-pub\_192.168.21.6 Cisco Unified Communications Manager IM and Presence 11.5.1.10000-4

**Administrator Login Configuration**

Enter the Platform administration username and password.  
Choose Help for username and password guidelines.

Administrator ID

Password

Confirm Password

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed;

21\_imp-pub\_192.168.21.6 Cisco Unified Communications Manager IM and Presence 11.5.1.10000-4

**Certificate Information**

Enter information about your organization. This is used to generate security certificates for this node.

Organization

Unit

Location

State

Country   
Indonesia  
Iran

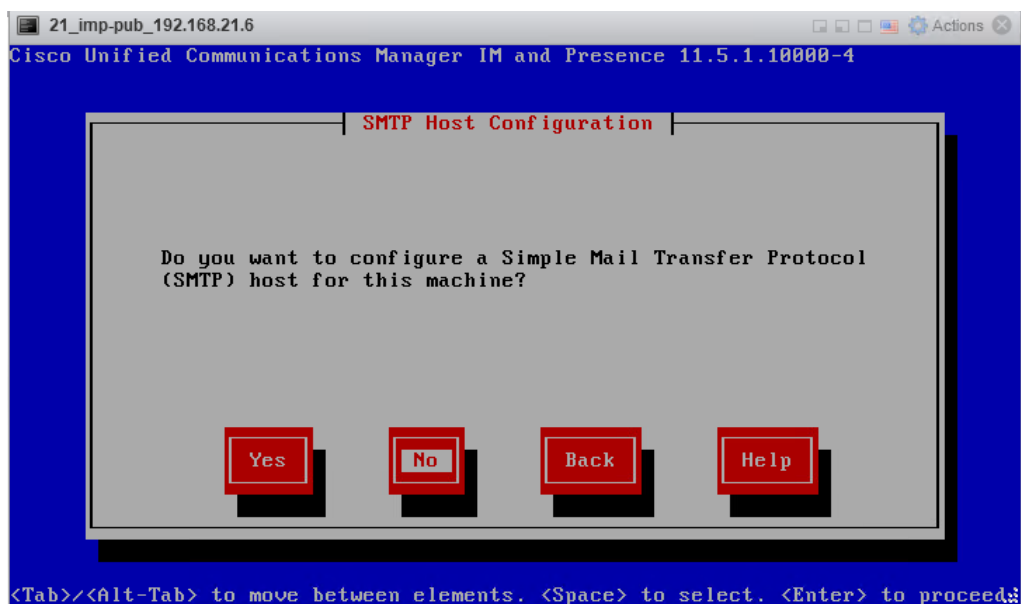
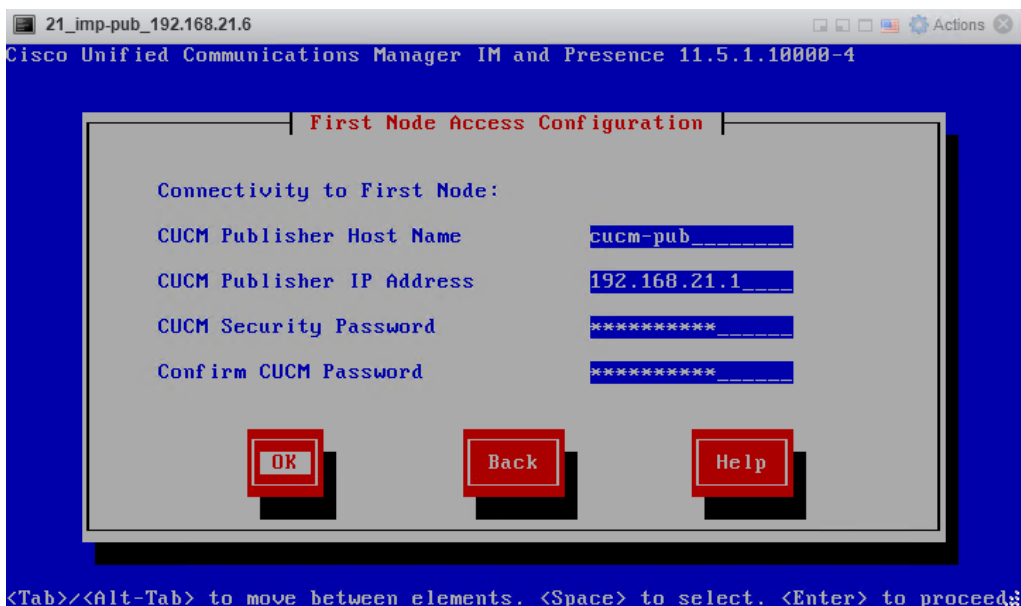
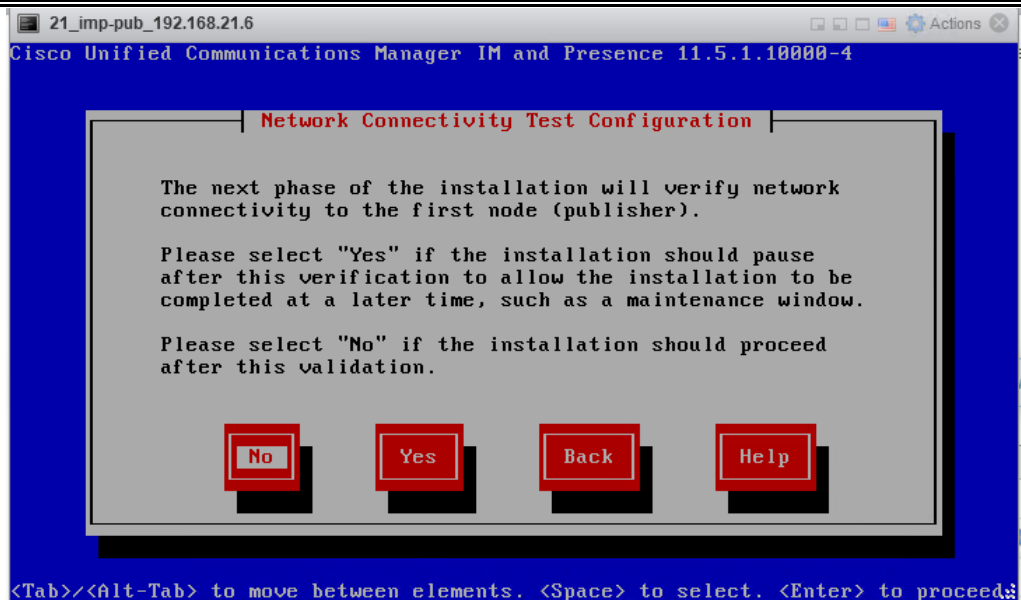
<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed;

21\_imp-pub\_192.168.21.6 Cisco Unified Communications Manager IM and Presence 11.5.1.10000-4

**First Node Configuration**

Warning: This is not the First Node in the cluster.  
You must first configure this server on the First Node before you can proceed. Also, this node must have network access to the First Node, which must be in service for the installation to complete successfully.

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed;





- There is no difference in IMP SUB Installation, it is exactly similar to IMP PUB, the whole cluster configuration is managed by CUCM PUB but the DB Replication is handled by IMP PUB
- The initially installed server becomes IMP PUB



## [Lab] IMP Integration with CUCM

The screenshot shows the Cisco Unified CM Administration web interface. The browser address bar displays `https://192.168.21.1/ccmadmin/showHome.do`. The page header includes the Cisco logo and navigation links for `admin`, `Search Documentation`, `About`, and `Logout`. A top navigation bar lists various system components: `System`, `Call Routing`, `Media Resources`, `Advanced Features`, `Device`, `Application`, `User Management`, `Bulk Administration`, and `Help`. On the left, a sidebar menu is expanded, showing a tree structure of configuration options. The `Presence Redundancy Groups` option is highlighted with a red arrow. The main content area displays a warning message about demo licenses expiring in 60 days and a section titled `Administration` with system information.

Navigation: Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Server

Cisco Unified CM

Cisco Unified CM Group

Presence Redundancy Groups ←

Phone NTP Reference

Date/Time Group

BLF Presence Group

Region Information ▶

Device Pool

Device Mobility ▶

DHCP

LDAP

SAML Single Sign-On

Cross-Origin Resource Sharing (CORS)

Location Info ▶

MLPP ▶

Physical Location

SRST

Enterprise Parameters

Enterprise Phone Configuration

Service Parameters

Security ▶

Application Server

Licensing ▶

Geolocation Configuration

Geolocation Filter

E911 Messages

ing on demo licenses that will expire in 60 days. Add this system to a Cisco Prime License efficient licenses to cover its usage before expiration in order to avoid losing the ability to vices.

Administration

tel(R) Xeon(R) CPU E5-2643 v2 @ 3.30GHz, 66MBbytes RAM, Partitions aligned

on Monday, March 8, 2021 3:19:15 PM IST, to node 192.168.21.1, from 192.168.11.1 using HTTPS

s, Inc.

ures and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are d local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to this product immediately.

o cryptographic products may be found at our [Export Compliance Product Report](#) web site.

munications Manager please visit our [Unified Communications System Documentation](#) web site.

our [Technical Support](#) web site.

The screenshot shows the `Presence Redundancy Group Configuration` page in the Cisco Unified CM Administration console. The browser address bar displays `https://192.168.21.1/ccmadmin/presenceRedundancyGroupEdit.do?key=...`. The page header is consistent with the previous screenshot. The main content area features a `Presence Redundancy Group Configuration` section with a `Status` indicator showing `Ready`. Below this, there are two configuration sections. The first section, `Presence Redundancy Group Configuration`, includes fields for `Name*` (set to `DefaultCUPSubcluster`) and `Description` (set to `Default subcluster`). The second section, `Presence Redundancy Group Configuration`, includes dropdown menus for `Presence Server*` (set to `imp-pub`) and `Presence Server` (set to `imp-sub`). At the bottom, there are buttons for `Save`, `Delete`, and `Add New`, along with a note indicating that an asterisk (\*) denotes a required item.

Navigation: Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Presence Redundancy Group Configuration Related Links: Back To Find/List Go

Save Delete Add New

Status

Status: Ready

Presence Redundancy Group Configuration

Name\* DefaultCUPSubcluster ←

Description Default subcluster

Presence Redundancy Group Configuration

Presence Server\* imp-pub ←

Presence Server imp-sub ←

Save Delete Add New

\* - indicates required item.

Cisco Unified Serviceability-Service Activation

Navigation Cisco Unified Serviceability Go

admin About Logout

Alarm Trace Tools Snmp CallHome Help

Service Activation Related Links: Control Center - Feature Services Go

Save Set to Default Refresh

Status: Ready

Select Server

Server\* cucm-sub01--CUCM Voice/Video Go

☐ Check All Services

CM Services

|                                     | Service Name                        | Activation Status |
|-------------------------------------|-------------------------------------|-------------------|
| <input checked="" type="checkbox"/> | Cisco CallManager                   | Activated         |
| <input type="checkbox"/>            | Cisco IP Voice Media Streaming App  | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco CTIManager                    | Activated         |
| <input type="checkbox"/>            | Cisco Extension Mobility            | Deactivated       |
| <input type="checkbox"/>            | Cisco Extended Functions            | Deactivated       |
| <input type="checkbox"/>            | Cisco DHCP Monitor Service          | Deactivated       |
| <input type="checkbox"/>            | Cisco Location Bandwidth Manager    | Deactivated       |
| <input type="checkbox"/>            | Cisco Directory Number Alias Lookup | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco Dialed Number Analyzer Server | Activated         |
| <input checked="" type="checkbox"/> | Cisco Dialed Number Analyzer        | Activated         |
| <input type="checkbox"/>            | Cisco Tftp                          | Deactivated       |

Cisco Unified Serviceability-Service Activation

Navigation Cisco Unified Serviceability Go

admin About Logout

Alarm Trace Tools Snmp CallHome Help

Service Activation Related Links: Control Center - Feature Services Go

Save Set to Default Refresh

Status: Update Operation Successful

Select Server

Server\* cucm-sub02--CUCM Voice/Video Go

☐ Check All Services

CM Services

|                                     | Service Name                        | Activation Status |
|-------------------------------------|-------------------------------------|-------------------|
| <input checked="" type="checkbox"/> | Cisco CallManager                   | Activated         |
| <input type="checkbox"/>            | Cisco IP Voice Media Streaming App  | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco CTIManager                    | Activated         |
| <input type="checkbox"/>            | Cisco Extension Mobility            | Deactivated       |
| <input type="checkbox"/>            | Cisco Extended Functions            | Deactivated       |
| <input type="checkbox"/>            | Cisco DHCP Monitor Service          | Deactivated       |
| <input type="checkbox"/>            | Cisco Location Bandwidth Manager    | Deactivated       |
| <input type="checkbox"/>            | Cisco Directory Number Alias Lookup | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco Dialed Number Analyzer Server | Activated         |
| <input type="checkbox"/>            | Cisco Dialed Number Analyzer        | Deactivated       |
| <input type="checkbox"/>            | Cisco Tftp                          | Deactivated       |

SIP Profile Configuration

[Back](#) [Forward](#) [Refresh](#) [Home](#)

<https://192.168.21.1/ccmadmin/sipProfileEdit.do?done=1&key=b2ab0a>

Cisco Unified CM Administration

Navigation Cisco Unified CM Administration Go

admin Search Documentation About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

SIP Profile Configuration

Related Links: Back To Find/List Go

Save

SIP Profile Information

Name\* IMP-SIP-TRUNK-SIP-PROFILE

Description Default SIP Profile

Default MTP Telephony Event Payload Type\* 101

Early Offer for G.Clear Calls\* Disabled

User-Agent and Server header information\* Send Unified CM Version Information as User-Agent

Version in User Agent and Server Header\* Major And Minor

Dial String Interpretation\* Phone number consists of characters 0-9, \*, #, and

Confidential Access Level Headers\* Disabled

☐ Redirect by Application

☐ Disable Early Media on 180

☐ Outgoing T.38 INVITE include audio mline

☐ Offer valid IP and Send/Receive mode only for T.38 Fax Relay

☐ Use Fully Qualified Domain Name in SIP Requests

☐ Assured Services SIP conformance

☐ Enable External QoS\*\*

SDP Information

SDP Session-level Bandwidth Modifier for Early Offer and Re-invites\* TIAS and AS

SDP Transparency Profile Pass all unknown SDP attributes

Accept Audio Codec Preferences in Received Offer\* Default

☐ Require SDP Inactive Exchange for Mid-Call Media Change

☐ Allow RR/RS bandwidth modifier (RFC 3556)

Parameters used in Phone

Timer Invite Expires (seconds)\* 180

Timer Register Delta (seconds)\* 5

Timer Register Expires (seconds)\* 3600

Timer T1 (msec)\* 500

Timer T2 (msec)\* 4000

Retry INVITE\* 6

Retry Non-INVITE\* 10

Media Port Ranges

☒ Common Port Range for Audio and Video

☐ Separate Port Ranges for Audio and Video

Start Media Port\* 16384

Stop Media Port\* 32766

DSCP for Audio Calls Use System Default

SIP Profile Configuration

[Back](#) [Forward](#) [Refresh](#) [Home](#)

<https://192.168.21.1/ccmadmin/sipProfileEdit.do?done=1&key=b2ab0a>

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SIP Profile Configuration

Related Links: Back To Find/List Go

Save

Caller ID DN

Caller Name

Trunk Specific Configuration

Reroute Incoming Request to new Trunk based on\* Never

Resource Priority Namespace List < None >

SIP RelXX Options\* Disabled

Video Call Traffic Class\* Mixed

Calling Line Identification Presentation\* Default

Session Refresh Method\* Invite

Early Offer support for voice and video calls\* Disabled (Default value)

☐ Enable ANAT

☐ Deliver Conference Bridge Identifier

☐ Allow Passthrough of Configured Line Device Caller Information

☐ Reject Anonymous Incoming Calls

☐ Reject Anonymous Outgoing Calls

☐ Send ILS Learned Destination Route String

☐ Connect Inbound Call before Playing Queuing Announcement

SIP OPTIONS Ping

☒ Enable OPTIONS Ping to monitor destination status for Trunks with Service Type "None (Default)"

Ping Interval for In-service and Partially In-service Trunks (seconds)\* 60

Ping Interval for Out-of-service Trunks (seconds)\* 120

Ping Retry Timer (milliseconds)\* 500

Ping Retry Count\* 6

SDP Information

☐ Send send-receive SDP in mid-call INVITE

☐ Allow Presentation Sharing using BFCP

☐ Allow IX Application Media

☐ Allow multiple codecs in answer SDP

Save

*i* \*. indicates required item.

*i* \*\*-. setting only takes effect if the External QoS Enabled Service Parameter is set to true.

SIP Trunk Security Profile Configuration

[Back To Find/List](#)
[Go](#)

Save

Status

*Info* Status: Ready

SIP Trunk Security Profile Information

Name\*

IMP-SIP-TRUNK-SIP-SEC-PROFILE

Description

Non Secure SIP Trunk Profile authenticated by null String

Device Security Mode

Non Secure

Incoming Transport Type\*

TCP+UDP

Outgoing Transport Type

TCP

☐ Enable Digest Authentication

Nonce Validity Time (mins)\*

600

X.509 Subject Name

Incoming Port\*

5060

☐ Enable Application level authorization

☒ Accept presence subscription

☒ Accept out-of-dialog refer\*\*

☒ Accept unsolicited notification

☒ Accept replaces header

☐ Transmit security status

☐ Allow charging header

SIP V.150 Outbound SDP Offer Filtering\*

Use Default Filter

Save

Region Configuration

[Back To Find/List](#)
[Go](#)

Save

Delete

Reset

Apply Config

Add New

Status

*Info* Add successful

*Info* Click on the Reset button to have the changes take effect.

Region Information

Name\*

IMP-SIP-TRUNK-REGION

Region Relationships

| Region                      | Audio Codec Preference List | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|-----------------------------|-----------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| NOTE: Regions not displayed | Use System Default          | Use System Default     | Use System Default                       | Use System Default                                 |

Modify Relationship to other Regions

| Regions                                                                                                                                              | Audio Codec Preference List     | Maximum Audio Bit Rate                                                                                            | Maximum Session Bit Rate for Video Calls                                                                                                                                                                    | Maximum Session Bit Rate for Immersive Video Calls                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>BANGALORE-PHONES-REGION</div> <div>CUC-SIP-TRUNK-REGION</div> <div>Default</div> <div>IMP-SIP-TRUNK-REGION</div> <div>TEXAS-PHONES-REGION</div> | <div>Keep Current Setting</div> | <div><input checked="" type="radio"/> Keep Current Setting</div> <div><input type="radio"/> <div>kbps</div></div> | <div><input checked="" type="radio"/> Keep Current Setting</div> <div><input type="radio"/> Use System Default</div> <div><input type="radio"/> None</div> <div><input type="radio"/> <div>kbps</div></div> | <div><input checked="" type="radio"/> Keep Current Setting</div> <div><input type="radio"/> Use System Default</div> <div><input type="radio"/> None</div> <div><input type="radio"/> <div>kbps</div></div> |

Save

Delete

Reset

Apply Config

Add New

Device Pool Configuration
+

https://192.168.21.1/ccmadmin/devicePoolEdit.do

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Device Pool Configuration
Related Links: Back To Find/List Go

Save

**Device Pool Settings**  
Device Pool Name\* IMP-SIP-TRUNK-DEVICE-POOL  
Cisco Unified Communications Manager Group\* SUB01-SUB02-CUCM-GROUP  
Calling Search Space for Auto-registration < None >  
Adjunct CSS < None >  
Reverted Call Focus Priority Default  
Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**  
Date/Time Group\* IST-DATE-TIME-GROUP  
Region\* IMP-SIP-TRUNK-REGION  
Media Resource Group List < None >  
Location < None >  
Network Locale < None >  
SRST Reference\* Disable  
Connection Monitor Duration\*\*\*  
Single Button Barge\* Default  
Join Across Lines\* Default  
Physical Location < None >  
Device Mobility Group < None >  
Wireless LAN Profile Group < None > View Details

**Local Route Group Settings**  
Standard Local Route Group < None >

**Device Mobility Related Information\*\*\*\***  
Device Mobility Calling Search Space < None >  
AAR Calling Search Space < None >  
AAR Group < None >  
Calling Party Transformation CSS < None >  
Called Party Transformation CSS < None >

**Geolocation Configuration**  
Geolocation < None >  
Geolocation Filter < None >

**Call Routing Information**  
**Incoming Calling Party Settings**  
If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter).

Trunk Configuration
IM and Presence Service Cons...
+

https://192.168.21.1/ccmadmin/trunkEdit.do?key=9967c139-6fad-8e76

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Trunk Configuration
Related Links: Back To Find/List Go

Save Delete Reset Add New

**Device Information**  
Product: SIP Trunk  
Device Protocol: SIP  
Trunk Service Type None(Default)  
Device Name\* IMP-SIP-TRUNK  
Description IMP-SIP-TRUNK  
Device Pool\* IMP-SIP-TRUNK-DEVICE-POOL  
Common Device Configuration < None >  
Call Classification\* Use System Default  
Media Resource Group List < None >  
Location\* Hub\_None  
AAR Group < None >  
Tunneled Protocol\* None  
QSIG Variant\* No Changes  
ASN.1 ROSE OID Encoding\* No Changes  
Packet Capture Mode\* None  
Packet Capture Duration 0  
☐ Media Termination Point Required  
☒ Retry Video Call as Audio  
☐ Path Replacement Support  
☐ Transmit UTF-8 for Calling Party Name  
☐ Transmit UTF-8 Names in QSIG APDU  
☐ Unattended Port  
☐ SRTP Allowed - When this flag is checked, Encrypted TLS needs to be configured in the network to provide end to end security. Failure to do so will expose keys and other information.  
Consider Traffic on This Trunk Secure\* When using both sRTP and TLS  
Route Class Signaling Enabled\* Default  
Use Trusted Relay Point\* Default  
☐ PSTN Access  
☒ Run On All Active Unified CM Nodes

**Intercompany Media Engine (IME)**  
E.164 Transformation Profile < None >

**MLPP and Confidential Access Level Information**  
MLPP Domain < None >  
Confidential Access Mode < None >  
Confidential Access Level < None >

Trunk Configuration

Save Delete Reset Add New

**SIP Information**

**Destination**

☐ Destination Address is an SRV

|    | Destination Address | Destination Address IPv6 | Destination Port |
|----|---------------------|--------------------------|------------------|
| 1* | 192.168.21.6        |                          | 5060             |
| 2  | 192.168.21.7        |                          | 5060             |

MTP Preferred Originating Codec\* 711ulaw

BLF Presence Group\* Standard Presence group

SIP Trunk Security Profile\* IMP-SIP-TRUNK-SIP-SEC-PROFILE

Rerouting Calling Search Space < None >

Out-Of-Dialog Refer Calling Search Space < None >

SUBSCRIBE Calling Search Space < None >

SIP Profile\* IMP-SIP-TRUNK-SIP-PROFILE View Details

DTMF Signaling Method\* No Preference

**Normalization Script**

Normalization Script < None >

☐ Enable Trace

| Parameter Name | Parameter Value |
|----------------|-----------------|
| 1              |                 |

**Recording Information**

☒ None

☐ This trunk connects to a recording-enabled gateway

☐ This trunk connects to other clusters with recording-enabled gateways

**Geolocation Configuration**

Geolocation < None >

Geolocation Filter < None >

☐ Send Geolocation Information

Save Delete Reset Add New

\*. indicates required item.

\*\*. Device reset is not required for changes to Packet Capture Mode and Packet Capture Duration.

Service Parameter Configuration

Save Set to Default Advanced

**Status**

Status: Ready

**Select Server and Service**

Server\* cucm-pub--CUCM Voice/Video (Active)

Service\* Cisco CallManager (Inactive)

All parameters apply only to the current server except parameters that are in the cluster-wide group(s).

**Cisco CallManager (Inactive) Parameters on server cucm-pub--CUCM Voice/Video (Active)**

| Parameter Name                                                                                | Parameter Value  | Suggested Value  |
|-----------------------------------------------------------------------------------------------|------------------|------------------|
| <b>Call Throttling</b>                                                                        |                  |                  |
| Code Yellow Entry Latency *                                                                   | 20               | 20               |
| Code Yellow Exit Latency Calculation *                                                        | 40               | 40               |
| Code Yellow Duration *                                                                        | 5                | 5                |
| Max Events Allowed *                                                                          | 2000             | 2000             |
| System Throttle Sample Size *                                                                 | 10               | 10               |
| <b>Memory Throttling</b>                                                                      |                  |                  |
| Enable Memory Throttling *                                                                    | True             | True             |
| There are hidden parameters in this group. Click on Advanced button to see hidden parameters. |                  |                  |
| <b>System</b>                                                                                 |                  |                  |
| CDR Enabled Flag *                                                                            | False            | False            |
| CDR Log Calls with Zero Duration Flag *                                                       | False            | False            |
| Digit Analysis Complexity *                                                                   | StandardAnalysis | StandardAnalysis |
| Database Debounce Timer *                                                                     | 0                | 0                |
| Maximum Phone Fallback Queue Depth *                                                          | 10               | 10               |
| Maximum Number of Registered Devices *                                                        | 5000             | 5000             |
| System Initialization Timer *                                                                 | 60               | 60               |
| There are hidden parameters in this group. Click on Advanced button to see hidden parameters. |                  |                  |
| <b>SDL Trace</b>                                                                              |                  |                  |
| SDL Trace Data Flags *                                                                        | 0x00000111       | 0x00000111       |
| SDL Trace Flush Immediately *                                                                 | False            | False            |
| SDL Trace Data Size *                                                                         | 0                | 0                |
| SDL Trace Flag *                                                                              | True             | True             |

Service Parameter Configuration | IM and Presence Service Config

Navigation: Cisco Unified CM Administration | admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Service Parameter Configuration | Related Links: Parameters for All Servers | Go

Save | Set to Default | Advanced

### Clusterwide Parameters (Device - SIP)

|                                                       |               |              |
|-------------------------------------------------------|---------------|--------------|
| SIP Interoperability Enabled *                        | True          | True         |
| Retrv Count for SIP Bye *                             | 10            | 10           |
| Retrv Count for SIP Cancel *                          | 10            | 10           |
| Retrv Count for SIP Invite *                          | 6             | 6            |
| Retrv Count for SIP PRACK *                           | 6             | 6            |
| Retrv Count for SIP ReliXX *                          | 10            | 10           |
| Retrv Count for SIP Publish *                         | 6             | 6            |
| Retrv Count for SIP Response *                        | 6             | 6            |
| SIP Connect Timer *                                   | 500           | 500          |
| SIP Disconnect Timer *                                | 500           | 500          |
| SIP Expires Timer *                                   | 180000        | 180000       |
| SIP PRACK Timer *                                     | 500           | 500          |
| SIP ReliXX Timer *                                    | 500           | 500          |
| SIP Trying Timer *                                    | 500           | 500          |
| SIP Publish Timer *                                   | 500           | 500          |
| SIP Min-SE Value *                                    | 1800          | 1800         |
| SIPS URI Handling *                                   | Reject        | Reject       |
| SIP statistics Periodic update Timer *                | 2             | 2            |
| SIP Session Expires Timer *                           | 1800          | 1800         |
| SIP Call Preservation Expires Timer *                 | 0             | 0            |
| SIP Trunk TspReq Retrv *                              | 2             | 2            |
| SIP TCP Unused Connection Timer *                     | 14            | 14           |
| SIP TCP Timer *                                       | 5             | 5            |
| SIP Station TCP Port Throttle Threshold *             | 100           | 100          |
| SIP Trunk TCP Port Throttle Threshold *               | 500           | 500          |
| SIP Station UDP Port Throttle Threshold *             | 50            | 50           |
| SIP Trunk UDP Port Throttle Threshold *               | 200           | 200          |
| SIP V.150 Outbound SDP Offer Filtering *              | No Filtering  | No Filtering |
| Send SIP Multicast TTL in SDP *                       | False         | False        |
| Default PUBLISH Expiration Timer *                    | 3600          | 3600         |
| Minimum PUBLISH Expiration Timer *                    | 60            | 60           |
| IM and Presence Publish Trunk                         | IMP-SIP-TRUNK |              |
| Send 181 Call Is Being Forwarded *                    | False         | False        |
| Delay Sending 181 until 180/183 message is received * | True          | True         |

UC Service Configuration | 192.168.21.6/cupadmin/topolo

Navigation: Cisco Unified CM Administration | admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

### UC Service Configuration

Next

Status: Status: Ready

Add a UC Service

UC Service Type: Voicemail

Next

\*- indicates required item.

- Credential Policy Default
- Credential Policy
- Role
- Access Control Group
- Application User CAPF Profile
- End User CAPF Profile
- UC Service
- Service Profile
- User Profile
- User Group
- User Rank

Application User

End User

User/Phone Add

SIP Realm

User Settings

Self-Provisioning

Assign Presence Users

Back To Find/List | Go



The screenshot shows the Cisco Unified CM Administration interface. The browser address bar displays `https://192.168.21.1/ccmadmin/ucServiceEdit.do`. The page title is "UC Service Configuration". The "Status" section shows "Status: Ready". The "UC Service Information" section is highlighted with a red box and contains the following fields:

| UC Service Type: Voicemail |                    |
|----------------------------|--------------------|
| Product Type*              | Unity Connection   |
| Name*                      | CUC-PUB-VM-SERVICE |
| Description                | CUC-PUB-VM-SERVICE |
| Host Name/IP Address*      | 192.168.21.4       |
| Port                       | 443                |
| Protocol                   | HTTP               |

A "Save" button is located at the bottom of the form.

The screenshot shows the Cisco Unified CM Administration interface. The browser address bar displays `https://192.168.21.1/ccmadmin/ucServiceEdit.do?clone=true&key=13e7...`. The page title is "UC Service Configuration". The "Status" section shows "Status: Ready". The "UC Service Information" section is highlighted with a red box and contains the following fields:

| UC Service Type: Voicemail |                    |
|----------------------------|--------------------|
| Product Type*              | Unity Connection   |
| Name*                      | CUC-SUB-VM-SERVICE |
| Description                | CUC-SUB-VM-SERVICE |
| Host Name/IP Address*      | 192.168.21.5       |
| Port                       | 443                |
| Protocol                   | HTTP               |

A "Save" button is located at the bottom of the form.

- EDI – Enhanced Directory Integration requires no configuration by default. If you install Cisco Jabber for Windows on a workstation that is registered to an Active Directory domain, Cisco Jabber for Windows automatically discovers the directory service and connects to a Global Catalog in the domain.
- UDS – User Data Service is an interface in Cisco Unified Communications Manager that makes contact information available to Cisco Jabber for Windows.



UC Service Configuration

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/ucServiceEdit.do

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UC Service Configuration Related Links: Back To Find/List Go

Next

Status

Status: Ready

Add a UC Service

UC Service Type IM and Presence

Next

\*- indicates required item.

UC Service Configuration

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/ucServiceEdit.do

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UC Service Configuration Related Links: Back To Find/List Go

Save

Status

Status: Ready

UC Service Information

UC Service Type: IM and Presence

Product Type\* Unified CM (IM and Presence)

Name\* IMP-PUB-IM-SERVICE

Description IMP-PUB-IM-SERVICE

Host Name/IP Address\* 192.168.21.6

Save

\*- indicates required item.

UC Service Configuration

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/ucServiceEdit.do?clone=true&key=b713

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UC Service Configuration Related Links: Back To Find/List Go

Save

Status

Status: Ready

UC Service Information

UC Service Type: IM and Presence

Product Type\* Unified CM (IM and Presence)

Name\* IMP-SUB-IM-SERVICE

Description IMP-SUB-IM-SERVICE

Host Name/IP Address\* 192.168.21.7

Save

\*- indicates required item.

UC Service Configuration

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/ucServiceEdit.do

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UC Service Configuration Related Links: Back To Find/List Go

Next

Status

Status: Ready

Add a UC Service

UC Service Type CTI

Next

\*- indicates required item.

UC Service Configuration

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/ucServiceEdit.do

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UC Service Configuration Related Links: Back To Find/List Go

Save

Status

Status: Ready

UC Service Information

UC Service Type: CTI

Product Type: CTI

Name\* CUCM-SUB01-CTI-SERVICE

Description CUCM-SUB01-CTI-SERVICE

Host Name/IP Address\* 192.168.21.2

Port 2748

Protocol: TCP

Save

\*- indicates required item.

UC Service Configuration

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/ucServiceEdit.do?done=true&key=4435

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UC Service Configuration Related Links: Back To Find/List Go

Save

Status

Status: Ready

UC Service Information

UC Service Type: CTI

Product Type: CTI

Name\* CUCM-SUB02-CTI-SERVICE

Description CUCM-SUB02-CTI-SERVICE

Host Name/IP Address\* 192.168.21.3

Port 2748

Protocol: TCP

Save

\*- indicates required item.

Find and List UC Services

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/ucServiceFindList.do

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**Find and List UC Services**

+ Add New Select All Clear All Delete Selected

**Status**  
6 records found

**UC Service (1 - 6 of 6)** Rows per Page 50

Find UC Service where Name begins with Find Clear Filter

|                          | Name                                   | UC Service Type | Product Type                 | Host/IP Address | Port | Protocol |
|--------------------------|----------------------------------------|-----------------|------------------------------|-----------------|------|----------|
| <input type="checkbox"/> | <a href="#">CUC-PUB-VM-SERVICE</a>     | Voicemail       | Unity Connection             | 192.168.21.4    | 443  | HTTP     |
| <input type="checkbox"/> | <a href="#">CUC-SUB-VM-SERVICE</a>     | Voicemail       | Unity Connection             | 192.168.21.5    | 443  | HTTP     |
| <input type="checkbox"/> | <a href="#">CUCM-SUB01-CTI-SERVICE</a> | CTI             | CTI                          | 192.168.21.2    | 2748 | TCP      |
| <input type="checkbox"/> | <a href="#">CUCM-SUB02-CTI-SERVICE</a> | CTI             | CTI                          | 192.168.21.3    | 2748 | TCP      |
| <input type="checkbox"/> | <a href="#">IMP-PUB-IM-SERVICE</a>     | IM and Presence | Unified CM (IM and Presence) | 192.168.21.6    |      |          |
| <input type="checkbox"/> | <a href="#">IMP-SUB-IM-SERVICE</a>     | IM and Presence | Unified CM (IM and Presence) | 192.168.21.7    |      |          |

Add New Select All Clear All Delete Selected

Find and List UC Services

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/ucServiceFindList.do

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

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**Find and List UC Services**

+ Add New Select All Clear All Delete Selected

**Status**  
6 records found

**UC Service (1 - 6 of 6)** Rows per Page 50

Find UC Service where Name begins with Find Clear Filter

|                          | Name                                   | UC Service Type | Product Type                 | Host/IP Address | Port | Protocol |
|--------------------------|----------------------------------------|-----------------|------------------------------|-----------------|------|----------|
| <input type="checkbox"/> | <a href="#">CUC-PUB-VM-SERVICE</a>     | Voicemail       | Unity Connection             | 192.168.21.4    | 443  | HTTP     |
| <input type="checkbox"/> | <a href="#">CUC-SUB-VM-SERVICE</a>     | Voicemail       | Unity Connection             | 192.168.21.5    | 443  | HTTP     |
| <input type="checkbox"/> | <a href="#">CUCM-SUB01-CTI-SERVICE</a> | CTI             | CTI                          | 192.168.21.2    | 2748 | TCP      |
| <input type="checkbox"/> | <a href="#">CUCM-SUB02-CTI-SERVICE</a> | CTI             | CTI                          | 192.168.21.3    | 2748 | TCP      |
| <input type="checkbox"/> | <a href="#">IMP-PUB-IM-SERVICE</a>     | IM and Presence | Unified CM (IM and Presence) | 192.168.21.6    |      |          |
| <input type="checkbox"/> | <a href="#">IMP-SUB-IM-SERVICE</a>     | IM and Presence | Unified CM (IM and Presence) | 192.168.21.7    |      |          |

Add New Select All Clear All Delete Selected

Application User  
End User  
User/Phone Add  
SIP Realm  
User Settings  
Self-Provisioning  
Assign Presence Users

Credential Policy Default  
Credential Policy  
Role  
Access Control Group  
Application User CAPF Profile  
End User CAPF Profile  
UC Service  
Service Profile  
User Profile  
User Group  
User Rank

Service Profile Configuration | 192.168.21.6/cupadmin/topolo | <https://192.168.21.1/cmadmin/serviceProfileEdit.do>

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**Service Profile Configuration** | Related Links: [Back To Find/List](#) | Go

Save

---

**Service Profile Information**

Name\* JABBER-SERVICE-PROFILE ←

Description JABBER-SERVICE-PROFILE ←

☐ Make this the default service profile for the system

---

**Voicemail Profile**

Primary CUC-PUB-VM-SERVICE ←

Secondary CUC-SUB-VM-SERVICE ←

Tertiary <None> v

Credentials source for voicemail service\* Unified CM - IM and Presence ←

---

**MailStore Profile**

Primary <None> v

Secondary <None> v

Tertiary <None> v

Inbox Folder\* INBOX

Trash Folder\* Deleted Items

Polling Interval (in seconds)\* 60

☒ Allow dual folder mode

---

**Conferencing Profile**

Primary <None> v

Secondary <None> v

Tertiary <None> v

Server Certificate Verification Any v

Credentials source for web conference service\* Not set v

---

**Directory Profile**

Primary <None> v

Secondary <None> v

Tertiary <None> v

☒ Use UDS for Contact Resolution

☐ Use Logged On User Credential

Username

Password

Search Base 1

Service Profile Configuration | 192.168.21.6/cupadmin/topolo | <https://192.168.21.1/cmadmin/serviceProfileEdit.do>

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**Service Profile Configuration** | Related Links: [Back To Find/List](#) | Go

Save

Credentials source for web conference service\* Not set v

---

**Directory Profile**

Primary <None> v

Secondary <None> v

Tertiary <None> v

☒ Use UDS for Contact Resolution

☐ Use Logged On User Credential *Uncheck this*

Username

Password

Search Base 1

Search Base 2

Search Base 3

☒ Recursive Search on All Search Bases

Search Timeout (seconds)\* 5

Base Filter (Only used for Advance Directory)

Predictive Search Filter (Only used for Advance Directory)

☐ Allow Jabber to Search and Add Security Groups

---

**IM and Presence Profile**

Primary IMP-SUB-IM-SERVICE ←

Secondary IMP-PUB-IM-SERVICE ←

Tertiary <None> v

---

**CTI Profile**

Primary CUCM-SUB01-CTI-SERVICE ←

Secondary CUCM-SUB02-CTI-SERVICE ←

Tertiary <None> v

---

**Video Conference Scheduling Portal Profile**

Primary <None> v

Secondary <None> v

Tertiary <None> v

Save ←

\*- indicates required item.

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/phoneEdit.do

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Add a New Phone Related Links: Back To Find/List Go

Next

Status

Status: Ready

Select the type of phone you would like to create

Phone Type\* Cisco Unified Client Services Framework

Next

\*- indicate  
\*\*- Create to enable template-based phone creation.

Cisco TelePresence Profile 42 (C60)  
Cisco TelePresence Profile 52 (C40)  
Cisco TelePresence Profile 52 (C60)  
Cisco TelePresence Profile 52 Dual (C60)  
Cisco TelePresence Profile 65 (C60)  
Cisco TelePresence Profile 65 Dual (C90)  
Cisco TelePresence Quick Set C20  
Cisco TelePresence SX10  
Cisco TelePresence SX20  
Cisco TelePresence SX80  
Cisco TelePresence TX1310-65  
Cisco TelePresence TX9000  
Cisco TelePresence TX9200  
Cisco Unified Client Services Framework  
Cisco Unified Communications for RTX  
Cisco Unified Personal Communicator  
Generic Desktop Video Endpoint  
Generic Multiple Screen Room System  
Generic Single Screen Room System  
H.323 Client

192.168.21.6/cupadmin/topolo

https://192.168.21.1/ccmadmin/phoneEdit.do

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Phone Configuration Related Links: Back To Find/List Go

Save

Phone Type

Product Type: Cisco Unified Client Services Framework  
Device Protocol: SIP

Device Information

☒ Device is trusted

Device Name\* CSFJASEEM

Description 11002 - Abdul Jaseem

Device Pool\* BANGALORE-PHONES-DEVICE-POOL View Details

Common Device Configuration < None > View Details

Phone Button Template\* Standard Client Services Framework

Common Phone Profile\* Standard Common Phone Profile View Details

Calling Search Space BANGALORE-PHONE-CSS

AAR Calling Search Space < None >

Media Resource Group List < None >

User Hold MOH Audio Source < None >

Network Hold MOH Audio Source < None >

Location\* Hub\_None

AAR Group < None >

User Locale < None >

Network Locale < None >

Built In Bridge\* Default

Device Mobility Mode\* Default

Owner ☒ User ☐ Anonymous (Public/Shared Space)

Owner User ID\* abdul.jaseem

Mobility User ID < None >

Primary Phone CIPC-JASEEM

Use Trusted Relay Point\* Default

Always Use Prime Line\* Default

Always Use Prime Line for Voice Message\* Default

Geolocation < None >

☐ Ignore Presentation Indicators (internal calls only)

☒ Allow Control of Device from CTI

☒ Logged Into Hunt Group

☐ Remote Device

☐ Require off-premise location

Number Presentation Transformation

Phone Configuration
192.168.21.6/cupadmin/topolo
https://192.168.21.1/ccmadmin/phoneEdit.do
Cisco Unified CM Administration
Navigation Cisco Unified CM Administration Go
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Phone Configuration Related Links: Back To Find/List Go
Save
Number Presentation Transformation
Caller ID For Calls From This Phone
Calling Party Transformation CSS < None >
☒ Use Device Pool Calling Party Transformation CSS (Caller ID For Calls From This Phone)
Remote Number
Calling Party Transformation CSS < None >
☒ Use Device Pool Calling Party Transformation CSS (Device Mobility Related Information)
Protocol Specific Information
Packet Capture Mode\* None
Packet Capture Duration 0
BLF Presence Group\* Standard Presence group
SIP Dial Rules < None >
MTP Preferred Originating Codec\* 711ulaw
Device Security Profile\* Cisco Unified Client Services Framework - Standard
Rerouting Calling Search Space < None >
SUBSCRIBE Calling Search Space < None >
SIP Profile\* Standard SIP Profile View Details
Digest User abdul.jaseem
☐ Media Termination Point Required
☐ Unattended Port
☐ Require DTMF Reception
Certification Authority Proxy Function (CAPF) Information
Certificate Operation\* No Pending Operation
Authentication Mode\* By Null String
Authentication String
Generate String
Key Order\* RSA Only
RSA Key Size (Bits)\* 2048
EC Key Size (Bits)
Operation Completes By 2021 03 19 12 (YYYY:MM:DD:HH)
Certificate Operation Status: None
Note: Security Profile Contains Addition CAPF Settings.
Extension Information
☐ Enable Extension Mobility

Phone Configuration
192.168.21.6/cupadmin/topolo
https://192.168.21.1/ccmadmin/phoneEdit.do?key=89d64a19-ed6e-0d...
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Phone Configuration Related Links: Back To Find/List Go
Save Delete Copy Reset Apply Config Add New
Status
Add successful
Association
Modify Button Items
1 Line [1] - Add a new DN
Phone Type
Product Type: Cisco Unified Client Services Framework
Device Protocol: SIP
Real-time Device Status
Registration: Unknown
IPv4 Address: None
Device Information
☒ Device is Active
☒ Device is trusted
Device Name\* CSFJASEEM
Description 11002 - Abdul Jaseem
Device Pool\* BANGALORE-PHONES-DEVICE-POOL View Details
Common Device Configuration < None > View Details
Phone Button Template\* Standard Client Services Framework
Common Phone Profile\* Standard Common Phone Profile View Details
Calling Search Space BANGALORE-PHONE-CSS
AAR Calling Search Space < None >
Media Resource Group List < None >
User Hold MOH Audio Source < None >
Network Hold MOH Audio Source < None >
Location\* Hub\_None
AAR Group < None >
User Locale < None >
Network Locale < None >
Built In Bridge\* Default
Device Mobility Mode\* Default View Current Device
Mobility Settings
Owner
☒ User ☐ Anonymous (Public/Shared Space)
Owner User ID\* abdul.jaseem
Mobility User ID < None >

Directory Number Configurati...
192.168.21.6/cupadmin/topolo...
https://192.168.21.1/cmadmin/directoryNumberEdit.do?key=96dae060
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Directory Number Configuration
Related Links: Configure Device (CSFJASEEM) Go
Save Delete Reset Apply Config Add New
Directory Number Information
Directory Number\* 11002 Urgent Priority
Route Partition BANGALORE-INTERNAL-PT
Description 11002 - Abdul Jaseem
Alerting Name 11002 - Abdul Jaseem
ASCII Alerting Name 11002 - Abdul Jaseem
External Call Control Profile < None >
Allow Control of Device from CTI
Associated Devices
CIPC-JASEEM
CIPC-JASEEM2
CSFJASEEM
Edit Device
Edit Line Appearance
Dissociate Devices
Directory Number Settings
Voice Mail Profile CUC-VM-PROFILE (Choose <None> to use system default)
Calling Search Space < None >
BLF Presence Group\* Standard Presence group
User Hold MOH Audio Source < None >
Network Hold MOH Audio Source < None >
Auto Answer\* Auto Answer Off
Reject Anonymous Calls
Enterprise Alternate Number
Add Enterprise Alternate Number
+E.164 Alternate Number
Add +E.164 Alternate Number
Directory URIs
Primary URI Partition Advertise Globally via ILS Rem
Add Row

Directory Number Configurati...
192.168.21.6/cupadmin/topolo...
https://192.168.21.1/cmadmin/directoryNumberEdit.do?key=96dae060
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Directory Number Configuration
Related Links: Configure Device (CSFJASEEM) Go
Save Delete Reset Apply Config Add New
Line 1 on Device CSFJASEEM
Display (Caller ID) 11002 - Abdul Jaseem Display text for a line appearance is intended for displaying text such as a name instead of a directory number for calls. If you specify a number, the person receiving a call may not see the proper identity of the caller.
ASCII Display (Caller ID) 11002 - Abdul Jaseem
External Phone Number Mask 80563110XX
Recording Option\* Call Recording Disabled
Recording Profile < None >
Recording Media Source\* Gateway Preferred
Monitoring Calling Search Space < None >
Submit
Propagate
Selected
Multiple Call/Call Waiting Settings on Device CSFJASEEM
Note:The range to select the Max Number of calls is: 1-6
Maximum Number of Calls\* 6
Busy Trigger\* 2 (Less than or equal to Max. Calls)
Forwarded Call Information Display on Device CSFJASEEM
Caller Name
Caller Number
Redirected Number
Dialed Number
Users Associated with Line
Full Name User ID Permission
Jaseem.Abdul abdul.jaseem
Associate End Users Select All Clear All Delete Selected

End User Configuration

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End User Configuration

Save Delete Add New

**User Information**

User Status: Active Enabled LDAP Synchronized User

User ID\*: abdul.jaseem

Self-Service User ID:

PIN:

Confirm PIN:

Last name\*: Jaseem

Middle name:

First name: Abdul

Display name: Abdul Jaseem

Title:

Directory URI: abdul.jaseem@gmail.com

Telephone Number: 11003

Home Number:

Mobile Number:

Pager Number:

Mail ID: abdul.jaseem@gmail.com

Manager User ID:

Department:

User Locale: < None >

Associated PC/Site Code:

Digest Credentials:

Confirm Digest Credentials:

User Profile: Use System Default ("Standard (Factory Default) User Profile")

User Rank\*: 1-Default User Rank

**Convert User Account**

☐ Convert LDAP Synchronized User to Local User

**Service Settings**

☒ Home Cluster

☒ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)

☒ Include meeting information in presence (Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)

UC Service Profile: JABBER-SERVICE-PROFILE

**Device Information**

Controlled Devices: CIPC-JASEEM, CIPC-JASEEM2, CSFJASEEM

Device Association: Line Appearance Association for Presence

End User Configuration

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End User Configuration

Save Delete Add New

☐ Enable Mobile Voice Access

Maximum Wait Time for Desk Pickup\*: 10000

Remote Destination Limit\*: 4

Remote Destination Profiles:

**Multilevel Precedence and Preemption Authorization**

MLPP User Identification Number:

MLPP Password:

Confirm MLPP Password:

MLPP Precedence Authorization Level: Default

**CAPF Information**

Associated CAPF Profiles:

**Permissions Information**

Groups: Standard CCM End Users, Standard CTI Allow Control of Phones supporting C, Standard CTI Allow Control of Phones supporting R, Standard CTI Enabled

Roles: Standard CCM End Users, Standard CCMUSER Administration, Standard CTI Allow Control of Phones supporting C, Standard CTI Allow Control of Phones supporting R, Standard CTI Enabled

**Conference Now Information**

☐ Enable End User to Host Conference Now

Meeting Number:

Attendees Access Code:

Save Delete Add New

\*- indicates required item.



End User Configuration Cisco Unified IM and Presence

https://192.168.21.6/cm/service/serviceactivation.jsp?txtModelID=20e5...

Cisco Unified IM and Presence Serviceability

admin About Logout

Service Activation Related Links: Control Center - Feature Services Go

Save Set to Default Refresh

Status:  
Update Completed

Select Server  
Server\* imp-pub--CUCM IM and Presence Go  
☐ Check All Services

Database and Admin Services

| Service Name                                                        | Activation Status |
|---------------------------------------------------------------------|-------------------|
| <input checked="" type="checkbox"/> Cisco AXL Web Service           | Activated         |
| <input checked="" type="checkbox"/> Cisco Bulk Provisioning Service | Activated         |

Performance and Monitoring Services

| Service Name                                                      | Activation Status |
|-------------------------------------------------------------------|-------------------|
| <input checked="" type="checkbox"/> Cisco Serviceability Reporter | Activated         |

IM and Presence Services

| Service Name                                                                     | Activation Status |
|----------------------------------------------------------------------------------|-------------------|
| <input checked="" type="checkbox"/> Cisco SIP Proxy                              | Activated         |
| <input checked="" type="checkbox"/> Cisco Presence Engine                        | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Text Conference Manager            | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Web Connection Manager             | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Connection Manager                 | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP SIP Federation Connection Manager  | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP XMPP Federation Connection Manager | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP File Transfer Manager              | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Message Archiver                   | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Directory Service                  | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Authentication Service             | Activated         |

Save Set to Default Refresh

\*. indicates required item.

Cisco Unified Serviceability-S Cisco Unified IM and Presence

https://192.168.21.6/cm/service/serviceactivation.jsp?txtModelID=...

Cisco Unified IM and Presence Serviceability

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Service Activation Related Links: Control Center - Feature Services Go

Save Set to Default Refresh

Status:  
Update Completed

Select Server  
Server\* imp-sub--CUCM IM and Presence Go  
☐ Check All Services

Database and Admin Services

| Service Name                                              | Activation Status |
|-----------------------------------------------------------|-------------------|
| <input checked="" type="checkbox"/> Cisco AXL Web Service | Activated         |

Performance and Monitoring Services

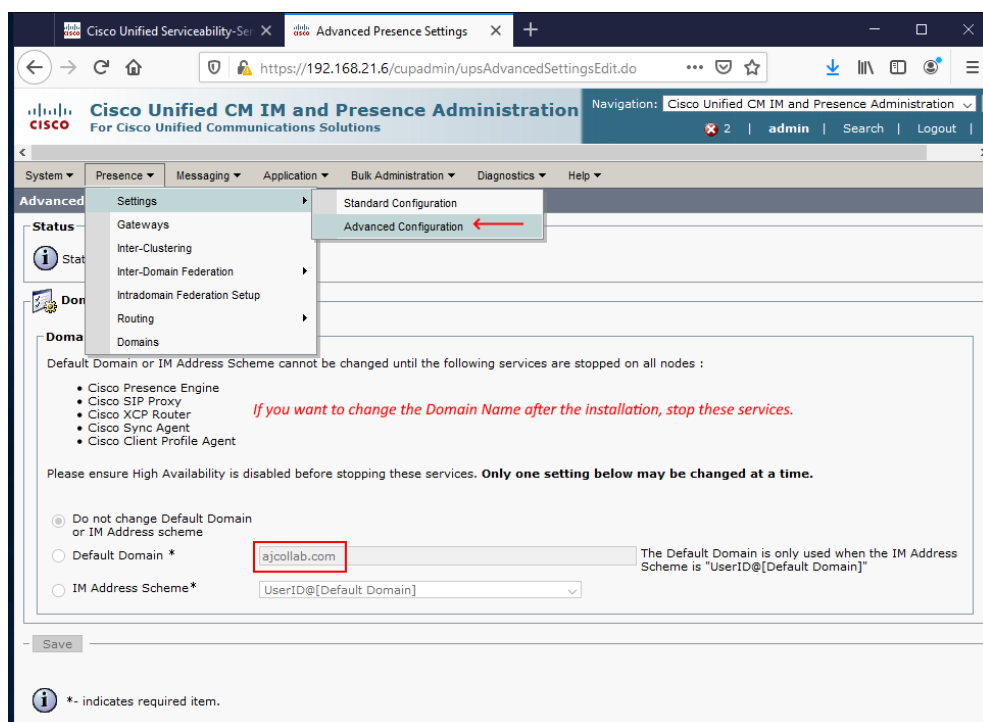
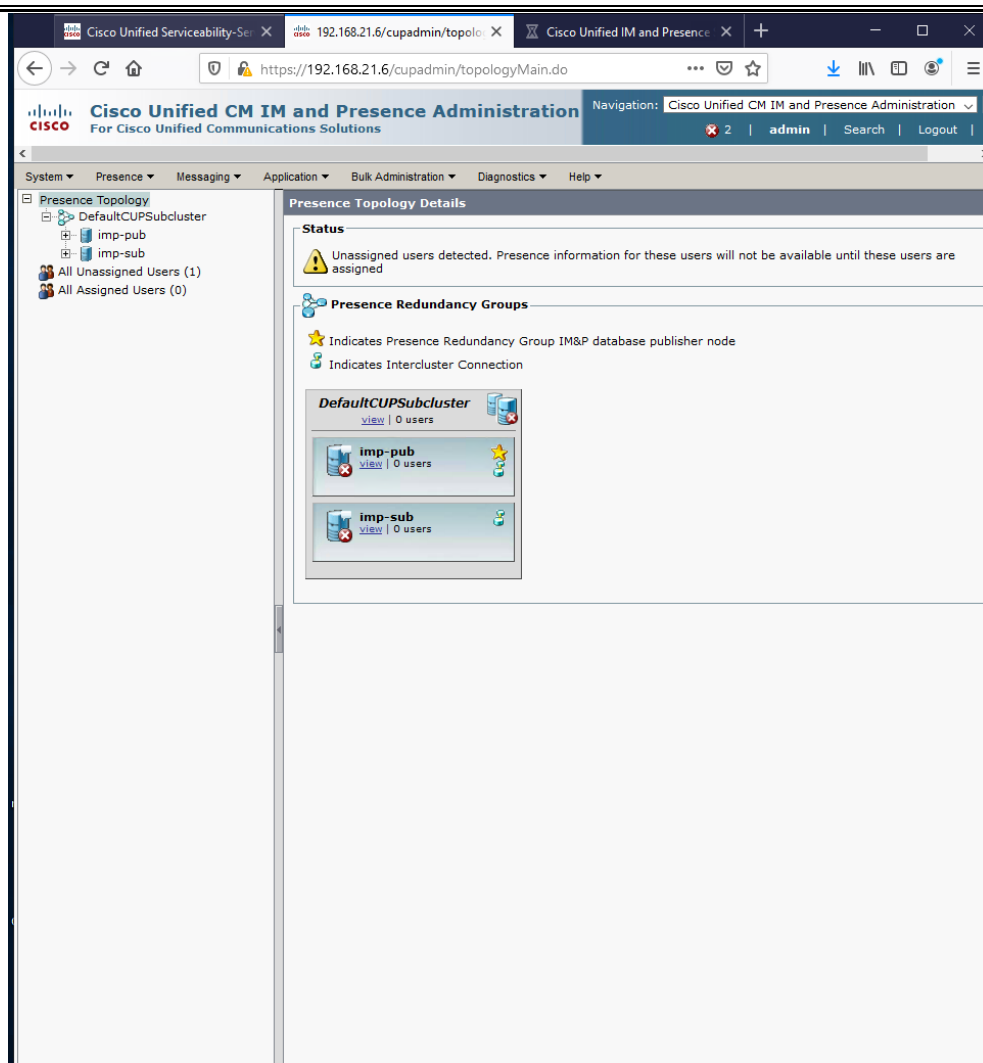
| Service Name                                                      | Activation Status |
|-------------------------------------------------------------------|-------------------|
| <input checked="" type="checkbox"/> Cisco Serviceability Reporter | Activated         |

IM and Presence Services

| Service Name                                                                     | Activation Status |
|----------------------------------------------------------------------------------|-------------------|
| <input checked="" type="checkbox"/> Cisco SIP Proxy                              | Activated         |
| <input checked="" type="checkbox"/> Cisco Presence Engine                        | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Text Conference Manager            | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Web Connection Manager             | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Connection Manager                 | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP SIP Federation Connection Manager  | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP XMPP Federation Connection Manager | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP File Transfer Manager              | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Message Archiver                   | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Directory Service                  | Activated         |
| <input checked="" type="checkbox"/> Cisco XCP Authentication Service             | Activated         |

Save Set to Default Refresh

\*. indicates required item.



Cisco Unified Serviceability-Ser X Presence Gateway Configuratio X Cisco Unified IM and Presence X

https://192.168.21.6/cupadmin/backendGatewayEdit.do

Cisco Unified CM IM and Presence Administration  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM IM and Presence Administration

System Presence Messaging Application Bulk Administration Diagnostics Help

Presence

Settings Gateways Inter-Clustering Inter-Domain Federation Intradomain Federation Setup Routing Domains

Related Links: Back To Find/List Go

Save

Status

Presence Gateway Settings (Cisco Unified Communications Manager)

You can configure a Cisco Unified Communications Manager server as a presence gateway. The IM and Presence Service will then trigger the Cisco Unified Communications Manager to publish phone presence information (e.g. phone on/off hook status).

Presence Gateway Type\* CUCM

Description\* CUCM

Presence Gateway\* 192.168.21.1 CUCM-PUB

Save

\*- indicates required item.

Cisco Unified Serviceability-Ser X CCMCIP Profile Configuration X Cisco Unified IM and Presence X

https://192.168.21.6/cupadmin/upcCCMCIPProfileEdit.do

Cisco Unified CM IM and Presence Administration  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM IM and Presence Administration

System Presence Messaging Application Bulk Administration Diagnostics Help

CCMCIP Profile Configuration

Related Links: Back To Find/List Go

Save

Status

Status: Ready

CCMCIP Profile Settings

Name\* CCMCIP-PROFILE

Description CCMCIP-PROFILE

Primary CCMCIP Host\* 192.168.21.2

Backup CCMCIP Host\* 192.168.21.3

Server Certificate Verification\* Self Signed or Keystore

☒ Make this the default CCMCIP Profile for the system.

Users in Profile

Add Users to Profile

Save

\*- indicates required item.

Cisco Unified CM Console
Client Settings
Cisco Unified IM and Presence

https://192.168.21.6/cupadmin/upcSettingsEdit.do
90%

Cisco Unified CM IM and Presence Administration
For Cisco Unified Communications Solutions
Navigation: Cisco Unified CM IM and Presence Administration
Go
2 | admin | Search | Logout | About

System Presence Messaging Application Bulk Administration Diagnostics Help

Client Settings
Save

Status: Ready

**TFTP Servers**
Primary TFTP Server 192.168.21.1
Backup TFTP Server
Backup TFTP Server

**Cisco Unified Personal Communicator Security Certificates Setting**
CSF certificate directory (relative to CSF install directory)

**Cisco Unified Personal Communicator LDAP Attribute Mapping**
These settings are for clients using Basic Directory Integration. For clients using Enhanced Directory Integration please refer to the client documentation.
Directory Server Type\* Microsoft Active Directory Restore Defaults

| Client User Fields  | LDAP User Fields         | Client User Fields | LDAP User Fields |
|---------------------|--------------------------|--------------------|------------------|
| UserID              | sAMAccountName           | FirstName          | givenName        |
| LastName            | sn                       | MiddleName         | middleName       |
| Nickname            | nickname                 | Photo              |                  |
| Title               | title                    | DisplayName        | displayName      |
| NamePrefix          | namePrefix               | NameSuffix         |                  |
| Gender              | gender                   | BusinessEmail      | mail             |
| BusinessPhoneNumber | ipPhone                  | BusinessVoiceMail  |                  |
| BusinessMobilePhone | mobile                   | BusinessPager      | pager            |
| BusinessFax         | facsimileTelephoneNumber | BusinessOtherPhone | otherTelephone   |
| HomeEmail           |                          | HomeMobilePhone    |                  |
| HomeFax             |                          | URL                | url              |
| Organization        | Company                  | PrimaryPhoneNumber | ipPhone          |
| AddressStreet       | streetAddress            | AddressLocation    | l                |
| AddressState        | st                       | AddressPostalCode  | postalCode       |
| AddressCountry      | co                       |                    |                  |

Save

\*- indicates required item.

- Restart IMP PUB and IMP SUB now

Presence Redundancy Group C X 192.168.21.6/cupadmin/topology X Cisco Unified IM and Presence X

Navigation: Cisco Unified CM IM and Presence Administration

admin | Search | Logout

System Presence Messaging Application Bulk Administration Diagnostics Help

Presence Topology

- DefaultCUPSubcluster
  - imp-pub (0) users
  - imp-sub (0) users
  - All Unassigned Users (1)
  - All Assigned Users (0)

Presence Topology Details

Status

Unassigned users detected. Presence information for these users will not be available until these users are assigned

Presence Redundancy Groups

Indicates Presence Redundancy Group IM&P database publisher node

Indicates Intercluster Connection

Default

imp-pub

- Verify IM/P Service Installed
- Verify Node Reachable (pingable)
- Version (11.5.1.10000(4))

High Availability

State: Failed

Reason: Critical Service Down

Services

- Cisco SIP Proxy (STARTED)
- Cisco Presence Engine (STARTED)
- Cisco Presence Datastore (STARTED)
- Cisco SIP Registration Datastore (STARTED)
- A Cisco DB (STARTED)
- Cisco XCP Router (STARTED)
- Cisco XCP Connection Manager (STARTED)
- Cisco XCP Authentication (STARTED)
- Cisco Sync Agent (STARTED)
- Cisco Client Profile Agent (STARTED)
- Cisco Inter-Cluster Sync Agent (STARTED)
- Cisco XCP Text Conference Manager (STARTED)

Presence Redundancy Group C X 192.168.21.1/ccmadmin/presenceRedundancyGroupEdit.do X Cisco Unified IM and Presence X

Navigation: Cisco Unified CM Administration

admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Presence Redundancy Group Configuration

Related Links: Back To Find/List Go

Save X Delete + Add New

Status

Status: Ready

Presence Redundancy Group Configuration

Name\* DefaultCUPSubcluster

Description Default subcluster

Presence Redundancy Group Configuration

Presence Server\* imp-pub

Presence Server imp-sub

High Availability

☒ Enable High Availability

| Monitored Server | Assigned Users | Active Users | Server State | Reason         | ServerAction |
|------------------|----------------|--------------|--------------|----------------|--------------|
| imp-pub          | 0              | 0            | Initializing | Initialization |              |
| imp-sub          | 0              | 0            | Initializing | Initialization |              |

Save Delete Add New

\*- indicates required item.

Presence Redundancy Group | 192.168.21.6/cupadmin/topology | Cisco Unified IM and Presence

Navigation: Cisco Unified CM IM and Presence Administration

System | Presence | Messaging | Application | Bulk Administration | Diagnostics | Help

### Presence Topology

- DefaultCUPSubcluster
  - imp-pub (0) users
  - imp-sub (0) users
  - All Unassigned Users (1)
  - All Assigned Users (0)

### Presence Topology Details

**Status**

Unassigned users detected. Presence information for these users will not be available until these users are assigned

**Presence Redundancy Groups**

- Indicates Presence Redundancy Group IM&P database publisher node
- Indicates Intercluster Connection

**DefaultCUPSubcluster**

- imp-pub
  - Verify IM/P Service Installed
  - Verify Node Reachable (pingable)
  - Version (11.5.1.10000(4))

**High Availability**

- State: Normal
- Reason: Normal

**Services**

- Cisco SIP Proxy (STARTED)
- Cisco Presence Engine (STARTED)
- Cisco Presence Datastore (STARTED)
- Cisco SIP Registration Datastore (STARTED)
- A Cisco DB (STARTED)
- Cisco XCP Router (STARTED)
- Cisco XCP Connection Manager (STARTED)
- Cisco XCP Authentication (STARTED)
- Cisco Sync Agent (STARTED)
- Cisco Client Profile Agent (STARTED)
- Cisco Inter-Cluster Sync Agent (STARTED)
- Cisco XCP Text Conference Manager (STARTED)

End User Configuration | 192.168.21.6/cupadmin/topology | Cisco Unified IM and Presence

Navigation: Cisco Unified CM IM and Presence Administration

System | Presence | Messaging | Application | Bulk Administration | Diagnostics | Help

### Node User Assignment (imp-pub)

**Status**

1 records found

**User Assignment (1 - 1 of 1)**

Find User Assignment where User ID begins with Find Clear Filter

| User ID      | First Name | Last Name | IM Address                | Directory URI          | Failed Over | Node    | Presence |
|--------------|------------|-----------|---------------------------|------------------------|-------------|---------|----------|
| abdul.jaseem | Abdul      | Jaseem    | abdul.jaseem@ajcollab.com | abdul.jaseem@gmail.com |             | imp-pub | DefaultC |

exp-c-01 - Unity Connection SE

Presence Redundancy Group C

+

←

→

↺

🏠

https://192.168.21.1/ccmadmin/presenceRedundancyGroupEdit.do

🔒

🌟

⬇

🔍

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🔗

☰

CISCO

Cisco Unified CM Administration

For Cisco Unified Communications Solutions

Navigation

Cisco Unified CM Administration

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▼

Media Resources

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Advanced Features

▼

Device

▼

Application

▼

User Management

▼

Bulk Administration

▼

Help

▼

Presence Redundancy Group Configuration

Related Links: Back To Find/List

Go

💾 Save

✖ Delete

➕ Add New

ℹ

Status: Ready

Presence Redundancy Group Configuration

Name\* DefaultCUPSubcluster

Description Default subcluster

Presence Redundancy Group Configuration

Presence Server\* imp-pub

Presence Server imp-sub

High Availability

☒ Enable High Availability

| Monitored Server | Assigned Users | Active Users | Server State | Reason | ServerAction |
|------------------|----------------|--------------|--------------|--------|--------------|
| imp-pub          | 1              | 1            | Normal       | Normal | Failover     |
| imp-sub          | 0              | 0            | Normal       | Normal | Failover     |

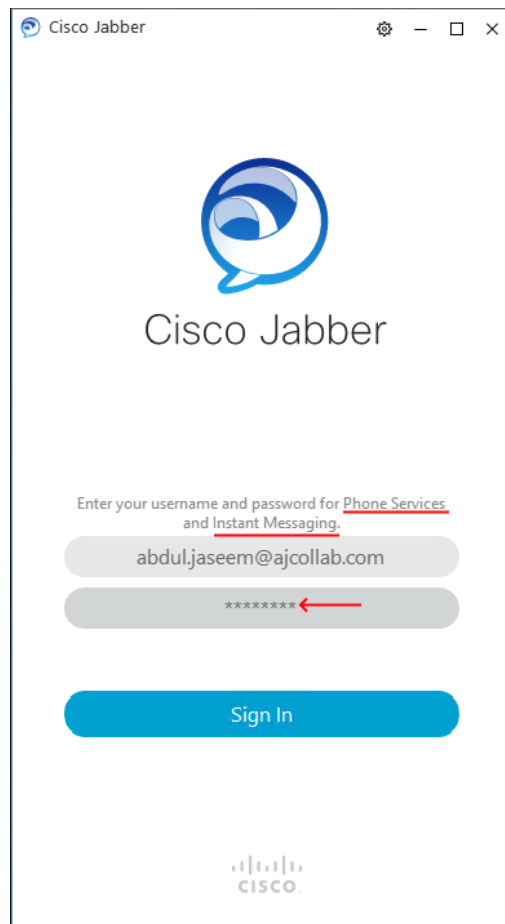
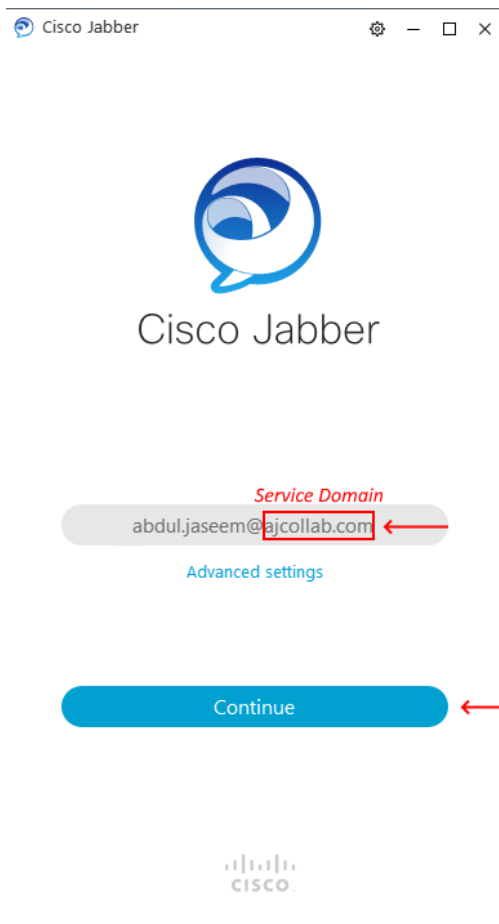
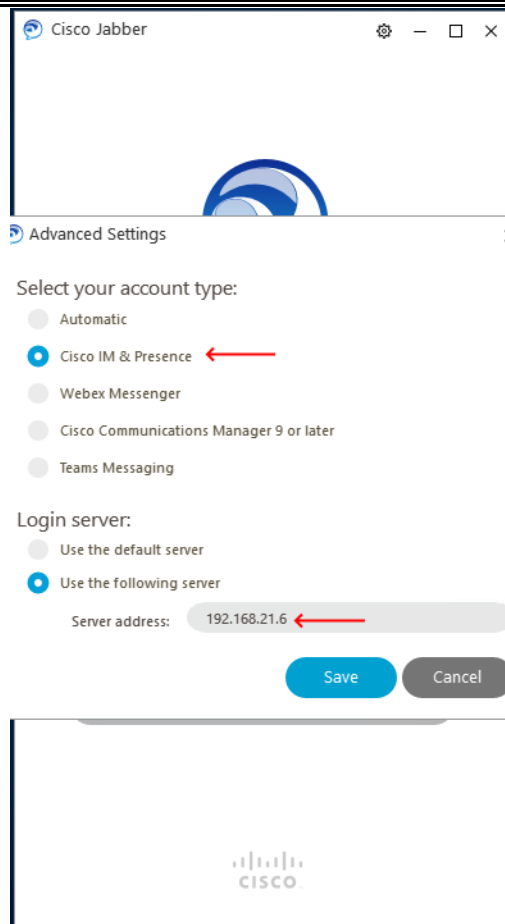
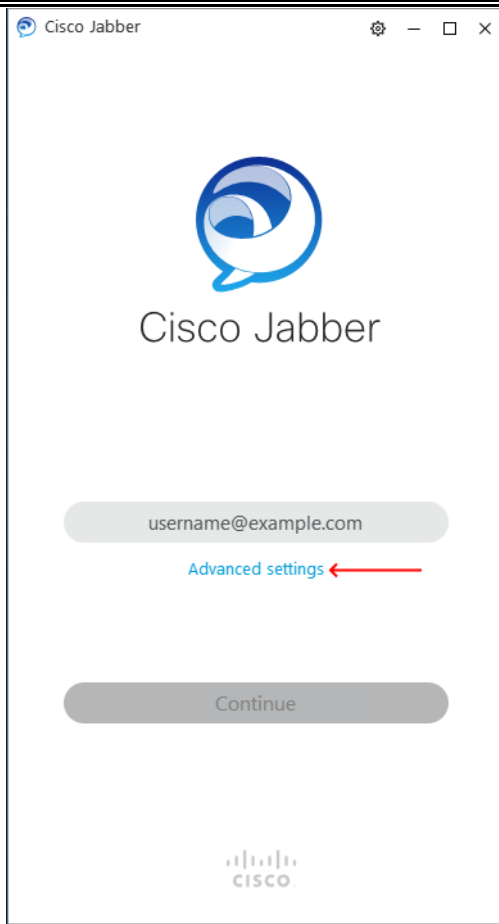
Save

Delete

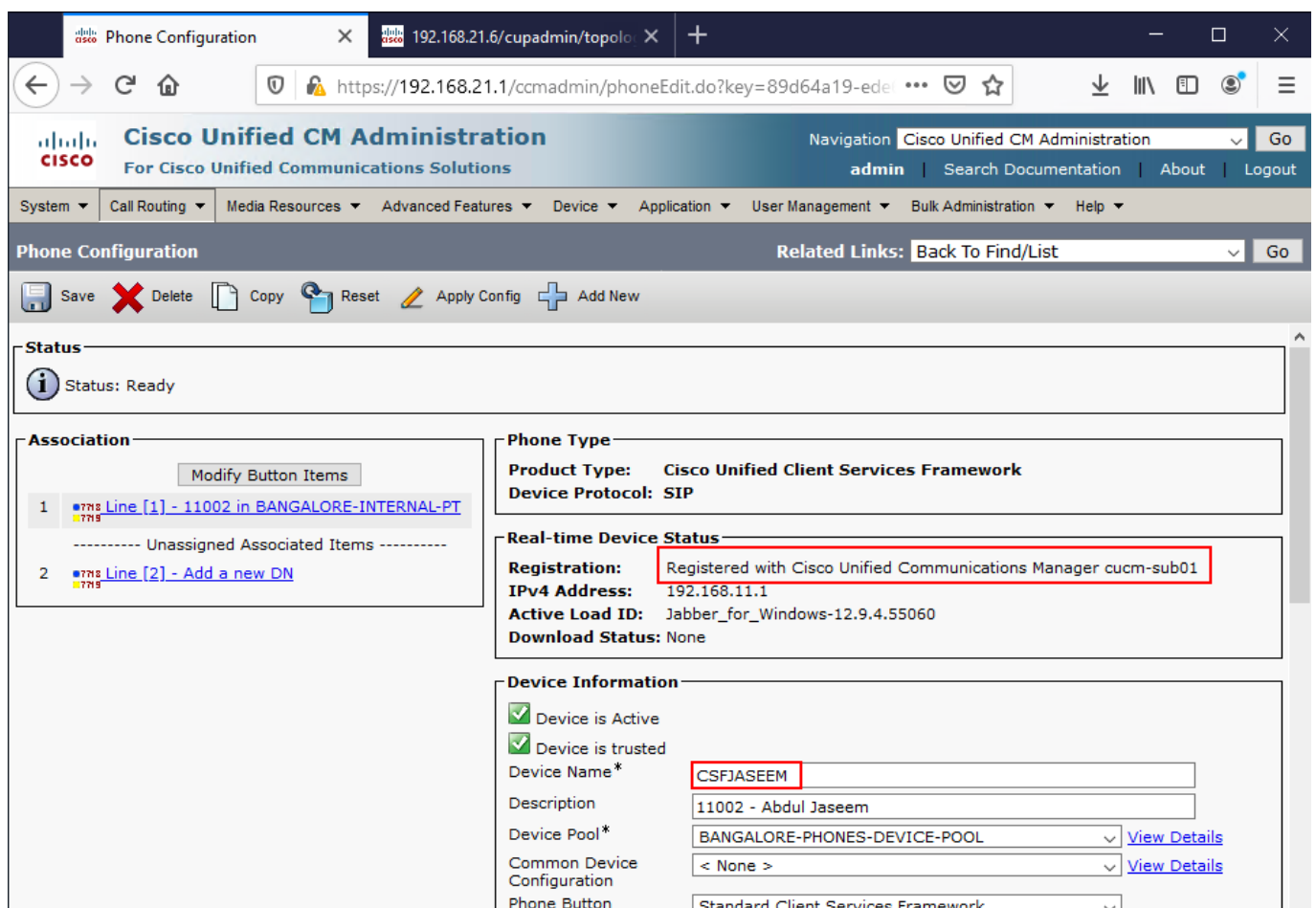
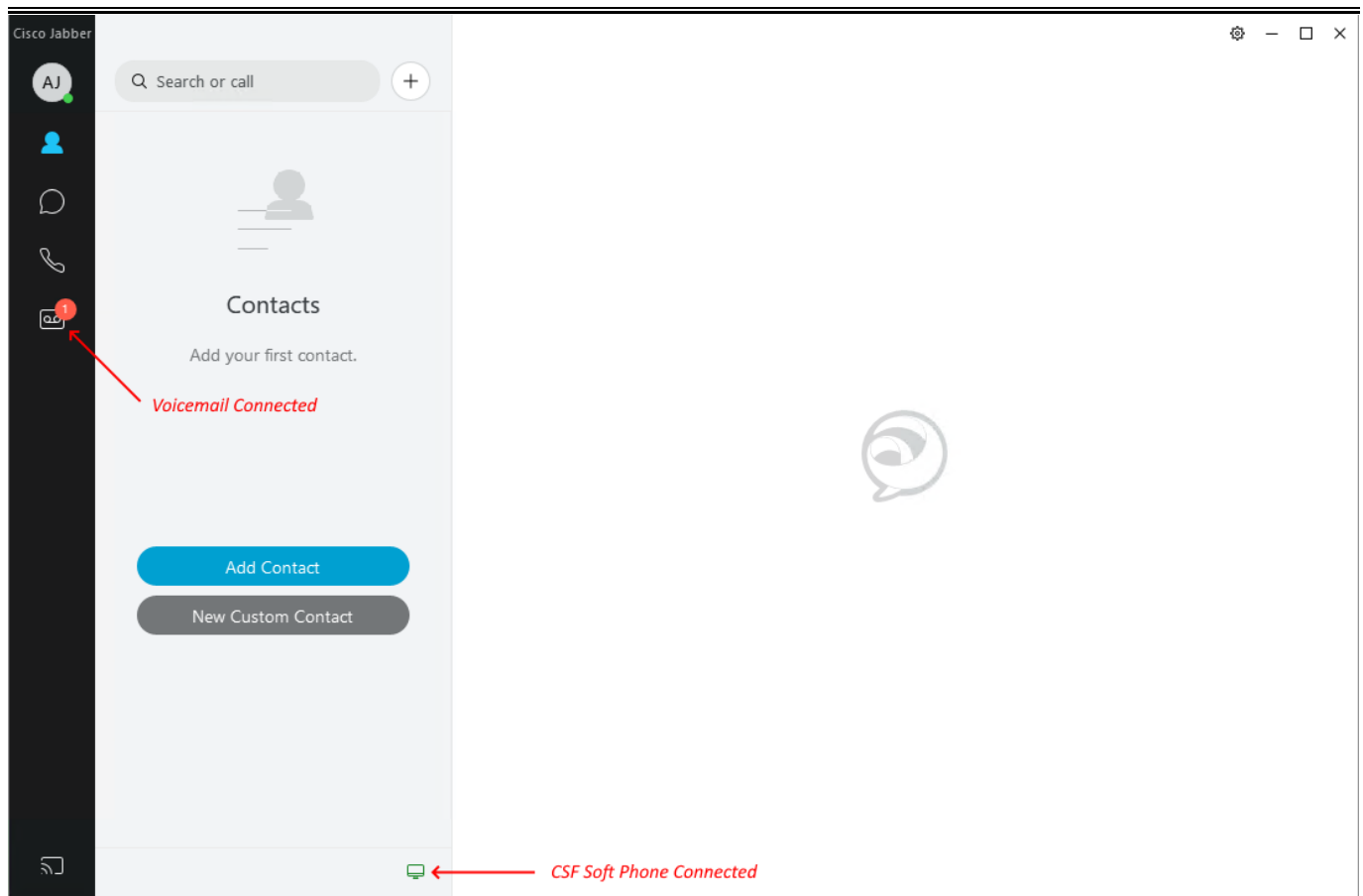
Add New

ℹ

\*- indicates required item.



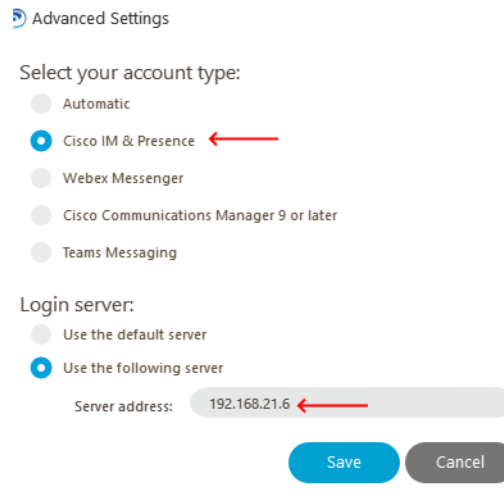




---

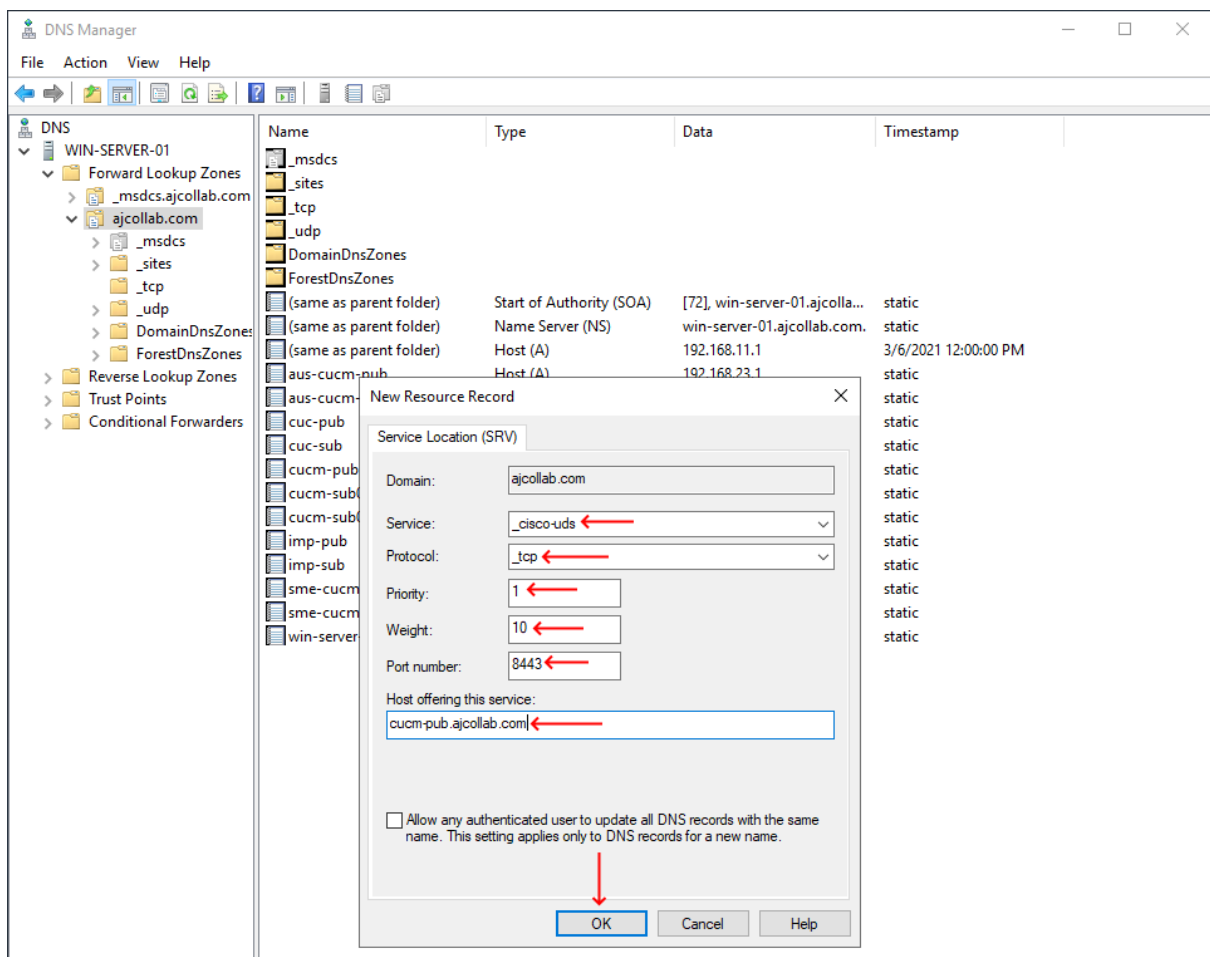
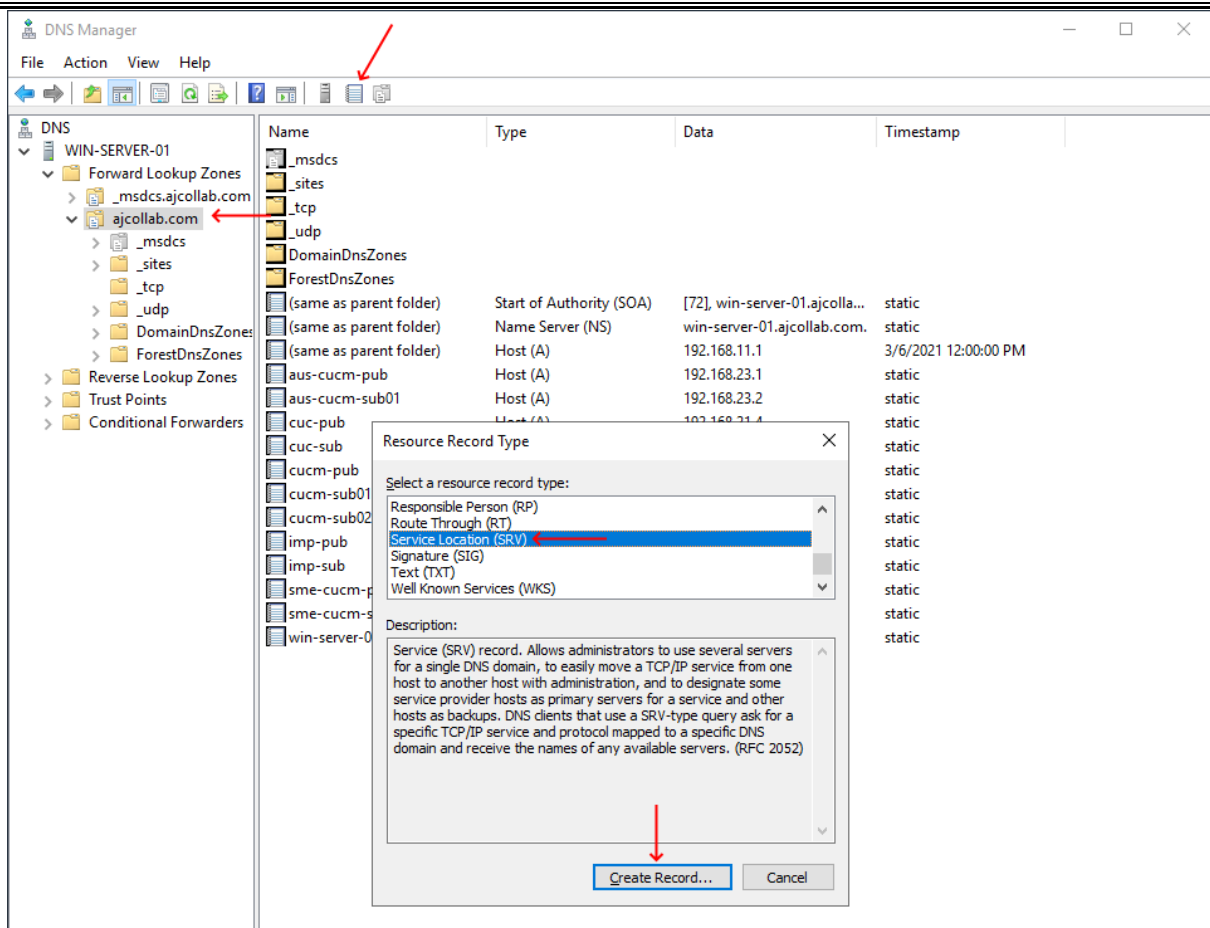
## [Lab] DNS SRV Records for Jabber On-premise

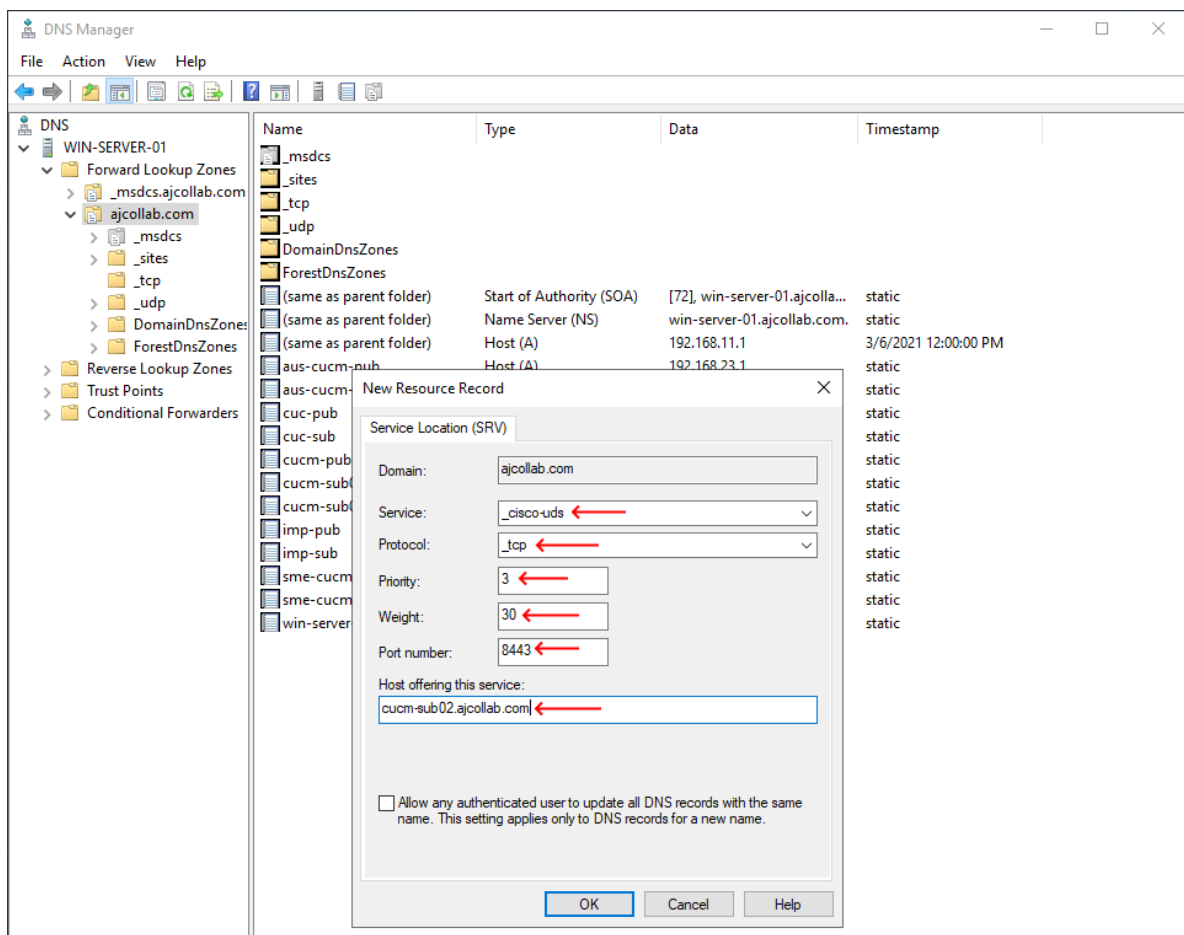
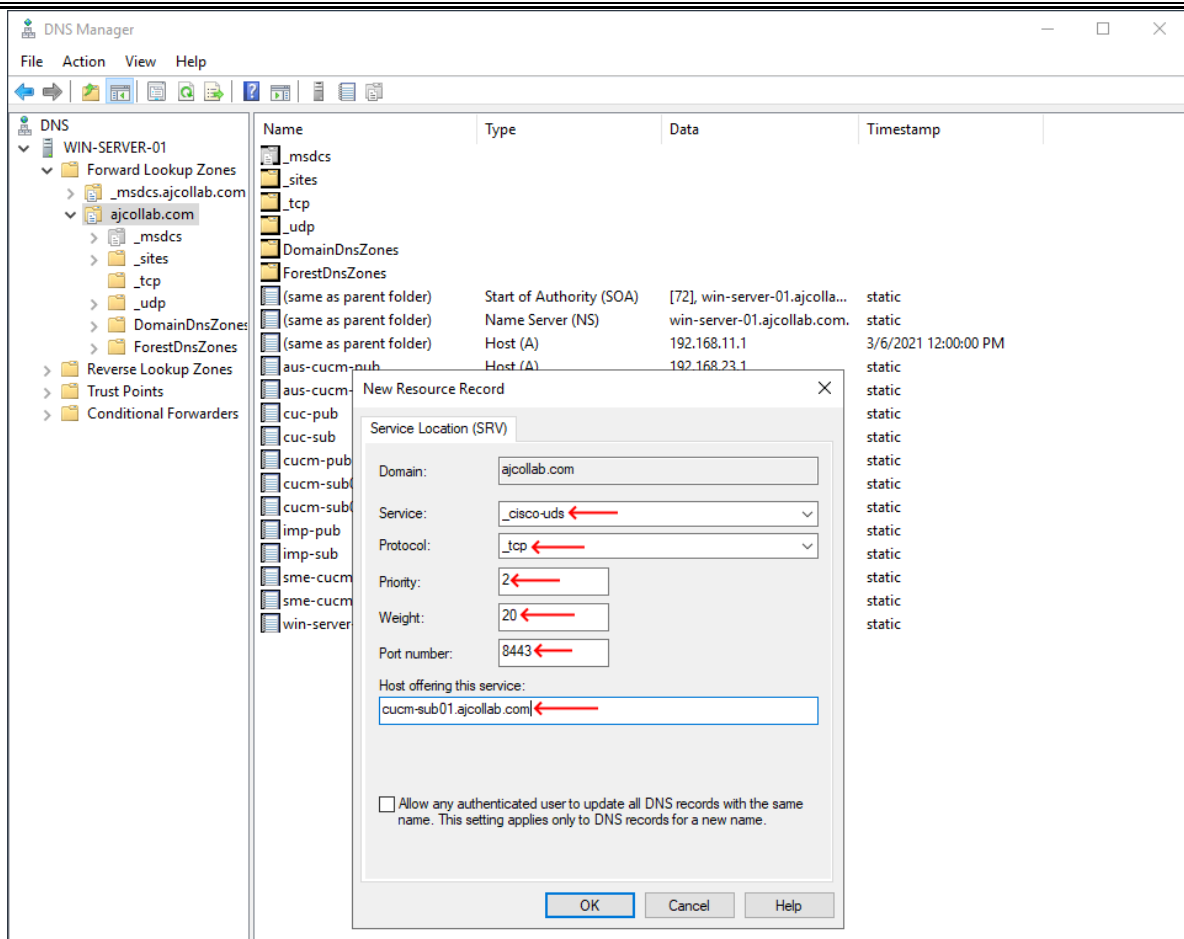
- As end user perspective, entering the IMP Server IP or FQDN on Jabber Advanced Settings not practical always
- We use DNS SRV (Service) Records to get rid of from the issue. SRVs are used for service discovery



The screenshot shows the 'Advanced Settings' dialog box for Jabber. It has a title bar with a blue icon and the text 'Advanced Settings' followed by a right-pointing arrow. The main content area is titled 'Select your account type:' and contains five radio button options: 'Automatic', 'Cisco IM & Presence' (which is selected and has a red arrow pointing to it), 'Webex Messenger', 'Cisco Communications Manager 9 or later', and 'Teams Messaging'. Below this is the 'Login server:' section with two radio button options: 'Use the default server' and 'Use the following server' (which is selected). Under the 'Use the following server' option, there is a text field labeled 'Server address:' containing the IP address '192.168.21.6', with a red arrow pointing to the text. At the bottom right are two buttons: a blue 'Save' button and a grey 'Cancel' button.

- When we enter the service domain (@ajcollab.com), Jabber can perform a DNS SRV check to identify the IP and CUCM server IP Address from its DNS Server
- If Jabber is inside corporate network, the DNS returns the private IP or IMP and CUCM servers
- If Jabber is outside the corporate network (on Internet), DNS returns the public IP of Expressway E server (This solution is called MRA, we will discuss that on the next chapter)
- Now let us configure DNS SRV records for the internal login so that users do not want to enter the IP manually while logging in





| DNS Manager           |                        |                                            |                      |  |
|-----------------------|------------------------|--------------------------------------------|----------------------|--|
| File Action View Help |                        |                                            |                      |  |
|                       |                        |                                            |                      |  |
| Name                  | Type                   | Data                                       | Timestamp            |  |
| _gc                   | Service Location (SRV) | [0][100][3268] win-server-01.ajcollab.com. | 3/6/2021 12:00:00 PM |  |
| _kerberos             | Service Location (SRV) | [0][100][88] win-server-01.ajcollab.com.   | 3/6/2021 12:00:00 PM |  |
| _kpasswd              | Service Location (SRV) | [0][100][464] win-server-01.ajcollab.com.  | 3/6/2021 12:00:00 PM |  |
| _ldap                 | Service Location (SRV) | [0][100][389] win-server-01.ajcollab.com.  | 3/6/2021 12:00:00 PM |  |
| _cisco-uds            | Service Location (SRV) | [1][10][8443] cucm-pub.ajcollab.com        |                      |  |
| _cisco-uds            | Service Location (SRV) | [2][20][8443] cucm-sub01.ajcollab.com      |                      |  |
| _cisco-uds            | Service Location (SRV) | [3][30][8443] cucm-sub02.ajcollab.com      |                      |  |

```

Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.737]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>nslookup
Default Server: win-server-01.ajcollab.com
Address: 192.168.11.1

> set type=srv
> _cisco-uds._tcp.ajcollab.com
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

_cisco-uds._tcp.ajcollab.com SRV service location:
priority = 1
weight = 10
port = 8443
svr hostname = cucm-pub.ajcollab.com
_cisco-uds._tcp.ajcollab.com SRV service location:
priority = 2
weight = 20
port = 8443
svr hostname = cucm-sub01.ajcollab.com
_cisco-uds._tcp.ajcollab.com SRV service location:
priority = 3
weight = 30
port = 8443
svr hostname = cucm-sub02.ajcollab.com
cucm-pub.ajcollab.com internet address = 192.168.21.1
cucm-sub01.ajcollab.com internet address = 192.168.21.2
cucm-sub02.ajcollab.com internet address = 192.168.21.3
>
> exit

C:\Users\Administrator>
C:\Users\Administrator>nslookup cucm-pub.ajcollab.com
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

Name: cucm-pub.ajcollab.com
Address: 192.168.21.1

C:\Users\Administrator>
C:\Users\Administrator>nslookup cucm-sub01.ajcollab.com
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

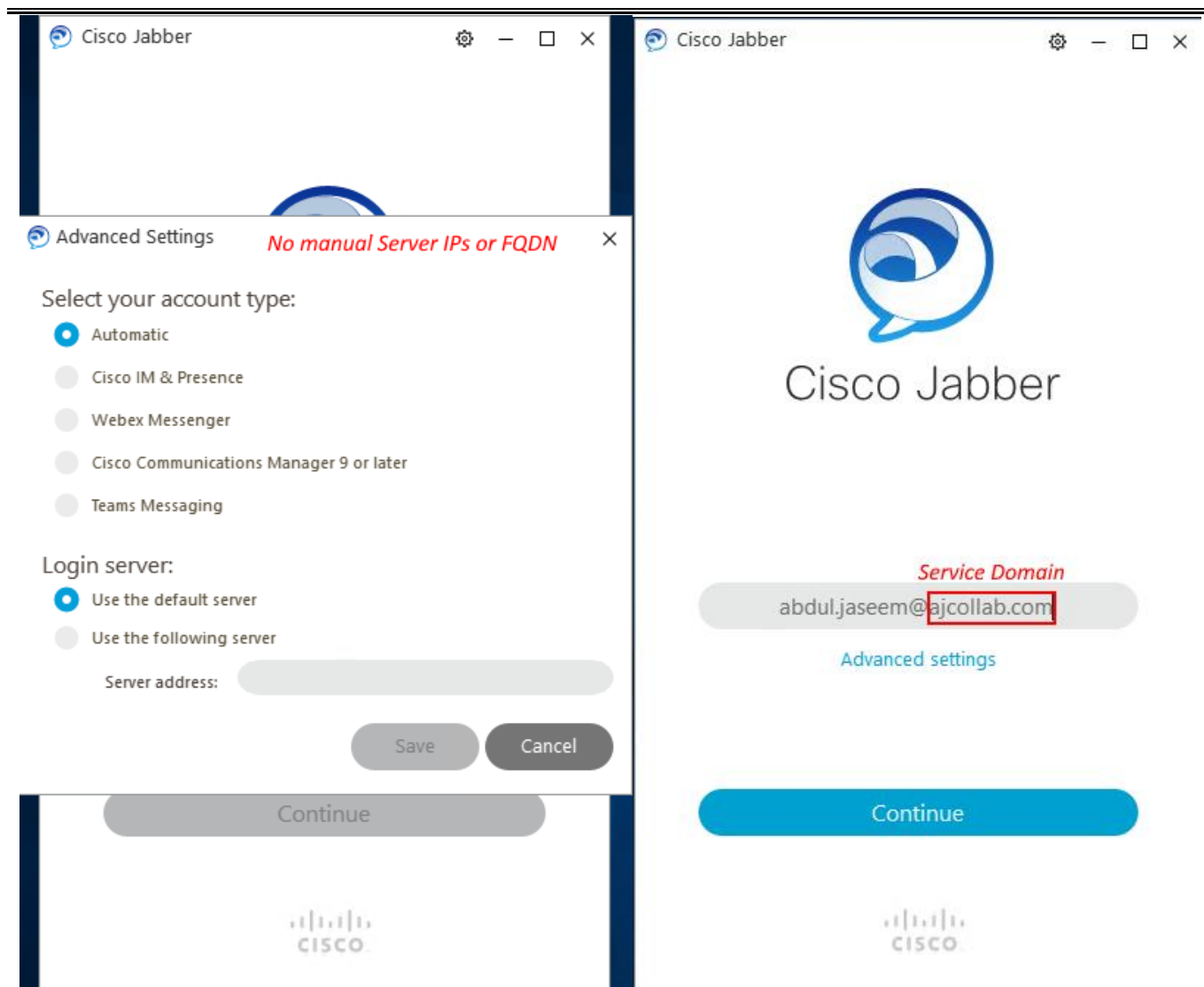
Name: cucm-sub01.ajcollab.com
Address: 192.168.21.2

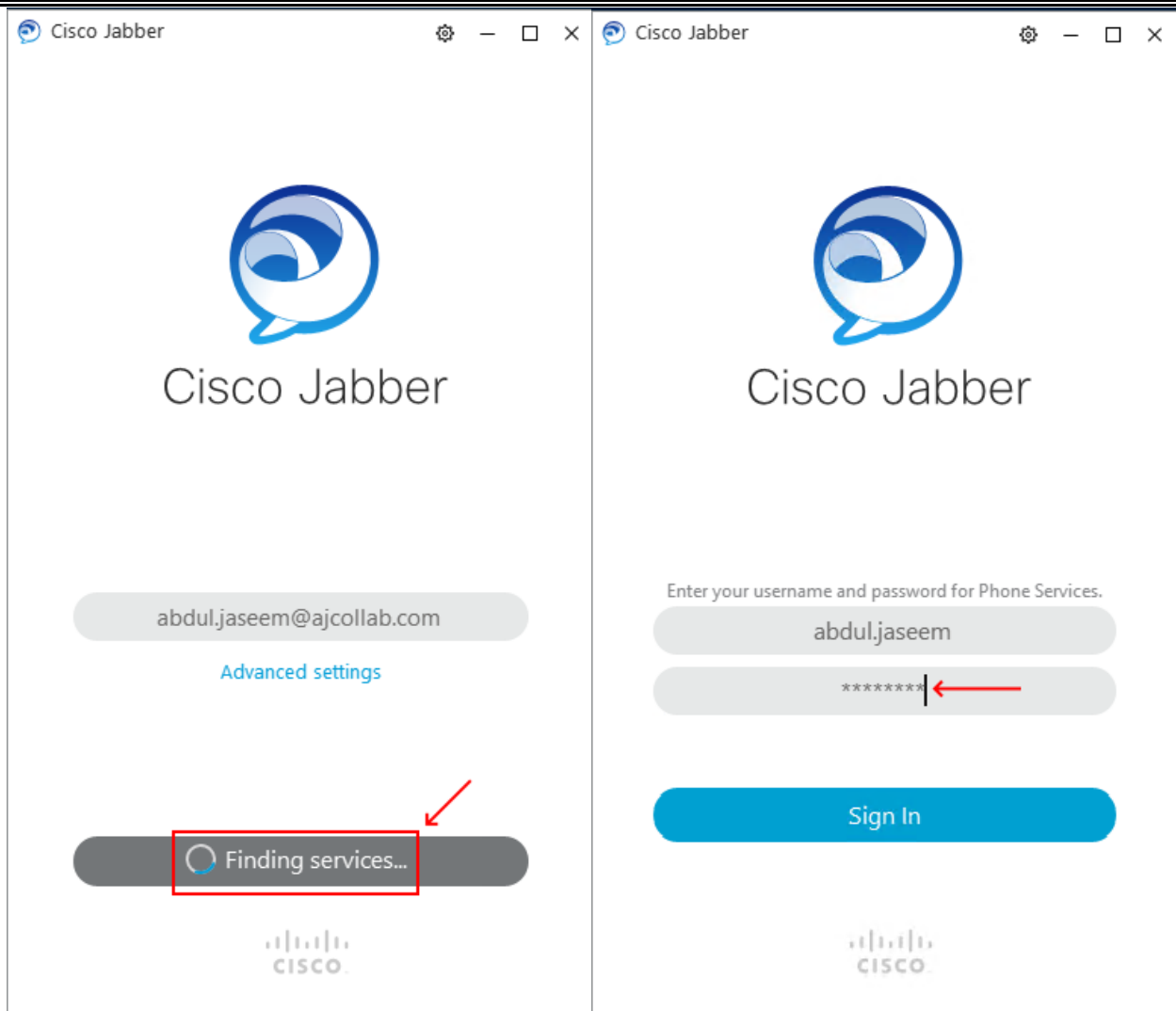
C:\Users\Administrator>
C:\Users\Administrator>nslookup cucm-sub02.ajcollab.com
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

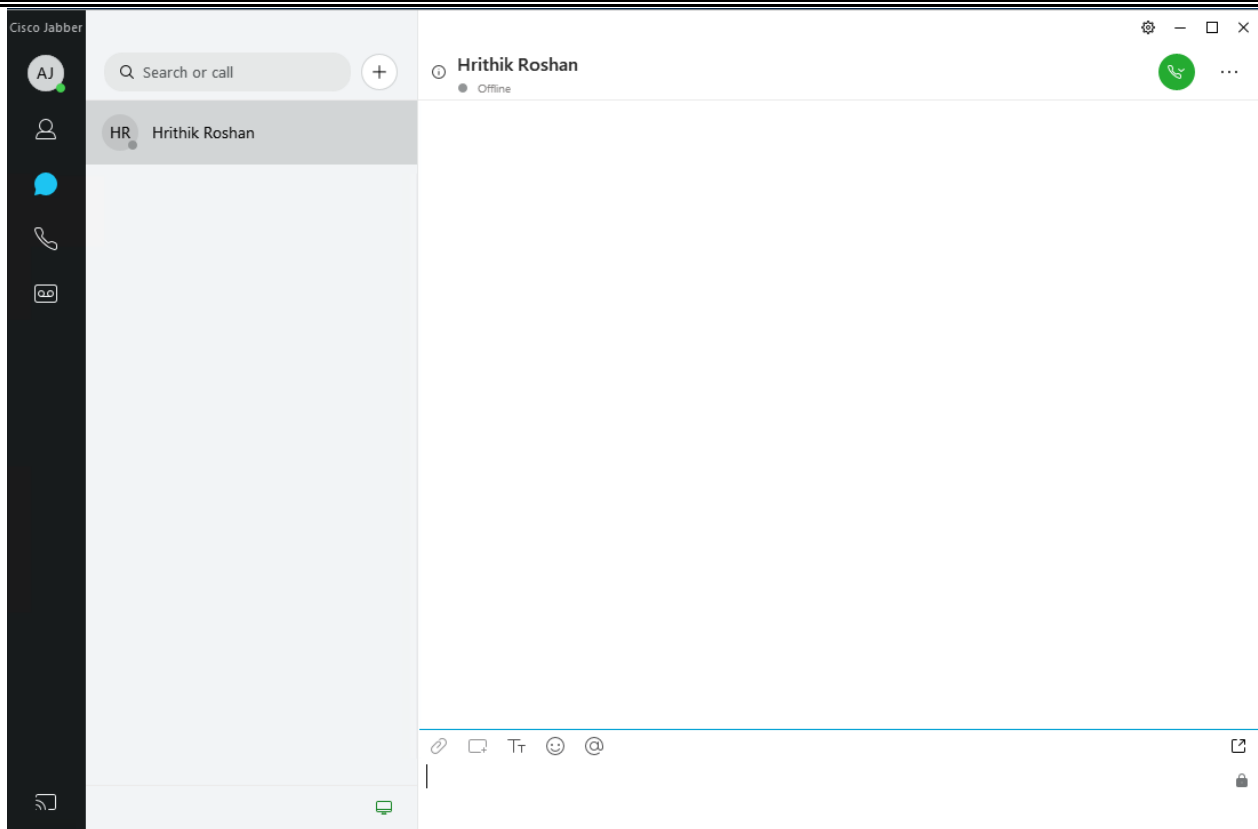
Name: cucm-sub02.ajcollab.com
Address: 192.168.21.3

C:\Users\Administrator>

```







## On-Prem Cisco Jabber Diagnostics & Problem Report (PRT)

- Hit “Ctrl + Shift + D” after launching Jabber
- This will give us the complete Service Discovery output



## Discovery

|                        |                                                |
|------------------------|------------------------------------------------|
| Discovery Outcome      | Success: Cisco IM & Presence                   |
| Domain Controller      | \\win-server-01.ajcollab.com                   |
| Edge Domain            | ajcollab.com                                   |
| Edge Required          | No                                             |
| Excluded Services      | None                                           |
| FIPS                   | OFF                                            |
| Internal Visibility    | Visible                                        |
| JID created from       | username + presence domain                     |
| Jabber ID              | abduljaseem@ajcollab.com                       |
| Services Domain        | ajcollab.com                                   |
| Services Domain Source | Email Address from UserInput                   |
| UPN                    | <b>Error: The system cannot open the file.</b> |
| User Image             | No image source                                |
| Voice Services Domain  | ajcollab.com                                   |

## UCM Summary

|                               |                                                                                                                                                         |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Device Configuration          | <a href="https://cucm-pub:6972/CSFJASEEM.cnf.xml">https://cucm-pub:6972/CSFJASEEM.cnf.xml</a>                                                           |
| Global Settings Configuration | <a href="https://cucm-pub:6972/global-settings.xml">https://cucm-pub:6972/global-settings.xml</a>                                                       |
| Home UDS                      | <a href="https://cucm-sub01.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-sub01.ajcollab.com:8443/cucm-uds/user/abduljaseem</a>             |
| Service Profile Configuration | <a href="https://cucm-pub:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml">https://cucm-pub:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml</a> |
| Supports SSO                  | FALSE                                                                                                                                                   |
| UCM Version                   | 11.5.1                                                                                                                                                  |

## UCM Configuration

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEVICE_XML          | <a href="https://cucm-pub:6972/CSFJASEEM.cnf.xml">https://cucm-pub:6972/CSFJASEEM.cnf.xml</a>                                                                                                                                                                                                                                                                                                                                         |
| GLOBAL_SETTINGS_XML | <a href="https://cucm-pub:6972/global-settings.xml">https://cucm-pub:6972/global-settings.xml</a>                                                                                                                                                                                                                                                                                                                                     |
| HOME_CLUSTER_XML    | <a href="https://cucm-sub01.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-sub01.ajcollab.com:8443/cucm-uds/user/abduljaseem</a>                                                                                                                                                                                                                                                                                           |
| HOME_UDS_NODES      | <a href="https://cucm-sub01.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-sub01.ajcollab.com:8443/cucm-uds/user/abduljaseem</a><br><a href="https://cucm-pub.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-pub.ajcollab.com:8443/cucm-uds/user/abduljaseem</a><br><a href="https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abduljaseem</a> |
| SERVICE_PROFILE_XML | <a href="https://cucm-pub:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml">https://cucm-pub:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml</a>                                                                                                                                                                                                                                                                               |
| TFTP_SERVERS        | cucm-pub                                                                                                                                                                                                                                                                                                                                                                                                                              |
| UDS_SERVERS         | <a href="https://cucm-sub01.ajcollab.com">cucm-sub01.ajcollab.com</a><br><a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a><br><a href="https://cucm-sub02.ajcollab.com">cucm-sub02.ajcollab.com</a>                                                                                                                                                                                                                   |

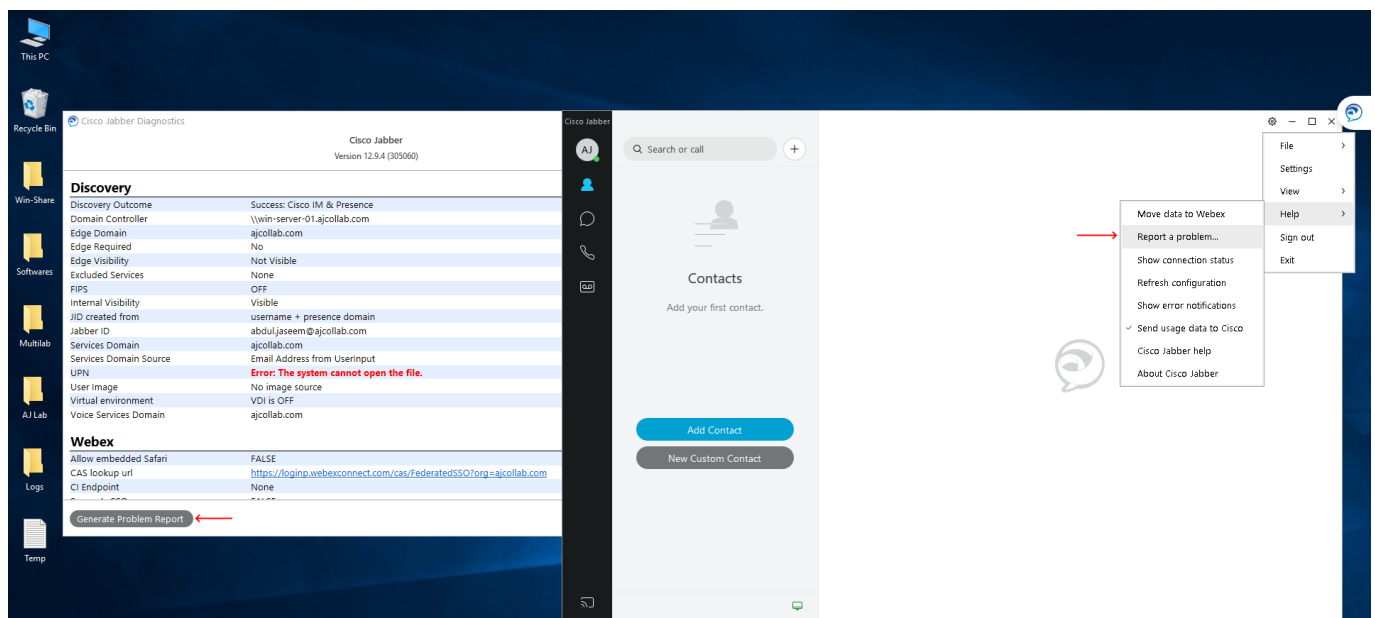
## Voicemail

Generate Problem Report

Save

Reload

- Now let's capture a complete on-premise Jabber registration events in the form of PRT
- Go to Settings >> Help >> Report a Problem



Cisco Jabber

Help us resolve your problem. Create a report that contains the Cisco Jabber log file from your computer. The report is confidential and anonymous.

\* Select the area in which the problem occurs

Sign in / Sign out

\* Summary of the problem

Jabber-Login

\* Problem details and steps to reproduce the problem

Jabber-Login

Contact E-mail

abduljaseem@ajcollab.com

Attach file

Screen Shot

☐ Include Memory dump

Thank you for your feedback

Save
Send
Cancel



Jabber-On-Premise-Login

File Home Share View

← → ↶ ↷ ↻ ↺ ↻ ↺ ↻ ↺

Logs > Jabber > Jabber-On-Premise-Login

Search Jabber-On-Premise-Lo...

| Name             | Date modified      | Type          | Size     |
|------------------|--------------------|---------------|----------|
| Bootstrap        | 4/15/2021 10:48 AM | File folder   |          |
| Config           | 4/15/2021 10:48 AM | File folder   |          |
| Contacts         | 4/15/2021 10:48 AM | File folder   |          |
| Diagnostics      | 4/15/2021 10:48 AM | File folder   |          |
| JabberWexCpp     | 4/15/2021 10:48 AM | File folder   |          |
| SystemInfo       | 4/15/2021 10:48 AM | File folder   |          |
| gdi.txt          | 4/15/2021 10:47 AM | Text Document | 10 KB    |
| jabber.log       | 4/15/2021 10:47 AM | Text Document | 5,180 KB |
| jabber.log.cef   | 4/15/2021 10:47 AM | CEF File      | 0 KB     |
| jabber_ui.log    | 4/15/2021 10:47 AM | Text Document | 4 KB     |
| metadata.txt     | 4/15/2021 10:47 AM | Text Document | 1 KB     |
| PRT.txt          | 4/15/2021 10:47 AM | Text Document | 5 KB     |
| user-comment.txt | 4/15/2021 10:47 AM | Text Document | 1 KB     |

Quick access

- Desktop
- Downloads
- Documents
- Pictures
- CUBE HA
- Logs
- SSO Metadata
- System32
- This PC
- Network

Cisco Jabber Diagnostics

Cisco Jabber  
Version 12.9.4 (305060)

### Discovery

|                        |                                                |
|------------------------|------------------------------------------------|
| Discovery Outcome      | Success: Cisco IM & Presence                   |
| Domain Controller      | \\win-server-01.ajcollab.com                   |
| Edge Domain            | ajcollab.com                                   |
| Edge Required          | No                                             |
| Edge Visibility        | Not Visible                                    |
| Excluded Services      | None                                           |
| FIPS                   | OFF                                            |
| Internal Visibility    | Visible                                        |
| JID created from       | username + presence domain                     |
| Jabber ID              | abdul.jaseem@ajcollab.com                      |
| Services Domain        | ajcollab.com                                   |
| Services Domain Source | Email Address from UserInput                   |
| UPN                    | <b>Error: The system cannot open the file.</b> |
| User Image             | No image source                                |
| Virtual environment    | VDI is OFF                                     |
| Voice Services Domain  | ajcollab.com                                   |

### Webex

|                       |                                                                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Allow embedded Safari | FALSE                                                                                                                                             |
| CAS lookup url        | <a href="https://loginp.webexconnect.com/cas/FederatedSSO?org=ajcollab.com">https://loginp.webexconnect.com/cas/FederatedSSO?org=ajcollab.com</a> |
| CI Endpoint           | None                                                                                                                                              |
| Supports SSO          | FALSE                                                                                                                                             |
| Webex Customer        | FALSE                                                                                                                                             |

### UCM Summary

|                               |                                                                                                                                                                                   |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Device Configuration          | <a href="https://cucm-pub.ajcollab.com:6972/CSFJASEEM.cnf.xml">https://cucm-pub.ajcollab.com:6972/CSFJASEEM.cnf.xml</a>                                                           |
| Global Settings Configuration | <a href="https://cucm-pub.ajcollab.com:6972/global-settings.xml">https://cucm-pub.ajcollab.com:6972/global-settings.xml</a>                                                       |
| Home UDS                      | <a href="https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abdul.jaseem">https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abdul.jaseem</a>                                     |
| Service Profile Configuration | <a href="https://cucm-pub.ajcollab.com:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml">https://cucm-pub.ajcollab.com:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml</a> |
| Supports SSO                  | FALSE                                                                                                                                                                             |
| UCM Version                   | 11.5.1                                                                                                                                                                            |

### UCM Configuration

|                     |                                                                                                                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEVICE_XML          | <a href="https://cucm-pub.ajcollab.com:6972/CSFJASEEM.cnf.xml">https://cucm-pub.ajcollab.com:6972/CSFJASEEM.cnf.xml</a>                                                           |
| GLOBAL_SETTINGS_XML | <a href="https://cucm-pub.ajcollab.com:6972/global-settings.xml">https://cucm-pub.ajcollab.com:6972/global-settings.xml</a>                                                       |
| HOME_CLUSTER_XML    | <a href="https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abdul.jaseem">https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abdul.jaseem</a>                                     |
| HOME_UDS_NODES      | <a href="https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abdul.jaseem">https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abdul.jaseem</a>                                     |
| SERVICE_PROFILE_XML | <a href="https://cucm-pub.ajcollab.com:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml">https://cucm-pub.ajcollab.com:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml</a> |
| TFTP_SERVERS        | <a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a>                                                                                                                 |
| UDS_SERVERS         | <a href="https://cucm-sub02.ajcollab.com">cucm-sub02.ajcollab.com</a>                                                                                                             |

Generate Problem Report

Save Reload

Cisco Jabber Diagnostics
Cisco Jabber
Version 12.9.4 (305060)

|              |        |
|--------------|--------|
| Supports SSO | FALSE  |
| UCM Version  | 11.5.1 |

### UCM Configuration

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DEVICE_XML          | <a href="https://cucm-pub.ajcollab.com:6972/CSFJASEEM.cnf.xml">https://cucm-pub.ajcollab.com:6972/CSFJASEEM.cnf.xml</a>                                                                                                                                                                                                                                                                                                               |
| GLOBAL_SETTINGS_XML | <a href="https://cucm-pub.ajcollab.com:6972/global-settings.xml">https://cucm-pub.ajcollab.com:6972/global-settings.xml</a>                                                                                                                                                                                                                                                                                                           |
| HOME_CLUSTER_XML    | <a href="https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abduljaseem</a>                                                                                                                                                                                                                                                                                           |
| HOME_UDS_NODES      | <a href="https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-sub02.ajcollab.com:8443/cucm-uds/user/abduljaseem</a><br><a href="https://cucm-pub.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-pub.ajcollab.com:8443/cucm-uds/user/abduljaseem</a><br><a href="https://cucm-sub01.ajcollab.com:8443/cucm-uds/user/abduljaseem">https://cucm-sub01.ajcollab.com:8443/cucm-uds/user/abduljaseem</a> |
| SERVICE_PROFILE_XML | <a href="https://cucm-pub.ajcollab.com:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml">https://cucm-pub.ajcollab.com:6972/SP1e69b98d-81ed-928d-6382-bbe085c546da.cnf.xml</a>                                                                                                                                                                                                                                                     |
| TFTP_SERVERS        | <a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a>                                                                                                                                                                                                                                                                                                                                                                     |
| UDS_SERVERS         | <a href="https://cucm-sub02.ajcollab.com">cucm-sub02.ajcollab.com</a><br><a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a><br><a href="https://cucm-sub01.ajcollab.com">cucm-sub01.ajcollab.com</a>                                                                                                                                                                                                                   |

### Voicemail

|                  |              |
|------------------|--------------|
| Voicemail Server | 192.168.21.4 |
|------------------|--------------|

### Certificate Validation

|                         |                  |
|-------------------------|------------------|
| 192.168.21.4            | [CN_NO_MATCH]    |
| ajcollab.com            | [UNTRUSTED_ROOT] |
| cucm-pub.ajcollab.com   | VALID            |
| cucm-sub02.ajcollab.com | VALID            |
| idbroker-b-us.webex.com | VALID            |
| idbroker.webex.com      | VALID            |
| imp-pub.ajcollab.com    | VALID            |
| loginp.webexconnect.com | VALID            |
| metrics-a.wbx2.com      | VALID            |
| u2c-a.wbx2.com          | VALID            |
| u2c-r.wbx2.com          | VALID            |

### Active Directory

|                  |     |
|------------------|-----|
| Directory Source | UDS |
|------------------|-----|

### DNS Records

|                                |                                                                                                                                                                                                                     |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| _cisco-uds_tcp.ajcollab.com.   | <a href="https://cucm-pub.ajcollab.com">cucm-pub.ajcollab.com</a><br><a href="https://cucm-sub01.ajcollab.com">cucm-sub01.ajcollab.com</a><br><a href="https://cucm-sub02.ajcollab.com">cucm-sub02.ajcollab.com</a> |
| _collab-edge_tls.ajcollab.com. | Domain does not exist                                                                                                                                                                                               |

### Presence Server

|        |                                          |
|--------|------------------------------------------|
| Server | imp-pub.ajcollab.com (status: Connected) |
|--------|------------------------------------------|

Generate Problem Report
Save
Reload

- You can download the sample PRT from here: Jabber On-Premise Login PRT

## Jabber Login Flow - IM Service (XMPP)

- Service Discovery
- Configuration Request
- SOAP Login to IMP
- XMPP Login

service-discovery|About to make DNS SRV record query|\\\*-----\\\* Configuring request|\\\*-----\\\* HTTP response code|Changing lifecycle State to|\\@CupSoapCli|parseSubjectCNField] - Subject CN field|XmppSDK: #., CTripConnectionClient::|XmppSDK: #0, .., Send:<auth xmlns|XmppSDK: #0, ..., Send:<auth xmlns|IMP Outage

```
6539 MTP: CcMns6Manager::CancelResolve, aObserver=0998DE60 this=09765510
6540 @MMTP: OnConnectIndication, real-transport: 0998ADE4 this=09918158
6541 rtThreadProxy] - @MMTP: ctor, actual-transport: 09918158 this=09960020
6542 T<class CcMConnectorThreadProxy::OnConnectIndication] - @MMTP: CcMAcceptorConnectorSinkThreadProxyT::OnConnectIndication aReason=0 aTrpt=09918158
6543 T<class CcMConnectorThreadProxy::OnConnectIndication] - @MMTP: send the OnConnectIndication event to main thread this=10DFEAA4
6544 - @MMTP: OnOutput return nOnCall: 0
6545 CcMConnectorThreadProxy::OnConnectIndication Event this=099459D0
6546 CcMConnectorItem::OnConnectIndication aReason = 0 aTrpt = 09960020 aRequestId = 10DFEAA4
6547 em::OnConnectIndication() , Final connection Priority = TOP_PRIORITY this=09757180
6548 OnConnectIndication, reason: 0, this: 099B4AF0
6549 OnConnectSuccess.server=imp-pub.ajcollab.com port=5222, this: 099B4AF0
6550 - @XmppSDK: #0, .., Send:<auth xmlns|IMP Outage
6551 rwnd: set timer: 31360
6552 MMTP: event_type: 0020, m_pMessageBlock = 2C30353A this=09945DB8
6553 :DK: #0, 154, SendV, nSend: 'ajcollab.com' xmlns='jabber:client' xmlns:stream='http://etherx.jabber.org/streams'
6554 t] - @MMTP: CcMConnectorThreadProxy::OnConnectIndication 9757180 this=09603660
6555 P: event_type=0, 0, m_pMessageBlock = 09945A98 this=09945DB8
6556 SendV, nSend: 0, m_pMessageBlock = 09945A98 this=09945DB8
6557 Recv_i return nRecv: 107 transport: 0998ADF4
6558 @XmppSDK: #0, 154, SendV, nSend: 'ajcollab.com' xmlns='jabber:client' xml:lang="en-US.UTF-8" id="222F9999"
6559 Recv_i return nRecv: 107 transport: 0998ADF4

Find result: (524 hits)
6559 Recv_i return nRecv: 107 transport: 0998ADF4

Find what: XmppSDK: #0, ..., Send:<auth xmlns|IMP Outage
Find Next
Find All in All Opened Documents
Find All in Current Document
Close
Search Mode
Backward direction
Match whole word only
Match case
Wrap around
Regular expression (checked, matches newlines)
On losing focus
Always
Transparency
On losing focus
Always
```



## Jabber Login Flow - Phone Service

- Authenticate with CUCM
- Register the Soft Phone

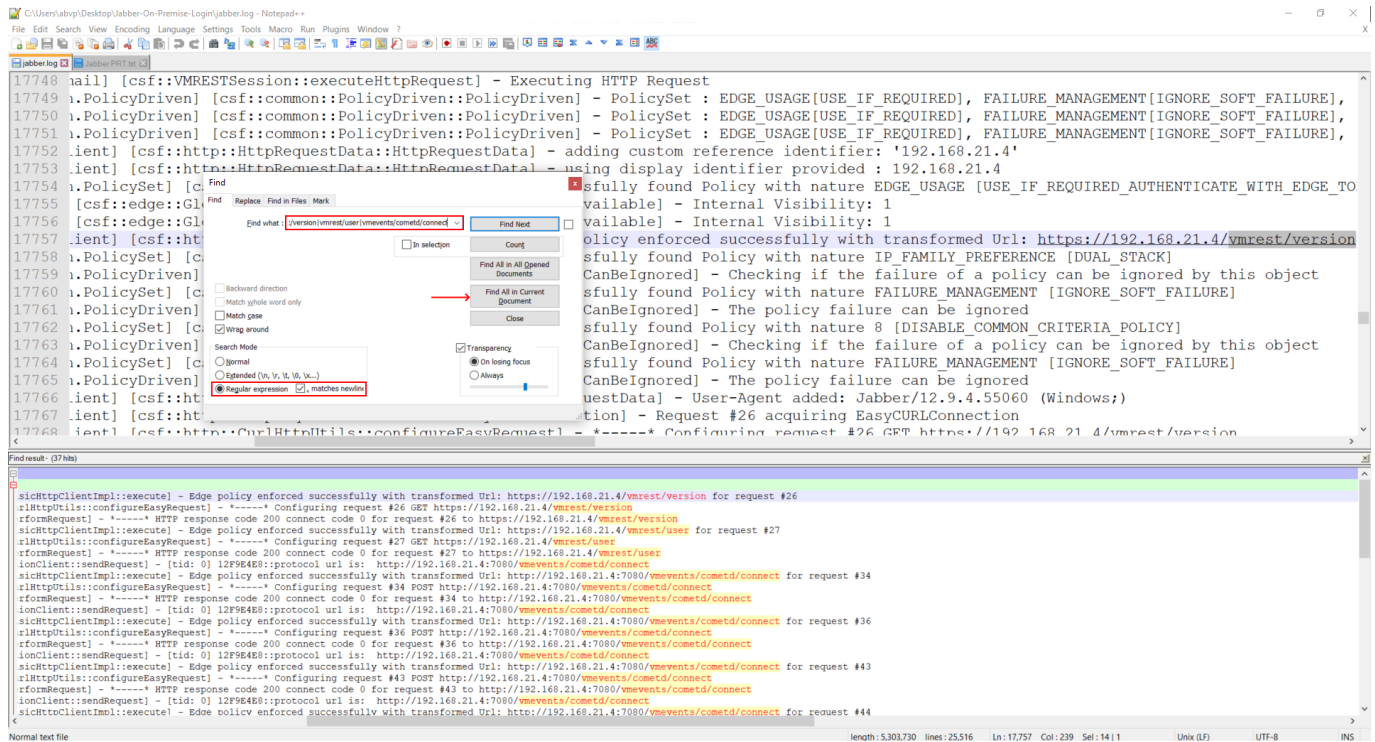
```
csf::ecc::CallControlManagerImpl::notifyAuthenticationStatusChange|CSFUnified::TelephonyCallControlDeviceHelper::processLineEvent] - Line Info:
```

The screenshot shows a Windows File Explorer window with the address bar displaying 'C:\Users\Administrator\Documents\Jabber-Login\Jabber-Login'. The search bar contains the text 'Find Next'. The search results are displayed in a list view, showing files and folders. The search criteria are set to 'Find Next' and 'Find All in Current Folder'. The search results show a list of files and folders, including 'vicesLifecycleStateMachine.cpp' and 'vicesLifecycleStateMachine.h'.

## Jabber Login Flow - Voicemail (vmrest API)

- Authenticate CUC via VMREST API

vmrest/version|vmrest/user|vmevents/cometd/connect



The screenshot shows a Notepad++ window with a log file open. A search overlay is visible in the center, showing the search term "version(vmrest/user/vmevents/cometd/connect)". The log file content includes various log entries, such as "Executing HTTP Request", "PolicySet", "adding custom reference identifier", "using display identifier", "successfully found Policy", "policy enforced successfully", "Checking if the failure of a policy can be ignored", "Request #26 acquiring EasyCURLConnection", and "Configuring request #26 GET https://192.168.21.4/vmrest/version". The search overlay also shows options like "Find Next", "Find All in All Opened Documents", "Find All in Current Document", "Search Mode", "Regular expression", and "Matches newline".



---

# **Chapter 1 Module 5 - Advanced Call Routing**

## **Cisco On-Premise Collaboration Solution**

### **CUBE, SME, Digit Manipulation & Media Resources**



---

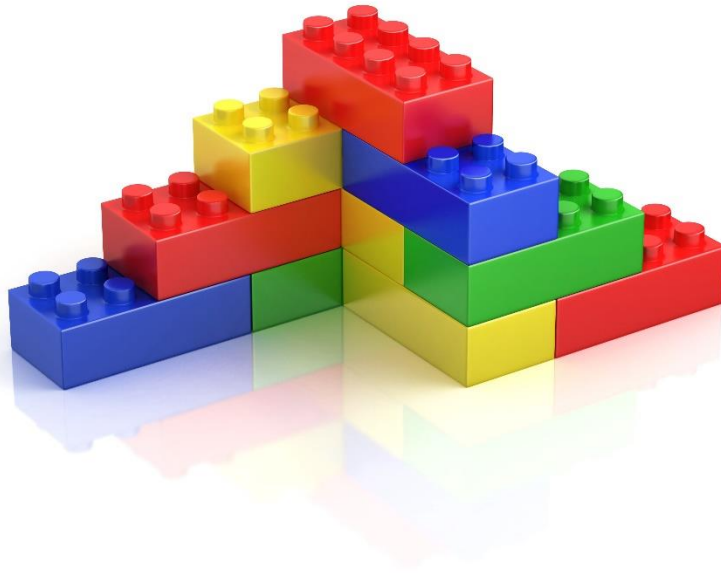
## Session Initiation Protocol - SIP



- Open standard communications protocol for signaling and controlling multimedia communication sessions, it is an ideal VoIP protocol for interconnecting different VoIP system and networks
- Uses 5060 port number and Secure SIP (SIPS) uses 5061 by default. Goal of SIP is creating, modifying & terminating sessions
- Internet Engineering Task Force (IETF) developed SIP as an alternative to H.323
- SIP is a peer-to-peer protocol where internet end points (User Agents) initiate sessions, similar to H.323
- SIP messages resemble with HTTP messages
- SIP uses SDP (Session Description Protocol) to exchange capabilities (Media IP, Port, Codec, DTMF Relay, etc.)
- Internet Telephony Service Provider (ITSP) uses SIP as their standard

---

## Components of SIP



- **User Agents (UA):** The SIP message originator is termed as User Agent Client (UAC) and the server who respond to the SIP message termed as User Agent Server (UAS)
- **Registrar Server:** Receive SIP Registration request from SIP endpoints and register the endpoint to a database. CUCM acts as a Registrar Server during phone registration
- **Proxy Server:** Initial point of contact for user agents. It receives SIP request from UAC and forward it on behalf of the client to the next SIP server in the network. CUCM acts as a Proxy Server when routing the call from one SIP device to another SIP device or SIP Trunk
- **Redirect Server:** Finds a location of an endpoint. It provides next hop information to UAC. CUCM acts as a Redirect Server during Call Forward scenarios
- **Location Server:** Keeps the database of all User agents. It implements the mechanism to resolve the address. CUCM itself a Location Server since it stores all SIP endpoint details
- **Presence Server:** Provides availability (Presence information) of User Agents. IM & Presence Server is an example of this

---

## SIP Request or Methods

- SIP Request or Methods are the SIP messages that takes an action
- Let's take a look at different SIP Requests that are common in CUCM
- **REGISTER:** Endpoint sends REGISTER request to the SIP Registrar Server. The SIP server provides a challenge to endpoint. User enters her/his valid user ID and password. The SIP server validates the user's credentials. It registers the user in its contact database and returns a response (200 OK)

```
REGISTER sip:cucm-sub01.ajcollab.com SIP/2.0 >> This is Request URI
Via: SIP/2.0/TCP 192.168.128.4:50136;branch=z9hG4bK687b7aa9 >> Indicates the path taken
From: <sip:11001@cucm-sub01.ajcollab.com>;tag=501cb00c71d500045362a3f9-3d42ea49 >> Contact
information of originator
To: sip:11001@cucm-sub01.ajcollab.com >> Indicates Recipient of the request
Call-ID: 501cb00c-71d50003-291a7902-22598ffe@192.168.128.4 >> unique identifier for SIP call
Max-Forwards: 70 >> Indicates how many proxies are supported
Session-ID: 5cf493c900105000a000501cb00c71d5;remote=00000000000000000000000000000000
Date: Thu, 15 Apr 2021 21:00:30 GMT
CSeq: 101 REGISTER >> Number of Request type, response will have the same value
User-Agent: Cisco-CP8865/11.7.1 >> Details about the user agent who send the message
Contact: <sip:2f137c23-734b-444f-b8b3-
e5f7f3d17792@192.168.128.4:50136;transport=tcp>;+sip.instance="urn:uuid:00000000-0000-0000-
0000-
501cb00c71d5">;+u.sip!devicename.ccm.cisco.com="SEP501CB00C71D5";+u.sip!model.ccm.cisco.com=
"36225";video >> URI used to contact the sender. DN PKID
Supported: replaces,join,sdp-anat,norefersub,resource-priority,extended-refer,X-cisco-
callinfo,X-cisco-serviceuri,X-cisco-escapecodes,X-cisco-service-control,X-cisco-srtp-
fallback,X-cisco-monrec,X-cisco-config,X-cisco-sis-7.0.0,X-cisco-xsi-8.5.1
Reason: SIP;cause=200;text="cisco-alarm:14 Name=SEP501CB00C71D5 ActiveLoad=sip8845_65.11-7-
1-17.loads InactiveLoad=sip8845_65.12-8-1-0001-455.loads Last=cm-closed-tcp" >> Used to
generate syslog alarm for last out of service
Expires: 3600 >> Lifespan of the registration, registration will timeout after 1 hour
Content-Type: multipart/mixed; boundary=uniqueBoundary >> identifies how the body is
formatted
Mime-Version: 1.0 >> Multipurpose Internet Mail Extension (MIME) version
Content-Length: 1337 >> Size of the message content in bytes
```

**Note:** CSeq or Command Sequence contains an integer and a method name. The CSeq number is incremented for each new request within a dialog

**RSeq** or Response Sequence Each provisional response is given a sequence number, carried in the RSeq header field in the response

- 
- **INVITE:** The INVITE method is used to establish media sessions between user agents. It is similar to a Q.931 Setup message in ISDN. Responses to INVITEs are always acknowledged with the ACK

```
INVITE sip:x-cisco-serviceuri-abbrdial-1@192.168.21.2 SIP/2.0
Via: SIP/2.0/TCP 192.168.128.1:52552;branch=z9hG4bK3ac85a1b
From: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>;tag=08cc6831d463009005a3afc3-1a06158a
To: <sip:x-cisco-serviceuri-abbrdial-1@192.168.21.2>
Call-ID: 08cc6831-d463007a-190deeb7-1977157c@192.168.128.1
Max-Forwards: 70
Date: Tue, 30 Mar 2021 18:43:19 GMT
CSeq: 101 INVITE
User-Agent: Cisco-CP9971/9.4.2
Contact: <sip:12534a53-2969-4d94-8a70-90f206a1f7da@192.168.128.1:52552;transport=tcp>;video
Expires: 180
Accept: application/sdp
Allow: ACK,BYE,CANCEL,INVITE,NOTIFY,OPTIONS,REFER,REGISTER,UPDATE,SUBSCRIBE,INFO
Remote-Party-ID: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>;party=calling;id-
type=subscriber;privacy=off;screen=yes >> Used to convey the calling telephone number and
source IP address. This gets displayed on the destination phone
Supported: replaces,join,sdp-anat,norefersub,resource-priority,extended-refer,X-cisco-
callinfo,X-cisco-serviceuri,X-cisco-escapecodes,X-cisco-service-control,X-cisco-srtp-
fallback,X-cisco-monrec,X-cisco-config,X-cisco-sis-7.0.0,X-cisco-xsi-8.0.1
Allow-Events: kpml,dialog >> Indicate which events or classes of events the notifier
supports. SIP KPML DTMF is supported here
Recv-Info: conference
Recv-Info: x-cisco-conference
Content-Length: 785
Content-Type: application/sdp
Content-Disposition: session;handling=optional
v=0 >> SDP Version 0
o=Cisco-SIPUA 16362 0 IN IP4 192.168.128.1 >> owner/creator and session identifier
s=SIP Call >> Session Name
t=0 0
m=audio 29938 RTP/AVP 102 9 124 0 8 116 18 101 >> Audio Port, Codec, DTMF Relay
c=IN IP4 192.168.128.1 >> Audio IP Address to establish
a=rtpmap:102 L16/16000 >> L16 Codec
a=rtpmap:9 G722/8000 >> G.722 Codec
a=rtpmap:124 ISAC/16000 >> ISAC Codec
a=rtpmap:0 PCMU/8000 >> G.711 ULaw Codec
a=rtpmap:8 PCMA/8000 >> G.711 aLaw Codec
a=rtpmap:116 iLBC/8000 >> iLBC Codec
a=fmtp:116 mode=20 >> iLBC Sample size 20 msec
a=rtpmap:18 G729/8000 >> G.729 Codec
a=fmtp:18 annexb=no >> G.729 non annexb type
a=rtpmap:101 telephone-event/8000 >> In-band DTMF relay
a=fmtp:101 0-15
a=sendrecv >> Who receives the request, will send and receive audio
m=video 21814 RTP/AVP 126 97 >> Video Port, Codec, DTMF Relay
c=IN IP4 192.168.128.1 >> Video IP Address to establish
b=TIAS:1000000
a=rtpmap:126 H264/90000 >> H.264 Codec Mode 1
a=fmtp:126 profile-level-id=42801E;packetization-mode=1;level-asymmetry-allowed=1
a=imageattr:* recv [x=640,y=480,q=0.50]
a=rtpmap:97 H264/90000 >> H.264 Codec Mode 0
a=fmtp:97 profile-level-id=42801E;packetization-mode=0;level-asymmetry-allowed=1
a=imageattr:* recv [x=640,y=480,q=0.50]
a=recvonly >> Who receives the request, will receive video but don't send
```

---

- 
- **ACK:** The ACK method is used to acknowledge final responses to INVITE requests. Final responses to all other requests are never acknowledged. Final responses are defined as 2XX, 3XX, 4XX, 5XX, or 6XX class responses. The CSeq number is never incremented for an ACK

**ACK** sip:x-cisco-serviceuri-abbrdial-1@192.168.21.2:5060;transport=tcp SIP/2.0  
Via: SIP/2.0/TCP 192.168.128.1:52552;branch=z9hG4bK1d3ef7e3  
From: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>;tag=08cc6831d463009005a3afc3-1a06158a  
To: <sip:x-cisco-serviceuri-abbrdial-1@192.168.21.2>;tag=188~3f48b4d4-2f05-4b61-86ad-47522208ed69-42836245  
Call-ID: 08cc6831-d463007a-190deeb7-1977157c@192.168.128.1  
Max-Forwards: 70  
Date: Tue, 30 Mar 2021 18:43:28 GMT  
**CSeq: 101 ACK**  
User-Agent: Cisco-CP9971/9.4.2  
Remote-Party-ID: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>;party=calling;id-type=subscriber;privacy=off;screen=yes  
Content-Length: 0  
Recv-Info: conference  
Recv-Info: x-cisco-conference

- **CANCEL:** The CANCEL method is used to terminate pending call attempts. When originator disconnects the call before the call connects, we will see CANCEL instead of BYE message

**CANCEL** sip:2@192.168.21.2;user=phone SIP/2.0  
Via: SIP/2.0/TCP 192.168.128.6:52570;branch=z9hG4bK2bbf3494  
From: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>;tag=84b517af4c4300296481aaad-69e78976  
To: <sip:2@192.168.21.2>  
Call-ID: 84b517af-4c430004-05451ecb-2eb41ce4@192.168.128.6  
Max-Forwards: 70  
Date: Sat, 17 Apr 2021 18:49:46 GMT  
**CSeq: 101 CANCEL**  
User-Agent: Cisco-CP9971/9.4.2  
Content-Length: 0



- **BYE:** The BYE method is used to terminate an established media session. In ISDN, it is similar to a RELEASE message. A session is considered established if an INVITE has received a success class response (2XX) or an ACK has been sent. A BYE is sent only by user agents participating in the session. It is an end-to-end method, so responses are only generated by the other user agent

```

BYE sip:8044260389@192.168.31.3:5060;transport=tcp SIP/2.0
Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK691ae67ef7
From: "11002 - Abdul Jaseem" <sip:8056311002@192.168.21.2>;tag=189~3f48b4d4-2f05-4b61-86ad-47522208ed69-42836246
To: <sip:8044260389@192.168.31.2>;tag=279F53-23D0
Date: Tue, 30 Mar 2021 18:43:24 GMT
Call-ID: cbbab000-6317149-67-215a8c0@192.168.21.2
User-Agent: Cisco-CUCM11.5
Max-Forwards: 70
P-Asserted-Identity: "11002 - Abdul Jaseem" <sip:8056311002@192.168.21.2> >> Verified identity of the user sending a SIP message
CSeq: 103 BYE
Reason: Q.850;cause=16 >> Disconnect reason (16 is normal call clearance)
Session-ID: 7c8b24ebbb0140d0ab8cdeba452aa188;remote=e60906e41ff12aa229378d9b697ab189
Content-Length: 0

```

- **PRACK:** It is an ACK for 1XX series informational message. The informational messages are not a final response for INVITE; hence they acknowledge by PRACK. 2XX, 3XX, 4XX, 5XX, 6XX are acknowledged by actual ACK method. The PRACK echoes the number in the RSeq and the CSeq of the response in a RACK header. This can be enabled in CUCM SIP Profile if needed

The screenshot displays the 'SIP Profile Configuration' interface in Cisco Unified CM Administration. At the top, there's a navigation bar with 'Cisco Unified CM Administration' and a search bar. Below this, a breadcrumb trail shows 'System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help'. The main heading is 'SIP Profile Configuration' with a 'Related Links: Back To Find/List' button. Below the heading are icons for 'Copy', 'Reset', 'Apply Config', and 'Add New'. The configuration fields include 'Caller ID DN' and 'Caller Name'. The 'Trunk Specific Configuration' section contains several dropdown menus: 'Reroute Incoming Request to new Trunk based on\*' (set to 'Never'), 'Resource Priority Namespace List' (set to '< None >'), 'SIP Rel1XX Options\*' (highlighted with a red box and showing a dropdown menu with options: 'Disabled', 'Send PRACK if 1xx Contains SDP', 'Send PRACK for all 1xx Messages', and 'Disabled (Default value)'), 'Video Call Traffic Class\*' (set to 'Disabled'), 'Calling Line Identification Presentation\*' (set to 'Disabled'), 'Session Refresh Method\*' (set to 'Disabled (Default value)'), and 'Early Offer support for voice and video calls\*' (set to 'Disabled (Default value)'). There are also checkboxes for 'Enable ANAT', 'Deliver Conference Bridge Identifier', and 'Allow Bypass of Configured Line Device Caller Information'.

- 
- **OPTIONS:** The OPTIONS method is used to discover the capabilities of the user agent. The response to the request lists the capabilities of the user agent or server. It works as a Keepalive mechanism

**OPTIONS** sip:192.168.21.5:5060 SIP/2.0  
Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK78c3275c37e  
From: <sip:192.168.21.2>;tag=2074871202  
To: <sip:192.168.21.5>  
Date: Sat, 17 Apr 2021 18:30:00 GMT  
Call-ID: e9bb4980-7b12928-77a-215a8c0@192.168.21.2  
User-Agent: Cisco-CUCM11.5  
CSeq: 101 OPTIONS  
Contact: <sip:192.168.21.2:5060;transport=tcp>  
Max-Forwards: 0  
Content-Length: 0



- **Session Refresh:** If an active session is more than the value specified in the 'Session-Expires' header, then **re-Invite** or **Update** used to refresh the session

**SIP/2.0 200 OK**

Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK673ca1eae4

From: "11002 - Abdul Jaseem" <sip:8056311002@192.168.21.2>;tag=189~3f48b4d4-2f05-4b61-86ad-47522208ed69-42836246

To: <sip:8044260389@192.168.31.2>;tag=279F53-23D0

Date: Tue, 30 Mar 2021 20:52:44 GMT

Call-ID: cbbab000-6317149-67-215a8c0@192.168.21.2

CSeq: 102 INVITE

Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO, REGISTER

Allow-Events: telephone-event

Remote-Party-ID: "Bangalore PSTN - 8044260389"

<sip:8044260389@192.168.31.3>;party=called;screen=yes;privacy=off

Contact: <sip:8044260389@192.168.31.3:5060;transport=tcp>

Supported: replaces

Supported: sdp-anat

Server: Cisco-SIPGateway/IOS-15.5.2.S

**Session-Expires: 1800;refresher=uas** >> *Refresh must come from UAS after 1800/2=900 Sec = 15 Min*

Require: timer

Supported: timer

Content-Type: application/sdp

Content-Disposition: session;handling=required

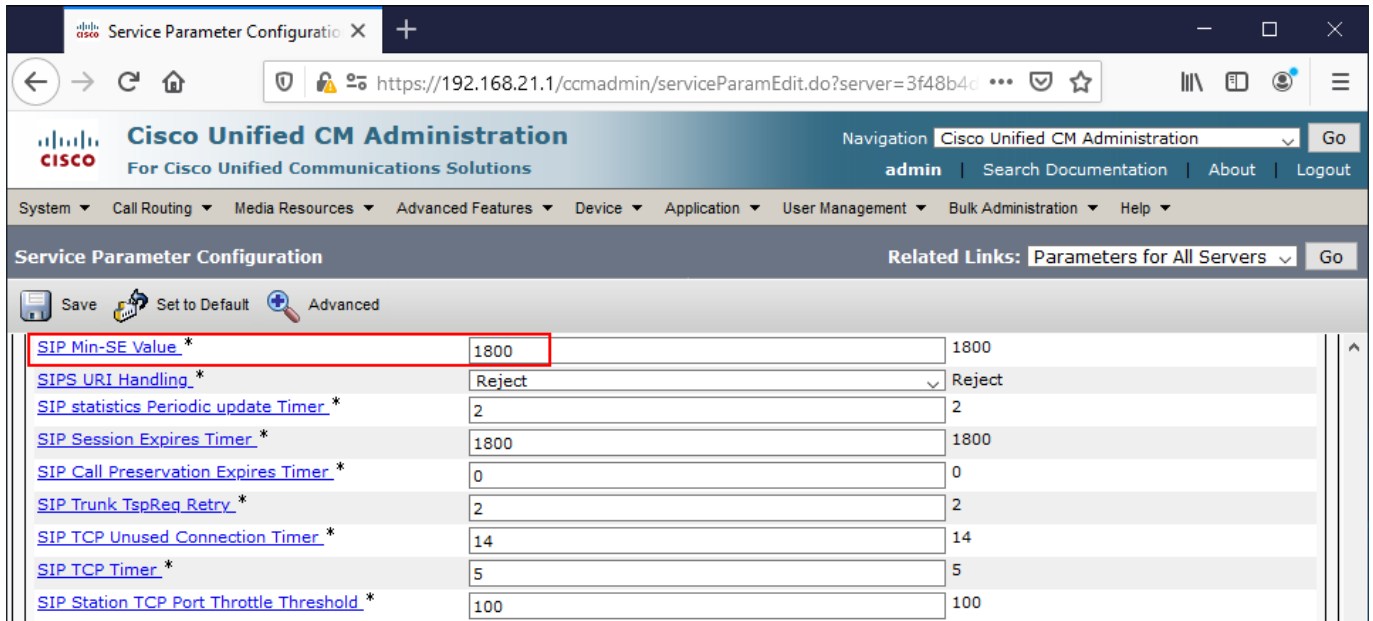
Content-Length: 318

- This can be configured in CUCM SIP Profile

The screenshot displays the 'SIP Profile Configuration' page in the Cisco Unified CM Administration interface. The 'Trunk Specific Configuration' section is expanded, showing several configuration options:

- Reroute Incoming Request to new Trunk based on\*: Never
- Resource Priority Namespace List: < None >
- SIP Rel1XX Options\*: Disabled
- Video Call Traffic Class\*: Mixed
- Calling Line Identification Presentation\*: Default
- Session Refresh Method\*: Invite (highlighted with a red box, showing 'Invite This is re-Invite' and 'Update' as options)
- Early Offer support for voice and video calls\*: ☐
- Enable ANAT: ☐
- Deliver Conference Bridge Identifier: ☐

- The session expire time can be customized in CUCM Service Parameter
- The request (whether re-Invite or Update is decided by SIP Profile and the expire timer decided by Service parameter)



**Service Parameter Configuration**

Navigation: Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Service Parameter Configuration Related Links: Parameters for All Servers Go

Save Set to Default Advanced

|                                                           |        |        |
|-----------------------------------------------------------|--------|--------|
| <a href="#">SIP Min-SE Value</a> *                        | 1800   | 1800   |
| <a href="#">SIPS URI Handling</a> *                       | Reject | Reject |
| <a href="#">SIP statistics Periodic update Timer</a> *    | 2      | 2      |
| <a href="#">SIP Session Expires Timer</a> *               | 1800   | 1800   |
| <a href="#">SIP Call Preservation Expires Timer</a> *     | 0      | 0      |
| <a href="#">SIP Trunk TspReq Retry</a> *                  | 2      | 2      |
| <a href="#">SIP TCP Unused Connection Timer</a> *         | 14     | 14     |
| <a href="#">SIP TCP Timer</a> *                           | 5      | 5      |
| <a href="#">SIP Station TCP Port Throttle Threshold</a> * | 100    | 100    |

- When the call goes out, the session-expire value again depended on the next hop proxy (UAS) or ITSP

---

## SIP Responses

- **INFORMATIONAL (1XX):** The informational class of responses 1XX are end-to-end responses and used to indicate call progress. Informational responses
  - **100 TRYING:** This special case response is only a hop-by-hop request. It is never forwarded
  - **180 Ringing:** This response is used to indicate that the INVITE has been received by the user agent and that alerting is taken place
  - **182 Call Queued:** This response is used to indicate that the INVITE has been received and will be processed in a queue.
  - **The 183 Session Progress:** Indicates that information about the progress of the session. 183 is an end-to-end response. A typical use of this response is to allow a UAC to hear ring tone, busy tone, or a recorded announcement. 183 session progress can have SDP and PRACK used to acknowledge it. A one-way media connection is established from the calling party's telephone switch to the called party's telephone switch in the PSTN prior to the call being answered
- **SUCCESS (2XX):** Success class responses indicate that the request has succeeded or has been accepted
  - **200 OK:** Used to accept a session invitation, sometimes it has a body with media properties (SDP) of the UAS (called party)
  - **202 Accepted:** Response indicates that the UAS has received and understood the request, but that the request may not have been authorized or processed by the server
- **REDIRECT (3XX):** Server has returned possible locations. The client should retry request at another server. Generally sent by a SIP server acting as a redirect server in response to an INVITE.
  - **300 Multiple Choices:** Multiple Contact header fields, which indicate that the location service has returned multiple possible locations. They should be tried in the order in which they were listed in the response
  - **301 Moved Permanently:** This redirection response contains a Contact header field with the new permanent URI of the called party. The address can be saved and used in future INVITE requests
  - **302 Moved Temporarily:** This redirection response contains a URI that is currently valid but that is not permanent. During call forward situation, we will see 302
  - **305 Use Proxy:** This redirection response contains a URI that points to a proxy server
  - **380 Alternative Service:** This response returns a URI that indicates the type of service that the called party would like. An example might be a redirect to a voicemail server

- 
- **CLIENT ERROR (4XX):** The request has failed due to an error by the client. The client may retry the request
    - **400 Bad Request:** This response indicates that the request was not understood by the server
    - **401 Unauthorized:** This response indicates that the request requires the user to perform authentication & the authentication may fail.
    - **402 Payment Required:** This response is a placeholder for future definition in the SIP protocol. It could be used to negotiate call completion charges
    - **403 Forbidden:** This response is used to deny a request
    - **404 Not Found:** This response indicates that the user identified by the Request-URI cannot be located by the server
    - **405 Method Not Allowed:** This response indicates that the server or user agent has received and understood a request but is not willing to fulfill the request. An example might be a REGISTER request sent to a user agent.
    - **406 Not Acceptable:** This response indicates that the request cannot be processed due to a requirement in the request message.
    - **407 Proxy Authentication Required:** This request sent by a proxy indicates that the UAC must first authenticate itself with the proxy before the request can be processed
    - **408 Request Timeout:** This response is sent when an Expires header field is present in an INVITE request, and the specified time period has passed
    - **415 Unsupported Media Type:** This response sent by a user agent indicates that the media type contained in the INVITE request is not supported. For example, a request for a video conference to a PSTN gateway that only handles telephone calls will result in this response
    - **480 Temporarily Unavailable:** This response indicates that the request has reached the correct destination, but the called party is not available for some reason. The reason phrase should be modified for this response to give the caller a better understanding of the situation. The response should contain a Retry-After header indicating when the request may be fulfilled
    - **483 Too Many Hops:** This response indicates that the request has been forwarded the maximum number of times as set by the Max-Forwards header in the request
    - **486 Busy Here:** This response is used to indicate that the user agent is busy. This response is equivalent to the busy tone in the PSTN
    - **487 Request Terminated:** For pending Invites to terminate
-

- 
- **SERVER ERROR (5XX):** The request has failed due to an error by the server. The request may be retried at another server
    - **501 Not Implemented:** This response indicates that the server is unable to process the request because it is not supported. This response can be used to decline a request containing an unknown method
    - **502 Bad Gateway:** This response is sent by a proxy that is acting as a gateway to another network, and indicates that some problem in the other network is preventing the request from being processed
    - **503 Service Unavailable:** This response indicates that the requested service is temporarily unavailable. The request can be retried after a few seconds, or after the expiration of the Retry-After header field
    - **504 Gateway Timeout:** This response indicates that the request failed due to a timeout encountered in the other network to which that the gateway connects
    - **505 Version Not Supported:** This response indicates that the request has been refused by the server because of the SIP version number of the request. There is only one version of SIP (version 2.0) currently implemented
  - **GLOBAL FAILURE (6XX):** The request has failed. The request should not be tried again at this or other servers
    - **600 Busy Everywhere:** If there is a possibility that the Request could be answered in other locations, this response should not be sent
    - **604 Does Not Exist Anywhere:** This response is similar to the 404 Not Found response but indicates that the user in the Request-URI cannot be found anywhere
    - **606 Not Acceptable:** This response can be used to implement some session negotiation capability in SIP. This response indicates that some aspect of the desired session is not acceptable to the UAS, and as a result, the session cannot be established. The response may contain a Warning header field with a numerical code describing exactly what was not acceptable
-

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## Understanding LAB PSTN Setup

- To simulate external calls from CUCM, we have a simulated PSTN / ITSP running on 192.168.61.1
- In the backend, it is just another CUCM
- The simulated PSTN Phone is given below
- It has 3 PSTN numbers configured that corresponds to 3 Sites in the topology and 5 Speed Dials that simulates the incoming calls to the CUCM cluster from different locations



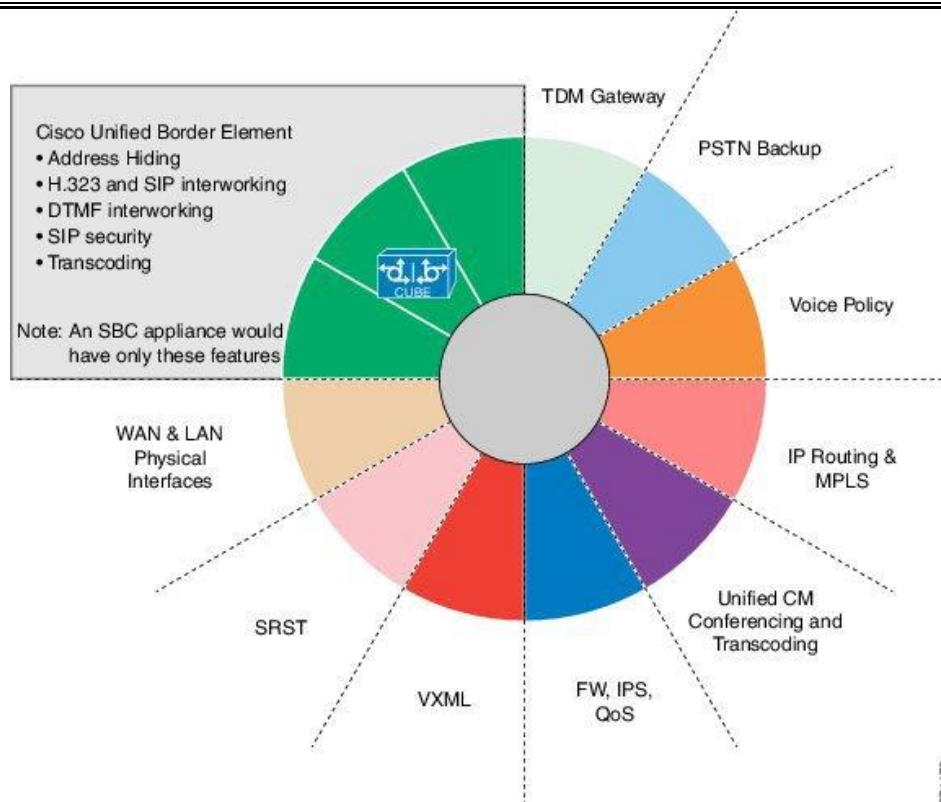
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## CUBE - Cisco Unified Border Element



- To extend the phone calls to PSTN we use voice gateways or CUBE (Cisco Unified Border Element)
- Voice Gateways use H.323, MGCP or SIP protocol to talk to CUCM on the one leg and the other leg uses Circuit Switched Network (ISDN PRI - Primary Rate Interface).
- Some old deployments and locations use E1 R2 Signaling CAS (Channel Associated Signaling)
- These days PRIs are obsolete, and we have SIP providers are available, hence we deal with CUBE
- CUBE bridges voice and video connectivity between two separate VoIP networks. It is like a traditional voice gateway, except for the replacement of physical voice cards with an IP connection.
- CUBE is a voice enabled IOS router or Cisco CSR 1000v that runs some additional voice features
- You can still use the CUBE router to perform other tasks such as Routing, Access List, etc. It is just a router
- CUBE is the Session Border Controller solution from Cisco available in Integrated Services Router (ISR), Cisco Catalyst Edge Routers and Aggregation Services Router (ASR) and virtualized environments with the Cisco Cloud Services Router (CSR) and Catalyst Edge Software





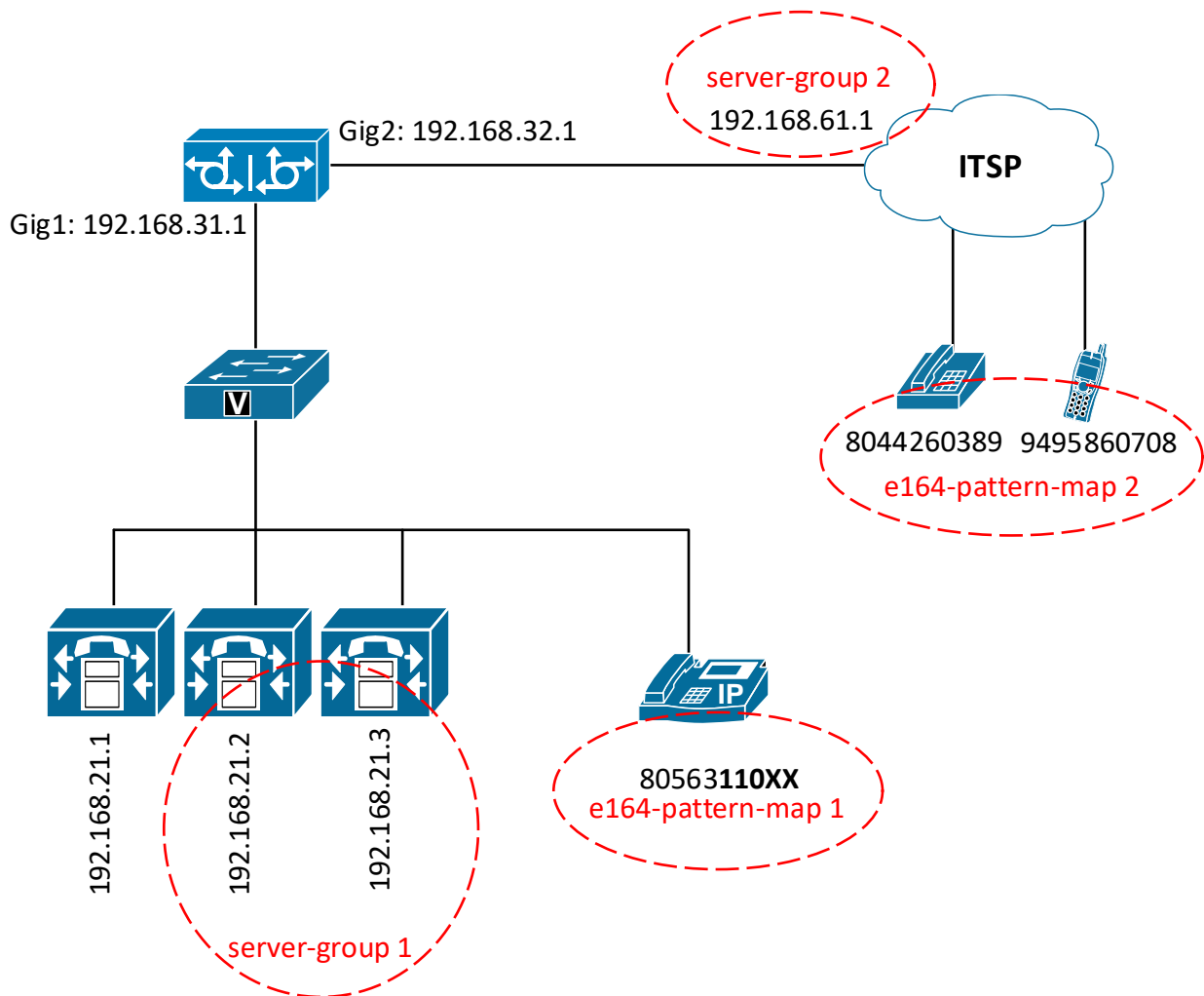
- CUBE talks to CUCM over SIP on one leg and the other leg connects to service provider (ITSP) also uses SIP
- ***allow connections sip to sip*** under ***voice service voip*** configurations makes an IOS router to perform CUBE functionality



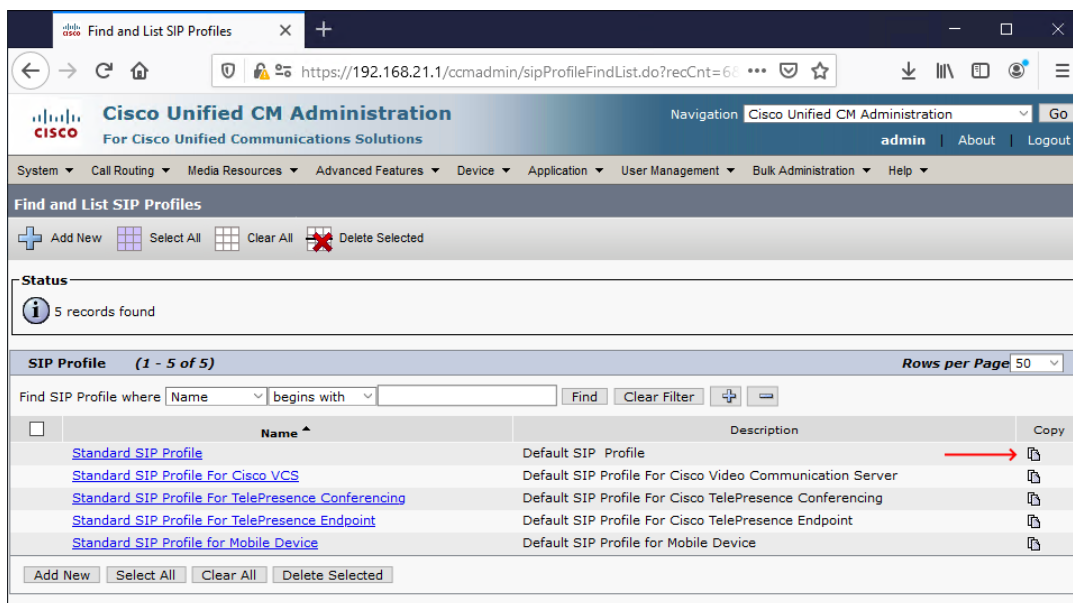
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## [Lab] CUBE Configuration

- Our aim is to make a call from our Lab IP Phone to '8044260389' which is a PSTN number in Bangalore
- Assume: Discussion happened between service provider that you have signed up for a specific SIP Account subscription from Airtel service provider
- In this lab, the service provider end is already configured. We must configure CUCM, CUBE Local side, CUBE Provider side
- You can see a PSTN phone with the same number configured. If all the configurations are in place, the PSTN phone will ring








- Device >> Device Settings >> SIP Profile >> Copy Standard SIP Profile
- I have named to AIRTEL-SIP-TRUNK-SIP-PROFILE

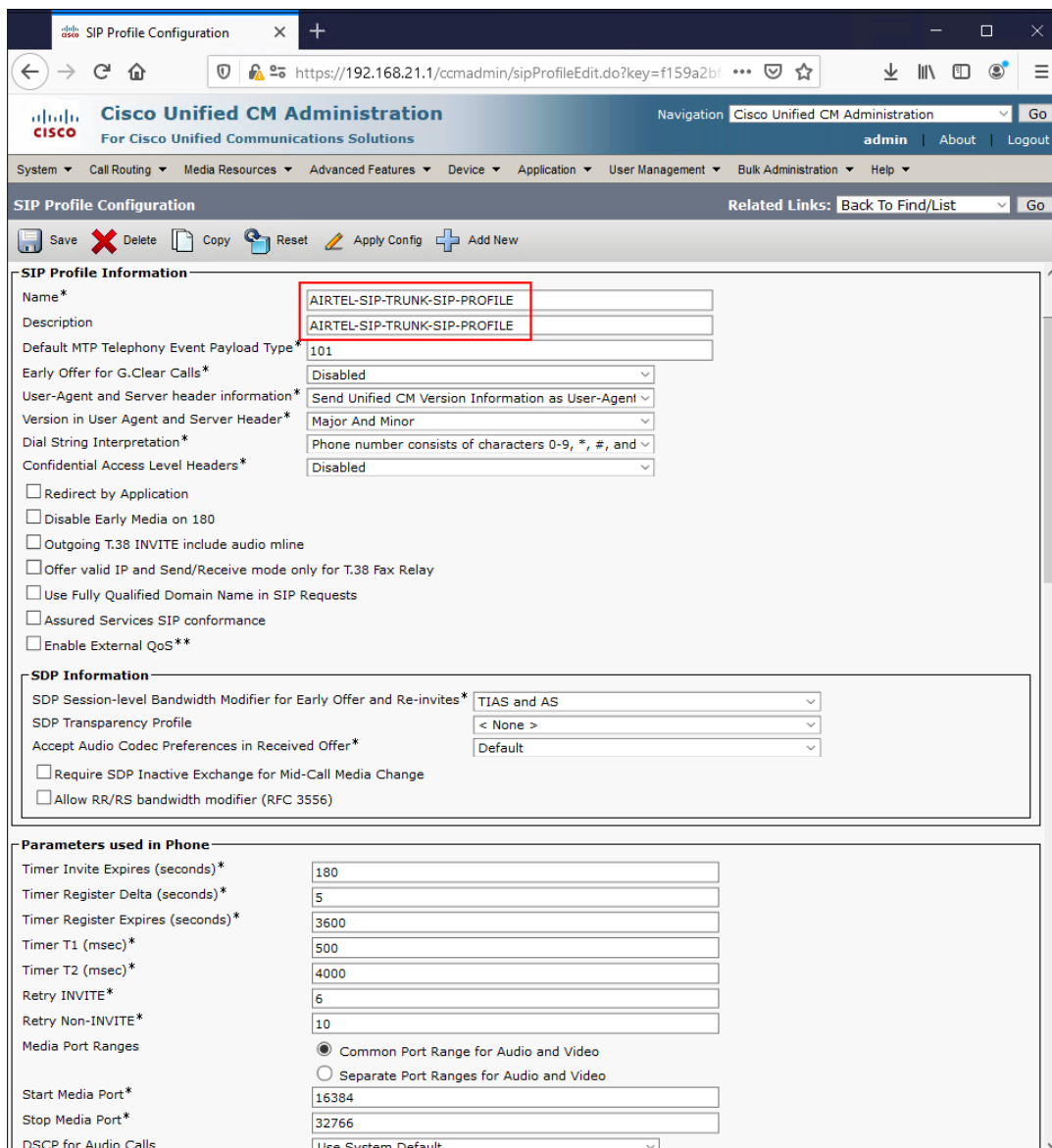


Find and List SIP Profiles

5 records found

SIP Profile (1 - 5 of 5) Rows per Page 50

| Name                                               | Description                                              | Copy                                                                                |
|----------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------------------------------------|
| Standard SIP Profile                               | Default SIP Profile                                      |  |
| Standard SIP Profile For Cisco VCS                 | Default SIP Profile For Cisco Video Communication Server |  |
| Standard SIP Profile For TelePresence Conferencing | Default SIP Profile For Cisco TelePresence Conferencing  |  |
| Standard SIP Profile For TelePresence Endpoint     | Default SIP Profile For Cisco TelePresence Endpoint      |  |
| Standard SIP Profile for Mobile Device             | Default SIP Profile for Mobile Device                    |  |



SIP Profile Configuration

Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

**SIP Profile Information**

Name\* AIRTEL-SIP-TRUNK-SIP-PROFILE

Description AIRTEL-SIP-TRUNK-SIP-PROFILE

Default MTP Telephony Event Payload Type\* 101

Early Offer for G.Clear Calls\* Disabled

User-Agent and Server header information\* Send Unified CM Version Information as User-Agent

Version in User Agent and Server Header\* Major And Minor

Dial String Interpretation\* Phone number consists of characters 0-9, \*, #, and

Confidential Access Level Headers\* Disabled

☐ Redirect by Application

☐ Disable Early Media on 180

☐ Outgoing T.38 INVITE include audio mline

☐ Offer valid IP and Send/Receive mode only for T.38 Fax Relay

☐ Use Fully Qualified Domain Name in SIP Requests

☐ Assured Services SIP conformance

☐ Enable External QoS\*\*

**SDP Information**

SDP Session-level Bandwidth Modifier for Early Offer and Re-invites\* TIAS and AS

SDP Transparency Profile < None >

Accept Audio Codec Preferences in Received Offer\* Default

☐ Require SDP Inactive Exchange for Mid-Call Media Change

☐ Allow RR/RS bandwidth modifier (RFC 3556)

**Parameters used in Phone**

Timer Invite Expires (seconds)\* 180

Timer Register Delta (seconds)\* 5

Timer Register Expires (seconds)\* 3600

Timer T1 (msec)\* 500

Timer T2 (msec)\* 4000

Retry INVITE\* 6

Retry Non-INVITE\* 10

Media Port Ranges

☒ Common Port Range for Audio and Video

☐ Separate Port Ranges for Audio and Video

Start Media Port\* 16384

Stop Media Port\* 32766

DSCP for Audio Calls Use System Default

SIP Profile Configuration

<https://192.168.21.1/ccmadmin/sipProfileEdit.do?key=f159a2bf>

Cisco
**Cisco Unified CM Administration**  
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SIP Profile Configuration
Related Links: Back To Find/List Go

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Caller ID DN  
Caller Name

**Trunk Specific Configuration**  
Reroute Incoming Request to new Trunk based on\* Never  
Resource Priority Namespace List < None >  
SIP Rel1XX Options\* Disabled  
Video Call Traffic Class\* Mixed  
Calling Line Identification Presentation\* Default  
Session Refresh Method\* Invite  
Early Offer support for voice and video calls\* Disabled (Default value)  
☐ Enable ANAT  
☐ Deliver Conference Bridge Identifier  
☐ Allow Passthrough of Configured Line Device Caller Information  
☐ Reject Anonymous Incoming Calls  
☐ Reject Anonymous Outgoing Calls  
☐ Send ILS Learned Destination Route String  
☐ Connect Inbound Call before Playing Queuing Announcement

**SIP OPTIONS Ping**  
☒ Enable OPTIONS Ping to monitor destination status for Trunks with Service Type "None (Default)"  
Ping Interval for In-service and Partially In-service Trunks (seconds)\* 60  
Ping Interval for Out-of-service Trunks (seconds)\* 120  
Ping Retry Timer (milliseconds)\* 500  
Ping Retry Count\* 6

**SDP Information**  
☐ Send send-receive SDP in mid-call INVITE  
☐ Allow Presentation Sharing using BFCP  
☐ Allow iX Application Media  
☐ Allow multiple codecs in answer SDP

Save Delete Copy Reset Apply Config Add New

*i* \*- indicates required item.  
*i* \*\* - setting only takes effect if the External QoS Enabled Service Parameter is set to true.

- System >> Security >> SIP Trunk Security Profile >> Copy Non Secure SIP Trunk Profile

The screenshot shows the Cisco Unified CM Administration web interface. The browser address bar displays the URL: `https://192.168.21.1/ccmadmin/sipTrunkSecurityProfileFindList...`. The page title is "Find and List SIP Trunk Security Profiles". Below the title, there are buttons for "Add New", "Select All", "Clear All", and "Delete Selected". A status bar indicates "2 records found". The main table lists the following records:

|                          | Name ^                                           | Description                                               | Copy                           |
|--------------------------|--------------------------------------------------|-----------------------------------------------------------|--------------------------------|
| <input type="checkbox"/> | <a href="#">Non Secure SIP Conference Bridge</a> | Non Secure SIP Conference Bridge                          |                                |
| <input type="checkbox"/> | <a href="#">Non Secure SIP Trunk Profile</a>     | Non Secure SIP Trunk Profile authenticated by null String | (highlighted with a red arrow) |

At the bottom of the table, there are buttons for "Add New", "Select All", "Clear All", and "Delete Selected".

SIP Trunk Security Profile Configuration

Navigation: Cisco Unified CM Administration

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System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help

SIP Trunk Security Profile Configuration

Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

**Status**

Status: Ready

**SIP Trunk Security Profile Information**

Name\* AIRTEL-SIP-TRUNK-SIP-SEC-PROFILE

Description Non Secure SIP Trunk Profile authenticated by null String

Device Security Mode Non Secure

Incoming Transport Type\* TCP+UDP

Outgoing Transport Type TCP

☐ Enable Digest Authentication

Nonce Validity Time (mins)\* 600

X.509 Subject Name

Incoming Port\* 5060

☐ Enable Application level authorization

☐ Accept presence subscription

☐ Accept out-of-dialog refer\*\*

☐ Accept unsolicited notification

☐ Accept replaces header

☐ Transmit security status

☐ Allow charging header

SIP V.150 Outbound SDP Offer Filtering\* Use Default Filter

Save Delete Copy Reset Apply Config Add New

\*- indicates required item.

\*\*If this profile is associated with an EMCC SIP trunk, Accept Out-of-Dialog REFER is enabled regardless of the setting on this page

- Call Routing >> Class of Control >> Calling Search Space >> Add new CSS
- This is used when we receive calls via the SIP Trunk from ITSP

Calling Search Space Configura

https://192.168.21.1/ccmadmin/cssEdit.do?key=ed43818f-7d1e

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**Calling Search Space** Configuration Related Links: Back To Find/List Go

Save Delete Copy Add New

Status

Status: Ready

Calling Search Space Information

Name\*

AIRTEL-SIP-TRUNK-INBOUND-CSS

Description

AIRTEL-SIP-TRUNK-INBOUND-CSS

Route Partitions for this Calling Search Space

Available Partitions\*\*

Directory URI  
Global Learned E164 Numbers  
Global Learned E164 Patterns  
Global Learned Enterprise Numbers  
Global Learned Enterprise Patterns

Selected Partitions

BANGALORE-INTERNAL

Save Delete Copy Add New

i

\*- indicates required item.

i

\*\*Selected Partitions are ordered by highest priority

- Create a new CUCM Group
- This will be assigned to the SIP Trunk

The screenshot displays the Cisco Unified CM Administration web interface. The browser address bar shows the URL `https://192.168.21.1/ccmadmin/ccmGroupEdit.do?key=` with a 90% zoom level. The page title is "Cisco Unified CM Group Configuration". The navigation menu includes System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The main content area shows the configuration for a CUCM Group named "AIRTEL-SIP-TRUNK-CCM-GROUP". The group is currently "Ready". The "Cisco Unified Communications Manager Group Information" section shows the group is used by 2 devices. The "Cisco Unified Communications Manager Group Settings" section shows the group name and an unchecked checkbox for "Auto-registration Cisco Unified Communications Manager Group". The "Cisco Unified Communications Manager Group Members" section shows a list of available managers and a list of selected managers, including "CM\_cucm-sub01" and "CM\_cucm-sub02". The bottom of the page contains a legend with three items: a required item indicator, a priority indicator, and an active manager indicator.

**Cisco Unified CM Group Configuration**

Navigation: Cisco Unified CM Administration Go

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Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**

Status: Ready

**Cisco Unified Communications Manager Group Information**

Cisco Unified Communications Manager Group: AIRTEL-SIP-TRUNK-CCM-GROUP (used by 2 devices)

**Cisco Unified Communications Manager Group Settings**

Name\* AIRTEL-SIP-TRUNK-CCM-GROUP

☐ Auto-registration Cisco Unified Communications Manager Group

**Cisco Unified Communications Manager Group Members**

Available Cisco Unified Communications Managers

Selected Cisco Unified Communications Managers

CM\_cucm-sub01

CM\_cucm-sub02

Save Delete Copy Reset Apply Config Add New

\*. indicates required item.

\*\*Selected Cisco Unified Communications Managers are ordered by highest priority

\*\*\*Only active Cisco Unified Communications Managers are available for adding to Cisco Unified Communications Manager Groups.

- Create a new REGION to control the Codec between devices and Sip Trunk
- I have set the codec to 64kbps

Region Configuration

←

→

↺

🏠

🔒

🔗

📄

https://192.168.21.1/ccmadmin/regionEdit.do?key=2

80%

⋮

🔒

☆

CISCO

Region Configuration

For Cisco Unified Communications Solutions

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Reset

Apply Config

Add New

Region Information

Name\* AIRTEL-SIP-TRUNK-REGION

Region Relationships

| Region                  | Audio Codec Preference List                   | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|-------------------------|-----------------------------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| AIRTEL-SIP-TRUNK-REGION | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| BANGALORE-REGION        | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| MEDIA-RESOURCE-REGION   | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| TEXAS-REGION            | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |

NOTE: Regions not displayed

Use System Default

Use System Default

Use System Default

Use System Default

Modify Relationship to other Regions

| Regions                                                                                                                                                 | Audio Codec Preference List | Maximum Audio Bit Rate                            | Maximum Session Bit Rate for Video Calls                                                      | Maximum Session Bit Rate for Immersive Video Calls                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <div> <div>AIRTEL-SIP-TRUNK-REGION</div> <div>BANGALORE-REGION</div> <div>Default</div> <div>MEDIA-RESOURCE-REGION</div> <div>TEXAS-REGION</div> </div> | Keep Current Setting        | <div>64 kbps (G.722, G.711)</div> <div>kbps</div> | <div>Keep Current Setting</div> <div>Use System Default</div> <div>None</div> <div>kbps</div> | <div>Keep Current Setting</div> <div>Use System Default</div> <div>None</div> <div>kbps</div> |

Save

Delete

Reset

Apply Config

Add New

ⓘ

\*- indicates required item.

544



- Create a new DEVICE POOL and associate CUCM Group and REGION to it
- This DEVICE POOL is specifically created for the SIP Trunk

**Device Pool Configuration**

Related Links: [Back To Find/List](#) [Go](#)

Save Delete Copy Reset Apply Config Add New

Device Pool Name\* AIRTEL-SIP-TRUNK-DEVICE-POOL

Cisco Unified Communications Manager Group\* AIRTEL-SIP-TRUNK-CCM-GROUP

Calling Search Space for Auto-registration < None >

Adjunct CSS < None >

Reverted Call Focus Priority Default

Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**

Date/Time Group\* IST-DATE-TIME-GROUP

Region\* AIRTEL-SIP-TRUNK-REGION

Media Resource Group List < None >

Location < None >

Network Locale < None >

SRST Reference\* Disable

Connection Monitor Duration\*\*\*

Single Button Barge\* Default

Join Across Lines\* Default

Physical Location < None >

Device Mobility Group < None >

Wireless LAN Profile Group < None > [View Details](#)

**Local Route Group Settings**

Standard Local Route Group < None >

**Device Mobility Related Information\*\*\*\***

Device Mobility Calling Search Space < None >

AAR Calling Search Space < None >

AAR Group < None >

Calling Party Transformation CSS < None >

Called Party Transformation CSS < None >

**Geolocation Configuration**

Geolocation < None >

Geolocation Filter < None >

**Call Routing Information**

**Incoming Calling Party Settings**

If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

- Device >> Trunk >> Add New >> Trunk Type: SIP >> Next

**Trunk Configuration**

Save Delete Reset Add New

Product: SIP Trunk  
Device Protocol: SIP  
Trunk Service Type: None(Default)  
Device Name\*: AIRTEL-SIP-TRUNK  
Description: AIRTEL-SIP-TRUNK  
Device Pool\*: AIRTEL-SIP-TRUNK-DEVICE-POOL  
Common Device Configuration: < None >  
Call Classification\*: OffNet  
Media Resource Group List: < None >  
Location\*: Hub\_None  
AAR Group: < None >  
Tunneled Protocol\*: None  
QSIG Variant\*: No Changes  
ASN.1 ROSE OID Encoding\*: No Changes  
Packet Capture Mode\*: None  
Packet Capture Duration: 0  
☐ Media Termination Point Required  
☒ Retry Video Call as Audio  
☐ Path Replacement Support  
☐ Transmit UTF-8 for Calling Party Name  
☐ Transmit UTF-8 Names in QSIG APDU  
☐ Unattended Port  
☐ SRTP Allowed - When this flag is checked, Encrypted TLS needs to be configured in the network to provide end to end security. Failure to do so will expose keys and other information.  
Consider Traffic on This Trunk Secure\*: When using both sRTP and TLS  
Route Class Signaling Enabled\*: Default  
Use Trusted Relay Point\*: Default  
☐ PSTN Access  
☒ Run On All Active Unified CM Nodes

Intercompany Media Engine (IME)

Trunk Configuration

[Back](#) [Forward](#) [Refresh](#) [Home](#)

[https://192.168.21.1/ccmadmin/trunkEdit.do?key=d5](#) 90%

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Navigation Cisco Unified CM Administration Go

admin | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Trunk Configuration
Related Links: Back To Find/List Go

Save Delete Reset Add New

**Call Routing Information**

☒ Remote-Party-Id  
☒ Asserted-Identity  
Asserted-Type\* Default  
SIP Privacy\* Default

**Inbound Calls**

Significant Digits\* 5  
Connected Line ID Presentation\* Default  
Connected Name Presentation\* Default  
Calling Search Space AIRTEL-SIP-TRUNK-INBOUND-CSS  
AAR Calling Search Space < None >  
Prefix DN  
☐ Redirecting Diversion Header Delivery - Inbound

**Incoming Calling Party Settings**

If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

Clear Prefix Settings Default Prefix Settings

| Number Type     | Prefix  | Strip Digits | Calling Search Space | Use Device Pool CSS                 |
|-----------------|---------|--------------|----------------------|-------------------------------------|
| Incoming Number | Default | 0            | < None >             | <input checked="" type="checkbox"/> |

**Incoming Called Party Settings**

If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

Clear Prefix Settings Default Prefix Settings

| Number Type     | Prefix  | Strip Digits | Calling Search Space | Use Device Pool CSS                 |
|-----------------|---------|--------------|----------------------|-------------------------------------|
| Incoming Number | Default | 0            | < None >             | <input checked="" type="checkbox"/> |

**Connected Party Settings**

Trunk Configuration

[←](#) [→](#) [↺](#) [🏠](#)
<https://192.168.21.1/ccmadmin/trunkEdit.do?key=d5>
90%

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**Trunk Configuration**
Related Links: Back To Find/List Go

Save Delete Reset Add New

Calling Line ID Presentation Default

Calling Name Presentation\* Default

Calling and Connected Party Info Format\* Deliver DN only in connected party

☐ Redirecting Diversion Header Delivery - Outbound

Redirecting Party Transformation CSS < None >

☒ Use Device Pool Redirecting Party Transformation CSS

**Caller Information**

Caller ID DN

Caller Name

☐ Maintain Original Caller ID DN and Caller Name in Identity Headers

**SIP Information**

**Destination**

☐ Destination Address is an SRV

|     | Destination Address | Destination Address IPv6 | Destination Port |
|-----|---------------------|--------------------------|------------------|
| 1 * | 192.168.31.1        |                          | 5060             |

MTP Preferred Originating Codec\* 711ulaw

BLF Presence Group\* Standard Presence group

SIP Trunk Security Profile\* AIRTEL-SIP-TRUNK-SIP-SEC-PROFILE

Rerouting Calling Search Space < None >

Out-Of-Dialog Refer Calling Search Space < None >

SUBSCRIBE Calling Search Space < None >

SIP Profile\* AIRTEL-SIP-TRUNK-SIP-PROFILE View Details

DTMF Signaling Method\* No Preference

**Normalization Script**

Normalization Script < None >

☐ Enable Trace

|   | Parameter Name | Parameter Value |
|---|----------------|-----------------|
| 1 |                |                 |

**Recording Information**

☒ None

☐ This trunk connects to a recording-enabled gateway

☐ This trunk connects to other clusters with recording-enabled gateways

**Geolocation Configuration**

Geolocation < None >

Geolocation Filter < None >

☐ Send Geolocation Information

- Add Route Group, Route List and Route Pattern

The screenshot displays the 'Route Group Configuration' page in the Cisco Unified CM Administration interface. The page is titled 'Route Group Configuration' and includes a navigation bar with links to 'System', 'Call Routing', 'Media Resources', 'Advanced Features', 'Device', 'Application', 'User Management', 'Bulk Administration', and 'Help'. The 'Route Group Configuration' section includes a 'Status' field showing 'Ready', a 'Route Group Information' section with fields for 'Route Group Name' (AIRTEL-SIP-TRUNK-RG) and 'Distribution Algorithm' (Circular), and a 'Route Group Member Information' section. The 'Route Group Member Information' section contains a 'Find Devices to Add to Route Group' section with a 'Device Name contains' field and a 'Find' button. Below this is a list of 'Available Devices' with 'AIRTEL-SIP-TRUNK' selected. A red arrow points from the 'AIRTEL-SIP-TRUNK' device in the 'Available Devices' list to the 'Add to Route Group' button. Another red arrow points from the 'Add to Route Group' button to the 'Current Route Group Members' section. The 'Current Route Group Members' section shows 'Selected Devices (ordered by priority)' with 'AIRTEL-SIP-TRUNK (All Ports)' listed. Below this is a 'Removed Devices' section. A 'Reverse Order of Selected Devices' button is also present. At the bottom, the 'Route Group Members' section shows a list of members with 'AIRTEL-SIP-TRUNK' listed.

Partition Configuration

https://192.168.21.1/ccmadmin/partitionEdit.do

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Partition Configuration

Related Links: Back To Find/List Go

Save

Status

Status: Ready

Partition Information

To enter multiple partitions, use one line for each partition entry. You can enter up to 75 partitions; the names and descriptions can have up to a total of 1475 characters. The partition name cannot exceed 50 characters. Use a comma (,) to separate the partition name and description on each line. If a description is not entered, Cisco Unified Communications Manager uses the partition name as the description. For example:

```
<< partitionName >> , << description >>
CiscoPartition, Cisco employee partition
DallasPartition
```

Name\*

BANGALORE-NATIONAL

Save

\*- indicates required item.

**Route Pattern Configuration**

Save Delete Copy Add New

**Pattern Definition**

Route Pattern\* 9.XXXXXXXXXX

Route Partition BANGALORE-NATIONAL

Description ALL INDIA CALL FROM BANGALORE PHONES

Numbering Plan -- Not Selected --

Route Filter < None >

MLPP Precedence\* Default

☐ Apply Call Blocking Percentage

Resource Priority Namespace Network Domain < None >

Route Class\* Default

Gateway/Route List\* AIRTEL-SIP-TRUNK-RL (Edit)

Route Option

☒ Route this pattern

☐ Block this pattern No Error

Call Classification\* OffNet

External Call Control Profile < None >

☐ Allow Device Override ☒ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority

☐ Require Forced Authorization Code

Authorization Level\* 0

☐ Require Client Matter Code

**Calling Party Transformations**

☒ Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation\* Default

Calling Name Presentation\* Default

Calling Party Number Type\* Cisco CallManager

Calling Party Numbering Plan\* Cisco CallManager

**Connected Party Transformations**

Connected Line ID Presentation\* Default

Connected Name Presentation\* Default

**Called Party Transformations**

Discard Digits PreDot

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

Called Party Number Type\* Cisco CallManager

Called Party Numbering Plan\* Cisco CallManager

- In BANGALORE-PHONE-CSS, update the BANGALORE-NATIONAL partition so that Bangalore Phones can dial Indian National Number

Calling Search Space Configura X

https://192.168.21.1/ccmadmin/cssEdit.do?key=1c7f6dea-3804

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**Calling Search Space Configuration** Related Links: Back To Find/List Go

Save Delete Copy Add New

**Status**  
Update successful

**Calling Search Space Information**  
Name\* BANGALORE-PHONE-CSS  
Description BANGALORE-PHONE-CSS

**Route Partitions for this Calling Search Space**  
Available Partitions\*\*  
Directory URI  
Global Learned E164 Numbers  
Global Learned E164 Patterns  
Global Learned Enterprise Numbers  
Global Learned Enterprise Patterns  
Selected Partitions  
BANGALORE-INTERNAL  
BANGALORE-NATIONAL  
TEXAS-INTERNAL

Save Delete Copy Add New



- Update the Phone Line page External Phone Number Mask
- When the call hits the Route Pattern 9.XXXXXXXXXX, the calling number 11002 is transformed to 80563110XX = 8056311001
- Hence the PSTN Phone will see the actual DID number rather than 5-digit internal number

The screenshot shows the Cisco Unified CM Administration web interface. The page title is "Directory Number Configuration". The breadcrumb navigation shows "System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help". The "Related Links" section shows "Configure Device (CIPC-ABDUL)". The "Line 1 on Device CIPC-ABDUL" section contains a table with the following fields:

|                                          | Value                                      | Update Shared Device Settings |
|------------------------------------------|--------------------------------------------|-------------------------------|
| Display (Caller ID)                      | 11002 - Abdul Jaseem                       | <input type="checkbox"/>      |
| ASCII Display (Caller ID)                | 11002 - Abdul Jaseem                       | <input type="checkbox"/>      |
| Line Text Label                          | 11002 - Abdul Jaseem                       | <input type="checkbox"/>      |
| External Phone Number Mask               | 80563110XX <i>This Bangalore DID range</i> | <input type="checkbox"/>      |
| Visual Message Waiting Indicator Policy* | Use System Policy                          | <input type="checkbox"/>      |

- Next you can use below configurations on the CUBE
- Referring the topology, we can understand the IP details and DID number details

```
a_cube01_192.168.31.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
a_cube01_192.168.31.1 abvp_desk-switch
cube01#show running-config | s dial-peer
dial-peer voice 1 voip
description INBOUND FROM CUCM
session protocol sipv2
incoming called e164-pattern-map 2
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet1
voice-class sip bind media source-interface GigabitEthernet1
dtmf-relay rtp-nte
no vad
dial-peer voice 2 voip
description OUTBOUND TO ITSP
session protocol sipv2
session server-group 2
destination e164-pattern-map 2
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet2
voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay rtp-nte
no vad
dial-peer voice 3 voip
description INBOUND FROM ITSP
session protocol sipv2
incoming called e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet2
voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay rtp-nte
no vad
dial-peer voice 4 voip
description OUTBOUND TO CUCM
session protocol sipv2
session server-group 1
destination e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet1
voice-class sip bind media source-interface GigabitEthernet1
dtmf-relay rtp-nte
no vad
cube01#
```

Ready ssh2: AES-256-CTR 40, 8 40 Rows, 89 Cols Xterm CAP NUM

---

```

!
voice service voip
 ip address trusted list
 ipv4 192.168.21.1
 ipv4 192.168.21.2
 ipv4 192.168.21.3
 exit
 mode border-element
 allow-connections sip to sip
!
voice class codec 1
 codec preference 1 g711alaw
 codec preference 2 g711ulaw
 codec preference 3 g729r8
 codec preference 4 g729br8
!
voice class server-group 1
 description LOCAL CUCM SIDE
 ipv4 192.168.21.2
 ipv4 192.168.21.3
!
voice class server-group 2
 description ITSP SIDE
 ipv4 192.168.61.1
!
voice class e164-pattern-map 1
 description BANGALORE INTERNAL DID
 e164 ^80563110..$
 e164 ^8056310002$
!
voice class e164-pattern-map 2
 description BANGALORE ITSP NATIONAL NUMBERS
 e164 ^.....$
!
dial-peer voice 1 voip
 description INBOUND FROM CUCM
 incoming called e164-pattern-map 2
 session protocol sipv2
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet1
 voice-class sip bind media source-interface GigabitEthernet1
 dtmf-relay rtp-nte
 no vad
!
dial-peer voice 2 voip
 description OUTBOUND TO ITSP
 session server-group 2
 destination e164-pattern-map 2
 session protocol sipv2
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet2

```

---

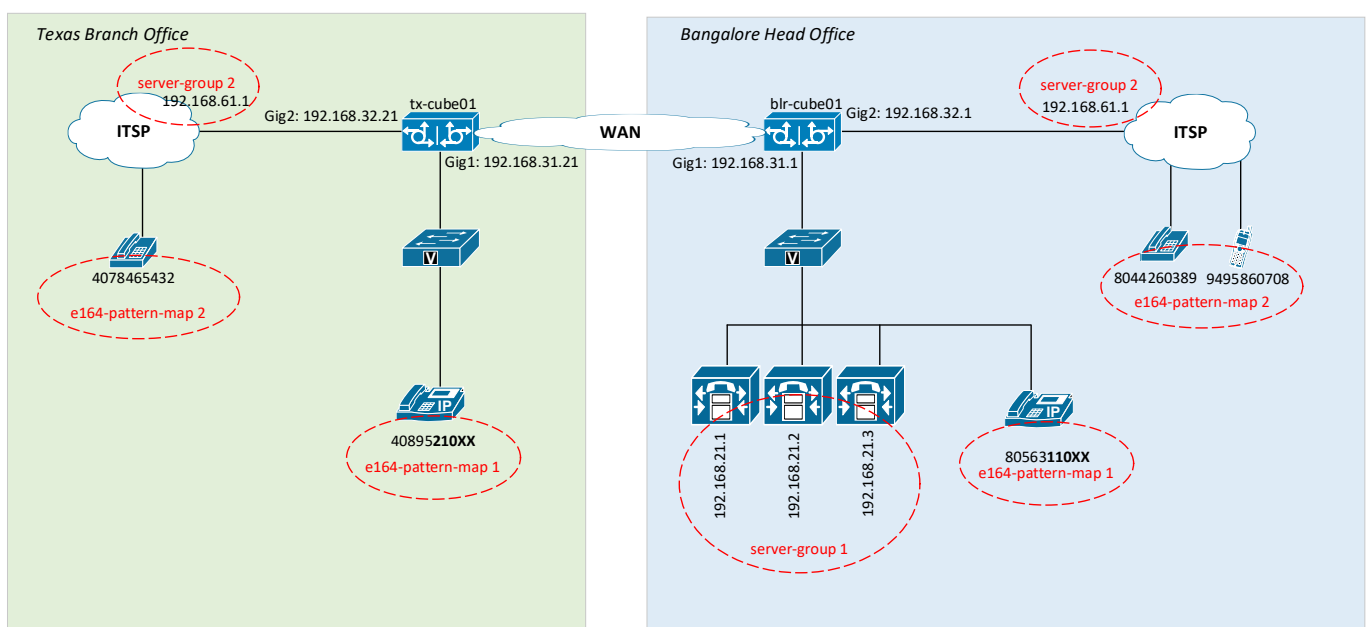
```

voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay rtp-nte
no vad
!
dial-peer voice 3 voip
description INBOUND FROM ITSP
session protocol sipv2
incoming called e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet2
voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay rtp-nte
no vad
!
dial-peer voice 4 voip
description OUTBOUND TO CUCM
session protocol sipv2
session server-group 1
destination e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet1
voice-class sip bind media source-interface GigabitEthernet1
dtmf-relay rtp-nte
no vad
!
show voip rtp connections
show cube calls all

```



- We have one more CUBE in remote site TEXAS to make PSTN calls from Texas phones
- Verizon is the SIP Service Provider in Texas site follow the similar steps to configure SIP Trunk
- You have to create below configurations
  - VERIZON-SIP-TRUNK-SIP-PROFILE
  - VERIZON-SIP-TRUNK-SIP-SEC-PROFILE
  - VERIZON-SIP-TRUNK-INBOUND-CSS with TEXAS-INTERNAL
  - VERIZON-SIP-TRUNK-CCM-GROUP
  - VERIZON-SIP-REGION
  - VERIZON-SIP-TRUNK-DEVICE-POOL
  - VERIZON-SIP-TRUNK
  - VERIZON-SIP-TRUNK-RG
  - VERIZON-SIP-TRUNK-RL
  - Route Pattern 9.XXXXXXXXXX on TEXAS-NATIONAL
  - Update TEXAS-PHONE-CSS
  - TX-CUBE Configurations



```

!
voice service voip
 ip address trusted list
 ipv4 192.168.21.1
 ipv4 192.168.21.2
 ipv4 192.168.21.3
 mode border-element
 allow-connections sip to sip
!

```

---

```

voice class codec 1
 codec preference 1 g711alaw
 codec preference 2 g711ulaw
 codec preference 3 g729r8
 codec preference 4 g729br8
!
voice class server-group 1
 description LOCAL CUCM SIDE
 ipv4 192.168.21.2
 ipv4 192.168.21.3
!
voice class server-group 2
 description ITSP SIDE
 ipv4 192.168.61.1
!
voice class e164-pattern-map 1
 description TEXAS INTERNAL DID
 e164 ^40895210..$
!
voice class e164-pattern-map 2
 description TEXAS ITSP NATIONAL NUMBERS
 e164 ^.....$
!
dial-peer voice 1 voip
 description INBOUND FROM CUCM
 session protocol sipv2
 incoming called e164-pattern-map 2
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet1
 voice-class sip bind media source-interface GigabitEthernet1
 dtmf-relay rtp-nte
 no vad
!
dial-peer voice 2 voip
 description OUTBOUND TO ITSP
 session protocol sipv2
 session server-group 2
 destination e164-pattern-map 2
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet2
 voice-class sip bind media source-interface GigabitEthernet2
 dtmf-relay rtp-nte
 no vad
!
dial-peer voice 3 voip
 description INBOUND FROM ITSP
 session protocol sipv2
 incoming called e164-pattern-map 1
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet2
 voice-class sip bind media source-interface GigabitEthernet2

```

---

---

```
dtmf-relay rtp-nte
no vad
!
dial-peer voice 4 voip
description OUTBOUND TO CUCM
session protocol sipv2
session server-group 1
destination e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet1
voice-class sip bind media source-interface GigabitEthernet1
dtmf-relay rtp-nte
no vad
!
```

---

## **[Lab] Standard Local Route Group (SLRG)**

- SLRG reduces the complexity and size of Dial-plan in CUCM. LRG is a device pool parameter and introduced in CUCM 7
- It is a mechanism for device pool-based gateway / Trunk selection to route the calls
- Each device pools will have their own respective local gateway. Instead of multiple route pattern for multiple locations, we create generic pattern and point list and then to SLRG
- In our lab, instead of creating 9.XXXXXXXXXX in two different partition, we create just one route pattern 9.XXXXXXXXXX and one route list
- When Bangalore Phone initiates a call, it will go via Bangalore CUBE and if Texas Phone makes a call, it will go via Texas CUBE



## Steps:

- Create 2 different Route Groups BANGALORE-PSTN-ROUTE-GROUP and TEXAS-PSTN-ROUTE-GROUP
- Add the in AIRTEL-SIP-TRUNK in BANGALORE-PSTN-ROUTE-GROUP

Route Group Configuration

Navigation: Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help

Route Group Configuration Related Links: Back To Find/List Go

Save Delete Add New

**Status**

Status: Ready

**Route Group Information**

Route Group Name\* BANGALORE-PSTN-ROUTE-GROUP

Distribution Algorithm\* Circular

**Route Group Member Information**

**Find Devices to Add to Route Group**

Device Name contains Find

Available Devices\*\*

- AIRTEL-SIP-TRUNK
- BLR-CUC-PUB-SIP-TRUNK
- BLR-CUC-SUB-SIP-TRUNK
- BLR-IMP-SIP-TRUNK
- VERIZON-SIP-TRUNK

Port(s) None Available

Add to Route Group

**Current Route Group Members**

Selected Devices (ordered by priority)\* AIRTEL-SIP-TRUNK (All Ports)

Reverse Order of Selected Devices

Removed Devices\*\*\*

**Route Group Members**

SIP AIRTEL-SIP-TRUNK

Save Delete Add New

- Add the in VERIZON-SIP-TRUNK in TEXAS-PSTN-ROUTE-GROUP

Route Group Configuration

https://blr-cucm-pub.ajcollab.com/ccmadmin/routeGroupEdit.do?key=cbde8dd0-9f0e-156

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Route Group Configuration Related Links: Back To Find/List Go

Save Delete Add New

Status

Status: Ready

Route Group Information

Route Group Name\* TEXAS-PSTN-ROUTE-GROUP

Distribution Algorithm\* Circular

Route Group Member Information

Find Devices to Add to Route Group

Device Name contains Find

Available Devices\*\*  
AIRTEL-SIP-TRUNK  
BLR-CUC-PUB-SIP-TRUNK  
BLR-CUC-SUB-SIP-TRUNK  
BLR-IMP-SIP-TRUNK  
VERIZON-SIP-TRUNK

Port(s) All

Add to Route Group

Current Route Group Members

Selected Devices (ordered by priority)\* VERIZON-SIP-TRUNK (All Ports)

Reverse Order of Selected Devices

Removed Devices\*\*\*

Route Group Members

SIP VERIZON-SIP-TRUNK

Save Delete Add New

- On BANGALORE-PHONES-DEVICE-POOL add BANGALORE-PSTN-ROUTE-GROUP as the Standard Local Route Group

Device Pool Configuration
+

https://blr-cucm-pub.ajcollab.com/ccmadmin/devicePoolEdit.do?key=435c5a88-d1d3-

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Device Pool Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**  
Status: Ready

**Device Pool Information**  
Device Pool: BANGALORE-PHONES-DP (10 members\*\*)

**Device Pool Settings**  
Device Pool Name\* BANGALORE-PHONES-DP  
Cisco Unified Communications Manager Group\* BANGALORE-PHONES-CCM-GROUP  
Calling Search Space for Auto-registration < None >  
Adjunct CSS < None >  
Reverted Call Focus Priority Default  
Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**  
Date/Time Group\* IST-DATE-TIME-GROUP  
Region\* BANGALORE-PHONES-REGION  
Media Resource Group List < None >  
Location < None >  
Network Locale < None >  
SRST Reference\* Disable  
Connection Monitor Duration\*\*\*  
Single Button Barge\* Default  
Join Across Lines\* Default  
Physical Location < None >  
Device Mobility Group < None >  
Wireless LAN Profile Group < None > [View Details](#)

**Local Route Group Settings**  
Standard Local Route Group BANGALORE-PSTN-ROUTE-GROUP

**Device Mobility Related Information\*\*\*\***  
Device Mobility Calling Search Space < None >  
AAR Calling Search Space < None >  
AAR Group < None >  
Calling Party Transformation CSS < None >

- On TEXAS-PHONES-DEVICE-POOL add TEXAS-PSTN-ROUTE-GROUP as the Standard Local Route Group

Device Pool Configuration

Navigation: Cisco Unified CM Administration Go

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System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Device Pool Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**

Status: Ready

**Device Pool Information**

Device Pool: TEXAS-PHONES-DP (2 members\*\*)

**Device Pool Settings**

Device Pool Name\* TEXAS-PHONES-DP

Cisco Unified Communications Manager Group\* TEXAS-PHONES-CCM-GROUP

Calling Search Space for Auto-registration < None >

Adjunct CSS < None >

Reverted Call Focus Priority Default

Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**

Date/Time Group\* CST-DATE-TIME-GROUP

Region\* TEXAS-PHONES-REGION

Media Resource Group List < None >

Location < None >

Network Locale < None >

SRST Reference\* Disable

Connection Monitor Duration\*\*\*

Single Button Barge\* Default

Join Across Lines\* Default

Physical Location < None >

Device Mobility Group < None >

Wireless LAN Profile Group < None > [View Details](#)

**Local Route Group Settings**

Standard Local Route Group TEXAS-PSTN-ROUTE-GROUP

**Device Mobility Related Information\*\*\*\***

Device Mobility Calling Search Space < None >

AAR Calling Search Space < None >

AAR Group < None >

Calling Party Transformation CSS < None >

- Create a Route List: PSTN-ROUTE-LIST and select Standard Local Route Group

Route List Configuration

Navigation: Cisco Unified CM Administration Go

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System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Route List Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**

Status: Ready

**Route List Information**

Registration: Unknown  
IPv4 Address: None  
Device is trusted: ☒  
Name\*: PSTN-ROUTE-LIST  
Description: PSTN-ROUTE-LIST  
Cisco Unified Communications Manager Group\*: SUB01-SUB02-CUCM-GROUP  
Enable this Route List (change effective on Save; no reset required): ☒  
Run On All Active Unified CM Nodes: ☐

**Route List Member Information**

Selected Groups\*\*  
Removed Groups\*\*\*

Add Route Group

Save Delete Copy Reset Apply Config Add New

Route List Detail Configuration

Navigation: Cisco Unified CM Administration Go

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System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Route List Detail Configuration Related Links: Back To Find/List Go

Save

**Status**

Status: Ready

**Route List Member Information**

Route Group\*: Standard Local Route Group(Local Route Group)

**Calling Party Transformations**

Use Calling Party's External Phone Number Mask\*: Default  
Calling Party Transform Mask:  
Prefix Digits (Outgoing Calls):  
Calling Party Number Type\*: Cisco CallManager  
Calling Party Numbering Plan\*: Cisco CallManager

**Called Party Transformations**

Discard Digits: < None >  
Called Party Transform Mask:  
Prefix Digits (Outgoing Calls):  
Called Party Number Type\*: Cisco CallManager  
Called Party Numbering Plan\*: Cisco CallManager

Save

- Create a Route Pattern: 9.XXXXXXXXXX in NATIONAL-PT and point to PSTN-CALL-ROUTE-LIST

Cisco
Route Pattern Configuration
+

https://blr-cucm-pub.ajcollab.com/ccmadmin/routePattern2Edit.do
90%

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Route Pattern Configuration
Related Links: Back To Find/List Go

Save

**Pattern Definition**

Route Pattern\* 9.XXXXXXXXXX
Route Partition NATIONAL-PT
Description
Numbering Plan -- Not Selected --
Route Filter < None >
MLPP Precedence\* Default
☐ Apply Call Blocking Percentage
Resource Priority Namespace Network Domain < None >
Route Class\* Default
Gateway/Route List\* PSTN-ROUTE-LIST (Edit)
Route Option
☒ Route this pattern
☐ Block this pattern No Error
Call Classification\* OffNet
External Call Control Profile < None >
☐ Allow Device Override ☒ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority
☐ Require Forced Authorization Code
Authorization Level\* 0
☐ Require Client Matter Code

**Calling Party Transformations**

☐ Use Calling Party's External Phone Number Mask
Calling Party Transform Mask
Prefix Digits (Outgoing Calls)
Calling Line ID Presentation\* Default
Calling Name Presentation\* Default
Calling Party Number Type\* Cisco CallManager
Calling Party Numbering Plan\* Cisco CallManager

**Connected Party Transformations**

Connected Line ID Presentation\* Default
Connected Name Presentation\* Default

**Called Party Transformations**

Discard Digits PreDot
Called Party Transform Mask
Prefix Digits (Outgoing Calls)
Called Party Number Type\* Cisco CallManager
Called Party Numbering Plan\* Cisco CallManager

**ISDN Network-Specific Facilities Information Element**

Network Service Protocol -- Not Selected --

- Add the NATIONAL-PT to both Bangalore and Texas Phone CSS

Calling Search Space Configuration

Status: Ready

Calling Search Space Information

Name\*: BANGALORE-PHONE-CSS

Description: BANGALORE-PHONE-CSS

Route Partitions for this Calling Search Space

Available Partitions\*\*

- Global Learned E164 Numbers
- Global Learned E164 Patterns
- Global Learned Enterprise Numbers
- Global Learned Enterprise Patterns
- TEST-PT

Selected Partitions

- BANGALORE-INTERNAL-PT
- TEXAS-INTERNAL-PT
- VM-PT
- NATIONAL-PT

Save Delete Copy Add New

Calling Search Space Configuration

Status: Ready

Calling Search Space Information

Name\*: TEXAS-PHONE-CSS

Description: TEXAS-PHONE-CSS

Route Partitions for this Calling Search Space

Available Partitions\*\*

- Global Learned E164 Numbers
- Global Learned E164 Patterns
- Global Learned Enterprise Numbers
- Global Learned Enterprise Patterns
- TEST-PT

Selected Partitions

- TEXAS-INTERNAL-PT
- BANGALORE-INTERNAL-PT
- VM-PT
- NATIONAL-PT

Save Delete Copy Add New

- Enable debugs on both Bangalore and Texas CUBE's then try calling the 10-digit PSTN number from Bangalore and Texas phones. See which gateway is getting hit.

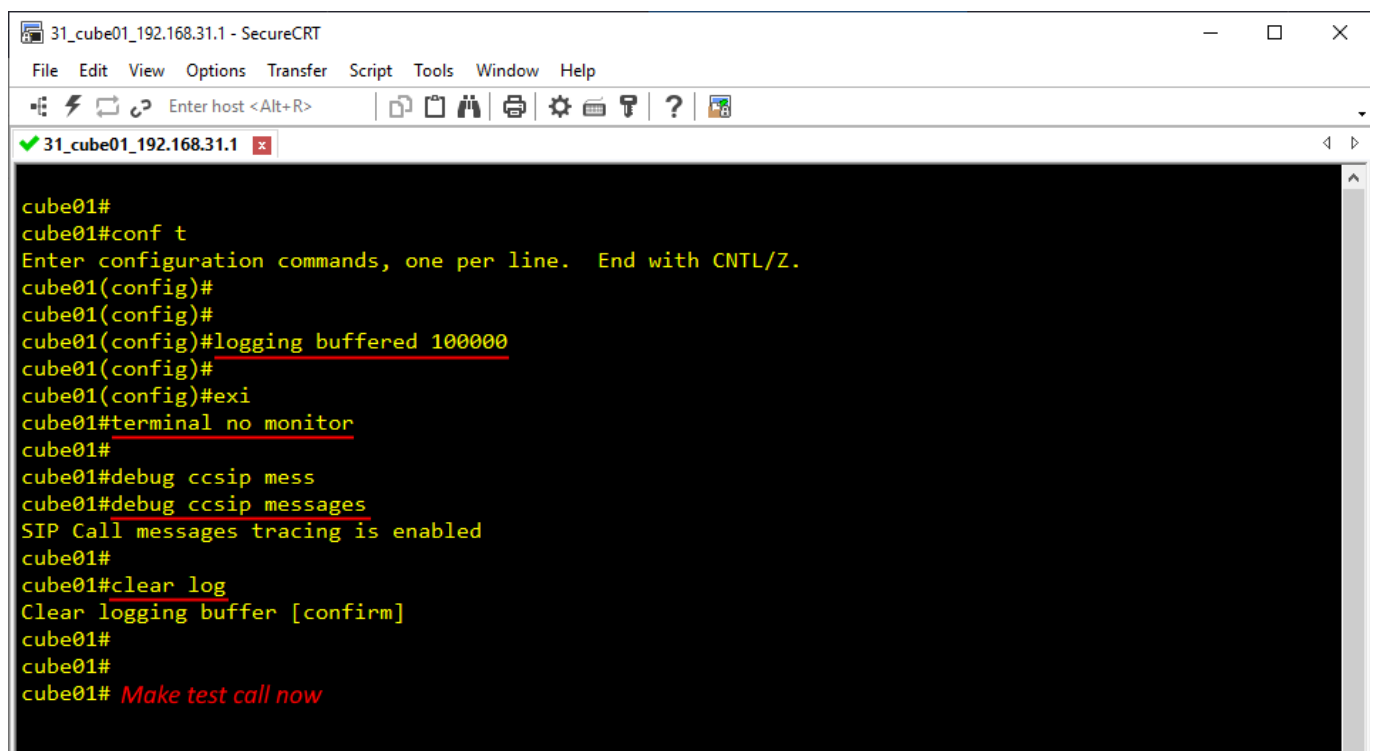
---

## CUBE Call Flow (with CUBE Debugs)

- **debug ccsip messages** debug command used to get the SIP logs from the CUBE router
- Since the CUBE interconnects CUCM and PSTN together, we can see the call leg between CUCM to CUBE and CUBE to ITSP in the CUBE debugs
- Use TranslatorX tool to analyses the SIP logs from CUBE
- While dealing with any CUBE debugs, it is always recommended to have below table filled

| DATA TO BE COLLECTED          | VALUES                                   |
|-------------------------------|------------------------------------------|
| Calling Number                | 8056311002                               |
| Called Number                 | 8044260389                               |
| Time of the call              | 21:18 (Approx.)                          |
| Duration of the call          | 14 Sec (Approx.)                         |
| Internal Phone IP             | 192.168.128.4                            |
| CUCM IPs                      | 192.168.21.1, 192.168.21.2, 192.168.21.3 |
| CUBE Internal IP              | 192.168.31.1                             |
| CUBE External IP              | 192.168.32.1                             |
| ITSP IP                       | 192.168.61.1                             |
| ITSP End device (if possible) | 192.168.130.1                            |

- If you have multiple calls on the CUBE, it is not recommended to have the logs collected via terminal monitor (directly on the SSH session), instead we can push the logs to a log buffer memory. If you have less calls, use **terminal monitor** and log the output to a Text file from Putty or Secure CRT.

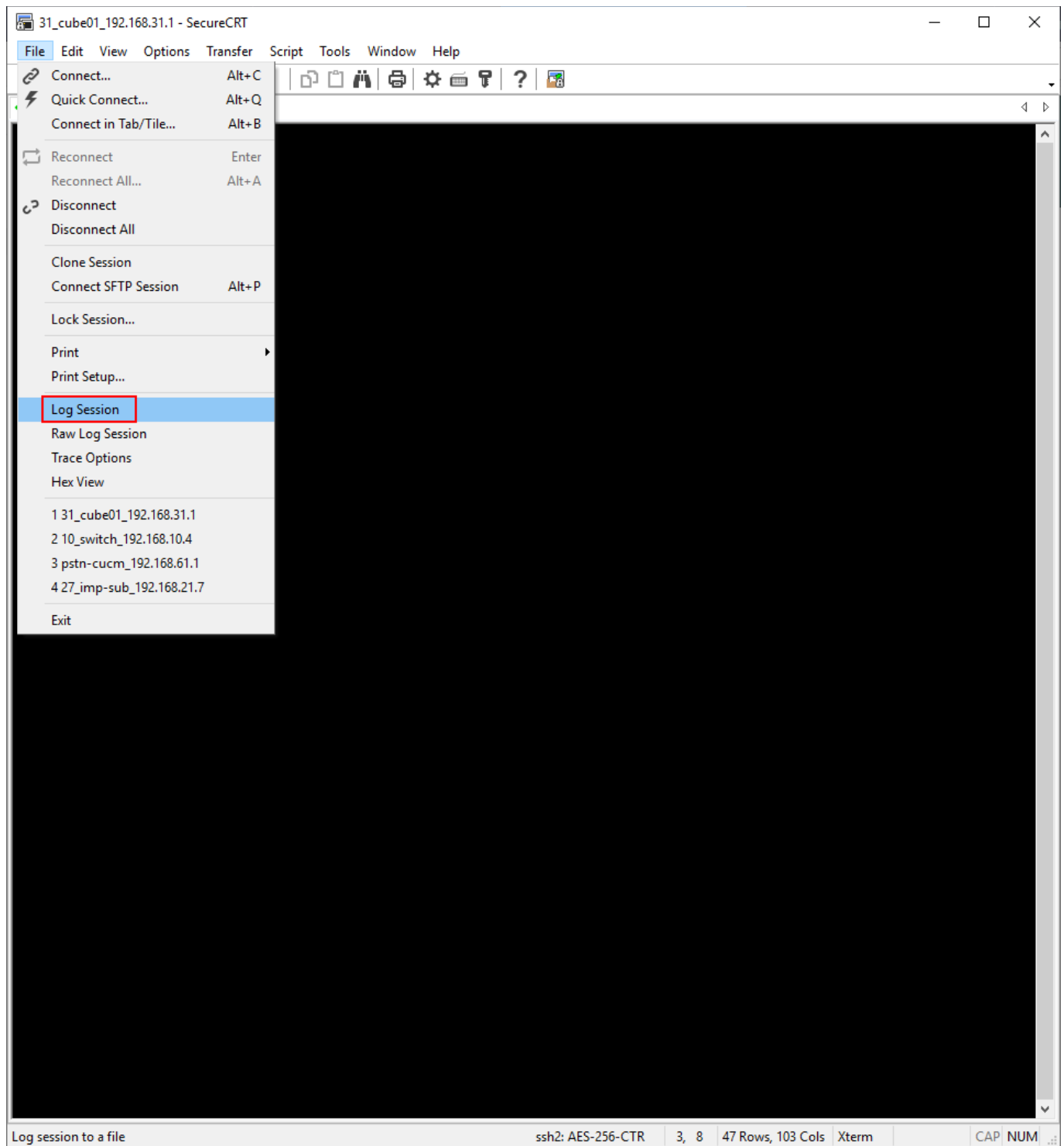
A screenshot of a SecureCRT terminal window titled '31\_cube01\_192.168.31.1 - SecureCRT'. The window has a menu bar (File, Edit, View, Options, Transfer, Script, Tools, Window, Help) and a toolbar. The terminal output shows the following commands and responses:

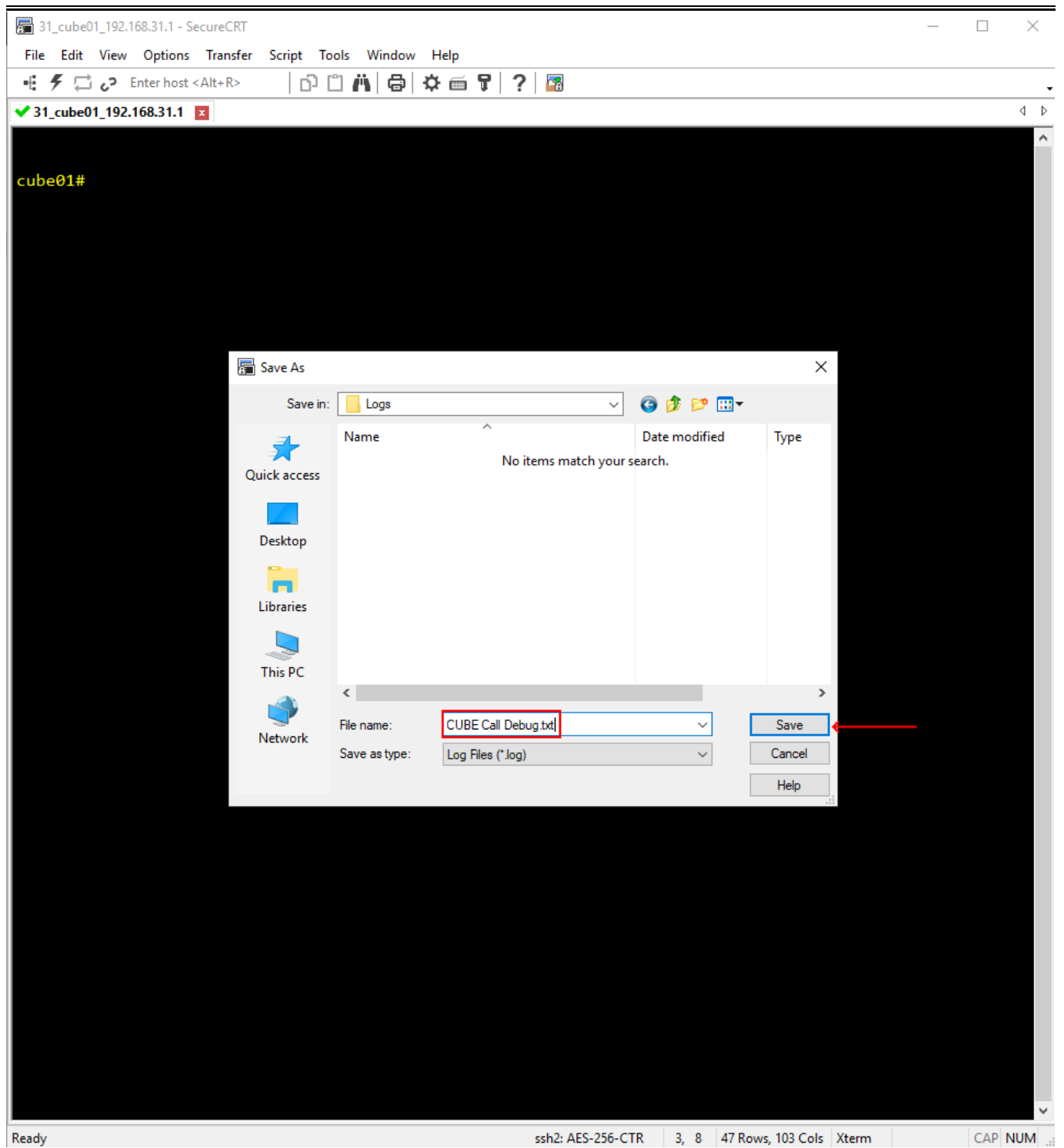
```
cube01#
cube01#conf t
Enter configuration commands, one per line. End with CNTL/Z.
cube01(config)#
cube01(config)#
cube01(config)#logging buffered 100000
cube01(config)#
cube01(config)#exi
cube01#terminal no monitor
cube01#
cube01#debug ccsip mess
cube01#debug ccsip messages
SIP Call messages tracing is enabled
cube01#
cube01#clear log
Clear logging buffer [confirm]
cube01#
cube01#
cube01# Make test call now
```

- Right after the call, disable the debug using **u all** command



- **show log** command will give the content of log buffer memory





```
31_cube01_192.168.31.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
31_cube01_192.168.31.1 x

cube01#
cube01#terminal length 0
cube01#
cube01#show log
Syslog logging: enabled (0 messages dropped, 2 messages rate-limited, 0 flushes, 0 overruns, xml disabled, filtering disabled)

No Active Message Discriminator.

No Inactive Message Discriminator.

Console logging: level debugging, 304 messages logged, xml disabled, filtering disabled
Monitor logging: level debugging, 55 messages logged, xml disabled, filtering disabled
Buffer logging: level debugging, 192 messages logged, xml disabled, filtering disabled
Exception logging: size (4096 bytes)
Count and timestamp logging messages: disabled
Persistent logging: disabled

No active filter modules.

Trap logging: level informational, 50 message lines logged
Logging Source-Interface: VRF Name:

Log Buffer (100000 bytes):

Mar 28 21:12:11.867: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:
Received:
OPTIONS sip:192.168.32.1:5060 SIP/2.0
Via: SIP/2.0/TCP 192.168.61.1:5060;branch=z9hG4bK513fa87e13
From: <sip:192.168.61.1>;tag=751088064
To: <sip:192.168.32.1>
Date: Sun, 28 Mar 2021 21:12:11 GMT
Call-ID: 41990d00-601f12b-4f-13da8c0@192.168.61.1
User-Agent: Cisco-CUCM11.5
CSeq: 101 OPTIONS
Contact: <sip:192.168.61.1:5060;transport=tcp>
Max-Forwards: 0
Content-Length: 0

Ready ssh2: AES-256-CTR 47, 11 47 Rows, 103 Cols Xterm CAP NUM
```

- Optionally **show voip rtp connections** command will give the local and remote RTP IP Address and Port details, this will be available on the SDP as well. This has to be collected when the call is active.

```

31_cube01_192.168.31.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
31_cube01_192.168.31.1 x

cube01#
cube01#
cube01#show voip rtp connections
VoIP RTP Port Usage Information:
Max Ports Available: 19999, Ports Reserved: 101, Ports in Use: 2

Media-Address Range Min Max Ports Ports Ports
 Port Port Available Reserved In-use

Global Media Pool 8000 48198 19999 101 2

VoIP RTP active connections :
No. CallId dstCallId LocalRTP RmtRTP LocalIP RemoteIP
1 126 127 8028 24872 192.168.31.1 192.168.128.4
2 127 126 8030 31440 192.168.32.1 192.168.130.1
Found 2 active RTP connections

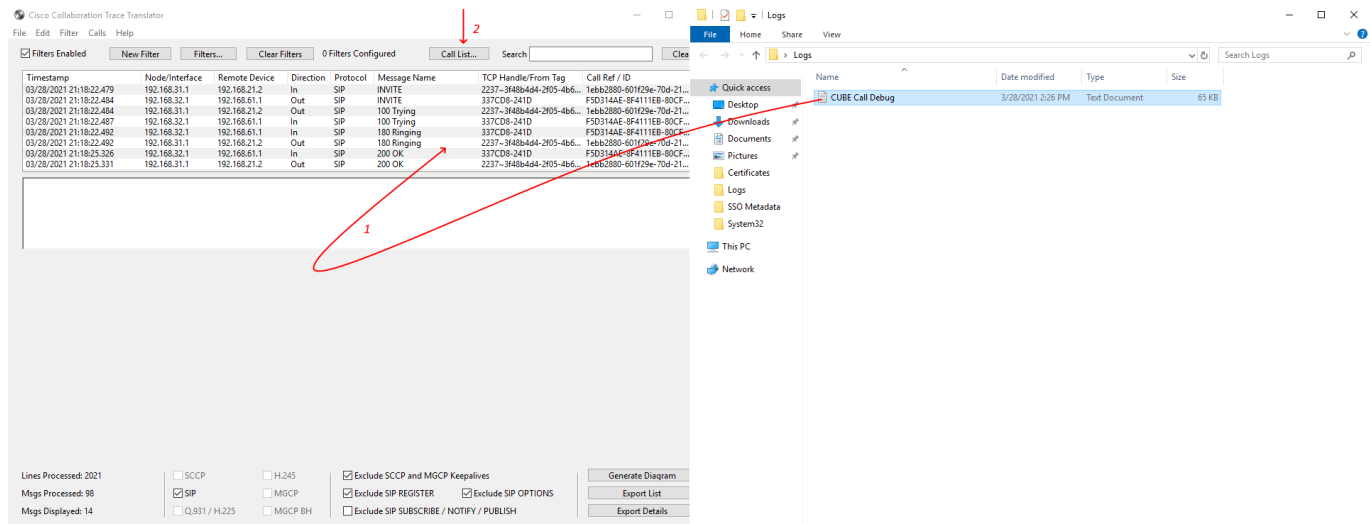
cube01#

```

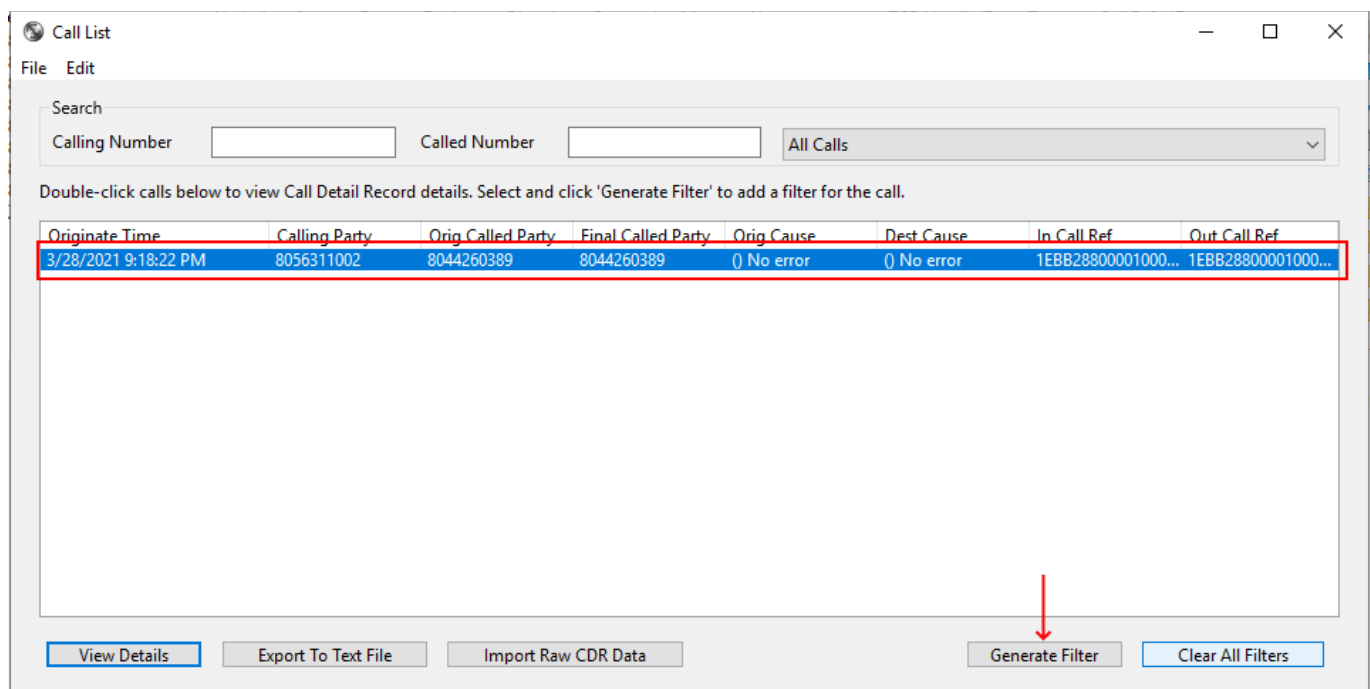
- Also Stream 1 from the IP Phone web page will give details about the Local (IP Phone) IP and Remote (CUBE Internal) IP along with RTP port numbers
- This will be helpful to isolate One-way Audio issue or No Audio issue as well

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|---------------|---------------------|------------|----------|---------------|--------|-----------|-----------------|----------------|-----|---------------|-------|--------------|--------|---------------------|---|-------------------------|----------|-------------------|-----|------------|-----|------------|--------|-------------------|---|-----------------------|----------|--------------|----|-------------|-------|---------|--------|-------------|--------|-------------|--------|-------------|--------|-----------------|------|
| <div>Log in - VMware ESXi</div> <div>Cisco Unified CM Console</div> <div>Cisco Systems, Inc.</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| 192.168.128.4/CGI/Java/Serviceability?adapter=device.statistics.stre                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| <div> <h1>Streaming Statistics</h1> <p>Cisco IP Phone CP-9971 ( SEP08CC6831D463 )</p> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| <div> <div>Device Information</div> <div>Network Setup</div> <div>Ethernet Statistics</div> <div>Ethernet Information</div> <div>Access</div> <div>Network</div> <div>Wireless Setup</div> <div>Current AP</div> <div>Wireless Statistics</div> <div>Device Logs</div> <div>Console Logs(Console Logs)</div> <div>Core Dumps(Core Dumps)</div> <div>Status Messages</div> <div>Wireless Site Survey</div> <div>Debug Display</div> <div>Streaming Statistics</div> <div>Stream 1</div> <div>Stream 2</div> <div>Stream 3</div> <div>Stream 4</div> <div>Stream 5</div> </div> | <table> <tr> <td>Remote Address</td><td>192.168.31.1/8020</td></tr> <tr> <td>Local Address</td><td>192.168.128.4/28822</td></tr> <tr> <td>Start Time</td><td>2:13:46a</td></tr> <tr> <td>Stream Status</td><td>Active</td></tr> <tr> <td>Host Name</td><td>SEP08CC6831D463</td></tr> <tr> <td>Sender Packets</td><td>320</td></tr> <tr> <td>Sender Octets</td><td>51200</td></tr> <tr> <td>Sender Codec</td><td>G.711u</td></tr> <tr> <td>Sender Reports Sent</td><td>1</td></tr> <tr> <td>Sender Report Time Sent</td><td>2:13:51a</td></tr> <tr> <td>Rcvr Lost Packets</td><td>122</td></tr> <tr> <td>Avg Jitter</td><td>220</td></tr> <tr> <td>Rcvr Codec</td><td>G.711u</td></tr> <tr> <td>Rcvr Reports Sent</td><td>0</td></tr> <tr> <td>Rcvr Report Time Sent</td><td>00:00:00</td></tr> <tr> <td>Rcvr Packets</td><td>91</td></tr> <tr> <td>Rcvr Octets</td><td>15652</td></tr> <tr> <td>MOS LQK</td><td>0.0000</td></tr> <tr> <td>Avg MOS LQK</td><td>0.0000</td></tr> <tr> <td>Min MOS LQK</td><td>0.0000</td></tr> <tr> <td>Max MOS LQK</td><td>0.0000</td></tr> <tr> <td>MOS LQK Version</td><td>0.95</td></tr> </table> | Remote Address | 192.168.31.1/8020 | Local Address | 192.168.128.4/28822 | Start Time | 2:13:46a | Stream Status | Active | Host Name | SEP08CC6831D463 | Sender Packets | 320 | Sender Octets | 51200 | Sender Codec | G.711u | Sender Reports Sent | 1 | Sender Report Time Sent | 2:13:51a | Rcvr Lost Packets | 122 | Avg Jitter | 220 | Rcvr Codec | G.711u | Rcvr Reports Sent | 0 | Rcvr Report Time Sent | 00:00:00 | Rcvr Packets | 91 | Rcvr Octets | 15652 | MOS LQK | 0.0000 | Avg MOS LQK | 0.0000 | Min MOS LQK | 0.0000 | Max MOS LQK | 0.0000 | MOS LQK Version | 0.95 |
| Remote Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 192.168.31.1/8020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Local Address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 192.168.128.4/28822                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Start Time                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 2:13:46a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Stream Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Active                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Host Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SEP08CC6831D463                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Sender Packets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 320                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Sender Octets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 51200                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Sender Codec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | G.711u                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Sender Reports Sent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Sender Report Time Sent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2:13:51a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Rcvr Lost Packets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 122                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Avg Jitter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 220                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Rcvr Codec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | G.711u                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Rcvr Reports Sent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Rcvr Report Time Sent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 00:00:00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Rcvr Packets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 91                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Rcvr Octets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 15652                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| MOS LQK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Avg MOS LQK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Min MOS LQK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| Max MOS LQK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.0000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |
| MOS LQK Version                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                   |               |                     |            |          |               |        |           |                 |                |     |               |       |              |        |                     |   |                         |          |                   |     |            |     |            |        |                   |   |                       |          |              |    |             |       |         |        |             |        |             |        |             |        |                 |      |

- Now drag the debug text file to TranslatorX and click Call List button



- Click Generate Filter button on the TranslatorX, then close the Call List window



- Click Generate Diagram

Cisco Collaboration Trace Translator

File Edit Filter Calls Help

☒ Filters Enabled
New Filter
Filters...
Clear Filters
2 Filters Configured
Call List...
Search
Clear

| Timestamp               | Node/Interface | Remote Device | Direction | Protocol | Message Name | TCP Handle/From Tag       | Call Ref / ID              |
|-------------------------|----------------|---------------|-----------|----------|--------------|---------------------------|----------------------------|
| 03/28/2021 21:18:22.479 | 192.168.31.1   | 192.168.21.2  | In        | SIP      | INVITE       | 2237~3f48b4d4-2f05-4b6... | 1ebb2880-601f29e-70d-21... |
| 03/28/2021 21:18:22.484 | 192.168.32.1   | 192.168.61.1  | Out       | SIP      | INVITE       | 337CD8-241D               | F5D314AE-8F4111EB-80CF...  |
| 03/28/2021 21:18:22.484 | 192.168.31.1   | 192.168.21.2  | Out       | SIP      | 100 Trying   | 2237~3f48b4d4-2f05-4b6... | 1ebb2880-601f29e-70d-21... |
| 03/28/2021 21:18:22.487 | 192.168.32.1   | 192.168.61.1  | In        | SIP      | 100 Trying   | 337CD8-241D               | F5D314AE-8F4111EB-80CF...  |
| 03/28/2021 21:18:22.492 | 192.168.32.1   | 192.168.61.1  | In        | SIP      | 180 Ringing  | 337CD8-241D               | F5D314AE-8F4111EB-80CF...  |
| 03/28/2021 21:18:22.492 | 192.168.31.1   | 192.168.21.2  | Out       | SIP      | 180 Ringing  | 2237~3f48b4d4-2f05-4b6... | 1ebb2880-601f29e-70d-21... |
| 03/28/2021 21:18:25.326 | 192.168.32.1   | 192.168.61.1  | In        | SIP      | 200 OK       | 337CD8-241D               | F5D314AE-8F4111EB-80CF...  |
| 03/28/2021 21:18:25.331 | 192.168.31.1   | 192.168.21.2  | Out       | SIP      | 200 OK       | 2237~3f48b4d4-2f05-4b6... | 1ebb2880-601f29e-70d-21... |

Lines Processed: 2021  
Msgs Processed: 98  
Msgs Displayed: 14

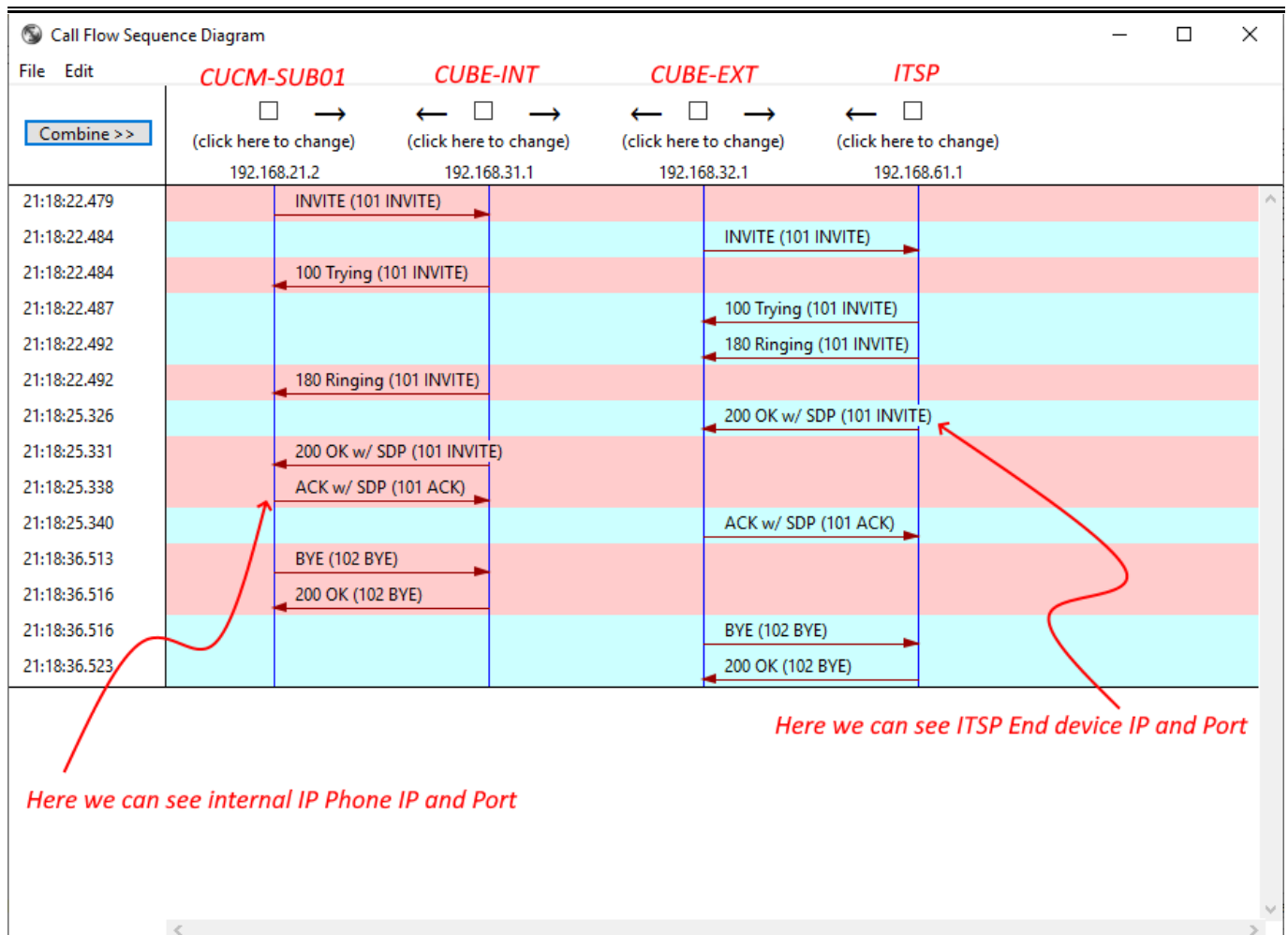
☐ SCCP  
☒ SIP  
☐ Q.931 / H.225

☐ H.245  
☐ MGCP  
☐ MGCP BH

☒ Exclude SCCP and MGCP Keepalives  
☒ Exclude SIP REGISTER  
☐ Exclude SIP SUBSCRIBE / NOTIFY / PUBLISH

☒ Exclude SIP OPTIONS

Generate Diagram  
Export List  
Export Details



- Once you familiar with TranslatorX tool, you can alternatively analyze the logs from NotePad++
- Grep for the Calling or Called Number, then get the first Invite, there will be 2 Invites as you have seen in the above diagram

```
C:\Users\Administrator\Desktop\Logs\CUBE Call Debug.txt - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
CUBE Call Debug.txt
830
831 Mar 28 21:18:22.479: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:
832 Received:
833 INVITE sip:8044260389@192.168.31.1:5060 SIP/2.0
834 Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK7267070f430
835 From: "11002 - Abdul Jaseem"
 <sip:8056311002@192.168.21.2>;tag=2237~3f48b4d4-2f05-4b61-86ad-47522208ed69-420
 92317
836 To: <sip:8044260389@192.168.31.1>
837 Date: Sun, 28 Mar 2021 21:18:22 GMT
838 Call-ID: lebb2880-601f29e-70d-215a8c0@192.168.21.2 → This will be unique for CUCM to CUBE leg
839 Supported: timer,resource-priority,replaces
840 Min-SE: 1800
841 User-Agent: Cisco-CUCM11.5 → Message came from CUCM
842 Allow: INVITE, OPTIONS, INFO, BYE, CANCEL, ACK, PRACK, UPDATE, REFER,
 SUBSCRIBE, NOTIFY
843 CSeq: 101 INVITE
844 Expires: 180
845 Allow-Events: presence, kpml
846 Supported: X-cisco-srtp-fallback,X-cisco-original-called
847 Call-Info:
 <sip:192.168.21.2:5060>;method="NOTIFY;Event=telephone-event;Duration=500"
848 Call-Info: <urn:x-cisco-remotecc:callinfo>;x-cisco-video-traffic-class=DESKTOP
849 Session-ID:
 7c8b24ebbb0140d0ab8cdeba45aa2235;remote=00000000000000000000000000000000
850 Cisco-Guid: 0515582080-0000065536-0000000013-0034973888
851 Session-Expires: 1800

Search results - (36 hits)
Search "8044260389" (36 hits in 1 file of 1 searched)
C:\Users\Administrator\Desktop\Logs\CUBE Call Debug.txt (36 hits)
Line 833: INVITE sip:8044260389@192.168.31.1:5060 SIP/2.0 Invite from CUCM to CUBE
Line 836: To: <sip:8044260389@192.168.31.1>
Line 861: INVITE sip:8044260389@192.168.61.1 SIP/2.0
Line 865: To: <sip:8044260389@192.168.61.1>
Line 888: To: <sip:8044260389@192.168.31.1>
Line 902: To: <sip:8044260389@192.168.61.1>
Line 915: To: <sip:8044260389@192.168.61.1>;tag=111~6d68c7b1-6dc3-4f9e-b3d4-c3249872f990-25383825
Line 925: P-Asserted-Identity: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>
Line 925: P-Asserted-Identity: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>
Line 926: Remote-Party-ID: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>;party=called;screen=yes;;
Line 926: Remote-Party-ID: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>;party=called;screen=yes;;
Line 927: Contact: <sip:8044260389@192.168.61.1:5060>
Line 936: To: <sip:8044260389@192.168.31.1>;tag=337CE0-1651
Line 942: Remote-Party-ID: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.31.1>;party=called;screen=yes;;
Line 942: Remote-Party-ID: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.31.1>;party=called;screen=yes;;

Normal text file length: 66,511 lines: 2,021 Ln: 834 Col: 20 Pos: 26,717 Windows (CR LF) UTF-8-BOM INS
```



```
C:\Users\Administrator\Desktop\Logs\CUBE Call Debug.txt - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
CUBE Call Debug.txt
874 Timestamp: 1616966302
875 Contact: <sip:8056311002@192.168.32.1:5060>
876 Expires: 180
877 Allow-Events: telephone-event
878 Max-Forwards: 68
879 Session-Expires: 1800
880 Content-Length: 0
881
882
883 Mar 28 21:18:22.484: //169/1EBB28800000/SIP/Msg/ccsipDisplayMsg:
884 Sent:
885 SIP/2.0 100 Trying
886 Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK7267070f430
887 From: "11002 - Abdul Jaseem"
 <sip:8056311002@192.168.21.2>;tag=2237~3f48b4d4-2f05-4b61-86ad-47522208ed69-420
 92317
888 To: <sip:8044260389@192.168.31.1>
889 Date: Sun, 28 Mar 2021 21:18:22 GMT
890 Call-ID: 1ebbb2880-601f29e-70d-215a8c0@192.168.21.2
891 CSeq: 101 INVITE
 Grep on the call-id to track CUCM-CUBE leg
892 Allow-Events: telephone-event
893 Server: Cisco-SIPGateway/IOS-15.5.2.S
894 Content-Length: 0
895
896
897 Mar 28 21:18:22.487: //170/1EBB28800000/SIP/Msg/ccsipDisplayMsg:
898 Received:

Search results - (7 hits)
Search "1ebbb2880-601f29e-70d-215a8c0" (7 hits in 1 file of 1 searched)
C:\Users\Administrator\Desktop\Logs\CUBE Call Debug.txt (7 hits)
Line 838: Call-ID: 1ebbb2880-601f29e-70d-215a8c0@192.168.21.2
Line 890: Call-ID: 1ebbb2880-601f29e-70d-215a8c0@192.168.21.2
Line 938: Call-ID: 1ebbb2880-601f29e-70d-215a8c0@192.168.21.2
Line 1036: Call-ID: 1ebbb2880-601f29e-70d-215a8c0@192.168.21.2
Line 1074: Call-ID: 1ebbb2880-601f29e-70d-215a8c0@192.168.21.2
Line 1127: Call-ID: 1ebbb2880-601f29e-70d-215a8c0@192.168.21.2
Line 1144: Call-ID: 1ebbb2880-601f29e-70d-215a8c0@192.168.21.2
Search "8044260389" (36 hits in 1 file of 1 searched)
```

- You can now get all the messages between CUCM and CUBE
- To track the CUBE-ITSP leg, identify the call-id of second Invite and search for the call-id

```
C:\Users\Administrator\Desktop\Logs\CUBE Call Debug.txt - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
CUBE Call Debug.txt
855 Max-Forwards: 69
856 Content-Length: 0
857
858
859 Mar 28 21:18:22.484: //170/1EBB28800000/SIP/Msg/ccsipDisplayMsg:
860 Sent:
861 INVITE sip:8044260389@192.168.61.1 SIP/2.0
862 Via: SIP/2.0/UDP 192.168.32.1:5060;branch=z9hG4bK186DE
863 Remote-Party-ID: "11002 - Abdul Jaseem"
864 <sip:8056311002@192.168.32.1>;party=calling;screen=yes;privacy=off
865 From: "11002 - Abdul Jaseem" <sip:8056311002@192.168.32.1>;tag=337CD8-241D
866 To: <sip:8044260389@192.168.61.1>
867 Date: Sun, 28 Mar 2021 21:18:22 GMT
868 Call-ID: F5D314AE-8F4111EB-80CFBC96-4640BB65@192.168.32.1
869 Supported: timer,resource-priority,replaces,sdp-anat
870 Min-SE: 1800
871 Cisco-Guid: 0515582080-0000065536-0000000013-0034973888
872 User-Agent: Cisco-SIPGateway/IOS-15.5.2.S Message originated from CUBE
873 Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE,
874 NOTIFY, INFO, REGISTER
875 CSeq: 101 INVITE
876 Timestamp: 1616966302
877 Contact: <sip:8056311002@192.168.32.1:5060>
878 Expires: 180
879 Allow-Events: telephone-event
880 Max-Forwards: 68
881 Session-Expires: 1800

Search results - (36 hits)
Search "8044260389" (36 hits in 1 file of 1 searched)
C:\Users\Administrator\Desktop\Logs\CUBE Call Debug.txt (36 hits)
Line 833: INVITE sip:8044260389@192.168.31.1:5060 SIP/2.0
Line 836: To: <sip:8044260389@192.168.31.1>
Line 861: INVITE sip:8044260389@192.168.61.1 SIP/2.0 Invite from CUBE to ITSP
Line 865: To: <sip:8044260389@192.168.61.1>
Line 888: To: <sip:8044260389@192.168.31.1>
Line 902: To: <sip:8044260389@192.168.61.1>
Line 915: To: <sip:8044260389@192.168.61.1>;tag=111~6d68c7b1-6dc3-4f9e-b3d4-c3249872f990-25383825
Line 925: P-Asserted-Identity: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>
Line 925: P-Asserted-Identity: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>
Line 926: Remote-Party-ID: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>;party=called;screen=yes;;
Line 926: Remote-Party-ID: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>;party=called;screen=yes;;
Line 927: Contact: <sip:8044260389@192.168.61.1:5060>
Line 936: To: <sip:8044260389@192.168.31.1>;tag=337CE0-1651
Line 942: Remote-Party-ID: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.31.1>;party=called;screen=yes;;
Line 942: Remote-Party-ID: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.31.1>;party=called;screen=yes;;
```

- The transaction between CUCM and CUBE is also available in Cisco CallManager logs that can be collected using RTMT Software
- From the CallManager logs, we could see the IP Phone to CUCM signaling as well

## CUBE Call Flow (with CallManager Logs)

Cisco Unified Real Time Monitoring Tool (Currently Logged into: cucm-pub.ajcollab.com)

File System Voice/Video AnalysisManager IM and Presence Edit Window Application Help

Real Time Monitoring Tool For Cisco Unified Communications Solutions

**System**

- System Summary
- Server
  - CPU and Memory
  - Process
  - Disk Usage
  - Critical Services
- Performance
  - Performance
  - Performance Log Viewer
- Tools
  - Alert Central
  - Trace & Log Central**
  - Job Status
  - SysLog Viewer
  - VLT
  - AuditLog Viewer

**Trace & Log Central**

- Trace & Log Central
- Remote Browse
- Collect Files
- Query Wizard
- Schedule Collection
- Local Browse
- Real Time Trace
- Collect Crash Dump

**Collect Files**

Select UCM Services/Applications

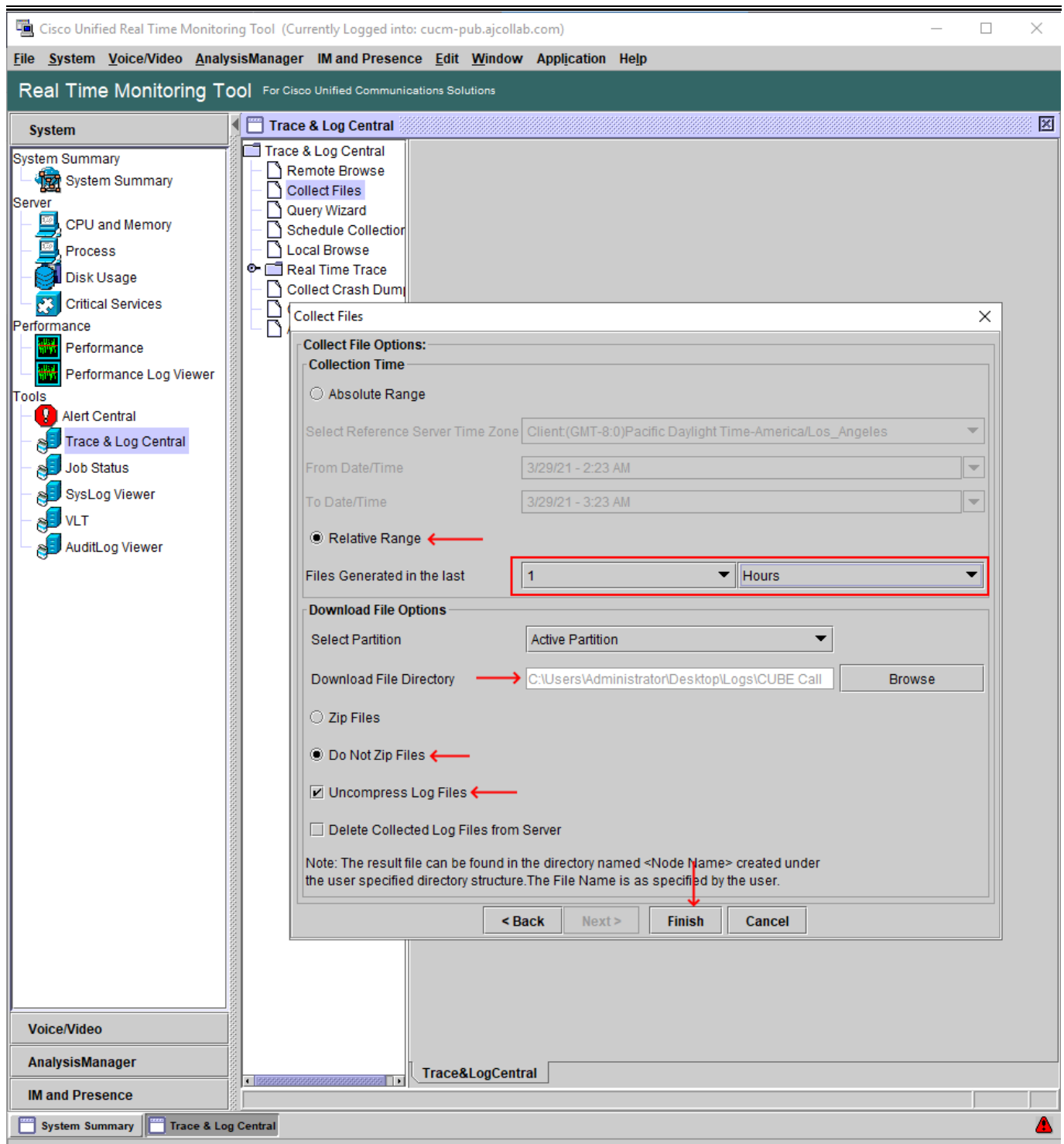
☐ Select all Services on all Servers

| Name                                       | All Servers                         | cucm-pub.ajcollab.com               | cucm-su                             |
|--------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Cisco CAR Web Service                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco CDR Agent                            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco CDR Repository Manager               | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco CDR files on CM server               | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco CDR files on Publisher Processed     | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco CTIManager                           | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco CTL Provider                         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| <b>Cisco CallManager</b>                   | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Cisco CallManager SNMP Service             | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Certificate Authority Proxy Function | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Change Credential Application        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco DHCP Monitor Service                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Dialed Number Analyzer               | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Dialed Number Analyzer Server        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Directory Number Alias Lookup        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Directory Number Alias Sync          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Extended Functions                   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Extended Functions Report            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Extension Mobility                   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Extension Mobility Application       | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco IP Manager Assistant                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco IP Voice Media Streaming App         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Intercluster Lookup Service          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco License Manager                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Location Bandwidth Manager           | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Management Agent Service             | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| Cisco Push Notification Service            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |

< Back Next > Finish Cancel

Trace&LogCentral

System Summary Trace & Log Central



Cisco Unified Real Time Monitoring Tool (Currently Logged into: cucm-pub.ajcollab.com)

File System Voice/Video AnalysisManager IM and Presence Edit Window Application Help

### Real Time Monitoring Tool For Cisco Unified Communications Solutions

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  - Performance
  - Performance Log Viewer
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  - Alert Central
  - Trace & Log Central
  - Job Status
  - SysLog Viewer
  - VLT
  - AuditLog Viewer

#### Trace & Log Central

- Trace & Log Central
- Remote Browse
- Collect Files
- Query Wizard
- Schedule Collection
- Local Browse
- Real Time Trace
- Collect Crash Dump
- Collect Install Logs
- Audit Logs

Collect Files in progress for node cucm-pub.ajcollab.com

Collect Files in progress for node cucm-sub02.ajcollab.com

Collect Files in progress for node cucm-sub01.ajcollab.com

Downloading results into C:\Users\Administrator\Desktop\CUBE Call\TraceCollectionResult\_2021-

Completed downloading results into ...C:\Users\Administrator\Desktop\CUBE Call\TraceCollectionF

Downloading files for node cucm-sub02.ajcollab.com

No files matched the date Range for node cucm-pub.ajcollab.com

Downloading results into C:\Users\Administrator\Desktop\CUBE Call\TraceCollectionResult\_2021-

Completed downloading results into ...C:\Users\Administrator\Desktop\CUBE Call\TraceCollectionF

Downloading files for node cucm-sub01.ajcollab.com

Downloaded SDL002\_100\_000035.txt from the node: cucm-sub01.ajcollab.com

Downloaded SDL003\_100\_000031.txt from the node: cucm-sub02.ajcollab.com

Downloaded SDL002\_100\_000036.txt from the node: cucm-sub01.ajcollab.com

Downloaded SDL003\_100\_000032.txt from the node: cucm-sub02.ajcollab.com

Downloaded SDL002\_100\_000037.txt from the node: cucm-sub01.ajcollab.com

Downloaded SDL003\_100\_000033.txt from the node: cucm-sub02.ajcollab.com

Downloaded SDL002\_100\_000038.txt from the node: cucm-sub01.ajcollab.com

Downloaded SDL003\_100\_000034.txt from the node: cucm-sub02.ajcollab.com

Downloaded SDL002\_100\_000039.txt from the node: cucm-sub01.ajcollab.com

Downloaded SDL003\_100\_000035.txt from the node: cucm-sub02.ajcollab.com

Downloaded SDL002\_100\_000036.txt from the node: cucm-sub02.ajcollab.com

Downloaded SDL002\_100\_000040.txt from the node: cucm-sub01.ajcollab.com

Downloaded SDL003\_100\_000037.txt from the node: cucm-sub02.ajcollab.com

Downloaded calllogs\_00000001.txt from the node: cucm-sub02.ajcollab.com

\*\*\*\*\*Collection Summary\*\*\*\*\*

HostName: cucm-sub02.ajcollab.com

No. of files Collected: 8

\*\*\*\*\*

Completed downloading for node cucm-sub02.ajcollab.com

Downloaded SDL002\_100\_000041.txt from the node: cucm-sub01.ajcollab.com

Downloaded SDL002\_100\_000042.txt from the node: cucm-sub01.ajcollab.com

Downloaded SDL002\_100\_000043.txt from the node: cucm-sub01.ajcollab.com

Downloaded calllogs\_00000001.txt from the node: cucm-sub01.ajcollab.com

\*\*\*\*\*Collection Summary\*\*\*\*\*

HostName: cucm-sub01.ajcollab.com

No. of files Collected: 10

\*\*\*\*\*

Completed downloading for node cucm-sub01.ajcollab.com

Cancel

Collect Files\_02:27:18

Completed downloading for node cucm-sub01.ajcollab.com

*→ This will be grayed out after collecting the logs*

System Summary Trace & Log Central

Collaboration Solutions Analyz

+


← → ↺ 🏠

🔒 <https://cway.cisco.com/csa/>

80%

⋮ 📄 📁 📧

⌵

 Tools Catalog / Cisco TAC Tool

Abdul Jaseem V.P. 🔊 ⌂ ?

⚠️ Note that Webex will be changing CA provider and that you will need to update the CA trust store on your VCS/Expressway systems before March 31, 2021 when using it for video calls to Webex, Webex Edge Audio or when running Connectors on Expressway. Instructions on how to update it, can be found in this article [216950-cisco-webex-root-ca-certificate-update](#)

Upload files

1 Files are being uploaded to the same storage used and controlled by a service request and hence meets the same security requirements. For analysis the files are fetched in a sandbox unique and only accessible by the cco id and kept there for 8 hours after which they are automatically removed.

Use this tool when troubleshooting any issue on your collaboration servers or endpoints. Diagnostic signatures will suggest next action plan in case any known issues were found. Alternatively, use the tool output to visualize and better understand the communication flows and configuration to troubleshoot the issue further. [More info](#)

Available files

▼ More info

| Select                              | Filename        | Size     | Product type |
|-------------------------------------|-----------------|----------|--------------|
| <input checked="" type="checkbox"/> | CUBE Call.zip ← | 2.602 MB | CUCM         |

Select all

Run Analysis ←

Delete all

Diagnostic signatures

SEARCH

🔍

RESULT TYPE

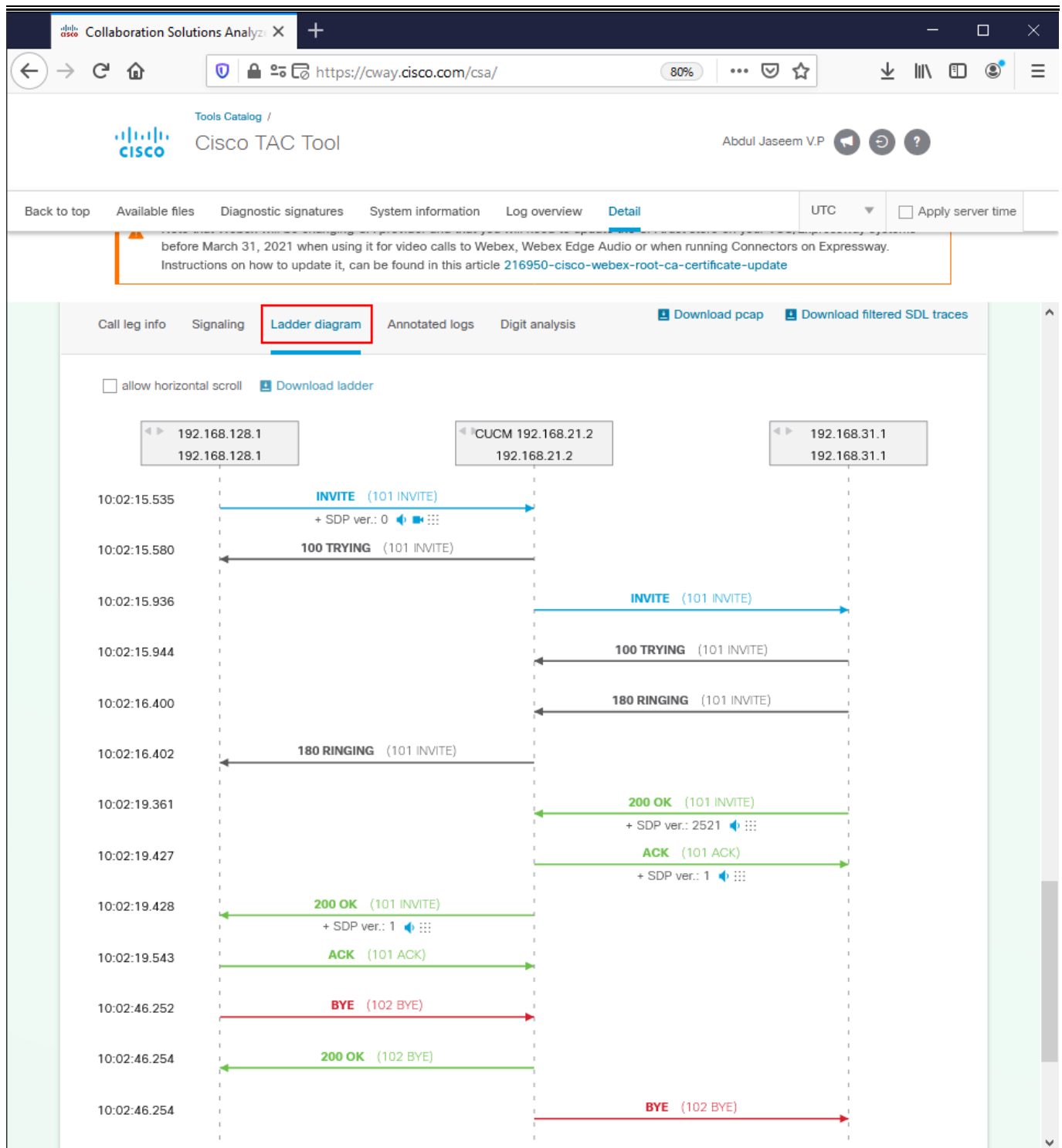
☒ Issue (0)

☐ Ok (25)

✓ No issues were found.

You can still view the diagnostic signatures that were run but did not find any issue by selecting the result type in the left panel.

582



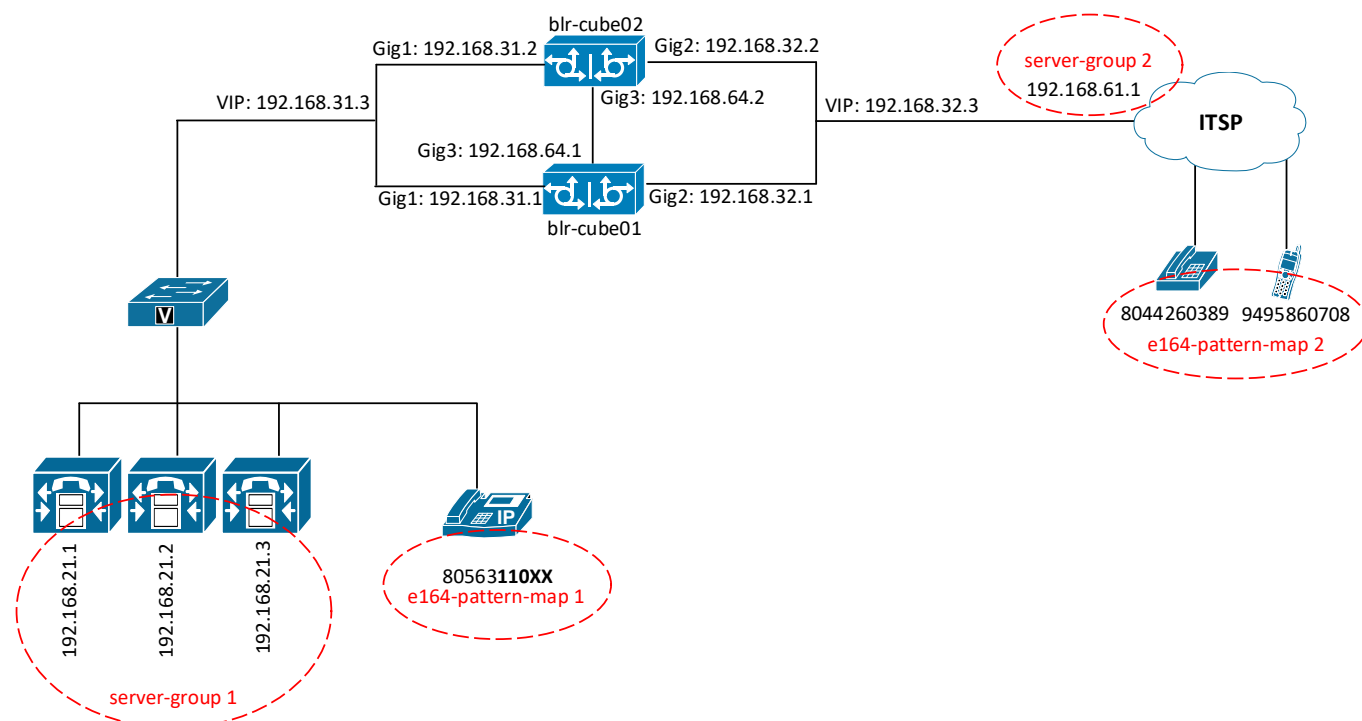


---

## CUBE High Availability (HA)



- The High Availability (HA) feature provides failover capability of Cisco Unified Border Element (CUBE) on two routers, one active and one standby
- When the active router goes down for any reason, the standby router takes over seamlessly, preserving and processing your calls
- We configure a Virtual IP Address to make the two CUBEs to appear like one device
- HA is accomplished using the Hot Standby Routing Protocol (HSRP)





---

## CUBE Base Configuration

- CUBE01 and CUBE02 should have similar call routing configurations (dial-peers, voice-class, etc.)
- Make sure your calls are routing via each CUBEs separately
- Below are the base configurations of CUBE

```
!
voice service voip
 ip address trusted list
 ipv4 192.168.21.1
 ipv4 192.168.21.2
 ipv4 192.168.21.3
 mode border-element
 allow-connections sip to sip
!
voice class codec 1
 codec preference 1 g711alaw
 codec preference 2 g711ulaw
 codec preference 3 g729r8
 codec preference 4 g729br8
!
voice class server-group 1
 description LOCAL CUCM SIDE
 ipv4 192.168.21.2
 ipv4 192.168.21.3
!
voice class server-group 2
 description ITSP SIDE
 ipv4 192.168.61.1
!
voice class e164-pattern-map 1
 description BANGALORE INTERNAL DID
 e164 ^80563110..$
 e164 ^8056310002$
!
voice class e164-pattern-map 2
 description BANGALORE ITSP NATIONAL NUMBERS
 e164 ^.....$
!
dial-peer voice 1 voip
 description INBOUND FROM CUCM
 session protocol sipv2
 incoming called e164-pattern-map 2
 voice-class codec 1
 voice-class sip bind control source-interface GigabitEthernet1
 voice-class sip bind media source-interface GigabitEthernet1
 dtmf-relay rtp-nte
 no vad
!
dial-peer voice 2 voip
```

---

---

```
description OUTBOUND TO ITSP
session protocol sipv2
session server-group 2
destination e164-pattern-map 2
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet2
voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay rtp-nte
no vad
!
dial-peer voice 3 voip
description INBOUND FROM ITSP
session protocol sipv2
incoming called e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet2
voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay rtp-nte
no vad
!
dial-peer voice 4 voip
description OUTBOUND TO CUCM
session protocol sipv2
session server-group 1
destination e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet1
voice-class sip bind media source-interface GigabitEthernet1
dtmf-relay rtp-nte
no vad
!
```

---

- 
- Now, monitor the status of the internal and external interfaces of CUBE- this is Gig1 and Gig2
  - Monitoring the line-protocol status of the interfaces allows the redundancy application to determine when a resource has gone offline
  - These configurations have to be applied on CUBE01 and CUBE02

#### **CUBE01**

```
!
track 1 interface GigabitEthernet1 line-protocol
track 2 interface GigabitEthernet2 line-protocol
!
```

#### **CUBE02**

```
!
track 1 interface GigabitEthernet1 line-protocol
track 2 interface GigabitEthernet2 line-protocol
!
```

- Configure the Redundancy Application that tracks Gig1 and Gig2 status

#### **CUBE01**

```
!
redundancy
application redundancy
group 1
name CUBE-HA
priority 101
timers delay 30 reload 60
control GigabitEthernet3 protocol 1
data GigabitEthernet3
track 1 shutdown
track 2 shutdown
!
```

#### **CUBE02**

```
!
redundancy
application redundancy
group 1
name CUBE-HA
priority 100
timers delay 30 reload 60
control GigabitEthernet3 protocol 1
data GigabitEthernet3
track 1 shutdown
track 2 shutdown
!
```

- Enable the redundancy in the voice service configuration of each CUBE

#### **CUBE01**

```
!
voice service voip
redundancy-group 1
!
```

#### **CUBE02**

```
!
voice service voip
redundancy-group 1
!
```

- Now let's configure the internal and external Virtual Interfaces
- The Command "redundancy rii" (Redundant Interface Identifier) is used for generating a Virtual IP (VIP) and Virtual MAC (VMAC)

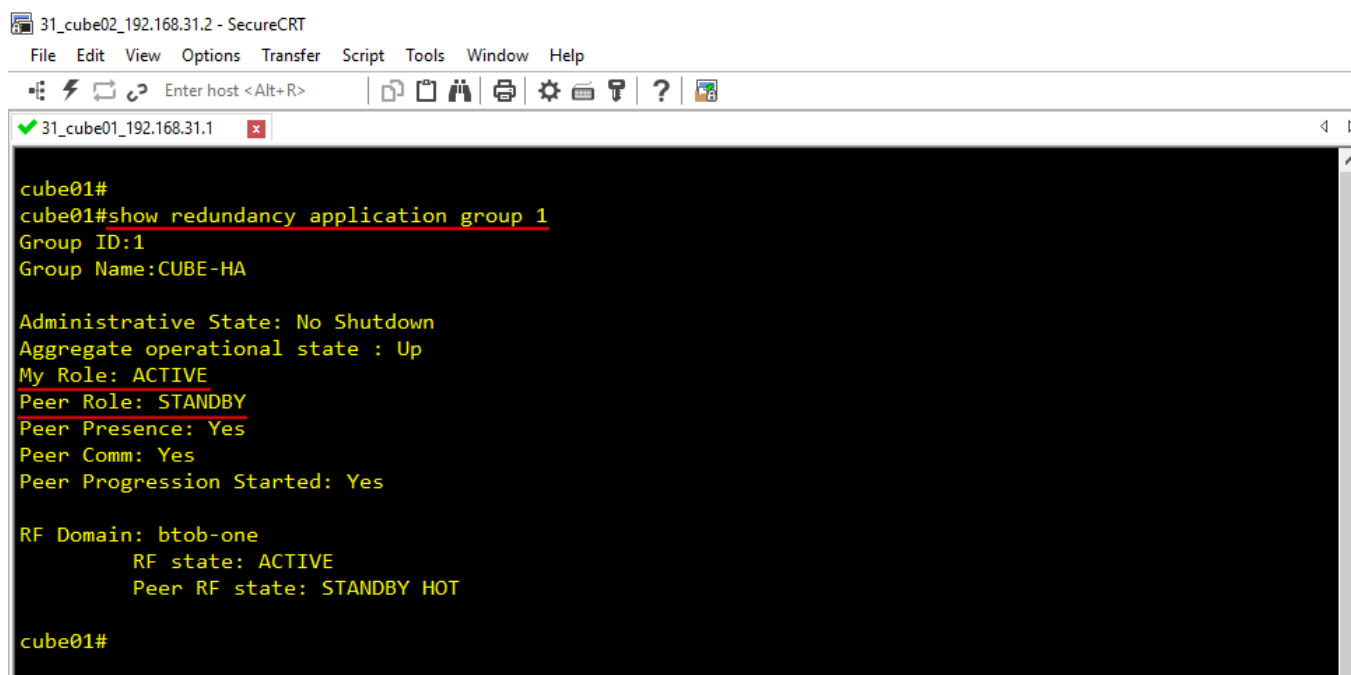
### CUBE01

```
!
interface GigabitEthernet1
redundancy rii 1
redundancy group 1 IP 192.168.31.3 exclusive
interface GigabitEthernet2
redundancy rii 2
redundancy group 1 IP 192.168.32.3 exclusive
!
```

### CUBE02

```
!
interface GigabitEthernet1
redundancy rii 1
redundancy group 1 IP 192.168.31.3 exclusive
interface GigabitEthernet2
redundancy rii 2
redundancy group 1 IP 192.168.32.3 exclusive
!
```

- *show redundancy application group 1* OR (*show redundancy application group*)  
command will give the status of HA
- *show redundancy application transport group 1*



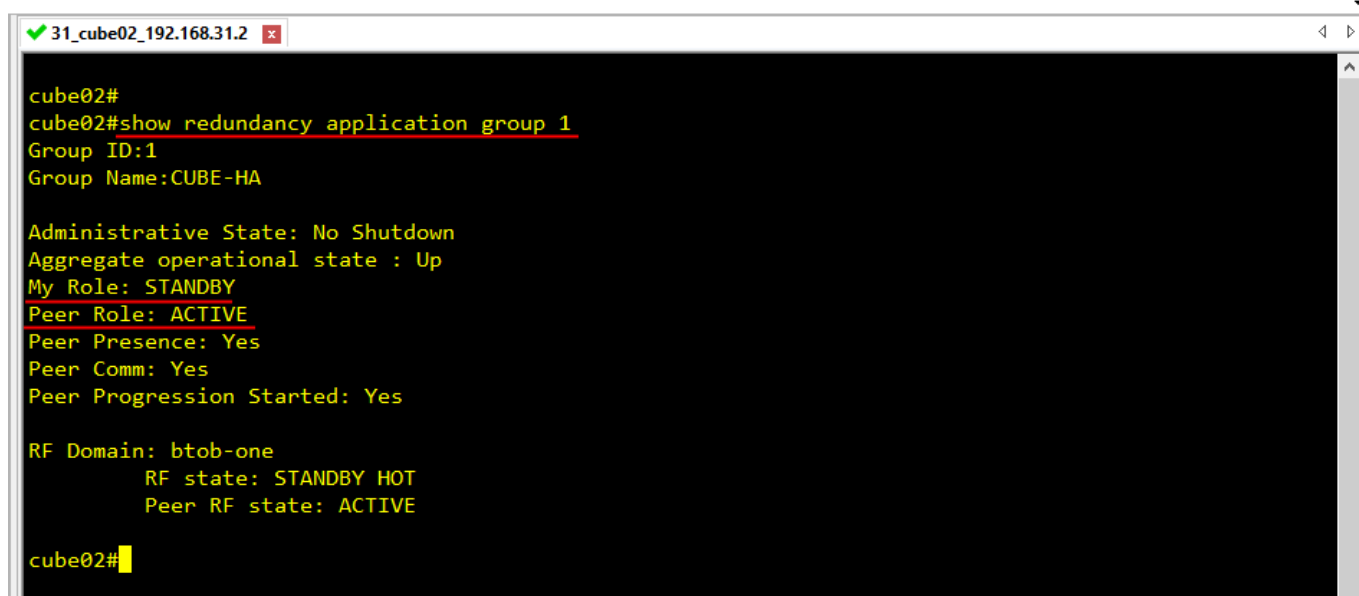
The screenshot shows a terminal window titled "31\_cube02\_192.168.31.2 - SecureCRT". The terminal displays the command `cube01#show redundancy application group 1` and its output. The output provides detailed status information for the redundancy group, including administrative state, aggregate operational state, roles, and peer status.

```
31_cube02_192.168.31.2 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
31_cube01_192.168.31.1
cube01#
cube01#show redundancy application group 1
Group ID:1
Group Name:CUBE-HA

Administrative State: No Shutdown
Aggregate operational state : Up
My Role: ACTIVE
Peer Role: STANDBY
Peer Presence: Yes
Peer Comm: Yes
Peer Progression Started: Yes

RF Domain: btob-one
RF state: ACTIVE
Peer RF state: STANDBY HOT

cube01#
```



```
31_cube02_192.168.31.2 x
cube02#
cube02#show redundancy application group 1
Group ID:1
Group Name:CUBE-HA

Administrative State: No Shutdown
Aggregate operational state : Up
My Role: STANDBY
Peer Role: ACTIVE
Peer Presence: Yes
Peer Comm: Yes
Peer Progression Started: Yes

RF Domain: btob-one
 RF state: STANDBY HOT
 Peer RF state: ACTIVE

cube02#
```

- *redundancy application reload group 1 self* command used to flip between Active and Standby state
- Now configure CUCM SIP Trunk Destination to VIP: 192.168.31.3

Trunk Configuration | Find and List Trunks

https://192.168.21.1/ccmadmin/trunkEdit.do?key=e60906 90%

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

**Trunk Configuration** Related Links: Back To Find/List Go

Save Delete Reset Add New

Called Party Transformation CSS: < None >  
☒ Use Device Pool Called Party Transformation CSS  
 Calling Party Transformation CSS: < None >  
☒ Use Device Pool Calling Party Transformation CSS  
 Calling Party Selection\*: Originator  
 Calling Line ID Presentation\*: Default  
 Calling Name Presentation\*: Default  
 Calling and Connected Party Info Format\*: Deliver DN only in connected party  
☐ Redirecting Diversion Header Delivery - Outbound  
 Redirecting Party Transformation CSS: < None >  
☒ Use Device Pool Redirecting Party Transformation CSS

**Caller Information**

Caller ID DN:   
 Caller Name:   
☐ Maintain Original Caller ID DN and Caller Name in Identity Headers

**SIP Information**

**Destination**

☐ Destination Address is an SRV

|     | Destination Address            | Destination Address IPv6 | Destination Port |
|-----|--------------------------------|--------------------------|------------------|
| 1 * | 192.168.31.3 CUBE Internal VIP |                          | 5060             |

MTP Preferred Originating Codec\*: 711ulaw  
 BLF Presence Group\*: Standard Presence group  
 SIP Trunk Security Profile\*: AIRTEL-SIP-TRUNK-SIP-SEC-PROFILE  
 Rerouting Calling Search Space: < None >  
 Out-Of-Dialog Refer Calling Search Space: < None >  
 SUBSCRIBE Calling Search Space: < None >  
 SIP Profile\*: AIRTEL-SIP-TRUNK-SIP-PROFILE View Details  
 DTMF Signaling Method\*: No Preference

**Normalization Script**

Normalization Script: < None >  
☐ Enable Trace

|   | Parameter Name       | Parameter Value      |     |
|---|----------------------|----------------------|-----|
| 1 | <input type="text"/> | <input type="text"/> | + - |

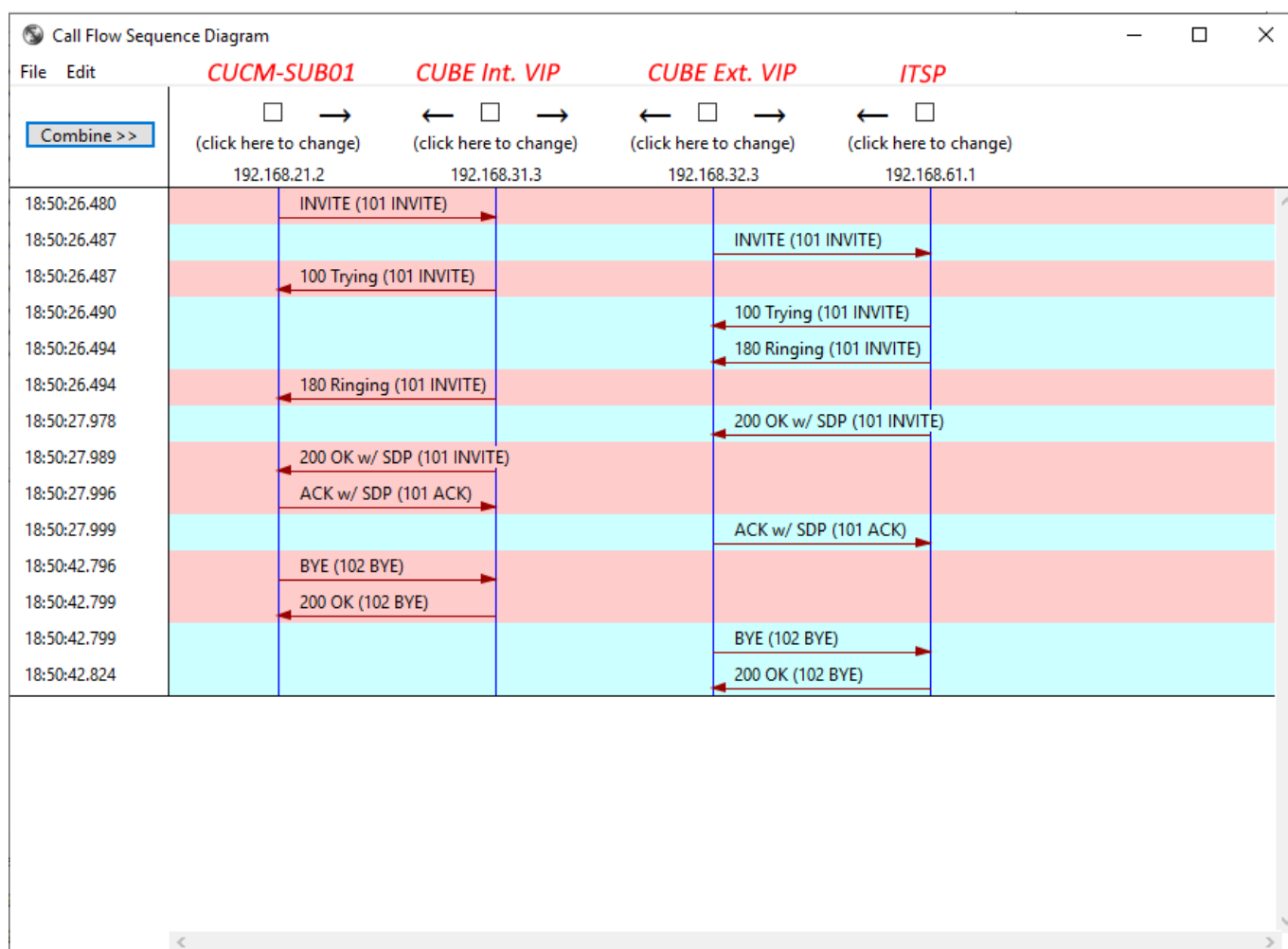
**Recording Information**

☒ None  
☐ This trunk connects to a recording-enabled gateway  
☐ This trunk connects to other clusters with recording-enabled gateways

- Also communicate to the ITS that you will be sending SIP traffic from the external VIP:  
192.168.32.3

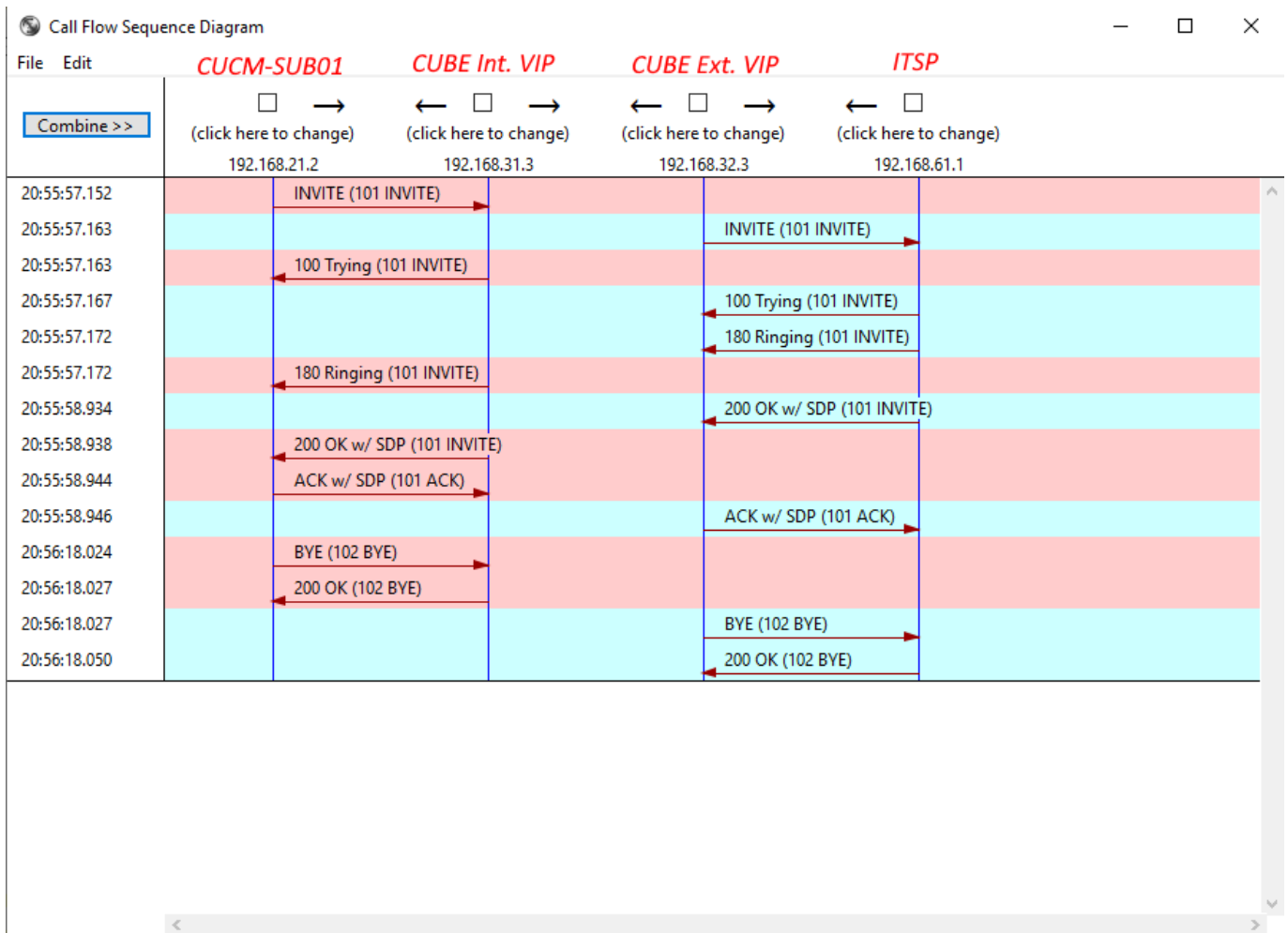
- When CUBE01 Active

| DATA TO BE COLLECTED          | VALUES                                   |
|-------------------------------|------------------------------------------|
| Calling Number                | 8056311002                               |
| Called Number                 | 8044260389                               |
| Time of the call              | 18:50:26(Approx.)                        |
| Duration of the call          | 16 Sec (Approx.)                         |
| Internal Phone IP             | 192.168.128.1                            |
| CUCM IPs                      | 192.168.21.1, 192.168.21.2, 192.168.21.3 |
| CUBE Internal IP              | 192.168.31.3 (VIP)                       |
| CUBE External IP              | 192.168.32.3 (VIP)                       |
| ITSP IP                       | 192.168.61.1                             |
| ITSP End device (if possible) | 192.168.130.2                            |



- When CUBE02 Active

| DATA TO BE COLLECTED          | VALUES                                   |
|-------------------------------|------------------------------------------|
| Calling Number                | 8056311002                               |
| Called Number                 | 8044260389                               |
| Time of the call              | 20:55:57 (Approx.)                       |
| Duration of the call          | 21 Sec (Approx.)                         |
| Internal Phone IP             | 192.168.128.1                            |
| CUCM IPs                      | 192.168.21.1, 192.168.21.2, 192.168.21.3 |
| CUBE Internal IP              | 192.168.31.3 (VIP)                       |
| CUBE External IP              | 192.168.32.3 (VIP)                       |
| ITSP IP                       | 192.168.61.1                             |
| ITSP End device (if possible) | 192.168.130.2                            |





---

## CUCM Digit Manipulation



- Automatic Number Identifier - ANI (Calling Number / Originating Number) and Dialed Number Identification Service - DNIS (Called Number / Destination Number / Dilled Number) can be modified at different levels in CUCM
- Complex CUCM Dial Plan contain different modification of digit at various degrees
- Digits can be modified from Translation Pattern, Transformation Pattern, Route Pattern, Route List-Route Group level, etc.

## Translation Pattern

- Translation Pattern has the highest preference while matching a DNIS
- In our cluster, the Bangalore location uses 11XXX and Texas location uses 21XXX
- There is a requirement to implement short dial for intra location calls
- That means when Bangalore Phone calls another Bangalore Phone, user just has to dial 1XXX only (not 11XXX)
- Similarly, when Texas Phone calls another Texas Phone, use has to dial 1XXX (not 21XXX)
- For intra location calls, user has to dial the complete extension number
- This can be implemented by Translation pattern

| PATTERN   | PARTITON                | CSS                      | PREFIX | RESULT     |
|-----------|-------------------------|--------------------------|--------|------------|
| 1XXX      | BANGALORE-SHORT-DIAL-PT | BANGALORE-SHORT-DIAL-CSS | 1      | 11XXX      |
| E.g. 1001 |                         |                          |        | E.g. 11001 |

- Add BANGALORE-SHORT-DIAL-PT to BANGALORE-PHONE-CSS so that the Bangalore Phones can reach 1XXX translation pattern
- Add BANGALORE-INTERNAL-PT to BANGALORE-SHORT-DIAL-CSS so that the Translation Pattern can reach Bangalore Phones

The screenshot shows the Cisco Unified CM Administration web interface. The main heading is "Calling Search Space Configuration". Below this, there are tabs for "Save", "Delete", "Copy", and "Add New". The "Status" section shows "Status: Ready". The "Calling Search Space Information" section has a "Name\*" field with the value "BANGALORE-PHONE-CSS" and a "Description" field with the value "BANGALORE-PHONE-CSS". The "Route Partitions for this Calling Search Space" section shows a list of "Available Partitions" and a list of "Selected Partitions". The "Available Partitions" list includes "Directory URI", "Global Learned E164 Numbers", "Global Learned E164 Patterns", "Global Learned Enterprise Numbers", and "Global Learned Enterprise Patterns". The "Selected Partitions" list includes "BANGALORE-INTERNAL-PT", "BANGALORE-NATIONAL-PT", "TEXAS-INTERNAL-PT", "VM-PT", and "BANGALORE-SHORT-DIAL-PT". The "BANGALORE-SHORT-DIAL-PT" partition is highlighted with a red box. At the bottom, there are "Save", "Delete", "Copy", and "Add New" buttons, and a note indicating that "\*" indicates a required item and "\*\*Selected Partitions are ordered by highest priority".

Calling Search Space Configura

Cisco Unified CM Console

https://192.168.21.1/ccmadmin/cssEdit.do?key=65ed7136-1d68-965

Cisco

Cisco Unified CM Administration

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Calling Search Space Configuration

Related Links: Back To Find/ListGo

Save

Delete

Copy

Add New

Status

Status: Ready

Calling Search Space Information

Name\*

BANGALORE-SHORT-DIAL-CSS

Description

BANGALORE-SHORT-DIAL-CSS

Route Partitions for this Calling Search Space

Available Partitions\*\*

BANGALORE-NATIONAL-PT  
BANGALORE-SHORT-DIAL-PT  
Directory URI  
Global Learned E164 Numbers  
Global Learned E164 Patterns

Selected Partitions

BANGALORE-INTERNAL-PT

Save

Delete

Copy

Add New

\*

\*- indicates required item.

\*\*

\*\*Selected Partitions are ordered by highest priority

- This Translation Pattern 1XXX will add a prefix 1 to the Called (Dialed or Destination) number, hence the final called number becomes 11XXX
- Proper Partition will ensure that other location phones will not be able to access this pattern
- Proper CSS will help to further route the call after adding prefix to the appropriate Bangalore Phone

**Translation Pattern Configuration**

Related Links: [Back To Find/List](#) [Go](#)

Save Delete Copy Add New

Translation Pattern: 1XXX

Partition: BANGALORE-SHORT-DIAL-PT

Description: BANGALORE SHORT DIAL

Numbering Plan: < None >

Route Filter: < None >

MLPP Precedence\*: Default

Resource Priority Namespace Network Domain: < None >

Route Class\*: Default

Calling Search Space: BANGALORE-SHORT-DIAL-CSS

☐ Use Originator's Calling Search Space

External Call Control Profile: < None >

Route Option: ☒ Route this pattern ☐ Block this pattern No Error

☐ Provide Outside Dial Tone *Un-check*

☐ Urgent Priority *Un-check*

☐ Do Not Wait For Interdigit Timeout On Subsequent Hops

☐ Route Next Hop By Calling Party Number

**Calling Party Transformations** *Here we can alter the Calling (Originator) number if needed*

☐ Use Calling Party's External Phone Number Mask

Calling Party Transform Mask:

Prefix Digits (Outgoing Calls):

Calling Line ID Presentation\*: Default

Calling Name Presentation\*: Default

Calling Party Number Type\*: Cisco CallManager

Calling Party Numbering Plan\*: Cisco CallManager

**Connected Party Transformations**

Connected Line ID Presentation\*: Default

Connected Name Presentation\*: Default

**Called Party Transformations** *Here we can alter the Called (Destination) number*

Discard Digits: < None >

Called Party Transform Mask:

Prefix Digits (Outgoing Calls): 1

Called Party Number Type\*: Cisco CallManager

Called Party Numbering Plan\*: Cisco CallManager

Save Delete Copy Add New

- We could see the entire call flow and modification in Dialed Number Analyzer (DNA)

DNA Analysis Output — Mozilla Firefox

https://192.168.21.1/dna/dnaOutput.do?outputKey=2&radSelectExt=12534a53-2969-4d94-8a70-90f206a1f7da&dialed

### Cisco Unified Communications Manager Dialed Number Analyzer

DNA Analysis Output Save the Displayed Output Save

#### Cisco Unified Communications Manager Dialed Number Analyzer Results

Expand All Collapse All

- ▶ **Results Summary**
  - ▶ **Calling Party Information**
    - **Dialed Digits** = 1001
    - **Match Result** = RouteThisPattern
  - ▶ **Matched Pattern Information**
    - **Called Party Number** = 11001
    - **Time Zone** = Asia/Kolkata
    - **Call Classification** = OnNet
    - **InterDigit Timeout** = NO
    - **Device Override** = Disabled
    - **Outside Dial Tone** = NO
- ▶ **Call Flow**
  - ▶ **TranslationPattern :Pattern= 1XXX**
    - **Partition** = BANGALORE-SHORT-DIAL-PT
    - **Positional Match List** = 11001
    - **Calling Party Number** = 11002
    - **PreTransform Calling Party Number** = 11002
    - **PreTransform Called Party Number** = 1001
    - ▶ **Calling Party Transformations**
    - ▶ **ConnectedParty Transformations**
    - ▶ **Called Party Transformations**
      - **Called Party Mask** =
      - **Discard Digits Instruction** = None
      - **Prefix** = 1
      - **Called Number** = 11001
    - ▶ **Directory Number :DN= 11001**
      - **Partition** = BANGALORE-INTERNAL-PT
      - **TypeCFACSSPolicy** = Use System Default
      - **Call Classification** = Unknown
      - ▶ **Forwarding Information**
      - ▶ **Device :Type= Cisco 8865**
        - **Device Status** = Registered
        - **Device Name** = SEP501CB00C71D5
        - **Ignore Presentation Indicators** = Disabled
        - **Logged Into Hunt Groups** = Enabled
        - **Alerting Name** = 11001 - Deepika Padukone
        - **Dual Mode** = Disabled
        - ▶ **Do Not Disturb(DND)**
        - ▶ **Automated Alternate Routing (AAR)**
- ▶ **Alternate Matches**

NOTE: The analysis results are purely based on configurations available in the Cisco Communications Manager database. For Gateway outbound calls, call details might differ depending on the Gateway's settings.

---

## Calling and Called Party Transformations

- Calls through transformation patterns are not routable. It is just to modify the calling and called number presentation at the exit point
- This will match after the call routing completed and right before sending the call to next hop
- There is a requirement from the ITSP that when we route the calls to ITSP via CUBE, the calling and called numbers should be in e.164 format, i.e. 80563110XX has to be +9180563110XX, Otherwise ITSP will drop the call
- We have used External Phone Number Mask in the Route Pattern configuration, that will ensure the 80563110XX as the calling number instead of 110XX that goes to ITSP
- We can alter the External Phone Number mask to +9180563110XX to achieve the requirement, but we will end up editing External Phone number mask of all the phones
- Let's see the current calling behavior

The screenshot displays the 'DNA Analysis Output' in a Mozilla Firefox browser window. The URL is <https://192.168.21.1/dna/dnaOutput.do?outputKey=2&radSelectExt=12534a53-2969-4d94-8a70-90f206a1f7>. The interface includes 'Expand All' and 'Collapse All' buttons. The main content is organized into sections: 'Results Summary', 'Call Flow', and 'Alternate Matches'. Under 'Results Summary', 'Calling Party Information' shows 'Dialed Digits = 98044260389' and 'Match Result = RouteThisPattern'. 'Matched Pattern Information' lists 'Called Party Number = 8044260389', 'Time Zone = Asia/Kolkata', 'End Device = AIRTEL-SIP-TRUNK-RL', 'Call Classification = OffNet', 'InterDigit Timeout = NO', 'Device Override = Disabled', and 'Outside Dial Tone = NO'. The 'Call Flow' section details the 'Route Pattern : Pattern = 9.XXXXXXXX' and 'Positional Match List = 8044260389'. It also shows 'Route Filter' settings, including 'Require Forced Authorization Code = No', 'Authorization Level = 0', 'Require Client Matter Code = No', 'Call Classification =', 'PreTransform Calling Party Number = 11002', and 'PreTransform Called Party Number = 98044260389'. Under 'Calling Party Transformations', 'External Phone Number Mask = YES' is highlighted, along with 'Calling Party Mask =', 'Prefix =', 'CallingLineId Presentation = Default', 'CallingName Presentation = Default', and 'Calling Party Number = 8056311002'. The 'ConnectedParty Transformations' and 'Called Party Transformations' sections are also visible. The 'Route List : Route List Name = AIRTEL-SIP-TRUNK-RL' section shows 'RouteGroup : RouteGroup Name = AIRTEL-SIP-TRUNK-RG' with 'PreTransform Calling Party Number = 11002' and 'PreTransform Called Party Number = 98044260389'. Under 'Calling Party Transformations', 'External Phone Number Mask = Default', 'Calling Party Mask =', 'Prefix =', and 'Calling Party Number = 11002' are listed, with a red note: 'This has to be transformed to +918056311002'. The 'Called Party Transformations' section shows 'Device : Type = SIPTrunk' with 'Transformed Calling Party = 8056311002' and a red note: 'This change is due to External Phone Number Mask'. Other fields include 'End Device Name = AIRTEL-SIP-TRUNK', 'PortNumber = 0', 'Device Status = UnKnown', 'AAR Group Name =', 'AAR Calling Search Space =', 'AAR Prefix Digits =', 'Call Classification = OffNet', 'Calling Party Selection = Originator', 'CallingLineId Presentation = Default', and 'CallerID DN ='. A note at the bottom states: 'NOTE: The analysis results are purely based on configurations available in the Cisco Communications Manager database. For Gateway outbound calls, call details might differ depending on the Gateway's settings.'

- 
- Invite received at the CUBE with External Phone Number Mask

\*Mar 31 11:15:15.988: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:

Received:

INVITE sip:8044260389@192.168.31.3:5060 SIP/2.0

Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK3f500da025

From: "11002 - Abdul Jaseem" <sip:8056311002@192.168.21.2>;tag=79~3f48b4d4-2f05-4b61-86ad-47522208ed69-43078165

To: <sip:8044260389@192.168.31.3>

Date: Wed, 31 Mar 2021 11:15:16 GMT

Call-ID: 5d6eff80-64159c4-40-215a8c0@192.168.21.2

Supported: timer,resource-priority,replaces

Min-SE: 1800

User-Agent: Cisco-CUCM11.5

Allow: INVITE, OPTIONS, INFO, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY

CSeq: 101 INVITE

Expires: 180

Allow-Events: presence, kpml

Supported: X-cisco-srtp-fallback,X-cisco-original-called

Call-Info: <sip:192.168.21.2:5060>;method="NOTIFY;Event=telephone - event;Duration=500"

Call-Info: <urn:x-cisco-remotecc:callinfo>;x-cisco-video-traffic-class=DESKTOP

Session-ID: 7c8b24ebbb0140d0ab8cdeba452aaa78;remote=00000000000000000000000000000000

Cisco-Guid: 1567555456-0000065536-000000002-0034973888

Session-Expires: 1800

P-Asserted-Identity: "11002 - Abdul Jaseem" <sip:8056311002@192.168.21.2>

Remote-Party-ID: "11002 - Abdul Jaseem"

<sip:8056311002@192.168.21.2>;party=calling;screen=yes;privacy=off

Contact: <sip:8056311002@192.168.21.2:5060;transport=tcp>;video;audio

Max-Forwards: 69

Content-Length: 0

- 
- Invite received at the CUBE with Calling Party Transformation Mask

\*Apr 1 17:18:18.032: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:

Received:

INVITE sip:8044260389@192.168.31.3:5060 SIP/2.0

Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK617da17d37

From: "11002 - Abdul Jaseem" <sip:+918056311002@192.168.21.2>;tag=111~3f48b4d4-2f05-4b61-86ad-47522208ed69-43507474

To: <sip:8044260389@192.168.31.3>

Date: Thu, 01 Apr 2021 17:18:16 GMT

Call-ID: 3dbd0180-6610058-62-215a8c0@192.168.21.2

Supported: timer,resource-priority,replaces

Min-SE: 1800

User-Agent: Cisco-CUCM11.5

Allow: INVITE, OPTIONS, INFO, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY

CSeq: 101 INVITE

Expires: 180

Allow-Events: presence, kpm1

Supported: X-cisco-srtp-fallback,X-cisco-original-called

Call-Info: <sip:192.168.21.2:5060>;method="NOTIFY;Event=telephone - event;Duration=500"

Call-Info: <urn:x-cisco-remotecc:callinfo>;x-cisco-video-traffic-class=DESKTOP

Session-ID: 7c8b24ebbb0140d0ab8cdeba452aa110;remote=00000000000000000000000000000000

Cisco-Guid: 1035796864-0000065536-000000001-0034973888

Session-Expires: 1800

P-Asserted-Identity: "11002 - Abdul Jaseem" <sip:+918056311002@192.168.21.2>

Remote-Party-ID: "11002 - Abdul Jaseem"

<sip:+918056311002@192.168.21.2>;party=calling;screen=yes;privacy=off

Contact: <sip:+918056311002@192.168.21.2:5060;transport=tcp>;video;audio

Max-Forwards: 69

Content-Length: 0



- Create a Partition and CSS for the Calling Party Transformation Mask


| PATTERN | PARTITON                                | PREFIX   | RESULT        |
|---------|-----------------------------------------|----------|---------------|
| 110XX   | BANGALORE-DID-CALLING-TRANSFORMATION-PT | +9180563 | +9180563110XX |

The screenshot displays the 'Calling Search Space Configuration' page in the Cisco Unified CM Administration interface. The browser address bar shows the URL: <https://192.168.21.1/ccmadmin/cssEdit.do?key=58>. The page title is 'Cisco Unified CM Administration For Cisco Unified Communications Solutions'. The navigation menu includes System, Call Routing, Media Resources, Advanced Features, Device, Application, and User. The main section is 'Calling Search Space Configuration'. It features a toolbar with 'Save', 'Delete', 'Copy', and 'Add New' buttons. The 'Status' section indicates 'Status: Ready'. The 'Calling Search Space Information' section contains two text boxes: 'Name\*' and 'Description', both containing the text 'BANGALORE-DID-CALLING-TRANSFORMATION-CSS'. The 'Route Partitions for this Calling Search Space' section has two lists: 'Available Partitions\*\*' and 'Selected Partitions'. The 'Available Partitions' list includes 'BANGALORE-INTERNAL-PT', 'BANGALORE-NATIONAL-PT', 'BANGALORE-SHORT-DIAL-PT', 'Directory URI', and 'Global Learned E164 Numbers'. The 'Selected Partitions' list contains 'BANGALORE-DID-CALLING-TRANSFORMATION-PT'. At the bottom, there are buttons for 'Save', 'Delete', 'Copy', and 'Add New'.

Calling Party Transformation P: XPhone Configuration

←→↻🏠


🔒📶📶https://192.168.21.1/ccmadmin/transformationPattern


Cisco Unified CM Administration


For Cisco Unified Communications Solutions


System ▾Call Routing ▾Media Resources ▾Advanced Features ▾Device ▾Application ▾User Man

Calling Party Transformation Pattern Configuration


 Save

 Delete

 Copy

 Add New

Status

 Status: Ready

Pattern Definition

Pattern\*110XX

PartitionBANGALORE-DID-CALLING-TRANSFORMATION-PT

DescriptionBANGALORE DID TO E164

Numbering Plan< None >

Route Filter< None >

☒ Urgent Priority

☐ MLPP Preemption Disabled

Calling Party Transformations

☐ Use Calling Party's External Phone Number Mask

Discard Digits< None >

Calling Party Transformation Mask

Prefix Digits+9180563

Calling Line ID Presentation\*Default

Calling Party Number Type\*Cisco CallManager

Calling Party Numbering Plan\*Cisco CallManager

SaveDeleteCopyAdd New

Trunk Configuration
Phone Configuration

https://192.168.21.1/ccmadmin/trunkEdit.do?key=e60906e4-1ff1-2a

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Trunk Configuration Related Links: Back To Find/List Go

Save Delete Reset Add New

**Connected Party Settings**  
Connected Party Transformation CSS < None >  
☒ Use Device Pool Connected Party Transformation CSS

**Outbound Calls**  
Called Party Transformation CSS < None >  
☒ Use Device Pool Called Party Transformation CSS  
Calling Party Transformation CSS BANGALORE-DID-CALLING-TRANSFORMATION-CSS  
☐ Use Device Pool Calling Party Transformation CSS *Un-check*  
Calling Party Selection\* Originator  
Calling Line ID Presentation\* Default  
Calling Name Presentation\* Default  
Calling and Connected Party Info Format\* Deliver DN only in connected party  
☐ Redirecting Diversion Header Delivery - Outbound  
Redirecting Party Transformation CSS < None >  
☒ Use Device Pool Redirecting Party Transformation CSS

**Caller Information**  
Caller ID DN  
Caller Name  
☐ Maintain Original Caller ID DN and Caller Name in Identity Headers

**SIP Information**  
**Destination**  
☐ Destination Address is an SRV  

|     | Destination Address | Destination Address IPv6 | Destination Port |
|-----|---------------------|--------------------------|------------------|
| 1 * | 192.168.31.3        |                          | 5060             |

MTP Preferred Originating Codec\* 711ulaw  
BLF Presence Group\* Standard Presence group  
SIP Trunk Security Profile\* AIRTEL-SIP-TRUNK-SIP-SEC-PROFILE  
Rerouting Calling Search Space < None >  
Out-Of-Dialog Refer Calling Search Space < None >  
SUBSCRIBE Calling Search Space < None >  
SIP Profile\* AIRTEL-SIP-TRUNK-SIP-PROFILE [View Details](#)  
DTMF Signaling Method\* No Preference

**Normalization Script**

## Note:

- Sometimes the modification works if we create the pattern for the External Phone Number mask format (shown below)
- DNA Result shows proper modification if we have pattern as 80563110XX with prefix 1, but it never works on actual call. It is wired

The screenshot shows the Cisco Unified CM Administration web interface. The browser address bar displays `https://192.168.21.1/ccmadmin/transformationPatternEdit.do?key=a6...`. The page title is "Calling Party Transformation Pattern Configuration". The status bar indicates "Update successful".

**Pattern Definition**

- Pattern\*: 80563110XX
- Partition: BANGALORE-DID-CALLING-TRANSFORMATION-PT
- Description: BANGALORE DID TO E164
- Numbering Plan: < None >
- Route Filter: < None >
- ☒ Urgent Priority
- ☐ MLPP Preemption Disabled

**Calling Party Transformations**

- ☐ Use Calling Party's External Phone Number Mask
- Discard Digits: < None >
- Calling Party Transformation Mask:
- Prefix Digits: +91
- Calling Line ID Presentation\*: Default
- Calling Party Number Type\*: Cisco CallManager
- Calling Party Numbering Plan\*: Cisco CallManager

At the bottom, there are buttons for Save, Delete, Copy, and Add New.

- The ideal pattern is 110XX with +9180563 prefix
- Always do real call testing while configuring Calling Party transformation Patterns
- Called Party Transformation will be used in the same way to modify the called (dialed or Destination number). I'm not showing the configuration as it affects my backend CUBE and ITSP routing if I modify the called number
- Other Digit Manipulation Technique such as Route Pattern Level, External Phone Number Mask, etc. are already discussed before

---

## CUBE Digit Manipulation



- Apart from altering ANS and DNIS from CUCM level, we can modify numbers from CUBE level as well
- Voice Translation Profile are used to modify the digits whereas SIP Profile used to modify the SIP headers and SIP messages

---

## Voice Translation Profile

- Voice Translation Rules are the method to modify calling (ANI) and called (DNIS) numbers in CUBE level
- Ideally, we keep CUBE dial plan minimal by doing all the translation and transformation at the CUCM level, but certain situation, we may have to implement digit manipulations at the CUBE level
- Scenario: We are not enabling External Phone Number mask and Calling Party transformation on CUCM; hence the calling party becomes 110XX that is being presented to ITSP
- ITSP is expecting calling party as the full DID 80563110XX
- We can apply CUBE level digit modification to archive this scenario

| Wildcards | Use                                            | Example            | Result                            |
|-----------|------------------------------------------------|--------------------|-----------------------------------|
| .         | 0 to 9 Match                                   |                    |                                   |
| *         | Match the character to the left 0 or more time | .*                 | 1., 2., . will repeat (Any Match) |
| ^         | Starting Match                                 | /^14821//00123/    | 148219 = 001239                   |
| \$        | Ending Match                                   | /28148\$/ /00123/  | 728148 = 700123                   |
| ^XXX\$    | Exact Match                                    | /^31148\$/ /00123/ | 3148 = 00123                      |
| [^X-Y]    | Do not match a single digit from the range     |                    |                                   |
| \(XXX\)   | Creating set                                   | \1                 | Calling set                       |

### Set Example:

Rule1 /<sup>^</sup>\(91\)<sup>35</sup>\(5551212\)<sup>480</sup>\(897\)<sup>\$</sup>/ /<sup>1</sup>812\2465\3/

### Result:

91 35 5551212 480 897 → 91 812 5551212 465 897

Route Pattern Configuration

Navigation Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Route Pattern Configuration Related Links: Back To Find/List Go

Save Delete Copy Add New

**Status**

Update successful

**Pattern Definition**

Route Pattern\* 9.XXXXXXXXXX

Route Partition BANGALORE-NATIONAL-PT

Description ALL INDIA CALL FROM BANGALORE PHONES

Numbering Plan -- Not Selected --

Route Filter < None >

MLPP Precedence\* Default

☐ Apply Call Blocking Percentage

Resource Priority Namespace Network Domain < None >

Route Class\* Default

Gateway/Route List\* AIRTEL-SIP-TRUNK-RL (Edit)

Route Option

☒ Route this pattern

☐ Block this pattern No Error

Call Classification\* OffNet

External Call Control Profile < None >

☐ Allow Device Override ☒ Provide Outside Dial Tone ☐ Allow Overlap Sending ☐ Urgent Priority

☐ Require Forced Authorization Code

Authorization Level\* 0

☐ Require Client Matter Code

**Calling Party Transformations**

☐ Use Calling Party's External Phone Number Mask *Un-check*

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation\* Default

Calling Name Presentation\* Default

Calling Party Number Type\* Cisco CallManager

Calling Party Numbering Plan\* Cisco CallManager

**Connected Party Transformations**

Connected Line ID Presentation\* Default

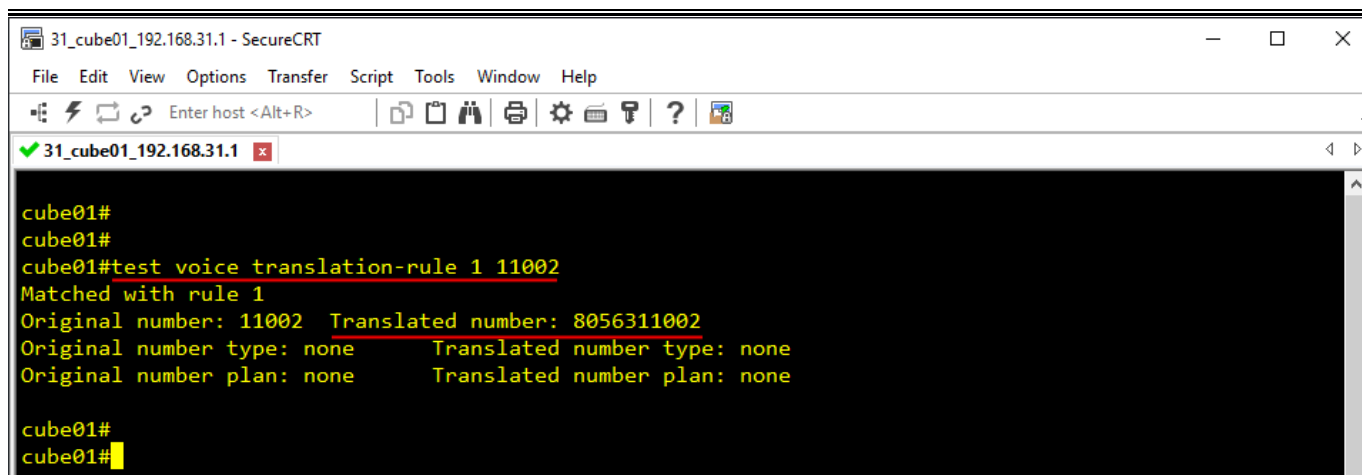
Connected Name Presentation\* Default

**Called Party Transformations**

Discard Digits PreDot

- Configure Voice Translation Rule and Profile

```
!
voice translation-rule 1
rule 1 /110\(\.\)\ /80563110\1/
!
voice translation-profile ITSP-OUT
translate calling 1
!
```



The screenshot shows a SecureCRT terminal window titled "31\_cube01\_192.168.31.1 - SecureCRT". The terminal displays the following commands and output:

```
cube01#
cube01#
cube01#test voice translation-rule 1 11002
Matched with rule 1
Original number: 11002 Translated number: 8056311002
Original number type: none Translated number type: none
Original number plan: none Translated number plan: none

cube01#
cube01#
```

- Apply the Voice Translation Profile under ITSP dial-peer

```
!
dial-peer voice 2 voip
description OUTBOUND TO ITSP
translation-profile outgoing ITSP-OUT
session protocol sipv2
session server-group 2
destination e164-pattern-map 2
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet2
voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay rtp-nte
no vad
!
```



- 
- Invite received at the CUBE after removing External Phone number mask and Calling Party transformation mask

\*Apr 1 17:31:03.679: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:

Received:

INVITE sip:8044260389@192.168.31.3:5060 SIP/2.0  
Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK817b4b0b7a  
From: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>;tag=167~3f48b4d4-2f05-4b61-86ad-47522208ed69-43507479  
To: <sip:8044260389@192.168.31.3>  
Date: Thu, 01 Apr 2021 17:31:03 GMT  
Call-ID: 6e7eb00-6610357-82-215a8c0@192.168.21.2  
Supported: timer,resource-priority,replaces  
Min-SE: 1800  
User-Agent: Cisco-CUCM11.5  
Allow: INVITE, OPTIONS, INFO, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY  
CSeq: 101 INVITE  
Expires: 180  
Allow-Events: presence, kpml  
Supported: X-cisco-srtp-fallback,X-cisco-original-called  
Call-Info: <sip:192.168.21.2:5060>;method="NOTIFY;Event=telephone-event;Duration=500"  
Call-Info: <urn:x-cisco-remotecc:callinfo>;x-cisco-video-traffic-class=DESKTOP  
Session-ID: 7c8b24ebbb0140d0ab8cdeba452aa166;remote=00000000000000000000000000000000  
Cisco-Guid: 0115862272-0000065536-000000003-0034973888  
Session-Expires: 1800  
P-Asserted-Identity: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>  
Remote-Party-ID: "11002 - Abdul Jaseem"  
<sip:11002@192.168.21.2>;party=calling;screen=yes;privacy=off  
Contact: <sip:11002@192.168.21.2:5060;transport=tcp>;video;audio  
Max-Forwards: 69  
Content-Length: 0

- After applying the voice translation rule on the outbound dial-peer, we can see the calling number has been modified

\*Apr 1 17:31:03.684: //6/06E7EB000000/SIP/Msg/ccsipDisplayMsg:

Sent:

INVITE sip:8044260389@192.168.61.1 SIP/2.0  
Via: SIP/2.0/UDP 192.168.32.3:5060;branch=z9hG4bK226A9  
Remote-Party-ID: "11002 - Abdul Jaseem"  
<sip:8056311002@192.168.32.3>;party=calling;screen=yes;privacy=off  
From: "11002 - Abdul Jaseem" <sip:8056311002@192.168.32.3>;tag=6FA932-1323  
To: <sip:8044260389@192.168.61.1>  
Date: Thu, 01 Apr 2021 17:31:03 GMT  
Call-ID: DE1E5BC1-924611EB-80139BE5-FEC8FA29@192.168.32.3  
Supported: timer,resource-priority,replaces,sdp-anat  
Min-SE: 1800  
Cisco-Guid: 0115862272-0000065536-000000003-0034973888  
User-Agent: Cisco-SIPGateway/IOS-15.5.2.S  
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO, REGISTER  
CSeq: 101 INVITE  
Timestamp: 1617298263  
Contact: <sip:8056311002@192.168.32.3:5060>  
Expires: 180  
Allow-Events: telephone-event  
Max-Forwards: 68  
Session-Expires: 1800  
Content-Length: 0

---



---

## SIP Profile

- SIP Headers (From, To, Remote-Party-ID, Contact, etc.) can be modified using SIP profiles at CUBE level
- Previously we have seen voice translation rule to provide complete DID to the ITSP
- We have a requirement that when the call is connected to the ITSP end device, the Remote-Party-ID of ITS number has to be in E.164 format, that is +9198044260389 rather than 98044260389
- The +91 prefix must be added only after the call is connected to ITSP end device, while the phone ringing, there shouldn't be any change
- Usually Remote-Party-ID is presented in Invite, 180 Ringing, 200OK and Update. Since we need the modification after call connected, we modify the 200OK Remote-Party-ID header rather than Invite and 180 Ringing
- We must also consider REINVITE and UPDATE messages since those are used to refresh the session after session expire (ideally 15 minutes)

```
!
voice class sip-profiles 1
 response 200 sip-header Remote-Party-ID modify "Remote-Party-ID:(.*)8044260389@(.*)"
 "Remote-Party-ID:\1+918044260389@\2"
 request REINVITE sip-header Remote-Party-ID modify "Remote-Party-ID:(.*)8044260389@(.*)"
 "Remote-Party-ID:\1+918044260389@\2"
 request UPDATE sip-header Remote-Party-ID modify "Remote-Party-ID:(.*)8044260389@(.*)"
 "Remote-Party-ID:\1+918044260389@\2"
!
dial-peer voice 1 voip
 description INBOUND FROM CUCM
 session protocol sipv2
 incoming called e164-pattern-map 2
 voice-class codec 1
 voice-class sip profiles 1
 voice-class sip bind control source-interface GigabitEthernet1
 voice-class sip bind media source-interface GigabitEthernet1
 dtmf-relay rtp-nte
 no vad
!
```

- First "" Represents the match pattern and second "" represents the change pattern
- () represents a set in the match pattern and it can be called from change pattern using \X, where X is the number of set
- Above SIP Profile can be applied to the inbound dial peer from CUCM to CUBE
- You can use SIP Profile Test Tool <https://cway.cisco.com/tools/SipProfileTest/> to verify the SIP Profile

SIP-Profile Test Tool

Tools Catalog / SIP-Profile Test Tool

Cisco TAC Tool

Abdul Jaseem V.P

SIP-Profile Test Tool

BETA

Contributors

SIP Profile Test tool simulates sip profile feature available for Cisco Unified Border Element ( CUBE ) and SIP Gateways. [details](#)

ADD INBOUND MESSAGE FOR COPY LIST

SIP-PROFILE:

```

voice class sip-profiles 1
response 200 sip-header Remote-Party-ID modify "Remote-Party-ID:(.*)8044260389@(.*)" "Remote-Party-ID:\1+918044260389@\2"
request REINVITE sip-header Remote-Party-ID modify "Remote-Party-ID:(.*)8044260389@(.*)" "Remote-Party-ID:\1+918044260389@\2"
request UPDATE sip-header Remote-Party-ID modify "Remote-Party-ID:(.*)8044260389@(.*)" "Remote-Party-ID:\1+918044260389@\2"

```

INPUT MESSAGE (SIP MESSAGE TO BE MODIFIED):

```

Apr 1 16:45:55.163:
//37/B79EBC000000/SIP/Msg/ccsipDisplayMsg:
Sent:
SIP/2.0 200 OK
Via: SIP/2.0/TCP
192.168.21.2:5060;branch=z9hG4bK17f601a68a1
From: "11002 - Abdul Jaseem"
<sip:11002@192.168.21.2>;tag=567-3f48b4d4-2f05-4b61-86ad-47522208ed69-43507511
To: <sip:8044260389@192.168.31.3>;tag=BCABAC-190D
Date: Thu, 01 Apr 2021 16:45:53 GMT
Call-ID: b79ebc00-651f8c1-164-215a8c0@192.168.21.2
CSeq: 101 INVITE
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK,
UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO, REGISTER
Allow-Events: telephone-event
Remote-Party-ID: "Bangalore PSTN - 8044260389"
<sip:8044260389@192.168.31.3>;party=called;screen=yes;privacy=off
Contact:
<sip:8044260389@192.168.31.3:5060;transport=tcp>
Supported: replaces
Supported: sdp-anat
Server: Cisco-SIPGateway/IOS-15.5.2.S
Session-Expires: 1800;refresher=uas
Require: timer
Supported: timer
Content-Type: application/sdp
Content-Disposition: session;handling=required
Content-Length: 318
v=0
o=CiscoSystemsSIP-GW-UserAgent 1138 9818 IN IP4
192.168.31.3
s=SIP Call

```


INPUT

```

Apr 1 16:45:55.163:
//37/B79EBC000000/SIP/Msg/ccsipDisplayMsg: Sent: SIP/2.0 200
OK Via: SIP/2.0/TCP
192.168.21.2:5060;branch=z9hG4bK17f601a68a1 From: "11002 -
Abdul Jaseem" <sip:11002@192.168.21.2>;tag=567-3f48b4d4-
2f05-4b61-86ad-47522208ed69-43507511 To:

```

612



Tools Catalog / SIP-Profile Test Tool

Abdul Jaseem V.P.

SIP-Profile Test Tool

cway.cisco.com/tools/SipProfileTest/

INPUT

```

Apr 1 16:45:55.163:
//37/B79EBC000000/SIP/Msg/ccsipDisplayMsg: Sent: SIP/2.0 200
OK Via: SIP/2.0/TCP
192.168.21.2:5060;branch=z9hG4bK17f601a68a1 From: "11002 -
Abdul Jaseem" <sip:11002@192.168.21.2>;tag=567~3f48b4d4-
2f05-4b61-86ad-47522208ed69-43507511 To:
<sip:8044260389@192.168.31.3>;tag=BCABAC-190D Date: Thu,
01 Apr 2021 16:45:53 GMT Call-ID: b79ebc00-651f8c1-164-
215a8c0@192.168.21.2 CSeq: 101 INVITE Allow: INVITE, OPTIONS,
BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY,
INFO, REGISTER Allow-Events: telephone-event Remote-Party-ID:
"Bangalore PSTN - 8044260389"
<sip:8044260389@192.168.31.3>;party=called;screen=yes;privacy=off
Contact: <sip:8044260389@192.168.31.3:5060;transport=tcp>
Supported: replaces Supported: sdp-anat Server: Cisco-
SIPGateway/IOS-15.5.2.S Session-Expires: 1800;refresher=uas
Require: timer Supported: timer Content-Type: application/sdp
Content-Disposition: session;handling=required Content-Length:
318 v=0 o=CiscoSystemsSIP-GW-UserAgent 1138 9818 IN IP4
192.168.31.3 s=SIP Call c=IN IP4 192.168.31.3 t=0 0 m=audio
8064 RTP/AVP 0 8 18 101 c=IN IP4 192.168.31.3 a=rtpmap:0
PCMU/8000 a=rtpmap:8 PCMA/8000 a=rtpmap:18 G729/8000
a=fmtp:18 annexb=yes a=rtpmap:101 telephone-event/8000
a=fmtp:101 0-15 a=ptime:20

```

OUTPUT

```

Apr 1 16:45:55.163:
//37/B79EBC000000/SIP/Msg/ccsipDisplayMsg: Sent: SIP/2.0 200
OK Via: SIP/2.0/TCP
192.168.21.2:5060;branch=z9hG4bK17f601a68a1 From: "11002 -
Abdul Jaseem" <sip:11002@192.168.21.2>;tag=567~3f48b4d4-
2f05-4b61-86ad-47522208ed69-43507511 To:
<sip:8044260389@192.168.31.3>;tag=BCABAC-190D Date: Thu,
01 Apr 2021 16:45:53 GMT Call-ID: b79ebc00-651f8c1-164-
215a8c0@192.168.21.2 CSeq: 101 INVITE Allow: INVITE, OPTIONS,
BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY,
INFO, REGISTER Allow-Events: telephone-event Remote-Party-ID:
"Bangalore PSTN - 8044260389"
<sip:918044260389@192.168.31.3>;party=called;screen=yes;privacy=off
Contact: <sip:8044260389@192.168.31.3:5060;transport=tcp>
Supported: replaces Supported: sdp-anat Server: Cisco-
SIPGateway/IOS-15.5.2.S Session-Expires: 1800;refresher=uas
Require: timer Supported: timer Content-Type: application/sdp
Content-Disposition: session;handling=required Content-Length:
318 v=0 o=CiscoSystemsSIP-GW-UserAgent 1138 9818 IN IP4
192.168.31.3 s=SIP Call c=IN IP4 192.168.31.3 t=0 0 m=audio

```

- 
- 200OK to CUCM before applying SIP Profile on dial-peer 1

Apr 1 16:45:55.163: //37/B79EBC000000/SIP/Msg/ccsipDisplayMsg:

Sent:

SIP/2.0 200 OK

Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK17f601a68a1

From: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>;tag=567~3f48b4d4-2f05-4b61-86ad-47522208ed69-43507511

To: <sip:8044260389@192.168.31.3>;tag=BCABAC-190D

Date: Thu, 01 Apr 2021 16:45:53 GMT

Call-ID: b79ebc00-651f8c1-164-215a8c0@192.168.21.2

CSeq: 101 INVITE

Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO, REGISTER

Allow-Events: telephone-event

Remote-Party-ID: "Bangalore PSTN - 8044260389"

<sip:8044260389@192.168.31.3>;party=called;screen=yes;privacy=off

Contact: <sip:8044260389@192.168.31.3:5060;transport=tcp>

Supported: replaces

Supported: sdp-anat

Server: Cisco-SIPGateway/IOS-15.5.2.S

Session-Expires: 1800;refresher=uas

Require: timer

Supported: timer

Content-Type: application/sdp

Content-Disposition: session;handling=required

Content-Length: 318

v=0

o=CiscoSystemsSIP-GW-UserAgent 1138 9818 IN IP4 192.168.31.3

s=SIP Call

c=IN IP4 192.168.31.3

t=0 0

m=audio 8064 RTP/AVP 0 8 18 101

c=IN IP4 192.168.31.3

a=rtpmap:0 PCMU/8000

a=rtpmap:8 PCMA/8000

a=rtpmap:18 G729/8000

a=fmtp:18 annexb=yes

a=rtpmap:101 telephone-event/8000

a=fmtp:101 0-15

a=ptime:20

- 200OK to CUCM after applying SIP Profile on dial-peer 1

Apr 1 16:50:12.493: //39/50CDD280000/SIP/Msg/ccsipDisplayMsg:

Sent:

SIP/2.0 200 OK

Via: SIP/2.0/TCP 192.168.21.2:5060;branch=z9hG4bK18c7cad7293

From: "11002 - Abdul Jaseem" <sip:11002@192.168.21.2>;tag=587~3f48b4d4-2f05-4b61-86ad-47522208ed69-43507513

To: <sip:8044260389@192.168.31.3>;tag=C0963A-16D6

Date: Thu, 01 Apr 2021 16:50:10 GMT

Call-ID: 50cdd280-651f9c2-16f-215a8c0@192.168.21.2

CSeq: 101 INVITE

Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO, REGISTER

Allow-Events: telephone-event

Remote-Party-ID: "Bangalore PSTN - 8044260389"

<sip:+918044260389@192.168.31.3>;party=called;screen=yes;privacy=off

Contact: <sip:8044260389@192.168.31.3:5060;transport=tcp>

Supported: replaces

Supported: sdp-anat

Server: Cisco-SIPGateway/IOS-15.5.2.S

Session-Expires: 1800;refresher=uas

Require: timer

Supported: timer

Content-Type: application/sdp

Content-Disposition: session;handling=required

Content-Length: 318

v=0

o=CiscoSystemsSIP-GW-UserAgent 5592 5791 IN IP4 192.168.31.3

s=SIP Call

c=IN IP4 192.168.31.3

t=0 0

m=audio 8068 RTP/AVP 0 8 18 101

c=IN IP4 192.168.31.3

a=rtpmap:0 PCMU/8000

a=rtpmap:8 PCMA/8000

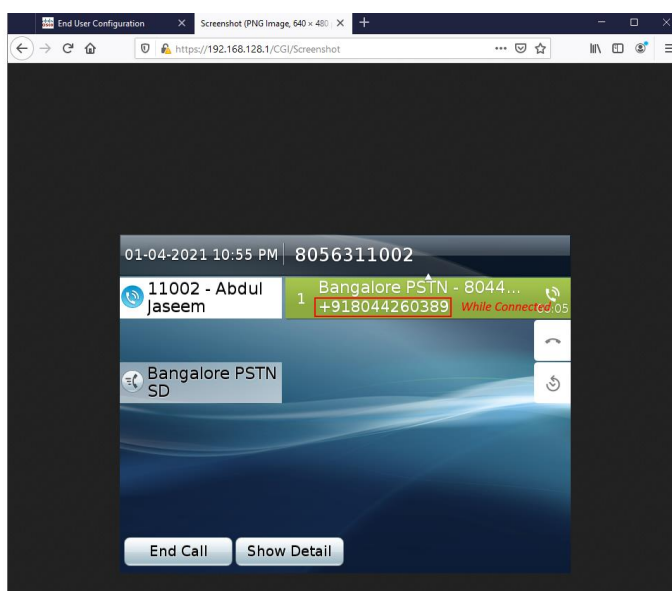
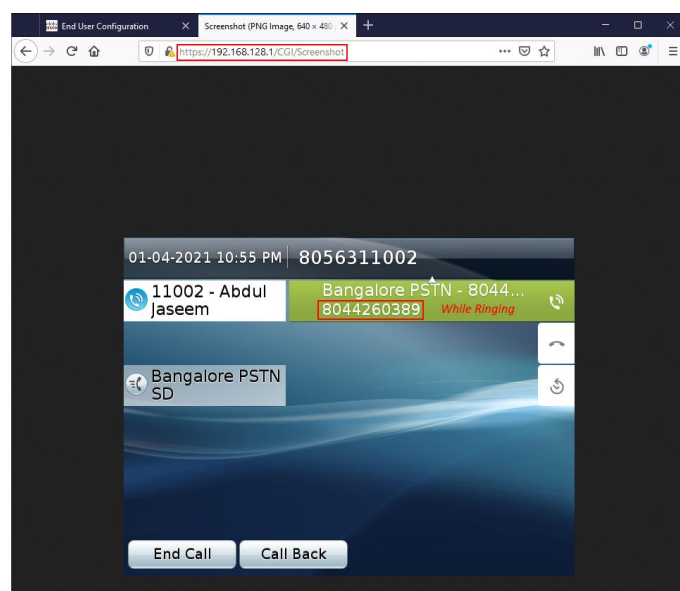
a=rtpmap:18 G729/8000

a=fmtp:18 annexb=yes

a=rtpmap:101 telephone-event/8000

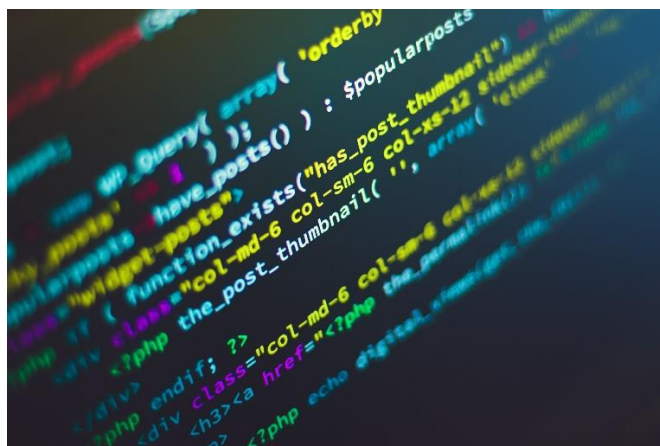
a=fmtp:101 0-15

a=ptime:20



---

## SIP Normalization (Lua) Script



- SIP Normalization Script can be used to manipulate SIP Headers in CUCM, previously we have seen CUBE SIP Profile to manipulate SIP messages at the CUBE level
- We can learn SIP Normalization Script with an incident that I have faced in the past

**Problem Description:** External PSTN Call to CUC Mainline number (Auto Attendant) is getting Opening Greetings “Hello, Welcome to Cisco Unity Connection Messaging System” instead of Main Line Greetings

### Data Collection:

- When was the issues started?
- Was the setup working before?
- Is it a new implementation?
- What is the behavior when you dial the mainline from an internal extension (IP Phone)?
- Was there any recent UC Network Change?
- CallManager Logs, CUC Logs (Connection Conversation Manager, Connection Mixer) and CUBE (debug ccsip messages) Logs when external PSTN number calls the mainline number
- Cisco CallManager Logs and CUC Logs (Connection Conversation Manager) when an internal extension calls mainline number internally

| DATA TO BE COLLECTED                    |  | VALUES                                   |
|-----------------------------------------|--|------------------------------------------|
| <b>Call Sample 1 (Problematic Call)</b> |  |                                          |
| External Calling Number                 |  | 8044260389                               |
| Called Number (Main Line)               |  | 8056310002                               |
| Time of the call                        |  | 21:18 (Approx.)                          |
| Duration of the call                    |  | 14 Sec (Approx.)                         |
| CUCM IPs                                |  | 192.168.21.1, 192.168.21.2, 192.168.21.3 |
| CUBE Internal IP                        |  | 192.168.31.1                             |
| CUBE External IP                        |  | 192.168.32.1                             |



ITSP IP 192.168.61.1

### Call Sample 2 (Working Call)

Internal Calling Number 11002  
Called Number (Main Line) 10002  
Time of the call 21:18 (Approx.)  
Duration of the call 14 Sec (Approx.)  
CUCM IPs 192.168.21.1, 192.168.21.2, 192.168.21.3  
CUBE Internal IP 192.168.31.1  
CUBE External IP 192.168.32.1  
ITSP IP 192.168.61.1

## Initial Analysis and Debugging

- Connect RTMT to CUC and go to Port Status Monitor, we will be able to see the CUC Calls in the Port Status Monitor Section

## Problematic Call Port Status:

Node: cuc-pub

| Port                | Caller               | Called          | Reason      | Redir      | Last Redir    | Application Status | Display Status                                      | Conversation Status         | Port Ext | Connecte |
|---------------------|----------------------|-----------------|-------------|------------|---------------|--------------------|-----------------------------------------------------|-----------------------------|----------|----------|
| CUCM-PORT-GROUP-004 |                      |                 |             |            |               | Idle               |                                                     | Idle                        | --       | --       |
| CUCM-PORT-GROUP-002 |                      |                 |             |            |               | Idle               |                                                     | Idle                        | --       | --       |
| CUCM-PORT-GROUP-010 |                      |                 |             |            |               | Idle               |                                                     | Idle                        | --       | --       |
| CUCM-PORT-GROUP-005 |                      |                 |             |            |               | Idle               |                                                     | Idle                        | --       | --       |
| CUCM-PORT-GROUP-008 |                      |                 |             |            |               | Idle               |                                                     | Idle                        | --       | --       |
| CUCM-PORT-GROUP-009 | 8044260389 Bangalore | 10001           | FwdNoAnswer | 8044269999 | 10002         | PHGreeting         | Playing greeting for Call Handler: Opening Greeting | Playing Greeting: Off Ho... | --       | --       |
| CUCM-PORT-GROUP-007 | External Number      | VM Pilot Number |             | ???        | CTI RP Number | Idle               | Playing Opening Greetings                           | Idle                        | --       | --       |
| CUCM-PORT-GROUP-003 |                      |                 |             |            |               | Idle               |                                                     | Idle                        | --       | --       |
| CUCM-PORT-GROUP-001 |                      |                 |             |            |               | Idle               |                                                     | Idle                        | --       | --       |
| CUCM-PORT-GROUP-005 |                      |                 |             |            |               | Idle               |                                                     | Idle                        | --       | --       |

Polling Rate (sec): 1 Set Polling Rate Stop Polling

7:36:05 AM Retrieved 10 ports

## Working Call Port Status:

Node: cuc-pub

| Port                | Caller                   | Called          | Reason      | Redir         | Last Redir    | Application Status | Display Status                                 | Conversation Status        | Port Ext | Connecte |
|---------------------|--------------------------|-----------------|-------------|---------------|---------------|--------------------|------------------------------------------------|----------------------------|----------|----------|
| CUCM-PORT-GROUP-004 |                          |                 |             |               |               | Idle               |                                                | Idle                       | --       | --       |
| CUCM-PORT-GROUP-002 |                          |                 |             |               |               | Idle               |                                                | Idle                       | --       | --       |
| CUCM-PORT-GROUP-010 |                          |                 |             |               |               | Idle               |                                                | Idle                       | --       | --       |
| CUCM-PORT-GROUP-006 |                          |                 |             |               |               | Idle               |                                                | Idle                       | --       | --       |
| CUCM-PORT-GROUP-008 | 11002 11002 Abdul Jas... | 10001           | FwdNoAnswer | 10002         | 10002         | PHGreeting         | Playing greeting for Call Handler: AJ-LABS-IVR | Playing Greeting: Stand... | --       | --       |
| CUCM-PORT-GROUP-009 | Internal Number          | VM Pilot Number |             | CTI RP Number | CTI RP Number | Idle               | Playing AJ-LABS-IVR                            | Idle                       | --       | --       |
| CUCM-PORT-GROUP-007 |                          |                 |             |               |               | Idle               |                                                | Idle                       | --       | --       |
| CUCM-PORT-GROUP-003 |                          |                 |             |               |               | Idle               |                                                | Idle                       | --       | --       |
| CUCM-PORT-GROUP-001 |                          |                 |             |               |               | Idle               |                                                | Idle                       | --       | --       |
| CUCM-PORT-GROUP-005 |                          |                 |             |               |               | Idle               |                                                | Idle                       | --       | --       |

Polling Rate (sec): 1 Set Polling Rate Stop Polling

7:32:35 AM Retrieved 10 ports

## Initial Findings:

- We could see a bogus Redirecting Number **8044269999** in the call setup
- By default, CUC process the call based on the First Redirecting Number as specified on the Advanced Conversation Settings in CUC

The screenshot shows the Cisco Unity Connection Administration interface. The left sidebar contains a navigation tree with the following items: Cisco Unity Connection, Unified Messaging Accounts Status, SpeechView Transcription, Video, Video Services, Video Services Accounts Status, Dial Plan, Partitions, Search Spaces, System Settings, General Configuration, Cluster, Authentication Rules, Roles, Restriction Tables, Licenses, Schedules, Holiday Schedules, Global Nicknames, Subject Line Formats, Attachment Descriptions, Enterprise Parameters, Service Parameters, Plugins, Fax Server, LDAP, SAML Single Sign on, Authz Servers, Cross-Origin Resource Sharing (C), SMTP Configuration, Advanced, SMPP Providers, Conversations, Messaging, Intrasite Networking, Telephony, Reports, Connection Administration, TRAP, Disk Capacity, PCA, RSS, Cluster Configuration, Fax, Unified Messaging Services, API Settings, Telephony Integrations, and Phone System. The 'Advanced' and 'Conversations' items are highlighted with red arrows. The main content area displays a list of settings for 'Conversations'. The setting 'Use Last (Rather than First) Redirecting Number for Routing Incoming Call' is highlighted with a red box and has an unchecked checkbox.

| Setting                                                                                                                   | Value                               |
|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Announce Secure Status in Message Header                                                                                  | <input checked="" type="checkbox"/> |
| Confirm Deletion of Deleted Messages                                                                                      | <input type="checkbox"/>            |
| Require Users to Record Names at Enrollment                                                                               | <input type="checkbox"/>            |
| Dial Prefix for Live Reply to Unidentified Callers                                                                        | <input type="text"/>                |
| Minimum Number of Digits Required for Prepending Live Reply Dial Prefix                                                   | 0                                   |
| Message Bookmark Timeout (in minutes)                                                                                     | 5                                   |
| Disable Spelled Name Searches                                                                                             | <input type="checkbox"/>            |
| Disable Message Summary on Replay                                                                                         | <input type="checkbox"/>            |
| Treat Skipped Messages as Saved                                                                                           | <input type="checkbox"/>            |
| Play Receipt Reason Code                                                                                                  | <input checked="" type="checkbox"/> |
| Maximum Age of Names in Addressing Priority Lists                                                                         | 90                                  |
| Maximum Number of Names in a User's Addressing Priority List                                                              | 100                                 |
| Play option to turn off message notification                                                                              | <input checked="" type="checkbox"/> |
| Use star to deactivate notification device                                                                                | <input type="checkbox"/>            |
| Prompt User to Record an Introduction when Forwarding Messages                                                            | <input checked="" type="checkbox"/> |
| Request Entry of User ID after Failed PIN Entry From Known Extension                                                      | <input checked="" type="checkbox"/> |
| Skip Recording of Greeting During Enrollment                                                                              | <input type="checkbox"/>            |
| Allow Voice Recognition Users to Speak Their Voicemail PINs                                                               | <input type="checkbox"/>            |
| Voice Recognition Confirmation Confidence Threshold                                                                       | 60                                  |
| Time to Wait Between Spoken Words (in Milliseconds)                                                                       | 750                                 |
| Use Advanced Name Dictionary for Voice Recognition                                                                        | <input type="checkbox"/>            |
| Save Speed and Volume Changes Made by User                                                                                | <input type="checkbox"/>            |
| Use Calling Directory Number in Live Reply                                                                                | <input checked="" type="checkbox"/> |
| Rapid Send - Allow [###] to Send a Message During Addressing                                                              | <input type="checkbox"/>            |
| Rapid Send - Allow Extension[#] Extension[#] Extension[#] to Send a Message During Addressing (Example : 2000#4000#6000#) | <input type="checkbox"/>            |
| Address Message Before Recording                                                                                          | <input type="checkbox"/>            |
| Wait Time in Seconds Between Call Transfer Attempts                                                                       | 5                                   |
| Maximum Call Transfer Attempts Allowed                                                                                    | 5                                   |
| Use Last (Rather than First) Redirecting Number for Routing Incoming Call                                                 | <input type="checkbox"/>            |
| Maximum Concurrent Sessions for Telephony Interface (Per User)                                                            | 0                                   |
| Use Text To Speech to Read Display Names When No Recording Is Available                                                   | <input checked="" type="checkbox"/> |
| Announce Message Status to User(s) while Replying                                                                         | <input type="checkbox"/>            |
| Announce Recipients list to User(s) while Replying                                                                        | <input type="checkbox"/>            |
| Maximum Number of Recipients Before Reply-All Warning                                                                     | 0                                   |
| IP Addresses Allowed To Connect For Port Status Monitor Output (comma-separated)                                          | <input type="text"/>                |
| Enable Remote Port Status Monitor Output                                                                                  | <input type="checkbox"/>            |

- CUC will look for the First Redirecting Number **8044269999** to route the call and there is no Voicemail Box or Call Handler with **8044269999**
- Since First Redirecting Number is not 10002, CUC fails to deliver the call to 10002 Call Handler
- Now we need to identify how the bogus number is getting added in the external call

## Cisco CallManager Logs from CUCM

- I have used Cisco Collaboration Solution Analyzer (CSA) Tool to track the call
- TranslatorX can also be used but more details will be processed in CSA Tool

The screenshot displays the Cisco TAC Tool interface for analyzing a call. The top navigation bar includes links for 'Back to top', 'Available files', 'Diagnostic signatures', 'Analysis switcher', 'System information', 'Log overview', and 'Detail'. A warning message is visible: 'Webex Edge Audio or when running Connectors on Expressway, instructions on how to update it, can be found in this article 216950-cisco-webex-root-ca-certificate-update'.

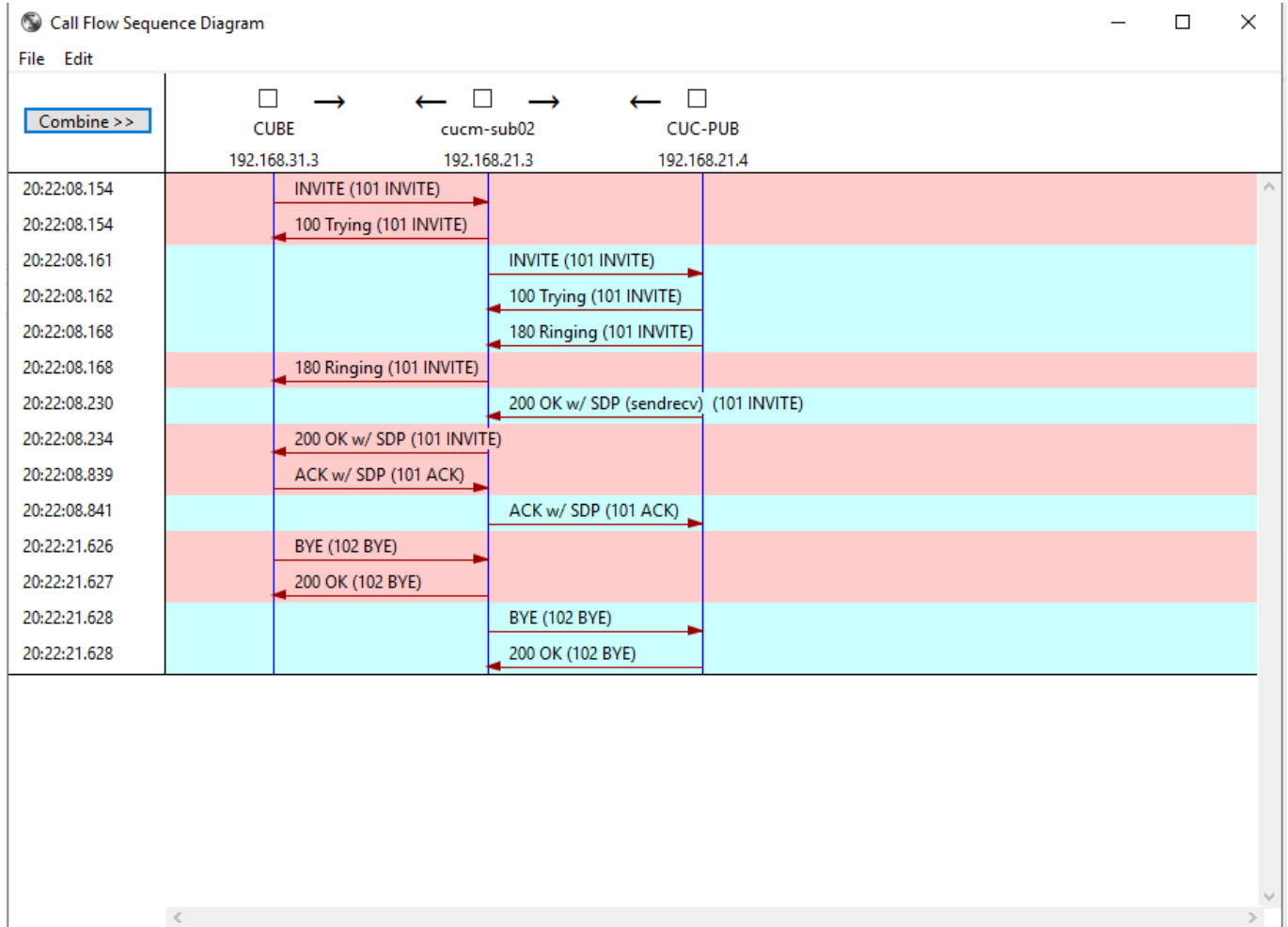
The call log entry shows the following details:

| From                    | To                      | Date       | Time     | Duration | Call ID    |
|-------------------------|-------------------------|------------|----------|----------|------------|
| 8044260389@192.168.21.3 | 8056310002@192.168.21.3 | 2021-04-03 | 14:52:08 | 0        | cucm-sub02 |

The 'Call detail' section provides a 'Ladder diagram' view of the call. The diagram shows the sequence of SIP messages between three entities: CUBE (192.168.31.3), CUCM (192.168.21.3), and CUC (192.168.21.1). The messages are as follows:

- 14:52:08.154**: CUBE sends **INVITE** (101 INVITE) to CUCM.
- 14:52:08.154**: CUCM sends **100 TRYING** (101 INVITE) to CUBE.
- 14:52:08.161**: CUCM sends **INVITE** (101 INVITE) to CUC.
- 14:52:08.162**: CUC sends **100 TRYING** (101 INVITE) to CUCM.
- 14:52:08.168**: CUCM sends **180 RINGING** (101 INVITE) to CUBE.
- 14:52:08.168**: CUCM sends **180 RINGING** (101 INVITE) to CUC.
- 14:52:08.230**: CUCM sends **200 OK** (101 INVITE) to CUC. SDP ver.: 2553824854.
- 14:52:08.234**: CUCM sends **200 OK** (101 INVITE) to CUBE. SDP ver.: 1.
- 14:52:08.752**: CUCM sends **200 OK** (101 INVITE) to CUC. SDP ver.: 1.
- 14:52:08.839**: CUCM sends **ACK** (101 ACK) to CUC. SDP ver.: 3369.
- 14:52:08.841**: CUCM sends **ACK** (101 ACK) to CUC. SDP ver.: 1.
- 14:52:09.191**: CUCM sends **ACK** (101 ACK) to CUC. SDP ver.: 4369.
- 14:52:21.626**: CUCM sends **BYE** (102 BYE) to CUBE.
- 14:52:21.627**: CUCM sends **200 OK** (102 BYE) to CUBE.
- 14:52:21.628**: CUCM sends **BYE** (102 BYE) to CUC.
- 14:52:21.628**: CUCM sends **200 OK** (102 BYE) to CUC.

- Here is the TranslatorX representation of the call



---

- INVITE from CUBE to CUCM

00095448.002 |20:22:08.154 |AppInfo |//SIP/SIPUdp/wait\_SdlDataInd: Incoming SIP UDP message  
size 979 from 192.168.31.3:[51267]:  
[6530,NET]  
INVITE sip:8056310002@192.168.21.3 SIP/2.0  
Via: SIP/2.0/UDP 192.168.31.3:5060;branch=z9hG4bK3912D1  
Remote-Party-ID: "Bangalore PSTN - 8044260389"  
<sip:8044260389@192.168.31.3>;party=calling;screen=yes;privacy=off  
From: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.31.3>;tag=1D79C48-250B  
To: <sip:8056310002@192.168.21.3>  
Date: Sat, 03 Apr 2021 14:52:08 GMT  
Call-ID: FF51ED43-93C211EB-80AF8068-7CAB84EE@192.168.31.3  
Supported: timer,resource-priority,replaces,sdp-anat  
Min-SE: 1800  
Cisco-Guid: 0678289792-0000065536-0000000029-0020818112  
User-Agent: Cisco-SIPGateway/IOS-15.5.2.S  
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO,  
REGISTER  
CSeq: 101 INVITE  
Timestamp: 1617461528  
Contact: <sip:8044260389@192.168.31.3:5060>  
Expires: 180  
Allow-Events: telephone-event  
Max-Forwards: 69  
Diversion: <sip:8044269999@192.168.61.1>;privacy=off;reason=unconditional;screen=yes  
Session-Expires: 1800  
Content-Length: 0

- Here we could see that Diversion Header is available when the call landed at CUCM from CUBE
- Also, the Domain Part of Diversion Header is 192.168.61.1 which doesn't belong to our network
- You can verify what is 192.168.61.1 because that is the entity added this diversion header
- Since the bogus Diversion is in the Invite from CUBE, we need to check CUBE debugs to further isolate the issue

---

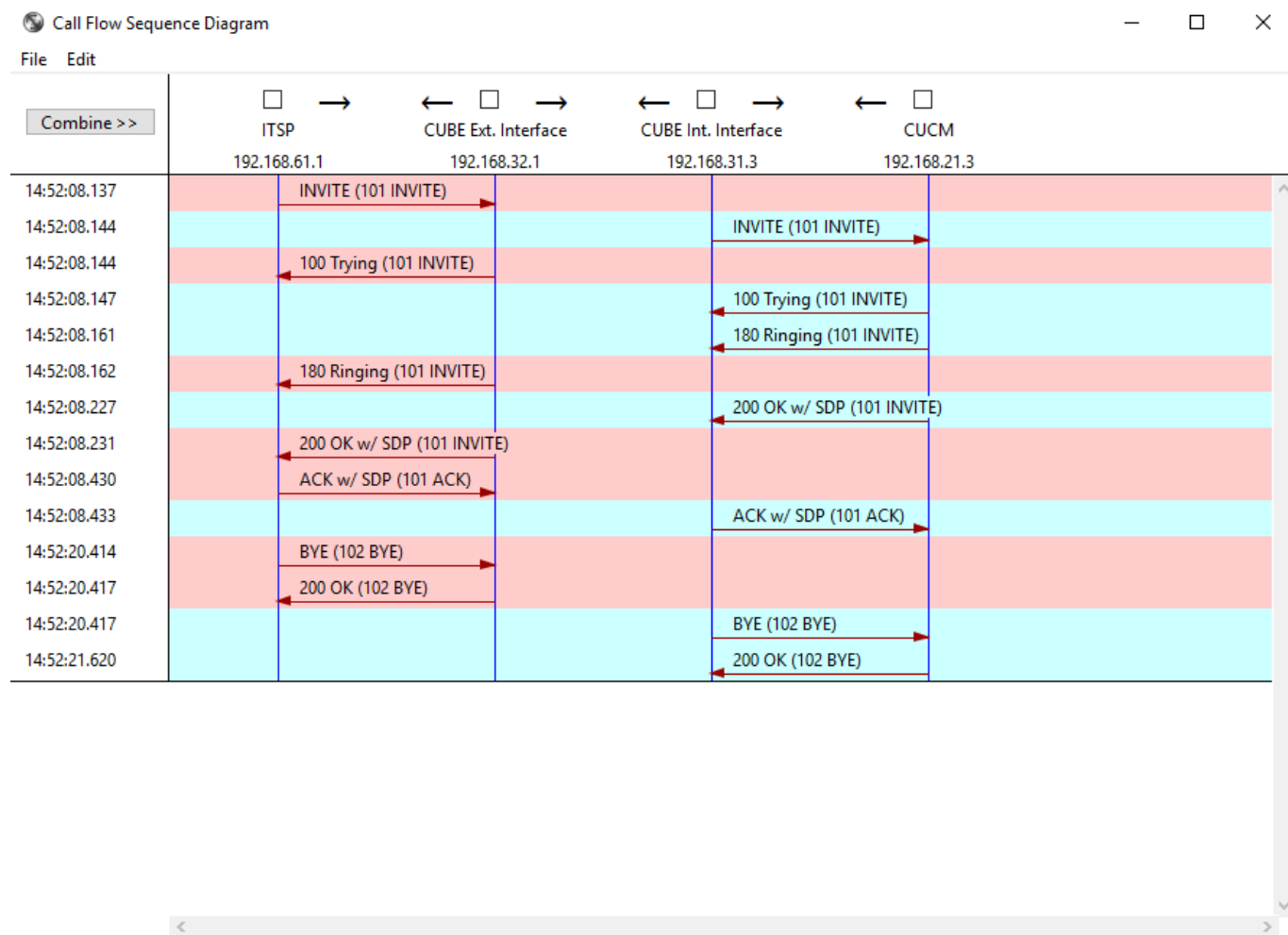
- INVITE from CUCM to CUC

00095532.001 |20:22:08.161 |AppInfo |SIPTcp - wait\_SdISPISignal: Outgoing SIP TCP message to 192.168.21.4 on port 5060 index 591  
[6532,NET]  
INVITE sip:10001@192.168.21.4:5060 SIP/2.0  
Via: SIP/2.0/TCP 192.168.21.3:5060;branch=z9hG4bK8bd216e3bb5  
From: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.21.3>;tag=3736~3f48b4d4-2f05-4b61-86ad-47522208ed69-60828658  
To: <sip:10001@192.168.21.4>  
Date: Sat, 03 Apr 2021 14:52:08 GMT  
Call-ID: 286de180-6818118-89e-315a8c0@192.168.21.3  
Supported: timer,resource-priority,replaces  
Min-SE: 1800  
User-Agent: Cisco-CUCM11.5  
Allow: INVITE, OPTIONS, INFO, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY  
CSeq: 101 INVITE  
Expires: 180  
Allow-Events: presence  
Supported: X-cisco-srtp-fallback  
Supported: Geolocation  
Call-Info: <urn:x-cisco-remotecc:callinfo>;x-cisco-video-traffic-class=MIXED  
Session-ID: e60906e41ff12aa229378d9b69ab3735;remote=00000000000000000000000000000000  
Cisco-Guid: 0678289792-0000065536-0000000010-0051751104  
Session-Expires: 1800  
Diversion: "10002 - AJ-LABS-IVR"  
<sip:10002@192.168.21.3>;reason=unconditional;privacy=off;screen=yes  
Diversion: <sip:8044269999@192.168.61.1>;reason=unconditional;privacy=off;screen=yes  
P-Asserted-Identity: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.21.3>  
Remote-Party-ID: "Bangalore PSTN - 8044260389"  
<sip:8044260389@192.168.21.3>;party=calling;screen=yes;privacy=off  
Contact: <sip:8044260389@192.168.21.3:5060;transport=tcp>  
Max-Forwards: 68  
Content-Length: 0

- Here we could see that First Redirecting Party is 8044269999 and Last Redirecting Party is 10002 (CTI RP Number)
- Since the bogus number 8044269999 present in the INVITE, CUC unable to route the call to 10002 Call Handler

## CUBE Debugs

- For CUBE debugs, I prefer TranslatorX



- 
- INVITE received from ITSP

Apr 3 14:52:08.137: //-1/xxxxxxxxxxxx/SIP/Msg/ccsipDisplayMsg:

Received:

INVITE sip:8056310002@192.168.32.1:5060 SIP/2.0

Via: SIP/2.0/TCP 192.168.61.1:5060;branch=z9hG4bK41448f6be7

From: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>;tag=49~6d68c7b1-6dc3-4f9e-b3d4-c3249872f990-27361085

To: <sip:8056310002@192.168.32.1>

Date: Sat, 03 Apr 2021 14:52:08 GMT

Call-ID: 286de180-6818118-1d-13da8c0@192.168.61.1

Supported: timer,resource-priority,replaces

Min-SE: 1800

User-Agent: Cisco-CUCM11.5

Allow: INVITE, OPTIONS, INFO, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY

CSeq: 101 INVITE

Expires: 180

Allow-Events: presence, kpml

Supported: X-cisco-srtp-fallback

Supported: Geolocation

Call-Info: <sip:192.168.61.1:5060>;method="NOTIFY;Event=telephone-event;Duration=500"

Call-Info: <urn:x-cisco-remotecc:callinfo>;x-cisco-video-traffic-class=VIDEO\_UNSPECIFIED

Session-ID: af2a88bc102b43c8900a39c03936dba0;remote=00000000000000000000000000000000

Cisco-Guid: 0678289792-0000065536-0000000029-0020818112

Session-Expires: 1800

Diversion: <sip:8044269999@192.168.61.1>;reason=unconditional;privacy=off;screen=yes

P-Asserted-Identity: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.61.1>

Remote-Party-ID: "Bangalore PSTN - 8044260389"

<sip:8044260389@192.168.61.1>;party=calling;screen=yes;privacy=off

Contact: <sip:8044260389@192.168.61.1:5060;transport=tcp>

Max-Forwards: 70

Content-Length: 0

- From this, it is clear that the Diversion Header is getting added from the ITSP provider
- We need to talk to ITSP to stop sending Diversion in the INVITE

### What is Next?

- Do you think ITSP will resolve this immediately when you raise a case with them? They will take their own time to get this sorted. Well, will you be able to wait that long since this is affecting your business's main line number?
- We have to do some technique that can remove the bogus Diversion Header, you can either apply a SIP Profile at CUBE to remove it or SIP Normalization Script at CUCM at Trunk Level



---

## Resolution - SIP Normalization Script to Remove Diversion Header

- SIP Normalization Scripts can be applied on SIP Trunks or SIP Profiles in CUCM
- In our case, Trunk level, we can either apply it on the CUCM-CUBE Trunk (AIRTEL-SIP-TRUNK) inbound direction or on CUCM-CUC Trunk (CUC-PUB-SIP-TRUNK, CUC-SUB-SIP-TRUNK)
- SIP Profile level can be done at AIRTEL-SIP-TRUNK-SIP-PROFILE or CUC-SIP-TRUNK-SIP-PROFILE
- Since CUC is always playing with Diversion Header, I don't prefer to apply anything that affects CUCM-CUC SIP Trunk
- I have decided to apply the Normalization Script on the CUCM-CUBE Trunk (AIRTEL-SIP-TRUNK) inbound direction
- Below Lua Script will remove the Diversion Header from Inbound INVITE SIP message

```
M = {}
function M.inbound_INVITE(msg)
 if msg.isReInviteRequest()
 then
 return
 end

 local diversion = msg.getHeader("Diversion")

 if diversion
 then
 diversionmask = string.match(diversion, '<sip:8044269999@.+')
 if diversionmask
 then
 msg.removeHeader("Diversion")
 end
 end
end
return M
```

- All kind of fine tuning of SIP Messages are possible via Lua Script, here is the complete document to explore more on Lua Scripting: [Developer Guide of SIP Normalization](#)

## Device >> Device Settings >> SIP Normalization Script >> Add New

SIP Normalization Script X

Cisco Unified CM Conf X

Cisco Unity Connect X

Collaboration Solution X

+

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□

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https://192.168.21.1/ccmadmin/sipNormalizationScriptEdit.do

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 **Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

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System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

**SIP Normalization Script Configuration** Related Links: [Back To Find/List](#) Go


📁 Save  Import File

**Status**

 Status: Ready

**SIP Normalization Script Info**

Name\*

CUC-DIVERSION-FIX 

Description

CUC-DIVERSION-FIX


Content\*

```
M = {}
function M.inbound_INVITE(msg)
 if msg.isReInviteRequest()
 then
 return
 end

 local diversion = msg.getHeader("Diversion")

 if diversion
 then
 diversionmask = string.match(diversion, '<sip:8044269999@.+')
 if diversionmask
 then
 msg.removeHeader("Diversion")
 end
 end
end

end
return M
```



Script Execution Error Recovery Action\*

Message Rollback Only ▾

System Resource Error Recovery Action\*

Disable Script ▾

Memory Threshold\*

50


kilobytes

Lua Instruction Threshold\*

1000

instructions

Save Import File

 \*- indicates required item.

Trunk Configuration | Cisco Unified CM Admin | Cisco Unity Connect | Collaboration Solution

https://192.168.21.1/ccmadmin/trunkEdit.do?key=e60906e4-1ff1-2a...

## Cisco Unified CM Administration

For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | Go

admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

### Trunk Configuration

Related Links: Back To Find/List | Go

Save | Delete | Reset | Add New

*This is the CUBE Trunk*

Caller Name:

☐ Maintain Original Caller ID DN and Caller Name in Identity Headers

#### SIP Information

##### Destination

☐ Destination Address is an SRV

|     | Destination Address | Destination Address IPv6 | Destination Port |
|-----|---------------------|--------------------------|------------------|
| 1 * | 192.168.31.3        |                          | 5060             |

MTP Preferred Originating Codec\*: 711ulaw

BLF Presence Group\*: Standard Presence group

SIP Trunk Security Profile\*: AIRTEL-SIP-TRUNK-SIP-SEC-PROFILE

Rerouting Calling Search Space: < None >

Out-Of-Dialog Refer Calling Search Space: < None >

SUBSCRIBE Calling Search Space: < None >

SIP Profile\*: AIRTEL-SIP-TRUNK-SIP-PROFILE [View Details](#)

DTMF Signaling Method\*: No Preference

##### Normalization Script

Normalization Script: CUC-DIVERSION-FIX

☐ Enable Trace

|   | Parameter Name | Parameter Value |
|---|----------------|-----------------|
| 1 |                |                 |

##### Recording Information

☒ None

☐ This trunk connects to a recording-enabled gateway

☐ This trunk connects to other clusters with recording-enabled gateways

##### Geolocation Configuration

Geolocation: < None >

Geolocation Filter: < None >

☐ Send Geolocation Information

Save | Delete | Reset | Add New

\*- indicates required item.

- A reset of SIP Trunk is required and that will terminate all the active call served by the SIPTrunk, hence recommended to apply this on off-business hours

---

## Result

- INVITE from CUBE to CUCM (before CUCM process the Script)

```
00111125.002 |21:49:31.668 |AppInfo |//SIP/SIPUdp/wait_SdlDataInd: Incoming SIP UDP message
size 977 from 192.168.31.3:[52757]:
[7839,NET]
INVITE sip:8056310002@192.168.21.3 SIP/2.0
Via: SIP/2.0/UDP 192.168.31.3:5060;branch=z9hG4bK3C3B1
Remote-Party-ID: "Bangalore PSTN - 8044260389"
<sip:8044260389@192.168.31.3>;party=calling;screen=yes;privacy=off
From: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.31.3>;tag=2279EC3-43B
To: <sip:8056310002@192.168.21.3>
Date: Sat, 03 Apr 2021 16:19:31 GMT
Call-ID: 34B2D0E2-93CF11EB-80B58068-7CAB84EE@192.168.31.3
Supported: timer,resource-priority,replaces,sdp-anat
Min-SE: 1800
Cisco-Guid: 1568682240-0000065536-0000000030-0020818112
User-Agent: Cisco-SIPGateway/IOS-15.5.2.S
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO,
REGISTER
CSeq: 101 INVITE
Timestamp: 1617466771
Contact: <sip:8044260389@192.168.31.3:5060>
Expires: 180
Allow-Events: telephone-event
Max-Forwards: 69
Diversion: <sip:8044269999@192.168.61.1>;privacy=off;reason=unconditional;screen=yes
Session-Expires: 1800
Content-Length: 0
```

- CUCM process the Script and Removes the Diversion

```
00111126.000 |21:49:31.676 |SdlSig |SIPNormalizeReq |wait
|SIPNormalization(3,100,81,1) |SIPHandler(3,100,82,1)
|3,100,10,1.44^192.168.31.3^* |*TraceFlagOverrode
00111126.001 |21:49:31.676 |AppInfo |//SIP/SIPNormalization/trace_sip_message: After
inbound SIP Normalization msg is:
[7839,INT]
INVITE sip:8056310002@192.168.21.3 SIP/2.0
Date: Sat, 03 Apr 2021 16:19:31 GMT
Allow: INVITE, OPTIONS, BYE, CANCEL, ACK, PRACK, UPDATE, REFER, SUBSCRIBE, NOTIFY, INFO,
REGISTER
From: "Bangalore PSTN - 8044260389" <sip:8044260389@192.168.31.3>;tag=2279EC3-43B
Allow-Events: telephone-event
Supported: timer,resource-priority,replaces,sdp-anat
Min-SE: 1800
Remote-Party-ID: "Bangalore PSTN - 8044260389"
<sip:8044260389@192.168.31.3>;party=calling;screen=yes;privacy=off
Cisco-Guid: 1568682240-0000065536-0000000030-0020818112
Content-Length: 0
User-Agent: Cisco-SIPGateway/IOS-15.5.2.S
To: <sip:8056310002@192.168.21.3>
Contact: <sip:8044260389@192.168.31.3:5060>
Expires: 180
Call-ID: 34B2D0E2-93CF11EB-80B58068-7CAB84EE@192.168.31.3
Via: SIP/2.0/UDP 192.168.31.3:5060;branch=z9hG4bK3C3B1
CSeq: 101 INVITE
Session-Expires: 1800
Max-Forwards: 69
```

---

---

### Alternate Fix using CUBE SIP Profiles:

- This issue can also be addressed using SIP Profiles at the CUBE
- We can completely remove the Diversion Header by matching to the bogus number 8044269999
- Below are the configurations

```
!
voice class sip-profiles 2
 request INVITE sip-header Diversion modify "Diversion:(.*)8044269999@(.*)" ""
!

!
dial-peer voice 4 voip
 description OUTBOUND TO CUCM
 session protocol sipv2
 session server-group 1
 destination e164-pattern-map 1
 voice-class codec 1
 voice-class sip profiles 2
 voice-class sip bind control source-interface GigabitEthernet1
 voice-class sip bind media source-interface GigabitEthernet1
 dtmf-relay rtp-nte
 no vad
!
```

---

### **Other Alternative Fixes:**

Apart from the Lua Script at CUCM and SIP Profile at CUBE, there are other possible solutions for this issue, but all of them affects the normal call routing in one or the other way,

1. Disable 'Redirecting Diversion Header Delivery - Inbound' on the CUBE Trunk

This will remove the Diversion Header whatever calls that comes via the Trunk

2. Disable 'Redirecting Diversion Header Delivery - Outbound' on CUC Trunk

This parameter is required for Normal Call Routing to CUC, disabling this will entirely break CUC Voicemail and Call Handler integration

3. Enable 'Use Last (Rather than First) Redirecting Number for Routing Incoming Call'

This will consider the last redirecting number while CUC routing the calls, this will change the entire call routing behavior of CUC including voicemail routing. Even though, it never breaks anything, but user experience will be changed

---

## Inbound Dial Peer Match



- When a CUBE receives a call setup request, the gateway begins searching for an applicable incoming dial-peer for this call
- A dial-peer only needs to satisfy one of the 10 conditions for matching. It is not necessary for all the attributes to be configured in the dial-peer or that every attribute match the call setup information
- All dial-peers are searched based on the first match criteria. The gateway moves on to the next criteria only if no match is found
- After matching the inbound dial-peer, the properties of the specific dial-peer applied to the call behavior (like Codec, DTMF Relay, etc.)
- If none of the dial-peer matches, then the default dial-peer get applied (dial-peer 0)

**Situation:** A user having internal extension 1001 calls a PSTN number 9495860708

ANI: 1001

DNIS: 9495860708

---

---

| Preference | Match Criteria            | Dial-peer Commands                                                                          |
|------------|---------------------------|---------------------------------------------------------------------------------------------|
| 1          | URI                       | incoming uri via <uri-tag>                                                                  |
| 2          | URI                       | incoming uri request <uri-tag>                                                              |
| 3          | URI                       | incoming uri to <uri-tag>                                                                   |
| 4          | URI                       | incoming uri from <uri-tag>                                                                 |
| 5          | Called Number             | incoming called-number <DNIS><br>incoming called e164-pattern-map <pattern-map-DNIS-number> |
| 6          | Calling Number            | answer-address <ANI><br>incoming calling e164-pattern-map <pattern-map-ANI-number>          |
| 7          | Destination-pattern (ANI) | destination-pattern <ANI>                                                                   |
| 8          | Port                      | Port through which call came in, this applies only for POTS dial-peer (PRI, FXO, FXS, etc.) |
| 9          | Carrier-ID                | carrier-id source <string>                                                                  |
| 10         | Default                   | dial-peer 0 (peer_tag=0, pid:0) This is a hidden dial-peer                                  |

---

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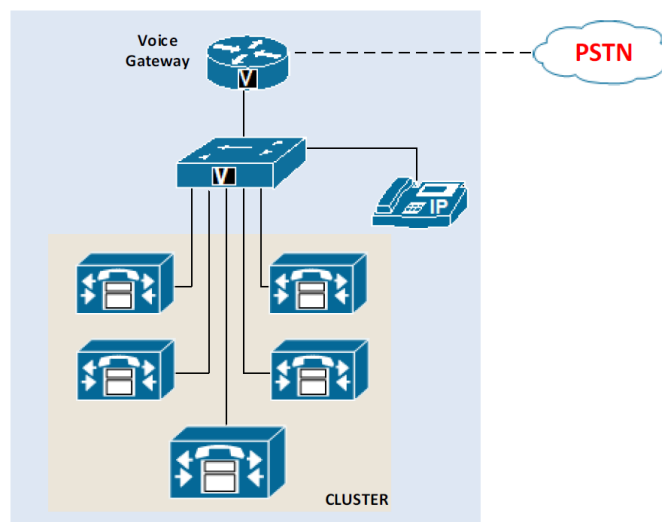
## Deployment Models



- CUCM Cluster can be deployed in many ways
- Since VoIP technology is network based; we can deploy the cluster that spread across the world

---

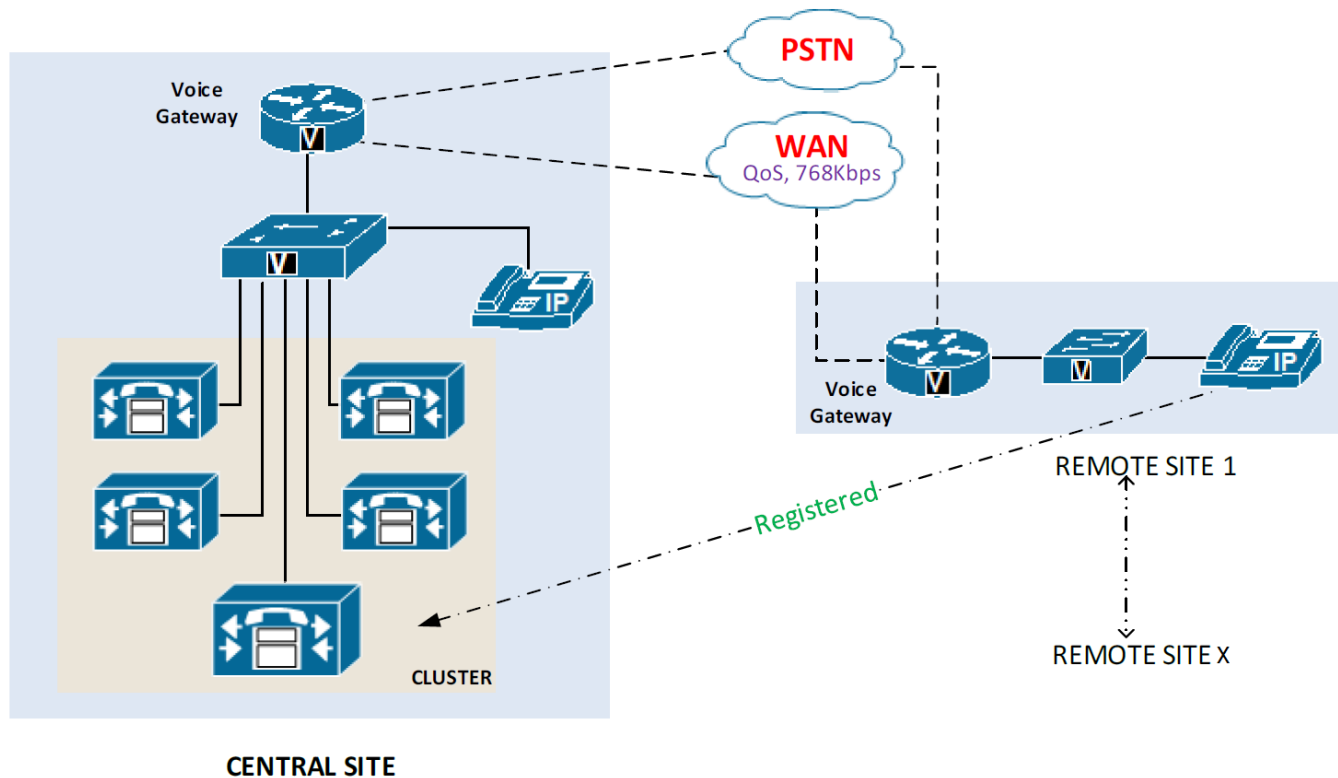
## Single Site Deployment



- Call processing agent, DSP resources are located on single site, no telephony service provided over IP WAN. VoIP Traffic occupy in single site
- Number of device support is based on the OVA deployment and number of Subscriber nodes available
- Voice Gateway (with T1, E1, PRI, FXO, FXS) or CUBE used to connect PSTN for handling all external calls
- High bandwidth audio & Video communication between devices within the site, No transcoding required because only one codec used

---

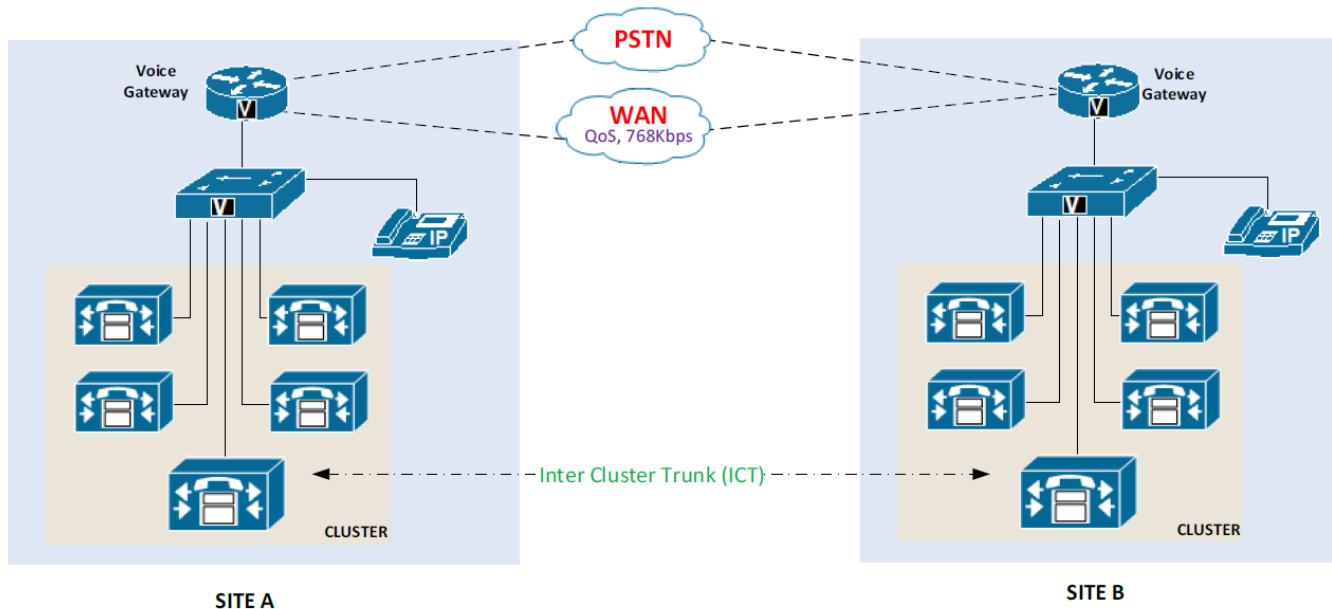
## Multisite with Centralized Call Processing over WAN



- Single call processing agent cluster provides telephony services to multiple remote sites over IP WAN
- Number of device support is based on the OVA deployment and number of Subscriber nodes available
- The remote site Voice Gateway have SRST capability to provide telephony service in the event if WAN failures
- External PSTN Calls are handled by site specific local Voice Gateway or CUBE
- We must have QoS enabled WAN to connect remote sites (768Kbps band width minimum).
- Call Admission control (use Location Mechanism) & AAR must be enabled for effective management of available bandwidth
- WAN connectivity options are Leased Lines, Frame Relay, ATM, MPLS VPN, IPSec VPN, etc.
- DSP resources are located at central site and remote sites to support local requirement
- High bandwidth audio between devices within the site & low bandwidth audio between devices in different site
- Free call between Central site and Remote sites over IP WAN
- TEHO (tail-end hop-off) can be implemented to bypass long distance PSTN calls via IP WAN
- Central dial-plan and Easy to administrate

---

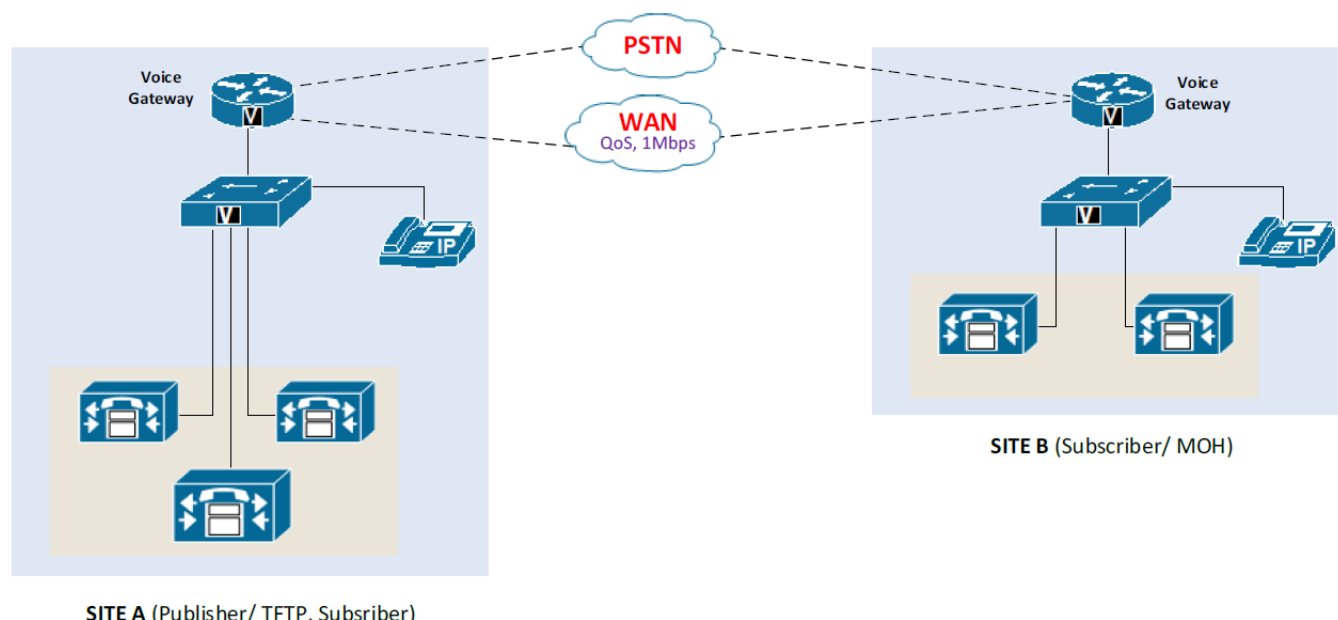
## Multisite with Distributed Call Processing over WAN



- Multiple independent sites each having its own call processing CUCM cluster
- Different sites are connected via SIP Trunks that uses IP WAN for network connectivity
- Each site can have again other remote sites
- External PSTN Calls are handled by site specific local Voice Gateway or CUBE
- WAN connectivity options are Leased Lines, Frame Relay, ATM, MPLS VPN, IPsec VPN, etc.
- High bandwidth audio between devices within the site, low bandwidth audio between devices in different sites
- Call Admission Control, AAR implemented to save bandwidth during inter cluster calls
- TEHO (tail-end hop-off) can be implemented to bypass long distance PSTN calls via IP WAN
- Session Management Edition (SME) used to interconnect if we have multiple clusters since it can reduce the dial-plan complexity and provide a kind of central dial-plan administration

---

## Clustering over IP WAN



- Servers in same CUCM cluster located at different sites via IP WAN (QoS enabled 1Mbps minimum bandwidth)
- Round trip delay less than 80 msec for Database Replication over WAN
- Single point of administration, Unified Dial Plan

**Note:** I have seen many customers are using mixed deployment models. Multiple clusters with each cluster are distributed to different data centers, one cluster will have many remote sites with local gateways. SME interconnects all clusters for inter cluster call routing. Hence the deployment is not specific to only the above-described models. Consult Cisco Professional Service Team or Cisco Partners to get guidelines while implementing your infrastructure.

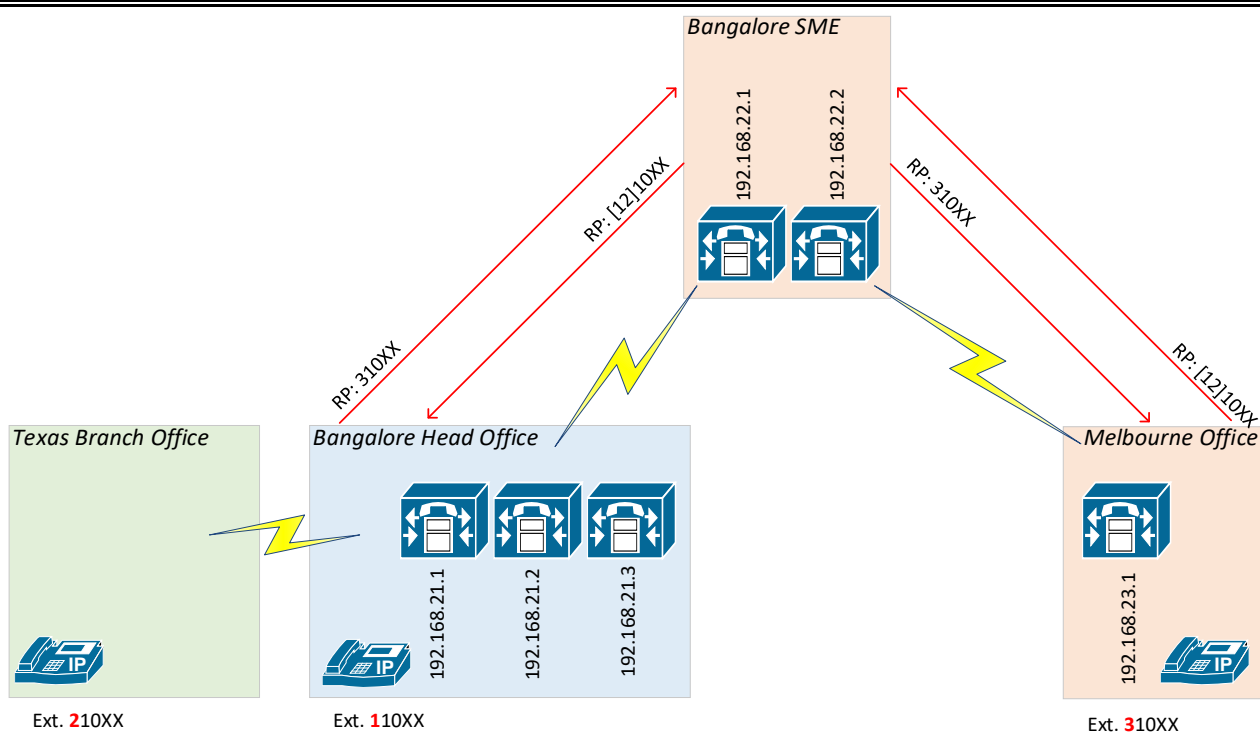
---

## Advanced Inter Cluster Call Routing via Session Management Edition (SME)

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- Cisco Unified Communications Manager Session Management Edition (SME) helps enterprises create a centralized architecture for Collaboration network
- It is just another CUCM Cluster that runs only Cisco CallManager feature service. Its primary function is to interconnect other clusters together via SIP Trunk
- Imagine that we are expanding our AJCollab UC Network to some geographical areas and we planned to implement different CUCM Cluster apart from creating remote location
- We have installed a CUCM Cluster in Australia, now we have Bangalore CUCM Cluster supporting Bangalore and Texas Location and Australia CUCM Cluster supporting Melbourne location, we may extend our footprint in future to other countries
- Instead of creating multiple Inter Cluster SIP trunk between all these clusters (full mesh), we decided to have a central CUCM Cluster that acts as the bridge between remote clusters



- The CUCM Cluster that is connected to SME called Leaf Cluster, here we have Bangalore Leaf and Australia Leaf Clusters
- We create SIP Trunk between Bangalore CUCM and SME also Australia CUCM and SME
- This way, even if you expand the locations in future, the call routing configuration will be much easier, you just create Sip Trunk between SME and new CUCM cluster
- Ideally no phones will be registered in SME, but for testing purpose, you can register phones there. SME is just another CUCM

- 
- Configuration Summary: I'm not adding detailed screenshots here since we already know how to create SIP Trunks. Make sure you create Region and Device Pool for respective trunks and set G.729 codec between Phone and SIP Trunk

## **1. Bangalore Cluster to SME**

310XX in SME-PT

BLR-SME-RL

BLR-SME-RG

BLR-SME-SIP-TRUNK (192.168.22.1, 192.168.22.2) in BLR-SME-SIP-TRUNK-DP

BLR-SME-SIP-TRUNK-INBOUND-CSS with BANGALORE-INTERNAL-PT, TEXAS-INTERNAL-PT)

Update BANGALORE-PHONE-CSS and TEXAS-PHONE-CSS with SME-PT

## **2. SME to Bangalore Cluster**

[12]10XX in BANGALORE-PT

SME-BLR-RL

SME-BLR-RG

SME-BLR-SIP-TRUNK (192.168.21.1, 192.168.21.2) in SME-BLR-SIP-TRUNK-DP

SME-BLR-SIP-TRUNK-INBOUND-CSS with MELBOURNE-PT

## **3. SME to Australia Cluster**

310XX in MELBOURNE -PT

SME-MEL-RL

SME-MEL-RG

SME-MEL-SIP-TRUNK (192.168.23.1) in SME-MEL-SIP-TRUNK-DP

SME-MEL-SIP-TRUNK-INBOUND-CSS with BANGALORE-PT

## **4. Australia Cluster to SME**

[12]10XX in SME-PT

MEL-SME-RL

MEL-SME-RG

MEL-SME-SIP-TRUNK (192.168.22.1, 192.168.22.2) in MEL-SME-SIP-TRUNK-DP

MEL-SME-SIP-TRUNK-INBOUND-CSS with MELBOURNE-INTERNAL-PT)

Update MELBOURNE -PHONE-CSS with SME-PT

---



---

## Inter Cluster Lookup Service (ILS)



- The ILS - Intercluster Lookup Service feature enables different CUCM Cluster to exchange directory URI with other clusters in an ILS network, URI Replication provides support for Intercluster URI dialing
- ILS runs as a service on the Publisher node of a cluster
- We can call ILS - Intercluster Lookup Service as Voice Dynamic Routing Protocol that advertise dial plan between clusters
- Each CUCM cluster node advertises its URIs and “SIP route string” to its neighbor’s (or Hubs). CUCM cluster later creates a table with URIs and associated SIP route string
- Finally, SIP route strings are routed through SIP route patterns
- If you have just 2 clusters, we can make one as the ILS HUB and other as ILS SPOKE cluster, but ideally in with SME infrastructure, we make SME as the HUB Cluster
- All the CUCM Leaf Clusters will advertise the local URIs to SME HUB and SME HUB will advertise whatever it received to other clusters

### Hub Cluster

- Each ILS network must have at least one hub cluster and they are the backbone of an ILS network
- Hub clusters exchange ILS updates with the other hub clusters in the ILS network and then relay that information to and from their spoke clusters
- You can connect a hub cluster to multiple other hub clusters, or you might configure a hub cluster as the only hub cluster in the network
- In addition, you can connect a hub cluster to multiple spoke clusters, or you might configure the hub cluster with no spoke clusters

### Spoke Cluster

- A spoke cluster in an ILS network relies on the hub cluster that it is connected to in order to relay ILS updates to and from the rest of the ILS network
- A spoke cluster can have only one hub cluster

## [Lab] Inter Cluster Lookup Service (ILS) Configuration URI Dialing

Step 1: Activate Intercluster Lookup Service on all the CUCM Publisher

Go to Service Ability > Tools > Service Activation > Select 'Intercluster Lookup Service' and save

The screenshots show the 'Service Activation' page in the Cisco Unified Serviceability interface for three different clusters: BLR, SME, and AUS. Each page has a 'Status' section at the top indicating 'Update Operation Successful'. Below this is a 'Select Server' dropdown menu. The main section is a table of 'CM Services' with columns for 'Service Name' and 'Activation Status'. In each table, 'Cisco Intercluster Lookup Service' is highlighted with a red box and its status is 'Activated'. Other services like 'Cisco CallManager', 'Cisco Unified Mobile Voice Access Service', and 'Cisco IP Voice Media Streaming App' are also listed with their respective statuses. There are also sections for 'CTI Services' and 'CDR Services'.

Step 2: Set Cluster ID for the CUCM Clusters

Cluster ID is a unique identifier for the cluster.

Go to CUCM Administration Page > System > Enterprise Parameter > Cluster ID

The screenshots show the 'Enterprise Parameters Configuration' page in the Cisco Unified CM Administration interface for three different clusters: BLR, SME, and AUS. Each page has a 'Status' section at the top indicating 'Status: Ready'. Below this is a table of 'Enterprise Parameters Configuration' with columns for 'Parameter Name', 'Parameter Value', and 'Suggested Value'. In each table, 'Cluster ID' is highlighted with a red box and its value is set to the cluster name (BLR-CLUSTER, SME, or AUS-CLUSTER). Other parameters like 'Max Number of Device Level Traces', 'DSCP for Phone-based Services', and 'DSCP for Cisco CallManager to Device Interface' are also listed with their respective values. There are also sections for 'CCMAdmin Parameters' and 'Self Care Portal Parameters'.

## Step 3: ILS Configuration

Go to Advanced Features > ILS Configuration > and configure as follows

The screenshots show the configuration for three clusters: BLR-Cluster, SME, and AUS-Cluster. Each cluster's configuration is identical, showing the 'Intercluster Lookup Service Configuration' and 'ILS Cluster Registration' sections. The status is 'Ready' for all clusters. The configuration steps are as follows:

- Intercluster Lookup Service Configuration:**
  - Role: Spoke Cluster
  - ☒ Exchange Global Dial Plan Replication Data with Remote Clusters
  - Advertised Route String: cucm-pub-ajcollab.com
  - Synchronize Clusters Every: 1 (1-1440 minutes)
  - ILS Authentication:
    - ☐ Use TLS Certificates (Un-check)
    - ☒ Use Password
    - Password: [Redacted]
    - Confirm Password: [Redacted]
- ILS Cluster Registration:**
  - Registration Server: 192.168.22.1
  - Role: SME HUB IP or FQDN
  - ☒ Activate the Intercluster Lookup Service on the publisher in this cluster

- Refresh after 2 minutes, you will see the ILS Network has been established

The screenshots show the status of the ILS network after 2 minutes. The status is 'Ready' for all clusters. The configuration steps are as follows:

- Intercluster Lookup Service Configuration:**
  - Role: Spoke Cluster
  - ☒ Exchange Global Dial Plan Replication Data with Remote Clusters
  - Advertised Route String: cucm-pub-ajcollab.com
  - Synchronize Clusters Every: 1 (1-1440 minutes)
  - ILS Authentication:
    - ☐ Use TLS Certificates
    - ☒ Use Password
    - Password: [Redacted]
    - Confirm Password: [Redacted]
- ILS Cluster Registration:**
  - Registration Server: 192.168.22.1
  - Role: SME HUB IP or FQDN
  - ☒ Activate the Intercluster Lookup Service on the publisher in this cluster

The 'ILS Clusters and Global Dial Plan Imported Catalogs' table shows the established ILS network:

| Cluster ID/Name | Last Contact Time | Role  | Advertised Route String  | Last USN Data Received | USN Data Synchronization Status | Action     |
|-----------------|-------------------|-------|--------------------------|------------------------|---------------------------------|------------|
| SME             | 4/3/21 1:02 PM    | Hub   | sme-cum-pub-ajcollab.com | 4/3/21 1:01 PM         | Up to date                      | Disconnect |
| AUS-CLUSTER     | 4/3/21 1:01 PM    | Spoke | auc-cum-pub-ajcollab.com | 4/3/21 1:01 PM         | Up to date                      | Disconnect |
| BLR-CLUSTER     | 4/3/21 1:02 PM    | Spoke | cucm-pub-ajcollab.com    | 4/3/21 1:01 PM         | Up to date                      | Disconnect |

## Step 4: Verify and Configure URIs

For Bangalore Clusters, the users are LDAP Sync, I do have an LDAP attribute that maps E-Mail address as Directory URI

In Australia Cluster, I have configured a local user with URI

The image displays two side-by-side screenshots of the Cisco Unified CM Administration web interface, specifically the 'End User Configuration' page. Both screenshots show the 'User Information' section with various fields for user details.

**Left Screenshot (BLR-Cluster):**

- Status:** Ready
- User Information:**
  - User Status: Active Enabled LDAP Synchronized User
  - User ID\*: abdul.jaseem
  - Self-Service User ID: 11002
  - PIN: [Redacted]
  - Confirm PIN: [Redacted]
  - Last name\*: Jaseem
  - Middle name: [Redacted]
  - First name: Abdul
  - Display name: Abdul Jaseem
  - Title: [Redacted]
  - Directory URI: abdul.jaseem@ajcollab.com (highlighted with a red box)
  - Telephone Number: 11002
  - Home Number: [Redacted]
  - Mobile Number: [Redacted]
  - Pager Number: [Redacted]
  - Mail ID: abdul.jaseem@ajcollab.com
  - Manager User ID: [Redacted]
  - Department: [Redacted]
  - User Locale: < None >
  - Associated PC/Site Code: [Redacted]
  - Digest Credentials: [Redacted]
  - Confirm Digest Credentials: [Redacted]
  - User Profile: Use System Default ("Standard (Factory Default) User Profile")
  - User Rank\*: 1-Default User Rank
- Convert User Account:**
  - ☐ Convert LDAP Synchronized User to Local User
- Service Settings:**
  - ☒ Home Cluster
  - ☒ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)

**Right Screenshot (AUS-Cluster):**

- Status:** Ready
- User Information:**
  - User Status: Enabled Local User
  - User ID\*: ryan.kwanten
  - Password: [Redacted]
  - Confirm Password: [Redacted]
  - Self-Service User ID: 31001
  - PIN: [Redacted]
  - Confirm PIN: [Redacted]
  - Last name\*: Kwanten
  - Middle name: [Redacted]
  - First name: Ryan
  - Display name: Ryan Kwanten
  - Title: [Redacted]
  - Directory URI: ryan.kwanten@ajcollab.com (highlighted with a red box)
  - Telephone Number: 31001
  - Home Number: [Redacted]
  - Mobile Number: [Redacted]
  - Pager Number: [Redacted]
  - Mail ID: ryan.kwanten@ajcollab.com
  - Manager User ID: [Redacted]
  - Department: [Redacted]
  - User Locale: < None >
  - Associated PC/Site Code: [Redacted]
  - Digest Credentials: [Redacted]
  - Confirm Digest Credentials: [Redacted]
  - User Profile: Use System Default ("Standard (Factory Default) User Profile")
  - User Rank\*: 1-Default User Rank
- Service Settings:**
  - ☐ Home Cluster
  - ☐ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)

- Each directory URI will be attached to a DN in CUCM, this mapping is done on the Primary Extension field of End User configuration
- Primary extension must be configured, since this will map URI to the respective DN

The image displays two side-by-side screenshots of the Cisco Unified CM Administration interface, specifically the 'End User Configuration' page. Both screenshots show the configuration for a user, with the left one for 'CSFJASEEM' and the right one for 'SEP84B517AF4C43'. Red arrows highlight the 'Primary Extension' field in the 'Directory Number Associations' section, which is set to '11002 in BANGALORE-INTERNAL-PT' on the left and '31001 in MELBOURNE-INTERNAL-PT' on the right.

**End User Configuration - Left Screenshot (User: CSFJASEEM)**

- Device Information:**
  - Controlled Devices: CSFJASEEM, SEP08CC6831D463 (highlighted with a red arrow)
  - Available Profiles: (empty)
  - CTI Controlled Device Profiles: (empty)
- Extension Mobility:**
  - Available Profiles: (empty)
  - Controlled Profiles: (empty)
  - Default Profile: -- Not Selected --
  - BLF Presence Group\*: Standard Presence group
  - SUBSCRIBE Calling Search Space: < None >
  - ☒ Allow Control of Device from CTI
  - ☐ Enable Extension Mobility Cross Cluster
- Directory Number Associations:**
  - Primary Extension: 11002 in BANGALORE-INTERNAL-PT (highlighted with a red arrow)
- Mobility Information:**
  - ☐ Enable Mobility
  - ☐ Enable Mobile Voice Access
  - Maximum Wait Time for Desk Pickup\*: 10000
  - Remote Destination Limit\*: 4

**End User Configuration - Right Screenshot (User: SEP84B517AF4C43)**

- Device Information:**
  - Controlled Devices: SEP84B517AF4C43 (highlighted with a red arrow)
  - Available Profiles: (empty)
  - CTI Controlled Device Profiles: (empty)
- Extension Mobility:**
  - Available Profiles: (empty)
  - Controlled Profiles: (empty)
  - Default Profile: -- Not Selected --
  - BLF Presence Group\*: Standard Presence group
  - SUBSCRIBE Calling Search Space: < None >
  - ☒ Allow Control of Device from CTI
  - ☐ Enable Extension Mobility Cross Cluster
- Directory Number Associations:**
  - Primary Extension: 31001 in MELBOURNE-INTERNAL-PT (highlighted with a red arrow)
- Mobility Information:**
  - ☐ Enable Mobility
  - ☐ Enable Mobile Voice Access
  - Maximum Wait Time for Desk Pickup\*: 10000

Cisco Unified CM Administration
For Cisco Unified Communications Solutions
admin
Search Documentation
About
Logout
System
Call Routing
Media Resources
Advanced Features
Device
Application
User Management
Bulk Administration
Directory Number Configuration
Related Links: Configure Device (SEP08CC6831D463)
Go
Save
Delete
Reset
Apply Config
Add New
BLR-Cluster

### Directory Number Information

Directory Number\* 11002 ☐ Urgent Priority

Route Partition BANGALORE-INTERNAL-PT

Description 11002 - Abdul Jaseem

Alerting Name 11002 - Abdul Jaseem

ASCII Alerting Name 11002 - Abdul Jaseem

External Call Control Profile <None>

☒ Allow Control of Device from CTI

Associated Devices CIPC-JASEEM  
CIPC-JASEEM2  
CSFJASEEM  
SEP08CC6831D463

[Edit Device](#)

[Edit Line Appearance](#)

Dissociate Devices

### Directory Number Settings

Voice Mail Profile CUC-VM-PROFILE (Choose <None> to use system default)

Calling Search Space <None>

BLF Presence Group\* Standard Presence group

User Hold MOH Audio Source <None>

Network Hold MOH Audio Source <None>

Auto Answer\* Auto Answer Off

☐ Reject Anonymous Calls

### Enterprise Alternate Number

[Add Enterprise Alternate Number](#)

### +E.164 Alternate Number

[Add +E.164 Alternate Number](#)

### Directory URIs

| Primary                             | URI                       | Partition     |
|-------------------------------------|---------------------------|---------------|
| <input checked="" type="checkbox"/> | abdul.jaseem@ajcollab.com | Directory URI |
| <input type="checkbox"/>            |                           | <None>        |

[Add Row](#)

### PSDN Failover for Enterprise Alternate Number, +E.164 Alternate Number, and URI Dialing

Advertised Failover Number <None>

### AAR Settings

| Voice Mail               | AAR Destination Mask | AAR Group |
|--------------------------|----------------------|-----------|
| <input type="checkbox"/> |                      | <None>    |

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AUS-Cluster

### Directory Number Information

Directory Number\* 31001 ☐ Urgent Priority

Route Partition MELBOURNE-INTERNAL-PT

Description 31001 - Ryan Kwanten

Alerting Name 31001 - Ryan Kwanten

ASCII Alerting Name 31001 - Ryan Kwanten

External Call Control Profile <None>

☒ Allow Control of Device from CTI

Associated Devices SEP84B517AF4C43

[Edit Device](#)

[Edit Line Appearance](#)

Dissociate Devices

### Directory Number Settings

Voice Mail Profile <None> (Choose <None> to use system default)

Calling Search Space <None>

BLF Presence Group\* Standard Presence group

User Hold MOH Audio Source <None>

Network Hold MOH Audio Source <None>

Auto Answer\* Auto Answer Off

☐ Reject Anonymous Calls

### Enterprise Alternate Number

[Add Enterprise Alternate Number](#)

### +E.164 Alternate Number

[Add +E.164 Alternate Number](#)

### Directory URIs

| Primary                             | URI                       | Partition     |
|-------------------------------------|---------------------------|---------------|
| <input checked="" type="checkbox"/> | ryan.kwanten@ajcollab.com | Directory URI |
| <input type="checkbox"/>            |                           | <None>        |

[Add Row](#)

### PSDN Failover for Enterprise Alternate Number, +E.164 Alternate Number, and URI Dialing

Advertised Failover Number <None>

### AAR Settings

| Voice Mail               | AAR Destination Mask | AAR Group |
|--------------------------|----------------------|-----------|
| <input type="checkbox"/> |                      | <None>    |

## Step 5: Verify the Learned Directory URIs

Go to Call Routing > Global Dial Plan Replication > Learned Directory URIs

The image displays three screenshots of the Cisco Unified CM Administration interface, specifically the 'Find and List Learned Directory URIs' page. Each screenshot shows a table of learned directory URIs for a specific cluster.

**BLR Cluster:** Shows 1 record found. The table has columns: Directory URI, Cluster ID, and Route String. The record is: [ryan.kwan@ajcollab.com](mailto:ryan.kwan@ajcollab.com), AUS-CLUSTER, aus-cum-pub.ajcollab.com. A red arrow points to the record with the text 'Learned from from AUS Cluster via HUB'.

**SME:** Shows 3 records found. The table has columns: Directory URI, Cluster ID, and Route String. The records are: [abdul.jassem@ajcollab.com](mailto:abdul.jassem@ajcollab.com), BLR-CLUSTER, cum-pub.ajcollab.com; [hrthik.raghav@ajcollab.com](mailto:hrthik.raghav@ajcollab.com), BLR-CLUSTER, cum-pub.ajcollab.com; and [ryan.kwan@ajcollab.com](mailto:ryan.kwan@ajcollab.com), AUS-CLUSTER, aus-cum-pub.ajcollab.com. A green arrow points to the first two records with the text 'Learned from AUS Cluster'. A red arrow points to the third record with the text 'Learned from BLR Cluster'.

**AUS-Cluster:** Shows 2 records found. The table has columns: Directory URI, Cluster ID, and Route String. The records are: [abdul.jassem@ajcollab.com](mailto:abdul.jassem@ajcollab.com), BLR-CLUSTER, cum-pub.ajcollab.com; and [hrthik.raghav@ajcollab.com](mailto:hrthik.raghav@ajcollab.com), BLR-CLUSTER, cum-pub.ajcollab.com. A red arrow points to the records with the text 'Learned from BLR Cluster via HUB'.

## Step 6: SIP Trunk between Clusters

- Any of the URI learned via ILS will be having 2 unique values. One is the **Route String** and another one is **Cluster ID**. Route String is used to route the call back to the respective cluster via a separate SIP trunk
- ILS will only take care of advertising the URIs between clusters. They do not participate in call routing. For dialing the URI from one cluster to another, we need to have a separate SIP trunk
- We have already configured the SIP Trunk between BLR, SME and AUS Clusters for regular dialing, we just need to add URI dialing to the respective SIP trunks

The image displays three side-by-side screenshots of the Cisco Unified CM Administration web interface, specifically the 'Find and List Trunks' page. Each screenshot shows a table of SIP trunks for a different cluster: BLR Cluster, SME, and AUS Cluster.

**BLR Cluster (1 record found):**

| Name              | Description       | Calling Search Space | Device Pool       | Route Pattern     | Partition         | Route Group       | Priority | Trunk Type | SIP Trunk Status |
|-------------------|-------------------|----------------------|-------------------|-------------------|-------------------|-------------------|----------|------------|------------------|
| BLR-SME-SIP-TRUNK | BLR-SME-SIP-TRUNK | BLR-SME-SIP-TRUNK    | BLR-SME-SIP-TRUNK | BLR-SME-SIP-TRUNK | BLR-SME-SIP-TRUNK | BLR-SME-SIP-TRUNK | 1        | SIP Trunk  | Full Service     |

**SME (2 records found):**

| Name              | Description       | Calling Search Space | Device Pool       | Route Pattern     | Partition         | Route Group       | Priority | Trunk Type | SIP Trunk Status |
|-------------------|-------------------|----------------------|-------------------|-------------------|-------------------|-------------------|----------|------------|------------------|
| SME-SME-SIP-TRUNK | SME-SME-SIP-TRUNK | SME-SME-SIP-TRUNK    | SME-SME-SIP-TRUNK | SME-SME-SIP-TRUNK | SME-SME-SIP-TRUNK | SME-SME-SIP-TRUNK | 1        | SIP Trunk  | Full Service     |
| SME-MEL-SIP-TRUNK | SME-MEL-SIP-TRUNK | SME-MEL-SIP-TRUNK    | SME-MEL-SIP-TRUNK | SME-MEL-SIP-TRUNK | SME-MEL-SIP-TRUNK | SME-MEL-SIP-TRUNK | 1        | SIP Trunk  | Full Service     |

**AUS Cluster (1 record found):**

| Name              | Description       | Calling Search Space | Device Pool       | Route Pattern     | Partition         | Route Group       | Priority | Trunk Type | SIP Trunk Status |
|-------------------|-------------------|----------------------|-------------------|-------------------|-------------------|-------------------|----------|------------|------------------|
| MEL-SME-SIP-TRUNK | MEL-SME-SIP-TRUNK | MEL-SME-SIP-TRUNK    | MEL-SME-SIP-TRUNK | MEL-SME-SIP-TRUNK | MEL-SME-SIP-TRUNK | MEL-SME-SIP-TRUNK | 1        | SIP Trunk  | Full Service     |



- By default, all the URIs will be assigned with 'Directory URI' partition. Hence you must have a CSS with Directory URI partition that is assigned as Inbound CSS at the SIP Trunks

The following table summarizes the 'Route Partitions for this Calling Search Space' configuration for each cluster:

| Cluster     | Available Partitions                                                                                                                                    | Selected Partitions                                     |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| BLR Cluster | BANGALORE-DID-CALLING-TRANSFORMATION-PT, BANGALORE-NATIONAL-PT, BANGALORE-SHORT-DIAL-PT, Global Learned E164 Numbers, Global Learned Enterprise Numbers | BANGALORE-INTERNAL-PT, TEXAS-INTERNAL-PT, Directory URI |
| SME         | BANGALORE-PT, Global Learned E164 Numbers, Global Learned E164 Patterns, Global Learned Enterprise Numbers, Global Learned Enterprise Patterns          | MELBOURNE-PT, Directory URI                             |
| AUS Cluster | Global Learned E164 Numbers, Global Learned E164 Patterns, Global Learned Enterprise Numbers, Global Learned Enterprise Patterns, SME-PT                | MELBOURNE-INTERNAL-PT, Directory URI                    |

The following table summarizes the 'Inbound Calls' configuration for each cluster:

| Cluster     | Available Partitions                                                                                                             | Selected Partitions                  |
|-------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| BLR Cluster | Global Learned E164 Numbers, Global Learned E164 Patterns, Global Learned Enterprise Numbers, Global Learned Enterprise Patterns | BANGALORE-PT, Directory URI          |
| SME         | Global Learned E164 Numbers, Global Learned E164 Patterns, Global Learned Enterprise Numbers, Global Learned Enterprise Patterns | MELBOURNE-PT, Directory URI          |
| AUS Cluster | Global Learned E164 Numbers, Global Learned E164 Patterns, Global Learned Enterprise Numbers, Global Learned Enterprise Patterns | MELBOURNE-INTERNAL-PT, Directory URI |

## Step 7: Configure SIP Route Pattern

The Advertise String of other ILS node will be the SIP Route Pattern.

Go to Call Routing > SIP Route Pattern > Add New and Point the SIP Trunk.

The image displays three screenshots of the Cisco Unified CM Administration interface, specifically the SIP Route Pattern Configuration page. Each screenshot shows a different cluster configuration:

- BLR Cluster:** The SIP Trunk/Route List is set to BLR-SME-SIP-TRUNK-RL. The Route String of AUS Cluster is highlighted in red.
- SME:** The SIP Trunk/Route List is set to SME-MEL-SIP-TRUNK-RL. The Route String of AUS Cluster is highlighted in red.
- AUS Cluster:** The SIP Trunk/Route List is set to MEL-SME-SIP-TRUNK-RL. The Route String of BLR Cluster is highlighted in red.

Each configuration includes fields for Pattern Definition (Pattern Usage, IPv4 Pattern, IPv6 Pattern, Description, Route Partition, SIP Trunk/Route List, Block Pattern), Calling Party Transformations (Use Calling Party's External Phone Mask, Calling Party Transformation Mask, Prefix Digits, Calling Line ID Presentation, Calling Line Name Presentation), and Connected Party Transformations (Connected Line ID Presentation, Connected Line Name Presentation). A Save button is present at the bottom of each configuration.

The image displays two side-by-side screenshots of the Cisco Unified CM Administration web interface, specifically the Phone Configuration page. Both screenshots show the same navigation menu at the top, including System, Call Routing, Media Resources, Advanced Features, Device, Application, and User Management.

**Left Screenshot (BLR Cluster):**

- Status:** Ready
- Association:** A list of 26 items. Item 3, "Add a new SD" with email "ryan.kwanten@ajcollab.com", is highlighted with a red box.
- Phone Type:** Product Type: Cisco 9971, Device Protocol: SIP.
- Real-time Device Status:** Registration: Registered with Cisco, IPv4 Address: 192.168.128.1, Active Load ID: sip9971.9-4-2SR2-2, Inactive Load ID: sip9971.9-4-2SR4-1, Download Status: None.
- Device Information:** Device is Active, Device is trusted, MAC Address: 08CC6831D46, Description: 11002 - Abdul, Device Pool: BANGALORE-PK, Common Device Configuration: <None>, Phone Button Template: Standard 9971, Softkey Template: Standard User, Common Phone Profile: Standard Comr, Calling Search Space: BANGALORE-PK, AAR Calling Search Space: <None>, Media Resource Group List: <None>, User Hold MOH Audio Source: <None>, Network Hold MOH Audio Source: <None>, Location: Hub\_None, AAR Group: <None>, User Locale: <None>, Network Locale: <None>, Built In Bridge: Default, Privacy: Default, Device Mobility Mode: Default.

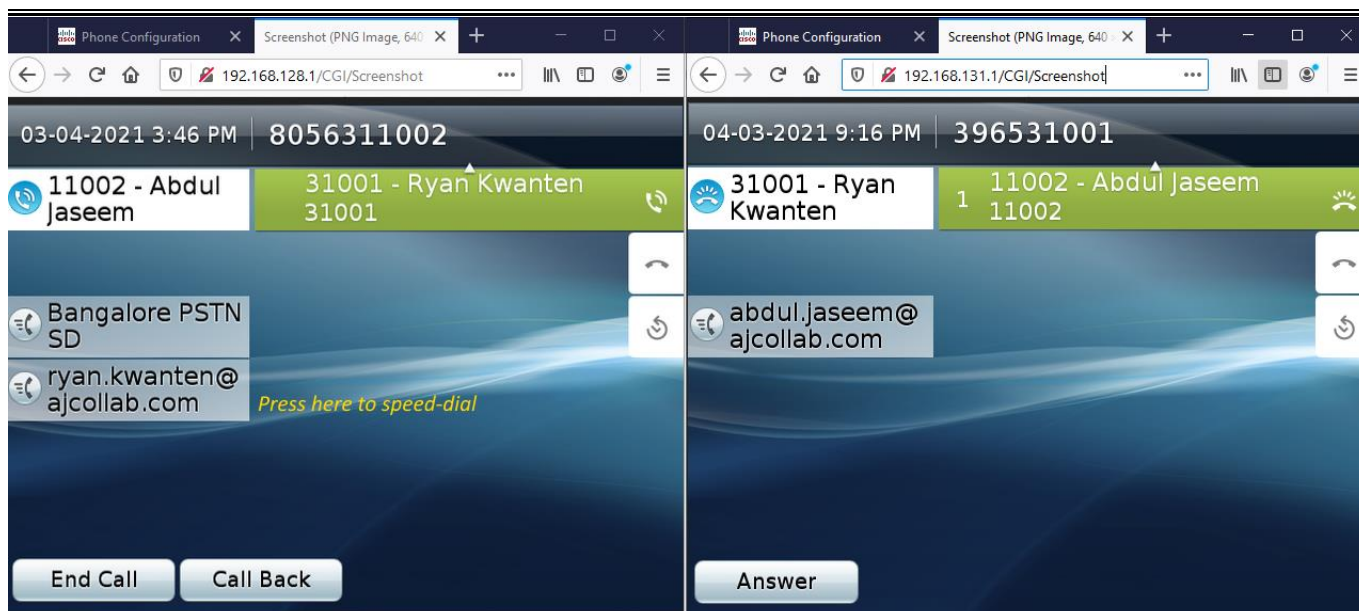
**Right Screenshot (AUS Cluster):**

- Status:** Ready
- Association:** A list of 26 items. Item 3, "Add a new SD" with email "abdul.jaseem@ajcollab.com", is highlighted with a red box.
- Phone Type:** Product Type: Cisco 9971, Device Protocol: SIP.
- Real-time Device Status:** Registration: Registered with Cisco U, IPv4 Address: 192.168.131.1, Active Load ID: sip9971.9-4-2SR2-2, Inactive Load ID: sip9971.9-4-2SR4-1, Download Status: None.
- Device Information:** Device is Active, Device is trusted, MAC Address: 84B517AF4C43, Description: 31001 - Ryan K, Device Pool: MELBOURNE-PK, Common Device Configuration: <None>, Phone Button Template: Standard 9971, Softkey Template: <None>, Common Phone Profile: Standard Comr, Calling Search Space: MELBOURNE-PK, AAR Calling Search Space: <None>, Media Resource Group List: <None>, User Hold MOH Audio Source: <None>, Network Hold MOH Audio Source: <None>, Location: Hub\_None, AAR Group: <None>, User Locale: <None>, Network Locale: <None>, Built In Bridge: Default, Privacy: Default, Device Mobility Mode: Default.

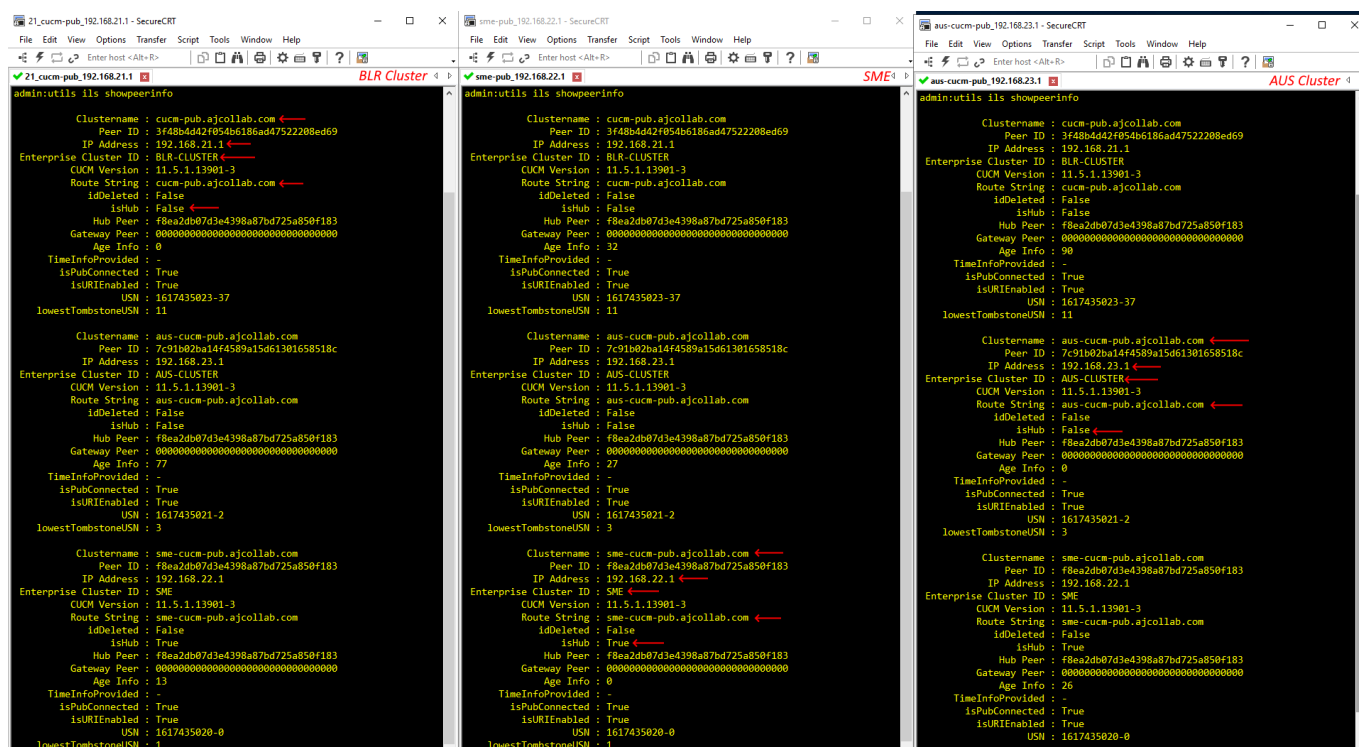
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- ***utils ils showpeerinfo*** CLI command will give a summary of ILS Network. This can be handy while troubleshooting ILS



- ILS can be configured with TLS Authentication as well, for that we need to configure proper Tomcat Certificates in all the clusters, recommended to have CA Signed Multi SAN Certificates. While signing the certificate, please make sure the Common Name must match CUCM PUB FQDN (while generating Multi SAN CSR, there will be an '-m' added to the common name, this has to be removed manually before generating CSR)
- Detailed documentation of Certificate based ILS is explained here - CUCM Inter Cluster Lookup Service

## [Lab] Global Pattern Replication

- In our SME implementation, we have manually created route patterns 310XX and [21]10XX to route the call to SME and eventually from SME to respective leaf clusters
- It requires log of configuration overhead and effort, we can achieve this using Advertise Pattern in Global Dial plan Replication
- on Bangalore cluster we create [12]10XX pattern and advertise over ILS and in Melbourne cluster we create 310XX pattern and advertise over ILS
- Respective patterns will be advertised over SME HUB cluster along with its own Route String

Call Routing >> Global Plan replication >> Advertised Patterns >> Add

The screenshots illustrate the process of configuring and replicating advertised patterns in Cisco Unified CM Administration.

**Advertised Pattern Configuration (BLR Cluster):** The first screenshot shows the configuration for the BLR Cluster. The status is 'Ready'. The description is 'BANGALORE-CLUSTER-EXTENSIONS-PATTERN'. The advertised pattern is '[12]10XX', which is an Enterprise Number Pattern. The 'Dont use PSTN Follower' option is selected.

**Advertised Pattern Configuration (AUS Cluster):** The second screenshot shows the configuration for the AUS Cluster. The status is 'Ready'. The description is 'MELBOURNE-CLUSTER-EXTENSIONS-PATTERN'. The advertised pattern is '310XX', which is an Enterprise Number Pattern. The 'Dont use PSTN Follower' option is selected.

**Find and List Learned Patterns (BLR Cluster):** The third screenshot shows the 'Find and List Learned Patterns' page for the BLR Cluster. It displays one record found. The learned pattern is '310XX', which is an Enterprise Pattern. The partition is 'Global Learned Enterprise Patterns'. The cluster ID is 'mel-cucm-cluster' and the route string is 'mel-cucm-pub.ajcollab.com'.

**Find and List Learned Patterns (AUS Cluster):** The fourth screenshot shows the 'Find and List Learned Patterns' page for the AUS Cluster. It displays one record found. The learned pattern is '[12]10XX', which is an Enterprise Pattern. The partition is 'Global Learned Enterprise Patterns'. The cluster ID is 'blr-cucm-cluster' and the route string is 'blr-cucm-pub.ajcollab.com'.

**Learned Object (BLR Cluster):** The fifth screenshot shows the 'Learned Object' page for the BLR Cluster. The status is 'Ready'. The object contents table shows the attribute 'Enterprise Pattern' with the value '310XX' and the partition 'Global Learned Enterprise Patterns'. The 'Use PSTN Follower' attribute is set to 'False'. The intercluster replication table shows the attribute 'Advertised by Cluster' with the value 'mel-cucm-cluster' and the attribute 'Route String' with the value 'mel-cucm-pub.ajcollab.com'. The 'Update Sequence Number (USN)' is 3.

**Learned Object (AUS Cluster):** The sixth screenshot shows the 'Learned Object' page for the AUS Cluster. The status is 'Ready'. The object contents table shows the attribute 'Enterprise Pattern' with the value '[12]10XX' and the partition 'Global Learned Enterprise Patterns'. The 'Use PSTN Follower' attribute is set to 'False'. The intercluster replication table shows the attribute 'Advertised by Cluster' with the value 'blr-cucm-cluster' and the attribute 'Route String' with the value 'blr-cucm-pub.ajcollab.com'. The 'Update Sequence Number (USN)' is 9.



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## Media Resources

- Media Resources are Software or Hardware that support the media processing functions and features of VoIP network, CUCM itself plays most of these roles
- **Voice Termination:** Converting an audio into IP packet and vice versa. TDM legs must be terminated by hardware that performs coding/decoding and Packetizing of audio. This is performed by DSPs in the Gateway router. This is applicable to H.323 or MGCP Gateways
- Software based Media Resources are offered by CUCM Nodes where we Enable IP Voice Media Streaming App - IPVMS service. Annunciator, MoH, Software CFB and Software MTP are activated with the IPVMS Service. After Enabling IPVMS, it recommended to put them in a dedicated region and device pool
- Hardware Media Resources are configured as SCCP endpoints in CUCM. The endpoint will be the DSP chips inside CUBE or Voice Gateway Router. Hardware CFB, Hardware MTP and XCODE are comes under this category

### Software Only Media Resources

- **Annunciator (ANN):** Provides spoken messages (“The call cannot be completed as dialed...” ) and various tones (Ring Back, Fast Busy, etc.). Uses SCCP Signaling to get register to CUCM and alays establish one-way RTP stream
- **Music On Hold (MOH):** Provide music to the caller when their call is placed on Hold, Parked or during consultant transfer

### Software or Hardware Media Resources

- **Conference Bridge (CFB):** Mixing of multiple audio stream together and provide a single stream for conference. Software conference bridge supports only G.711 call legs whereas Hardware Conference bridge supports any codec that is configured
- **Media Termination Point (MTP):** DTMF Internetworking between call legs (RFC 2833 to OOB). Software MTP supports only G.711 call leg DTMF internetworking whereas Hardware MTP supports any codec that is configured

### Hardware Only Media Resources

- **Transcoder (XCODE):** Convert one Codec to another Codec. There are two types, Regular and Universal. Regular XCODE switch between G.711 to any other codec (G.711 to G.729), one leg has to be G.711 whereas Universal XCODE switch any codec to any codec (G.729 to iLBC)
-

## [Lab] Software Media Resource Activation

- Software media resources are provided by CUCM Nodes where we activate IPVMS (IP Voice Media Streaming App) Service
- In large enterprise production deployments, we can dedicate one CUCM Node just for IPVMS Service, in my Lab, I have activated on CUCM-PUB

The screenshot shows the Cisco Unified Serviceability web interface. The browser address bar displays the URL: `https://192.168.21.1/ccmservice/serviceactivation.jsp?htxtNodeID=3f...`. The page title is "Cisco Unified Serviceability For Cisco Unified Communications Solutions". The navigation bar includes "admin", "About", and "Logout". The "Service Activation" section is active, with a "Related Links" dropdown set to "Control Center - Feature Services".

**Status:**  
Ready

**Select Server**  
Server\*: `cucm-pub.ajcollab.com--CUCM Voice/Video` Go  
☐ Check All Services

**CM Services**

|                                     | Service Name                              | Activation Status |
|-------------------------------------|-------------------------------------------|-------------------|
| <input type="checkbox"/>            | Cisco CallManager                         | Deactivated       |
| <input type="checkbox"/>            | Cisco Unified Mobile Voice Access Service | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco IP Voice Media Streaming App        | Activated         |
| <input type="checkbox"/>            | Cisco CTIManager                          | Deactivated       |
| <input type="checkbox"/>            | Cisco Extension Mobility                  | Deactivated       |
| <input type="checkbox"/>            | Cisco Extended Functions                  | Deactivated       |
| <input type="checkbox"/>            | Cisco DHCP Monitor Service                | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco Intercluster Lookup Service         | Activated         |
| <input type="checkbox"/>            | Cisco Location Bandwidth Manager          | Deactivated       |
| <input type="checkbox"/>            | Cisco Directory Number Alias Sync         | Deactivated       |
| <input type="checkbox"/>            | Cisco Directory Number Alias Lookup       | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco Dialed Number Analyzer Server       | Activated         |
| <input checked="" type="checkbox"/> | Cisco Dialed Number Analyzer              | Activated         |
| <input checked="" type="checkbox"/> | Cisco Tftp                                | Activated         |

**CTI Services**

|                          | Service Name                | Activation Status |
|--------------------------|-----------------------------|-------------------|
| <input type="checkbox"/> | Cisco IP Manager Assistant  | Deactivated       |
| <input type="checkbox"/> | Cisco WebDialer Web Service | Deactivated       |
| <input type="checkbox"/> | Self Provisioning IVR       | Deactivated       |

**CDR Services**

|                          | Service Name                     | Activation Status |
|--------------------------|----------------------------------|-------------------|
| <input type="checkbox"/> | Cisco SOAP - CDRonDemand Service | Deactivated       |
| <input type="checkbox"/> | Cisco CAR Web Service            | Deactivated       |

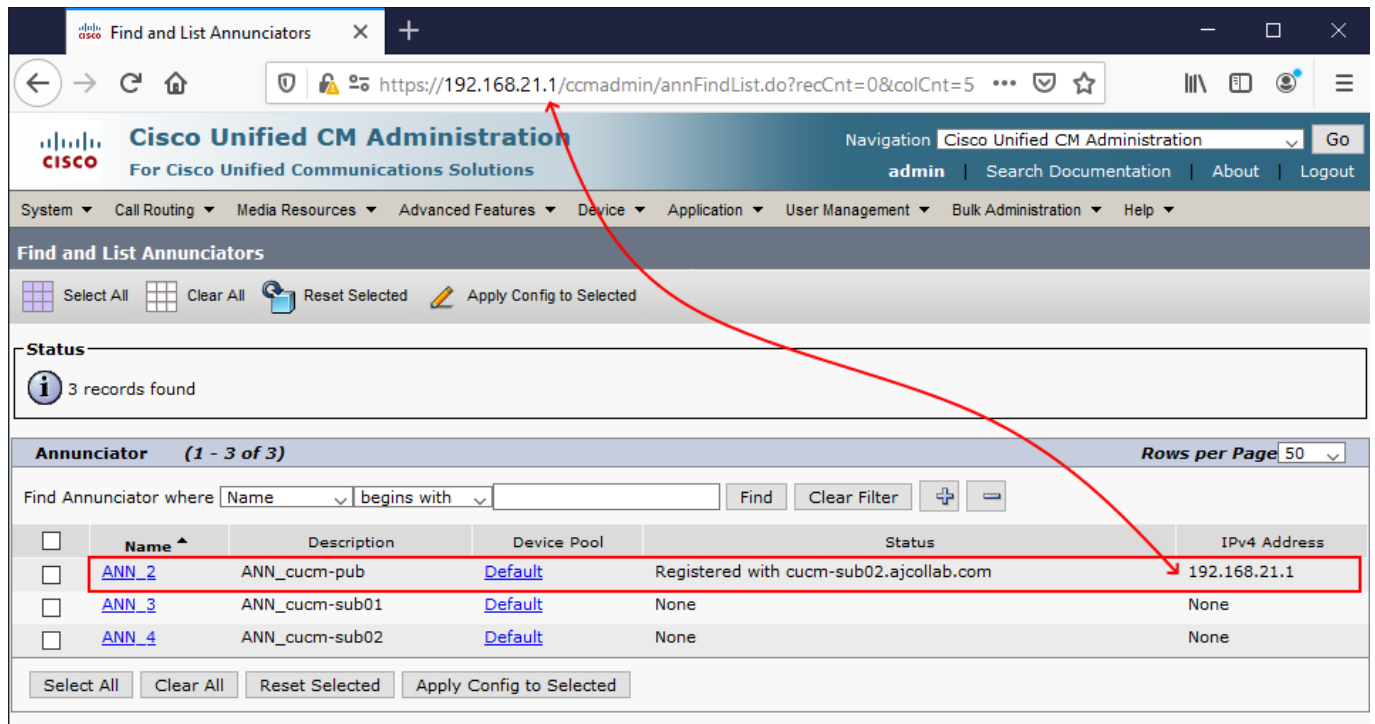
**Database and Admin Services**

|                          | Service Name                    | Activation Status |
|--------------------------|---------------------------------|-------------------|
| <input type="checkbox"/> | Cisco Bulk Provisioning Service | Deactivated       |



## [Lab] Annunciator Configuration

Go to Media Resources >> Annunciator >> Find



The screenshot shows the 'Find and List Annunciators' page in the Cisco Unified CM Administration interface. The page displays a table of 3 annunciators. The first row, 'ANN\_2', is highlighted with a red box and has a red arrow pointing to its IP address, 192.168.21.1. The other two rows, 'ANN\_3' and 'ANN\_4', have a status of 'None'.

| Name  | Description    | Device Pool | Status                                  | IPv4 Address |
|-------|----------------|-------------|-----------------------------------------|--------------|
| ANN_2 | ANN_cucm-pub   | Default     | Registered with cucm-sub02.ajcollab.com | 192.168.21.1 |
| ANN_3 | ANN_cucm-sub01 | Default     | None                                    | None         |
| ANN_4 | ANN_cucm-sub02 | Default     | None                                    | None         |

- We could see 3 Annunciators there and one is registered, and it has IP Address of 192.168.21.1 (CUCM-PUB)
- Since we have activated IPVM only on CUCM-PUB, that is registered, and others are 'None' state
- Even after enabling IPVMS if you see the status of Annunciator is 'None', make sure in the Device Pool of Annunciator has a valid CUCM Subscriber with Cisco CallManager Service running
- In my case, the default device pool has default CUCM Group and it has one subscriber and hence it shows registered
- It is recommended to keep the media resources in separate Device Pool (and Region) so that we can control the codec relations
- I have created MEDIA-RES-REGION and MED-RES-DP to accomplish this
- Also, set the MED-RES-REGION to all other region as G.711 Codec. This is important as otherwise you may face media resource allocation failures

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Navigation: Cisco Unified CM Administration | admin | Search Documentation | About | Logout

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### Region Configuration

Related Links: Back To Find/List ▾ Go

Save ✖ Delete ⌂ Reset 🖋️ Apply Config ➕ Add New

---

**Status**

- Update successful
- Click on the Reset button to have the changes take effect.

---

**Region Information**

Name \* MED-RES-REGION

---

**Region Relationships**

| Region                      | Audio Codec Preference List                   | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|-----------------------------|-----------------------------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| AIRTEL-SIP-TRUNK-REGION     | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| BANGALORE-PHONES-REGION     | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| BLR-SME-SIP-TRUNK-REGION    | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| CUC-SIP-TRUNK-REGION        | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| Default                     | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| NOTE: Regions not displayed | Use System Default                            | Use System Default     | Use System Default                       | Use System Default                                 |

---

**Modify Relationship to other Regions**

| Regions                                                                                                                  | Audio Codec Preference List | Maximum Audio Bit Rate                                                                        | Maximum Session Bit Rate for Video Calls                                                                                                                            | Maximum Session Bit Rate for Immersive Video Calls                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AIRTEL-SIP-TRUNK-REGION<br>BANGALORE-PHONES-REGION<br>BLR-SME-SIP-TRUNK-REGION<br>CUC-SIP-TRUNK-REGION<br><b>Default</b> | Keep Current Setting ▾      | <input checked="" type="radio"/> 64 kbps (G.722, G.711) ▾<br><input type="radio"/> _____ kbps | <input checked="" type="radio"/> Keep Current Setting<br><input type="radio"/> Use System Default<br><input type="radio"/> None<br><input type="radio"/> _____ kbps | <input checked="" type="radio"/> Keep Current Setting<br><input type="radio"/> Use System Default<br><input type="radio"/> None<br><input type="radio"/> _____ kbps |

Save Delete Reset Apply Config Add New

\* indicates required item.

Device Pool Configuration

Device Pool Configuration58.21.1/ccmadmin/devicePoolEdit.do?key=00662d1c-3e...

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Device Pool Configuration

Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**  
Add successful  
Click on the Reset button to have the changes take effect.

**Device Pool Information**  
Device Pool: MED-RES-DP (0 members\*\*)

**Device Pool Settings**  
Device Pool Name\* MED-RES-DP  
Cisco Unified Communications Manager Group\* SUB01-SUB02-CUCM-GROUP  
Calling Search Space for Auto-registration < None >  
Adjunct CSS < None >  
Reverted Call Focus Priority Default  
Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**  
Date/Time Group\* IST-DATE-TIME-GROUP  
Region\* MED-RES-REGION  
Media Resource Group List < None >  
Location < None >  
Network Locale < None >  
SRST Reference\* Disable  
Connection Monitor Duration\*\*\*  
Single Button Barge\* Default  
Join Across Lines\* Default  
Physical Location < None >  
Device Mobility Group < None >  
Wireless LAN Profile Group < None > [View Details](#)


**Local Route Group Settings**  
Standard Local Route Group < None >

**Device Mobility Related Information\*\*\*\***  
Device Mobility Calling Search Space < None >  
AAR Calling Search Space < None >  
AAR Group < None >  
Calling Party Transformation CSS < None >  
Called Party Transformation CSS < None >

**Geolocation Configuration**  
Geolocation < None >

Annunciator Configuration

https://192.168.21.1/ccmadmin/annEdit.do?key=e068f31d-df8c-43b...

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admin | Search Documentation | About | Logout


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Annunciator Configuration

Related Links: Back To Find/List Go

Save Reset Apply Config

Status

 Update successful

Annunciator Information

Registration: Registered with Cisco Unified Communications Manager cucm-sub02.ajcollab.com

IPv4 Address: 192.168.21.1

☒ Device is trusted

Server\* cucm-pub.ajcollab.com

Name\* ANN\_2

Description ANN\_cucm-pub

Device Pool\* MED-RES-DP

Location\* Hub\_None

Use Trusted Relay Point\* Off

Save Reset Apply Config

---

## [Lab] Media Resource Access Control

- Media Resources are distributed to Phones, Trunks, and other devices via Media Resource Group (MRG) and Media Resource Group List (MRGL)
- All media resources are in a NULL media resource group by default and every device will be able to access it
- When you place the media resource inside and MRG, it can be access only for those devices who is having access to specific MRGL where the MRG and Resource is a part of

Go to Media Resources >> Media Resource Group >> Add New

The screenshot shows the Cisco Unified CM Administration interface for Media Resource Group Configuration. The page title is "Media Resource Group Configuration" and the navigation path is "Media Resources > Media Resource Group > Add New". The status bar indicates "Add successful". The "Media Resource Group Status" section shows "Media Resource Group: SOFTWARE-MED-RES-GROUP (used by 0 devices)". The "Media Resource Group Information" section shows the "Name" as "SOFTWARE-MED-RES-GROUP" and the "Description" as "SOFTWARE-MED-RES-GROUP". The "Devices for this Group" section shows a list of "Available Media Resources" (ANN\_3, ANN\_4, CFB\_2, CFB\_3, CFB\_4) and a "Selected Media Resources" list containing "ANN\_2 (ANN)". A checkbox for "Use Multi-cast for MOH Audio" is present at the bottom.

Go to Media Resources >> Media Resource Group List >> Add New

**Media Resource Group List Configuration**

Navigation: Cisco Unified CM Administration | admin | Search Documentation | About | Logout

System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help

Media Resource Group List Configuration | Related Links: Back To Find/List | Go

Save X Delete Copy + Add New

**Status**  
Add successful

**Media Resource Group List Status**  
Media Resource Group List: SOFTWARE-MED-RES-GROUP-LIST (used by 0 devices)

**Media Resource Group List Information**  
Name\* SOFTWARE-MED-RES-GROUP-LIST

**Media Resource Groups for this List**  
Available Media Resource Groups  
Selected Media Resource Groups: SOFTWARE-MED-RES-GROUP

Save Delete Copy Add New

- Media Resource Group List applied to the Device Level or Device Pool Level
- MRGL in Device Pool Level serves everything that falls in the device pool

**Phone Configuration**

Navigation: Cisco Unified CM Administration | admin | Search Documentation | About | Logout

System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help

Phone Configuration | Related Links: Back To Find/List | Go

Save X Delete Copy Reset Apply Config + Add New

**Status**  
Update successful

**Association**  
1 Line [1] - 11002 in BANGALORE-INTERNAL-PT  
2 Line [2] - Add a new DN  
3 98044260389  
4 ryan.kwanten@ajcollab.com  
5 Add a new SD  
6 Add a new SD  
----- Unassigned Associated Items -----  
7 Add a new SD  
8 All Calls  
9 Add a new BLF Directed Call Park  
10 Call Park  
11 Call Pickup  
12 CallBack  
13 Group Call Pickup  
14 Hunt Group Logout  
15 Intercom [1] - Add a new Intercom  
16 Malicious Call Identification  
17 Meet Me Conference  
18 Mobility  
19 Other Pickup  
20 Quality Reporting Tool  
21 Redial  
22 Add a new SuRL  
23 Add a new BLF SD  
24 Answer Oldest  
25 Do Not Disturb  
26 Services  
27 Record

**Phone Type**  
Product Type: Cisco 9971  
Device Protocol: SIP

**Real-time Device Status**  
Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcollab.c  
IPv4 Address: 192.168.128.1  
Active Load ID: sip9971.9-4-2SR2-2  
Inactive Load ID: sip9971.9-4-2SR4-1  
Download Status: None

**Device Information**  
☒ Device is Active  
☒ Device is trusted  
 MAC Address\* 08CC6831D463  
 Description 11002 - Abdul Jaseem  
 Device Pool\* BANGALORE-PHONES-DEVICE-POOL View Details  
 Common Device Configuration < None > View Details  
 Phone Button Template\* Standard 9971 SIP  
 Softkey Template Standard User  
 Common Phone Profile\* Standard Common Phone Profile View Details  
 Calling Search Space BANGALORE-PHONE-CSS  
 AAR Calling Search Space < None >  
 Media Resource Group List SOFTWARE-MED-RES-GROUP-LIST  
 User Hold MOH Audio < None >  
 Source < None >  
 Network Hold MOH Audio < None >  
 Location\* Hub\_None  
 AAR Group < None >  
 User Locale < None >  
 Network Locale < None >  
 Built In Bridge\* Default  
 Privacy\* Default  
 Device Mobility Mode\* Default View Current  
 Owner User < Anonymous (Public/Shared Space) >  
 Owner User ID\* abdul.jaseem

Device Pool Configuration

https://192.168.21.1/ccmadmin/devicePoolEdit.do?key=e2a777df-40...

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

**Device Pool Configuration** Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**

- Update successful
- Click on the Reset button to have the changes take effect.

**Device Pool Information**

Device Pool: BANGALORE-PHONES-DEVICE-POOL (8 members\*\*)

**Device Pool Settings**

Device Pool Name\* BANGALORE-PHONES-DEVICE-POOL

Cisco Unified Communications Manager Group\* BANGALORE-CUCM-GROUP

Calling Search Space for Auto-registration < None >

Adjunct CSS < None >

Reverted Call Focus Priority Default

Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**

Date/Time Group\* IST-DATE-TIME-GROUP

Region\* BANGALORE-PHONES-REGION

Media Resource Group List SOFTWARE-MED-RES-GROUP-LIST

Location < None >

Network Locale < None >

SRST Reference\* Disable

Connection Monitor Duration\*\*\*

Single Button Barge\* Default

Join Across Lines\* Default

Physical Location < None >

Device Mobility Group < None >

Wireless LAN Profile Group < None > [View Details](#)

**Local Route Group Settings**

Standard Local Route Group < None >

**Device Mobility Related Information\*\*\*\***

Device Mobility Calling Search Space < None >

AAR Calling Search Space < None >

AAR Group < None >

Calling Party Transformation CSS < None >

Called Party Transformation CSS < None >

**Geolocation Configuration**

Geolocation < None >

- To test Annunciator feature, dial any wrong directory number (that is no in the CUCM DB) from the phone, you will be able to hear "The call cannot be completed as dialed. Please confirm your directory and call again" instead of fast busy tone

---

## **[Lab] Music on Hold (MoH) Configuration**

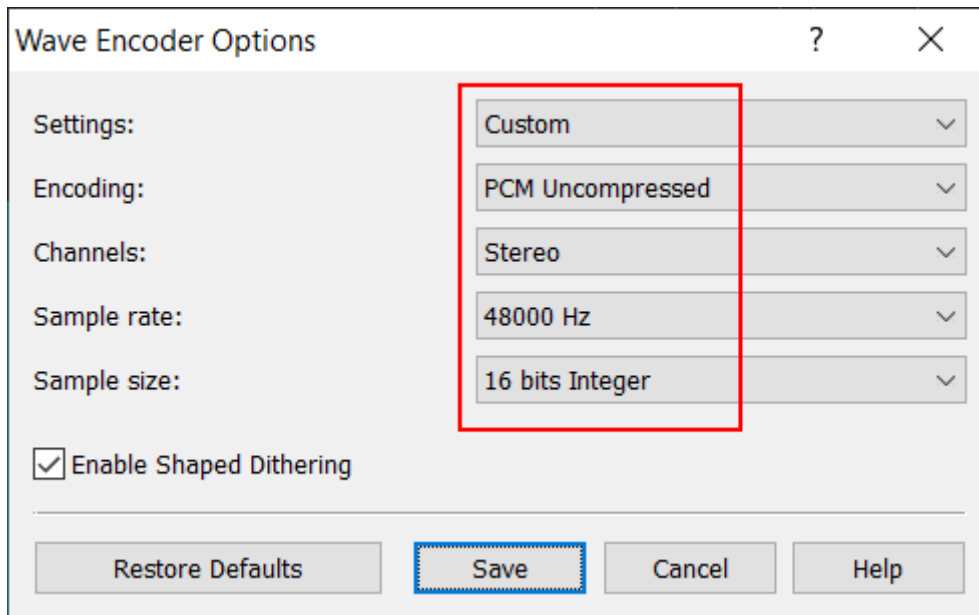
- The MoH sources makes music available when the call is on Hold
- Audio codecs supported by MoH server are G.711 alaw, G.711 ulaw, G.722, G.729
- If the held party doesn't support any of the above codecs, the MoH Server or the Held device invoke a Transcoder to perform audio codec conversion
- The CUCM integrated MoH server supports Unicast & Multicast streaming of music to the held party. Multicast method reduces the load of MoH server but requires multicast routing enabled at the network level
- Multicast also reduces the bandwidth because it enables multiple users to participate in a single audio stream. The recommended IP range of multicast IP is 239.1.1.1 to 239.255.255.255
- The MoH stream that an end point receives is determined by a combination two things. One is the source file configured in the Holding Party phone page and other one is the MoH resource on the held party's MRGL



---

## Audio File Preparation

- The format of MoH file is 16-bit PCM .WAV, Stereo or Mono. 8, 16, 32, 48 kHz sampling rate
- Using any Audio converter application, you can generate this file. (I have used WavePad Sound Editor)



File >> Export >> Export as WAV >>

Note: You can download this MoH File from [here](#) for lab testing

## Configure Music On Hold Server

- The IPVMS Service enable MoH server as well, we just need to change the Device Pool

Media Resources >> Music On Hold Servers >> Find

Find and List Music On Hold Servers

3 records found

Music On Hold Server (1 - 3 of 3) Rows per Page 50

Find Music On Hold Server where Name begins with Find Clear Filter Select item or enter search text

| <input type="checkbox"/> | Music On Hold Server Name ^ | Description    | Device Pool | Status                                  | IPv4 Address |
|--------------------------|-----------------------------|----------------|-------------|-----------------------------------------|--------------|
| <input type="checkbox"/> | MOH_2                       | MOH_cucm-pub   | Default     | Registered with cucm-sub02.ajcollab.com | 192.168.21.1 |
| <input type="checkbox"/> | MOH_3                       | MOH_cucm-sub01 | Default     | None                                    | None         |
| <input type="checkbox"/> | MOH_4                       | MOH_cucm-sub02 | Default     | None                                    | None         |

Select All Clear All Reset Selected Apply Config to Selected

Music On Hold (MOH) Server Configuration

Related Links: Back To Find/List Go

Save Reset Apply Config

Status: Ready

Device Information

Registration: Registered with Cisco Unified Communications Manager cucm-sub02.ajcollab.com

IPv4 Address: 192.168.21.1

☒ Device is trusted

Host Server\* cucm-pub.ajcollab.com

Music On Hold Server Name\* MOH\_2

Description MOH\_cucm-pub

Device Pool\* MED-RES-DP

Location\* Hub\_None

Maximum Half Duplex Streams\* 250

Maximum Multi-cast Connections\* 250000

Fixed Audio Source Device

Use Trusted Relay Point\* Off

Run Flag\* Yes

Multi-cast Audio Source Information

☒ Enable Multi-cast Audio Sources on this MOH Server

Base Multi-cast IP Address\* 239.1.1.1

Base Multi-cast Port Number\* 16384 (Even numbers only)

Increment Multi-cast on\* ☒ Port Number ☐ IP Address

Selected Multi-cast Audio Sources

There are no Music On Hold Audio Sources selected for Multi-casting. Click Configure Audio Sources in the top right corner of the page to select Multi-cast Audio Sources.


Save Reset Apply Config

- Now itself you will be able to hear Cisco's Default MoH while holding

- Place this MoH Server in MRG and MRGL respectively

Media Resource Group Configu

https://192.168.21.1/ccmadmin/mrsrcGroupEdit.do?key=e87fab3-1e


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Navigation Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

**Media Resource Group Configuration** Related Links: Back To Find/List Go

Save Delete Copy Add New

**Status**  
 Update successful

**Media Resource Group Status**  
Media Resource Group: SOFTWARE-MED-RES-GROUP (used by 8 devices)

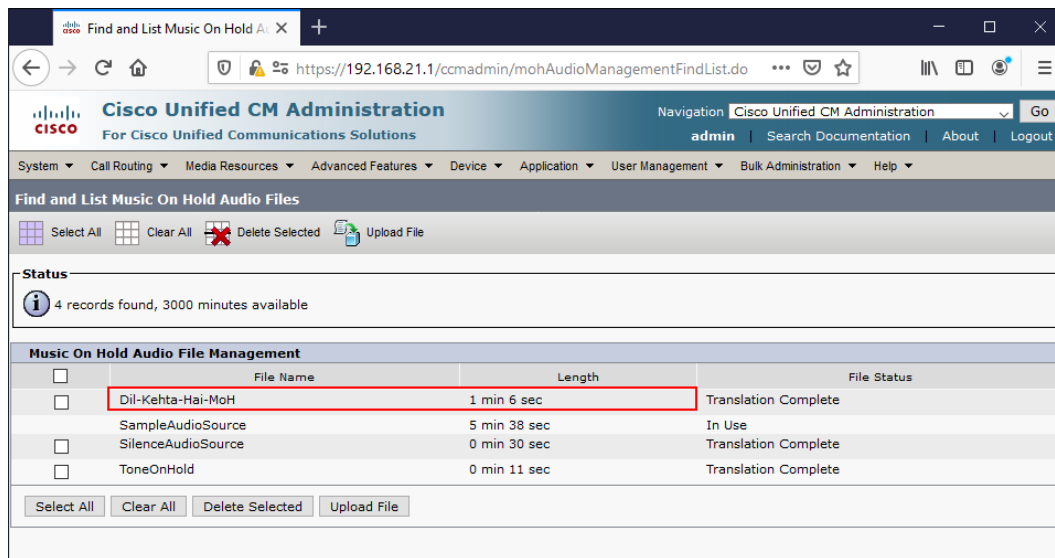
**Media Resource Group Information**  
Name\* SOFTWARE-MED-RES-GROUP  
Description SOFTWARE-MED-RES-GROUP

**Devices for this Group**  
Available Media Resources\*\*  
ANN\_3  
ANN\_4  
CFB\_2  
CFB\_3  
CFB\_4  
Selected Media Resources\*  
ANN\_2 (ANN)  
MOH\_2 (MOH)[Multicast]  
☐ Use Multi-cast for MOH Audio (If at least one multi-cast MOH resource is available)

Save Delete Copy Add New

## Upload MoH File

Media Resources >> MoH Audio File Management >> Upload File >> Select the file and upload

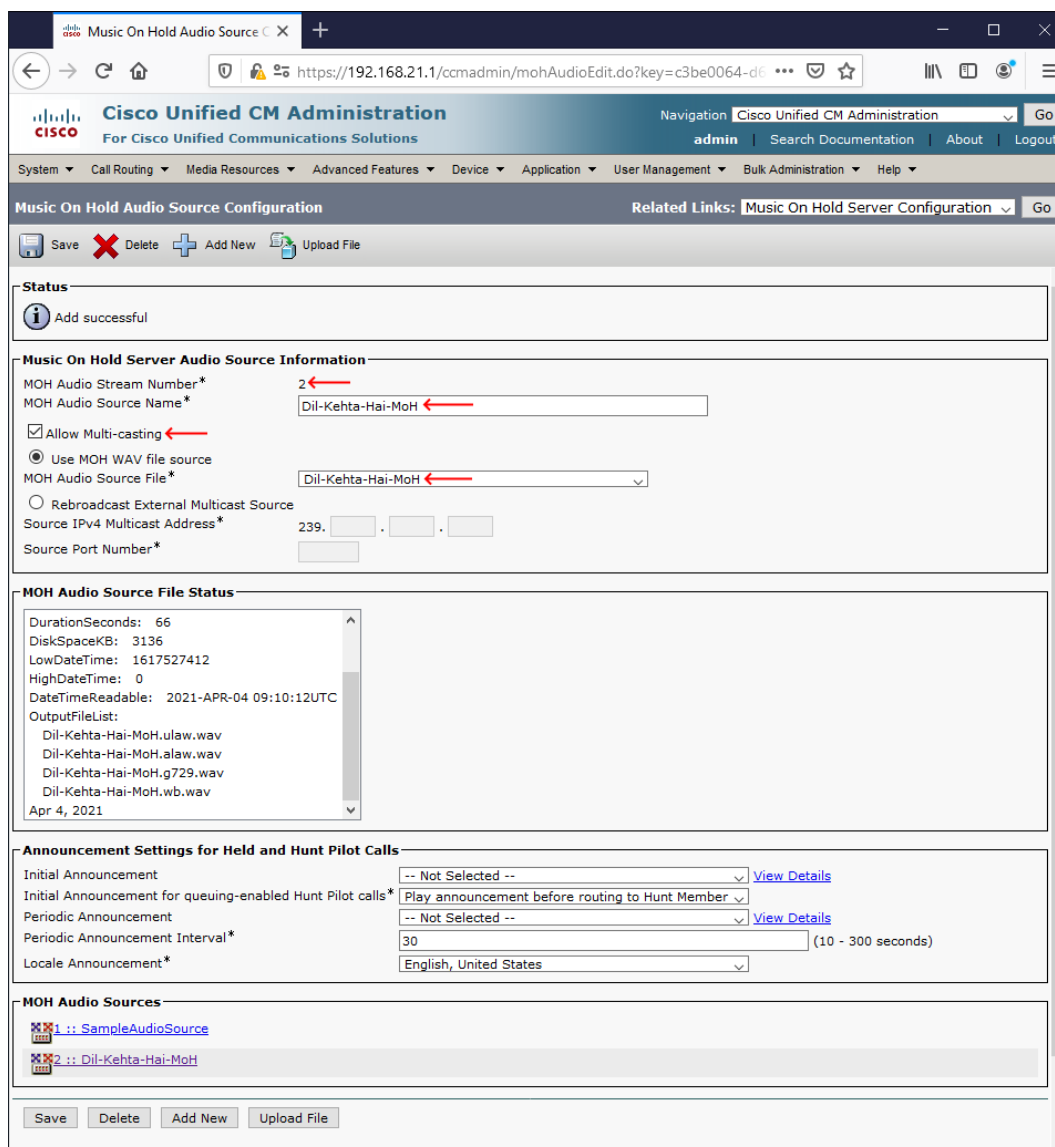


The screenshot shows the 'Find and List Music On Hold Audio Files' page in the Cisco Unified CM Administration interface. The page title is 'Find and List Music On Hold Audio Files'. Below the title, there are buttons for 'Select All', 'Clear All', 'Delete Selected', and 'Upload File'. A status bar indicates '4 records found, 3000 minutes available'. The main section is 'Music On Hold Audio File Management', which contains a table with the following data:

|                          | File Name          | Length       | File Status          |
|--------------------------|--------------------|--------------|----------------------|
| <input type="checkbox"/> | Dil-Kehta-Hai-MoH  | 1 min 6 sec  | Translation Complete |
| <input type="checkbox"/> | SampleAudioSource  | 5 min 38 sec | In Use               |
| <input type="checkbox"/> | SilenceAudioSource | 0 min 30 sec | Translation Complete |
| <input type="checkbox"/> | ToneOnHold         | 0 min 11 sec | Translation Complete |

At the bottom of the table, there are buttons for 'Select All', 'Clear All', 'Delete Selected', and 'Upload File'.

Media Resources >> Music on Hold Audio Source >> Add New



The screenshot shows the 'Music On Hold Audio Source Configuration' page in the Cisco Unified CM Administration interface. The page title is 'Music On Hold Audio Source Configuration'. Below the title, there are buttons for 'Save', 'Delete', 'Add New', and 'Upload File'. A status bar indicates 'Add successful'. The main section is 'Music On Hold Server Audio Source Information', which contains the following fields:

- MOH Audio Stream Number\*: 2
- MOH Audio Source Name\*: Dil-Kehta-Hai-MoH
- ☒ Allow Multi-casting
- ☒ Use MOH WAV file source
- MOH Audio Source File\*: Dil-Kehta-Hai-MoH
- ☐ Rebroadcast External Multicast Source
- Source IPv4 Multicast Address\*: 239. . .
- Source Port Number\*: .

The 'MOH Audio Source File Status' section shows the following information:

- DurationSeconds: 66
- DiskSpaceKB: 3136
- LowDateTime: 1617527412
- HighDateTime: 0
- DateTimeReadable: 2021-APR-04 09:10:12UTC
- OutputFileList:
  - Dil-Kehta-Hai-MoH.ulaw.wav
  - Dil-Kehta-Hai-MoH.alaw.wav
  - Dil-Kehta-Hai-MoH.g729.wav
  - Dil-Kehta-Hai-MoH.wb.wav
- Apr 4, 2021

The 'Announcement Settings for Held and Hunt Pilot Calls' section shows the following information:

- Initial Announcement: -- Not Selected --
- Initial Announcement for queuing-enabled Hunt Pilot calls\*: Play announcement before routing to Hunt Member
- Periodic Announcement: -- Not Selected --
- Periodic Announcement Interval\*: 30 (10 - 300 seconds)
- Locale Announcement\*: English, United States

The 'MOH Audio Sources' section shows the following information:

- 1 :: SampleAudioSource
- 2 :: Dil-Kehta-Hai-MoH

At the bottom of the page, there are buttons for 'Save', 'Delete', 'Add New', and 'Upload File'.

## Tune Service Parameter

Service Parameter Configuration

https://192.168.21.1/ccmadmin/serviceParamEdit.do?serve: 90%

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Service Parameter Configuration Related Links: Parameters for All Servers Go

Save Set to Default Advanced

Select Server and Service

Server\* cucm-pub.ajcollab.com--CUCM Voice/Video (Act ▾)

Service\* Cisco IP Voice Media Streaming App (Active) ▾

All parameters apply only to the current server except parameters that are in the cluster-wide group(s).

Cisco IP Voice Media Streaming App (Active) Parameters on server cucm-pub.ajcollab.com--CUCM Voice/Video (Active)

| Parameter Name                                                                 | Parameter Value                        | Suggested Value                  |
|--------------------------------------------------------------------------------|----------------------------------------|----------------------------------|
| <strong>Annunciator (ANN) Parameters</strong>                                  |                                        |                                  |
| <a href="#">Call Count</a> *                                                   | 48                                     | 48                               |
| <a href="#">Run Flag</a> *                                                     | True ▾                                 | True                             |
| <strong>Interactive Voice Response (IVR) Parameters</strong>                   |                                        |                                  |
| <a href="#">Call Count</a> *                                                   | 48                                     | 48                               |
| <a href="#">Run Flag</a> *                                                     | True ▾                                 | True                             |
| <strong>Conference Bridge (CFB) Parameters</strong>                            |                                        |                                  |
| <a href="#">Call Count</a> *                                                   | 48                                     | 48                               |
| <a href="#">Run Flag</a> *                                                     | True ▾                                 | True                             |
| <strong>Media Termination Point (MTP) Parameters</strong>                      |                                        |                                  |
| <a href="#">Call Count</a> *                                                   | 48                                     | 48                               |
| <a href="#">Run Flag</a> *                                                     | True ▾                                 | True                             |
| <a href="#">Enable Pass Through</a> *                                          | True ▾                                 | True                             |
| <strong>RTP Port Range</strong>                                                |                                        |                                  |
| <a href="#">Start Media Port</a> *                                             | 24576                                  | 24576                            |
| <a href="#">Number Of Ports</a> *                                              | 7168                                   | 7168                             |
| <strong>Clusterwide Parameters (Parameters that apply to all servers)</strong> |                                        |                                  |
| <a href="#">Supported MOH Codex</a> *                                          | 711 mulaw<br>711 alaw<br>729 Annex A ▾ | 711 mulaw<br><i>Ctrl + Click</i> |
| <a href="#">MOH Fixed Audio Quality level</a> *                                | Medium Quality ▾                       | Medium Quality                   |
| <a href="#">IP DSCP to Cisco Unified Communications Manager</a> *              | CS3(precedence 3) DSCP (011000) ▾      | CS3(precedence 3) DSCP (011000)  |
| <a href="#">Multicast MOH IP DSCP</a> *                                        | EF DSCP (101110) ▾                     | EF DSCP (101110)                 |
| <a href="#">MTP DTMF Duration</a> *                                            | 100                                    | 100                              |
| <a href="#">MTP DTMF Power (volume)</a> *                                      | 9                                      | 9                                |

There are hidden parameters in this group. Click on Advanced button to see hidden parameters.

Save Set to Default Advanced

javascript:alertHelp('loTosMediaResource2Cm')

- In Cisco CallManager Service Parameter, we can alter the default MoH Audio Source

Service Parameter Configuration
+

https://192.168.21.1/ccmadmin/serviceParamEdit.do

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Service Parameter Configuration
Related Links: Parameters for All Servers Go

Save Set to Default Advanced

There are hidden parameters in this group. Click on Advanced button to see hidden parameters.

**Clusterwide Parameters (Route Class Signaling)**

Route Class Trunk Signaling Enabled \* True
SIP Route Class Naming Authority \* cisco.com cisco.com

There are hidden parameters in this group. Click on Advanced button to see hidden parameters.

**Clusterwide Parameters (Hunt List)**

Stop Hunting on Out of Bandwidth Flag \* False
Use Pickup Group Of Line Group Member DN \* False

**Clusterwide Parameters (External QoS)**

External QoS Enabled \* False

**Clusterwide Parameters (Service)**

Default Network Hold MOH Audio Source ID \* 1 1
Default User Hold MOH Audio Source ID \* 1 1
Duplex Streaming Enabled \* False False
Media Exchange Interface Capability Timer \* 8 8
Send Multicast MOH in H.245 OLC Message \* True True
Media Exchange Timer \* 12 12
Media Exchange Stop Streaming Timer \* 8 8
Open Video Channel Response Timer for SIP Interop \* 500 500
Port Received Timer After Call Connection \* 500 500
Media Resource Allocation Timer \* 12 12
MTP and Transcoder Resource Throttling Percentage \* 95 95
Intercluster Capabilities Mismatch Timer \* 1000 1000
Silence Suppression \* False False
Silence Suppression for Gateways \* False False
Strip G.729 Annex B (Silence Suppression) from Capabilities \* False False
Enable Source IP Address Verification for Software Media Devices \* True True

**Clusterwide Parameters (System - General)**

Always Use Dial Tone Setting \* Default Default
Restart Cisco CallManager on Initialization Exception \* True True
Digit Analysis Timer \* 6 6
Station Enabled \* True True

## Apply the MoH File for the Phone

The screenshot shows the Cisco Unified CM Administration interface for a Cisco 9971 phone. The 'Phone Configuration' page is open, displaying various configuration sections. The 'Association' section on the left lists 27 items, including 'Line [1] - 11002 in BANGALORE-INTERNAL-PT' and 'Line [2] - Add a new DN'. The 'Phone Type' section shows 'Product Type: Cisco 9971' and 'Device Protocol: SIP'. The 'Real-time Device Status' section shows 'Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcollab.c' and 'IPv4 Address: 192.168.128.1'. The 'Device Information' section shows various settings, including 'Device is Active', 'Device is trusted', 'MAC Address: 08CC6831D463', 'Description: 11002 - Abdul Jaseem', 'Device Pool: BANGALORE-PHONES-DEVICE-POOL', 'Common Device Configuration: < None >', 'Phone Button Template: Standard 9971 SIP', 'Softkey Template: Standard User', 'Common Phone Profile: Standard Common Phone Profile', 'Calling Search Space: BANGALORE-PHONE-CSS', 'AAR Calling Search Space: < None >', 'Media Resource Group List: SOFTWARE-MED-RES-GROUP-LIST', 'User Hold MOH Audio Source: 2-Dil-Kehta-Hai-MoH', 'Network Hold MOH Audio Source: 2-Dil-Kehta-Hai-MoH', 'Location: Hub\_None', 'AAR Group: < None >', 'User Locale: < None >', 'Network Locale: < None >', 'Built In Bridge: Default', 'Privacy: Default', 'Device Mobility Mode: Default', 'Owner: User', and 'Owner User ID: abdul.jaseem'.

- Make a test from this phone to any other phone and hit Hold Button on this phone
- Now the other party will hear Music (Held Party should have MRGL Access with MoH Server)

---

## [Lab] Software Conference Bridge (CFB) Configuration

- Conference bridge handles conference calls (Ad Hoc or MeetMe)
- Enabling IPVMS will activate software Conference Bridge, since it is software based, it can support only G.711 call legs. Meaning whoever joins the conference must use G.711 as the codec
- **Basic Ad Hoc Conference:** Allows the conference controller (person who hit Conference soft key) to add specific participants to the conference. Here, a connected user hit conference call and dial another number then consult with him and press the Conference button again to start conferencing. Basic Ad Hoc is the default conference
- **Advanced Ad Hoc:** Any participant can add or remove other participants. It allows linking multiple Ad Hoc conferences together



## Configure Software CFB

Media Resources >> Conference Bridge >> Find

**Find and List Conference Bridges**

3 records found

| Conference Bridge Name | Description    | Device Pool | Status                                  | IPv4 Address | Copy |
|------------------------|----------------|-------------|-----------------------------------------|--------------|------|
| CFB_2                  | CFB_cucm-pub   | Default     | Registered with cucm-sub02.ajcollab.com | 192.168.21.1 |      |
| CFB_3                  | CFB_cucm-sub01 | Default     | None                                    | None         |      |
| CFB_4                  | CFB_cucm-sub02 | Default     | None                                    | None         |      |

- Change the Device Pool

**Conference Bridge Configuration**

Update successful

**Conference Bridge Information**

Conference Bridge : CFB\_2 (CFB\_cucm-pub)  
Registration: Registered with Cisco Unified Communications Manager cucm-sub02.ajcollab.com  
IPv4 Address: 192.168.21.1

**Software Conference Bridge Info**

Conference Bridge Type\* Cisco Conference Bridge Software  
Host Server cucm-pub.ajcollab.com


⚠ Device is not trusted

Conference Bridge Name\* CFB\_2  
Description CFB\_cucm-pub  
Device Pool\* MED-RES-DP  
Common Device Configuration < None >  
Location\* Hub\_None  
Use Trusted Relay Point\* Default

- Update the Software Conference bridge in the MRG and MRGL

Media Resource Group Configu

https://192.168.21.1/ccmadmin/mrsrcGroupEdit.do?key=e87fab3-1e

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Media Resource Group Configuration

Related Links: Back To Find/List Go

Save Delete Copy Add New

Status

 Update successful

Media Resource Group Status

Media Resource Group: SOFTWARE-MED-RES-GROUP (used by 10 devices)

Media Resource Group Information

Name\* SOFTWARE-MED-RES-GROUP

Description SOFTWARE-MED-RES-GROUP

Devices for this Group

Available Media Resources\*\*

ANN\_3  
ANN\_4  
CFB\_3  
CFB\_4  
IVR\_2

Selected Media Resources\*

ANN\_2 (ANN)  
CFB\_2 (CFB)  
MOH\_2 (MOH)

☐ Use Multi-cast for MOH Audio (If at least one multi-cast MOH resource is available)

Save Delete Copy Add New

## Tune Service Parameters

System >> Service Parameter >> CUCM-PUB >> Cisco CallManager

Service Parameter Configuratio X

← → ↺ 🏠 🔒 https://192.168.21.1/ccmadmin/serviceParamEdit.do?server=3f48b4c ... ☆

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Service Parameter Configuration Related Links: Parameters for All Servers Go

Save Set to Default Advanced

|                                                                           |                                    |                                    |
|---------------------------------------------------------------------------|------------------------------------|------------------------------------|
| Maximum Hold Duration Timer *                                             | 360                                | 360                                |
| Party Entrance Tone *                                                     | True                               | True                               |
| Message Waiting Lamp Policy *                                             | Primary Line - Light and Prompt    | Primary Line - Light and Prompt    |
| Audible Message Waiting Indication Policy *                               | OFF                                | OFF                                |
| Message Waiting Indicator Inbound Calling Search Space                    | < None >                           |                                    |
| Multiple Tenant MWI Modes *                                               | False                              | False                              |
| MWI Non Message Center Signaling Call Duration *                          | 0                                  | 0                                  |
| Message Waiting Indicator APDU Digit Translation CSS                      | < None >                           |                                    |
| Block OffNet To OffNet Transfer *                                         | False                              | False                              |
| Use Original Call Classification for Transferred Calls *                  | False                              | False                              |
| Use Restriction attribute of ID/Name Presentation of Transferring Party * | True                               | True                               |
| Local route group for redirected calls *                                  | Local route group of calling party | Local route group of calling party |
| Block Unencrypted Calls *                                                 | False                              | False                              |

There are hidden parameters in this group. Click on Advanced button to see hidden parameters.

**Clusterwide Parameters (Feature - Conference)**

|                                                                   |                                                |                                           |
|-------------------------------------------------------------------|------------------------------------------------|-------------------------------------------|
| Suppress MOH to Conference Bridge *                               | True                                           | True                                      |
| Drop Ad Hoc Conference *                                          | When No OnNet Parties Remain in the Conference | Never                                     |
| Maximum Ad Hoc Conference *                                       | 4                                              | 4                                         |
| Maximum MeetMe Conference Unicast *                               | 4                                              | 4                                         |
| Advanced Ad Hoc Conference Enabled *                              | True                                           | False                                     |
| Choose Encrypted Audio Conference Instead Of Video Conference *   | True                                           | True                                      |
| Minimum Video Capable Participants To Allocate Video Conference * | 2                                              | 2                                         |
| Enable Click-to-Conference for Third-Party Applications *         | False                                          | False                                     |
| IMS Conference Factory URI *                                      | cucm-conference-factory@cucm1.company.com      | cucm-conference-factory@cucm1.company.com |
| Cluster Conferencing Prefix Identifier                            |                                                |                                           |

There are hidden parameters in this group. Click on Advanced button to see hidden parameters.

**Clusterwide Parameters (Feature - Call Secure Status Policy)**

|                                   |                                                       |                                                           |
|-----------------------------------|-------------------------------------------------------|-----------------------------------------------------------|
| Secure Call Icon Display Policy * | All media except BFCP and iX transports must be encry | All media except BFCP and iX transports must be encrypted |
|-----------------------------------|-------------------------------------------------------|-----------------------------------------------------------|

**Clusterwide Parameters (Feature - Forward)**

|                             |    |    |
|-----------------------------|----|----|
| Forward Maximum Hop Count * | 12 | 12 |
| Forward No Answer Timer *   | 12 | 12 |
| Max Forward Hops to DN *    | 12 | 12 |

## Test Conference

- Make call to one number, hit 'Confrn' softkey, dial another number, hit 'Confrn' again



Note: Cisco IP Phone 88XX, 99XX Series phones has dedicated button for Conference, hence you don't find the softkeys sometimes

## MeetMe Conference

Call Routing >> MeetMe Number/Pattern >> Add New

The screenshot shows the 'Meet-Me Number Configuration' page in the Cisco Unified CM Administration interface. The browser address bar shows the URL: <https://192.168.21.1/ccmadmin/meetMeEdit.do?key=e00644fb-9340>. The page has a navigation bar with 'Cisco Unified CM Administration' and 'Go' button. Below the navigation bar, there are tabs for 'System', 'Call Routing', 'Media Resources', 'Advanced Features', 'Device', 'Application', 'User Management', 'Bulk Administration', and 'Help'. The 'Call Routing' tab is selected. The main content area is titled 'Meet-Me Number Configuration' and includes a 'Related Links' section with 'Back To Find/List' and 'Go' buttons. Below this, there are buttons for 'Save', 'Delete', 'Copy', and 'Add New'. The 'Status' section shows 'Update successful'. The 'Meet-Me Configuration' section contains the following fields:

|                              |                       |
|------------------------------|-----------------------|
| Directory Number or Pattern* | 1000[3-5]             |
| Description                  | MEET-ME-CONFERENCE    |
| Partition                    | BANGALORE-INTERNAL-PT |
| Minimum Security Level*      | Non Secure            |

At the bottom of the configuration section, there are buttons for 'Save', 'Delete', 'Copy', and 'Add New'.

- Here 10003, 10004, 10005 are dedicated to MeetMe Conference
- To start the conference, anyone has to initiate the conference by pressing 'MeetMe' softkey and dialing 10003 (or other patterns)

The screenshot shows the 'Softkey Template Configuration' page in the Cisco Unified CM Administration interface. The browser address bar shows the URL: <https://192.168.21.1/ccmadmin/softkeyTemplateLayoutEdit.do>. The page has a navigation bar with 'Cisco Unified CM Administration' and 'Go' button. Below the navigation bar, there are tabs for 'System', 'Call Routing', 'Media Resources', 'Advanced Features', 'Device', 'Application', 'User Management', 'Bulk Administration', and 'Help'. The 'Call Routing' tab is selected. The main content area is titled 'Softkey Template Configuration' and includes a 'Related Links' section with 'Softkey Template Configuration' and 'Go' buttons. Below this, there are buttons for 'Save', 'Reset', and 'Apply Config'. The 'Status' section shows 'Status: Ready'. The 'Notes' section contains the following text:

Use this window to specify the Softkeys and their relative order for any phone models that support downloadable Softkey templates. This window lists all the Softkeys in the system even though not all phones support all Softkeys. For information about the supported Softkeys for a particular phone, refer to the administration guide for the phone. If you choose a Softkey that is not supported by the phone, the Softkey will not display on the phone even if you configured it in this list.

The 'Softkey Layout Configuration' section contains the following fields:

Softkey Template: Standard User-MeetMe  
Select a call state to configure: On Hook

Unselected Softkeys

- Call Back (CallBack)
- Conference List (ConfList)
- Direct Transfer (DirTrfr)
- Group Pick Up (GPickUp)
- HLog (HLog)
- Immediate Divert (iDivert)
- Join (Join)
- Mobility (Mobility)
- Other Pickup (oPickup)
- Pick Up (PickUp)
- Quality Report Tool (QRT)
- Remove Last Conference Party (RmLstC)
- Select (Select)
- Toggle Do Not Disturb (DND)
- Undefined (Undefined)
- Video Mode Command (VidMode)

Selected Softkeys (ordered by position)\*\*

- Redial (Redial)
- \*\*NewCall (NewCall)
- Forward All (CfwdAll)
- Meet Me (MeetMe)

At the bottom of the configuration section, there are buttons for 'Save', 'Reset', and 'Apply Config'.

Legend:

- \* - indicates required item.
- \*\* - indicates mandatory fields



- Now others can simply dial 10003 and join the conference. Only the initiator has to use MeetMe softkey



- IP Phone model Cisco 99XX and 88XX uses completely different softly rather than the one assigned in phone page. Hence the MeetMe button ins configured on the button template

**Phone Button Template Configuration**

Related Links: [Back To Find/List](#) Go

Save Delete Copy Reset Apply Config Add New

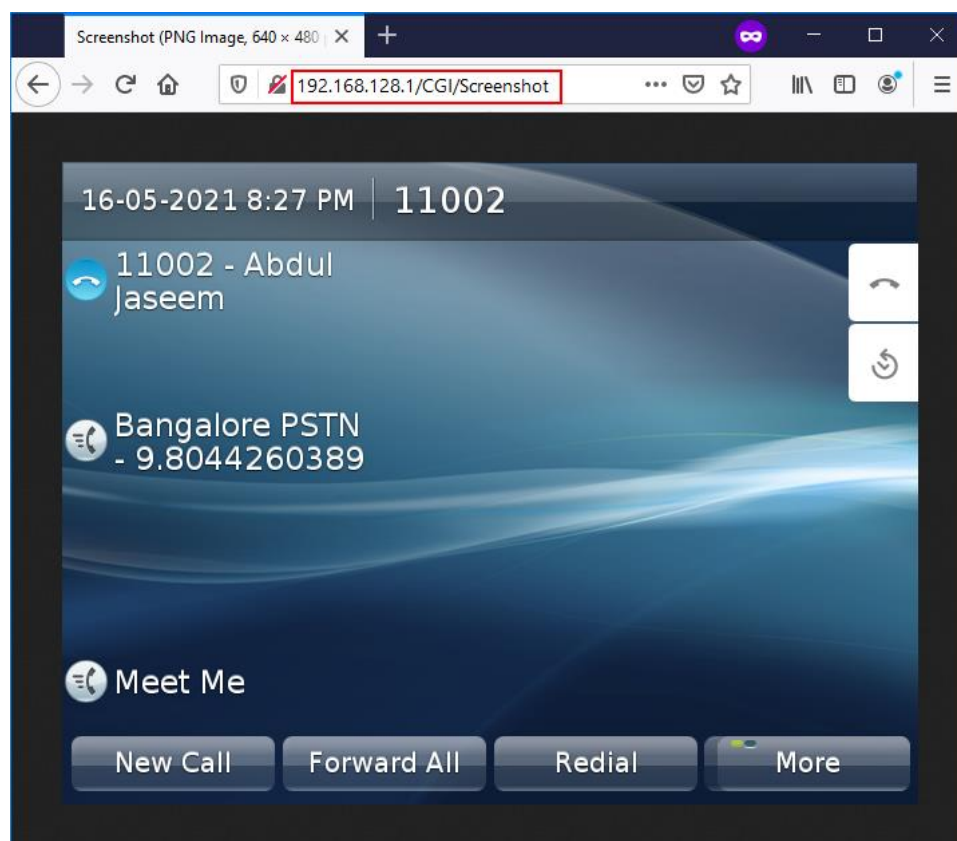
**Status**  
Update successful

**Phone Button Template Information**  
Button Template Name \* Standard 9971 SIP-MeetMe

**Button Information**

| Button | Feature            | Label              |
|--------|--------------------|--------------------|
| 1      | Line **            | Line1              |
| 2      | Line               | Line2              |
| 3      | Speed Dial         | Speed Dial         |
| 4      | Speed Dial         | Speed Dial 2       |
| 5      | Speed Dial         | Speed Dial 3       |
| 6      | Meet Me Conference | Meet Me Conference |
| 7      | None               | None               |
| 8      | None               |                    |
| 9      | None               |                    |

- <http://192.168.128.1/CGI/Screenshot>



- Meet-Me conference from Texas Phones will fail since the Region relation between Texas Phones (TEXAS-PHONES-REGION) and Software Conference bridge (MEDIA-RES-REGION) set to G.729

**Region Configuration**

Navigation: Cisco Unified CM Administration **admin** | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

**Region Configuration** Related Links: Back To Find/List Go

Save Delete Reset Apply Config Add New

**Region Information**

Name\* **TEXAS-PHONES-REGION**

**Region Relationships**

| Region                      | Audio Codec Preference List                    | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|-----------------------------|------------------------------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| BANGALORE-PHONES-REGION     | BLR-CLUSTER-AUDIO-CODEC-PREFERENCE-LIST        | 8 kbps (G.729)         | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| CUC-SIP-TRUNK-REGION        | BLR-CLUSTER-AUDIO-CODEC-PREFERENCE-LIST        | 8 kbps (G.729)         | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| <b>MEDIA-RES-REGION</b>     | <b>BLR-CLUSTER-AUDIO-CODEC-PREFERENCE-LIST</b> | <b>8 kbps (G.729)</b>  | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| TEXAS-PHONES-REGION         | BLR-CLUSTER-AUDIO-CODEC-PREFERENCE-LIST        | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| NOTE: Regions not displayed | Use System Default                             | Use System Default     | Use System Default                       | Use System Default                                 |

**Modify Relationship to other Regions**

| Regions                                                                                                       | Audio Codec Preference List | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|---------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| BANGALORE-PHONES-REGION<br>BLR-AIRTEL-SIP-TRUNK-REGION<br>CUC-SIP-TRUNK-REGION<br>Default<br>MEDIA-RES-REGION | Keep Current Setting        | Keep Current Setting   | Keep Current Setting                     | Keep Current Setting                               |

Save Delete Reset Apply Config Add New

- To address this issue, we must use Hardware Conference bridge that can support any codecs



---

## [Lab] Hardware Conference Bridge (CFB) Configuration

- IPVMS Service doesn't have any control on Hardware Media Resources
- Hardware CFB is configured on the IOS device (CUBE or Voice Gateways) and registered on CUCM as SCCP endpoint
- Hardware CFB support codecs that are configured on the IOS
- While designing the capacity, you can make use of DSP Calculator Tool to plan the resources



```
media-res# show version
```

```
Cisco IOS Software, C2900 Software (C2900-UNIVERSALK9-M), Version 15.5(3)M, RELEASE SOFTWARE (fc1)
```

```
Technical Support: http://www.cisco.com/techsupport
```

```
Copyright (c) 1986-2015 by Cisco Systems, Inc.
```

```
Compiled Thu 23-Jul-15 00:28 by prod_rel_team
```

```
ROM: System Bootstrap, Version 15.0(1r)M16, RELEASE SOFTWARE (fc1
```

```
media-res# show inventory
```

```
NAME: "CISCO2901/K9", DESCR: "CISCO2901/K9 chassis, Hw Serial#: FGL200220A6, Hw Revision: 1.0"
```

```
PID: CISCO2901/K9 , VID: V06 , SN: FGL200220A6
```

```
NAME: "PVDM3 DSP DIMM with 32 Channels on Slot 0 SubSlot 4", DESCR: "PVDM3 DSP DIMM with 32 Channels"
```

```
PID: PVDM3-32 , VID: V01 , SN: FOC162318B5
```

```
NAME: "C1941/C2901 AC Power Supply", DESCR: "C1941/C2901 AC Power Supply"
```

```
PID: PWR-1941-2901-AC , VID: , SN:
```

```
media-res# show voice dsp group slot 0
```

```
dsp 1:
```

```
State: UP, firmware: 40.2.0
```

```
Max signal/voice channel: 32/32
```

```
Max credits: 480, Voice credits: 480, Video credits: 0
```

```
num_of_sig_chnls_allocated: 0
```

```
Transcoding channels allocated: 0
```

```
Group: FLEX_GROUP_VOICE, complexity: FLEX
```

---

Shared credits: 480, reserved credits: 0  
Signaling channels allocated: 0  
Voice channels allocated: 0  
Credits used (rounded-up): 0  
Slot: 0  
Device idx: 0  
PVDM Slot: 0  
Dsp Type: SP2600

dsp-calc - Cisco

cisco.com/c/en/us/applications/dsp-calc.html

Worldwide [change] Welcome,

**CISCO** Products Support Buy Training & Events Partners Employees

## DSP Calculator

**Select Router and Software**

Router Model 2901  
Router IOS 15.0(1)M

**Slot 0 Interface Cards** *I don't have any voice termination cards (T1/E1)*

Slot 0/0 Empty  
Slot 0/1 Empty  
Slot 0/2 Empty  
Slot 0/3 Empty

Are you using [DSP sharing](#)? ☐ Yes ☒ No  
Are you using secure voice? ☐ Yes ☒ No  
Are you using H.320? ☐ Yes ☒ No  
Motherboard DSP type ☒ PVDM3

Start Over Clear Next

dsp-calc - Cisco x DSP Calculator - TDM Services - x +

cisco.com/c/en/us/applications/dsp-calc.html

Worldwide [change] Welcome,

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## DSP Calculator

Router: 2901 IOS: 15.0(1)M

| Voice IP Services     | Low Complexity       | Medium Complexity    | High Complexity      |                      |
|-----------------------|----------------------|----------------------|----------------------|----------------------|
| Transcoding           | <input type="text"/> | <input type="text"/> | <input type="text"/> |                      |
| Universal Transcoding | 5                    | 5                    | 5                    |                      |
| Voice Conferencing    | G.711                | G.729                | G.722                | iLBC                 |
| 8-Party               | 5                    | 5                    | 5                    | 5                    |
| 16-Party              | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 32-Party              | <input type="text"/> | <input type="text"/> | <input type="text"/> |                      |
| 64-Party              | <input type="text"/> |                      |                      |                      |

| Secure IP Services           | Low Complexity       | Medium Complexity    | High Complexity      |                      |
|------------------------------|----------------------|----------------------|----------------------|----------------------|
| Secure Transcoding           | <input type="text"/> | <input type="text"/> | <input type="text"/> |                      |
| Secure Universal Transcoding | <input type="text"/> | <input type="text"/> | <input type="text"/> |                      |
| Secure Voice Conferencing    | G.711                | G.729                | G.722                | iLBC                 |
| 8-Party                      | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Back Reset Next

Low Complexity Codecs: G.711, Fax Passthrough, Modem Passthrough, and Clear-Channel  
 Medium Complexity Codecs: G.726, G.729A, G.729AB, G.722, and T.38 Fax Relay  
 High Complexity Codecs: G.729, G.729B, G.723, G.728, iLBC, GSM-AMR, T.38 SG3 Fax, and Modem Relay

The calculator optimizes PVDM slot use. The results provided allocate the fewest number of PVDM slots to achieve the DSP resources necessary for the configuration entered. There are many other combinations of PVDMs that can also serve your configuration.

dsp-calc - Cisco x DSP Calculator - TDM Services - x +

cisco.com/c/en/us/applications/dsp-calc.html

Worldwide [change] Welcome,

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## DSP Calculator

Router: 2901  
 IOS: 15.0(1)M

DSP Modules Required:  
**PVDM3-192: 1**

---

DSP Module Allocation:  
 Router Slot 0: 143 Voice (75%) 49 Available (25%)  
 PVDM Slot 0/0: PVDM3-192

---

IP Services:

Universal Transcoding Low Comp: 5  
 Universal Transcoding Med Comp: 5  
 Universal Transcoding High Comp: 5  
 Conference 8 Party G.711: 5  
 Conference 8 Party G.729: 5  
 Conference 8 Party G.722: 5  
 Conference 8 Party iLBC: 5

---

Back Start Over

- This is the way you calculate DSP requirement; in my lab I just have one PVDM3-32, hence we can have a smaller number of conferencing and transcoding sessions
- Make sure you have activated UC license in IOS to get the voice functionality

```
media-res#show version
```

<--OUTPUT OMITTED-->

```
Technology Package License Information for Module:'c2900'
```

| Technology | Technology-package<br>Current | Type      | Technology-package<br>Next reboot |
|------------|-------------------------------|-----------|-----------------------------------|
| ipbase     | ipbasek9                      | Permanent | ipbasek9                          |
| security   | securityk9                    | Permanent | securityk9                        |
| uc         | None                          | None      | None                              |
| data       | None                          | None      | None                              |

```
media-res#show license
```

```
Index 1 Feature: ipbasek9
```

```
Period left: Life time
```

```
License Type: Permanent
```

```
License State: Active, In Use
```

```
License Count: Non-Counted
```

```
License Priority: Medium
```

```
Index 2 Feature: securityk9
```

```
Period left: Life time
```

```
License Type: Permanent
```

```
License State: Active, In Use
```

```
License Count: Non-Counted
```

```
License Priority: Medium
```

```
Index 3 Feature: uck9
```

```
Period left: 8 weeks 3 days
```

```
Period Used: 2 hours 16 minutes
```

```
License Type: EvalRightToUse
```

```
License State: Active, In Use
```

```
License Suite: AdvUCSuiteK9
```

```
License Count: Non-Counted
```

```
License Priority: Low
```

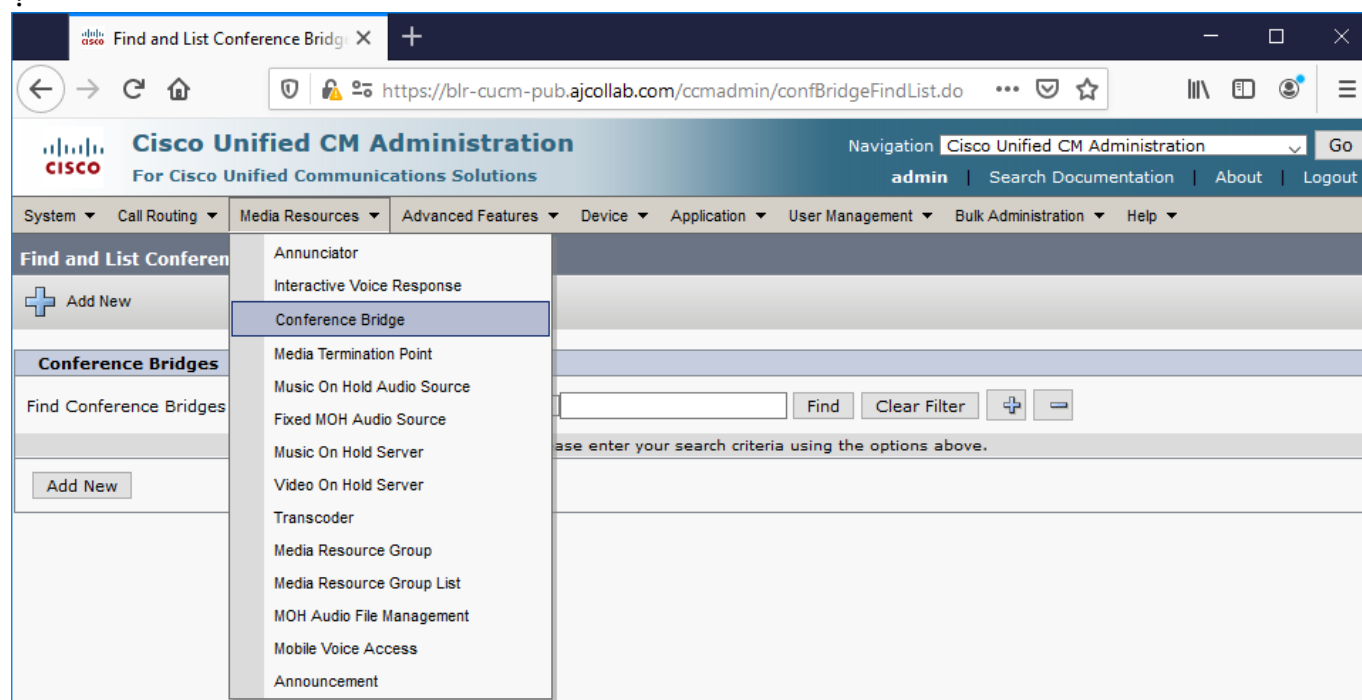
- You can use below command and reboot to activate Evaluation license

```
media-res(config)# license boot suite uck9 enable
```

---

## Conference Bridge Configuration

```
!
voice-card 0
 dspfarm
 dsp services dspfarm
!
sccp local GigabitEthernet0/0
sccp
sccp ccm 192.168.21.2 identifier 1 version 7.0
sccp ccm 192.168.21.3 identifier 2 version 7.0
!
dspfarm profile 1 conference
 codec g729br8
 codec g729r8
 codec g729ar8
 codec g711alaw
 codec g711ulaw
 codec g729abr8
 maximum sessions 2
 associate application SCCP
 no shutdown
!
sccp ccm group 1
 associate ccm 1 priority 1
 associate ccm 2 priority 2
 bind interface gigabitEthernet 0/0
 associate profile 1 register CFB-2901
!
```



- Refer this link to know more about the Conference bridge Types

Conference Bridge Configuration

Navigation: Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Conference Bridge Configuration Related Links: Back To Find/List Go

Save

**Status**

Status: Ready

**Conference Bridge Information**

Conference Bridge : New

**IOS Conference Bridge Info**

Conference Bridge Type\* Cisco IOS Conference Bridge ▾

⚠ Device is not trusted

Conference Bridge Name\* CFB-2901 ← This should match the IOS Configuration

Description CFB-2901

Device Pool\* MEDIA-RES-DP ▾

Common Device Configuration < None > ▾

Location\* Hub\_None ▾

Use Trusted Relay Point\* Default ▾

Save

**\*** - indicates required item.

Conference Bridge Configurati

+

← → ↺ 🏠


🔒 <https://blr-cucm-pub.ajcollab.com/ccmadmin/confBridgeEdit.do?key=> ... 🛡️ ☆

📶

📄

🔍

☰







 **Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation **Cisco Unified CM Administration** Go


admin | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

**Conference Bridge Configuration** Related Links: **Back To Find/List** Go

 Save  Delete  Copy  Reset  Apply Config  Add New

**Status**

 Status: Ready

**Conference Bridge Information**


Conference Bridge : CFB-2901 (CFB-2901)

Registration: Registered with Cisco Unified Communications Manager blr-cucm-sub01

IPv4 Address: [192.168.128.252](#)

**IOS Conference Bridge Info**

Conference Bridge Type\* Cisco IOS Conference Bridge

 Device is not trusted

Conference Bridge Name\*


Description

Device Pool\*  ▾

Common Device Configuration  ▾

Location\*  ▾

Use Trusted Relay Point\*  ▾

 \*- indicates required item.

Media Resource Group Configu

Media Resource Group Configuration

Navigation Cisco Unified CM AdministrationGoadmin | Search Documentation | About | LogoutSystem | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Media Resource Group ConfigurationRelated Links: Back To Find/ListGo

Save

StatusStatus: Ready

Media Resource Group StatusMedia Resource Group: New

Media Resource Group InformationName\*HARDWARE-MED-RES-GROUPDescriptionHARDWARE-MED-RES-GROUP

Devices for this GroupAvailable Media Resources\*\*ANN\_2ANN\_3ANN\_4CFB\_2CFB\_3Selected Media Resources\*CFB-2901Use Multi-cast for MOH Audio (If at least one multi-cast MOH resource is available)

Save

Media Resource Group List Cor

Media Resource Group List Configuration

Navigation Cisco Unified CM AdministrationGoadmin | Search Documentation | About | LogoutSystem | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Media Resource Group List ConfigurationRelated Links: Back To Find/ListGo

SaveDeleteCopyAdd New

StatusUpdate successful

Media Resource Group List StatusMedia Resource Group List: MED-RES-GROUP-LIST (used by 12 devices)

Media Resource Group List InformationName\*MED-RES-GROUP-LIST

Media Resource Groups for this ListAvailable Media Resource GroupsSelected Media Resource GroupsHARDWARE-MED-RES-GROUPSOFTWARE-MED-RES-GROUP

SaveDeleteCopyAdd New



Cisco
Device Pool Configuration
+

https://blr-cucm-pub.ajcollab.com/ccmadmin/devicePoolEdit.do?key=

Cisco Unified CM Administration
For Cisco Unified Communications Solutions
Navigation Cisco Unified CM Administration Go
admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Device Pool Configuration
Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**  
Status: Ready

**Device Pool Information**  
Device Pool: BANGALORE-PHONES-DP (3 members\*\*)

**Device Pool Settings**  
Device Pool Name\* BANGALORE-PHONES-DP  
Cisco Unified Communications Manager Group\* BANGALORE-PHONES-CCM-GROUP  
Calling Search Space for Auto-registration < None >  
Adjunct CSS < None >  
Reverted Call Focus Priority Default  
Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**  
Date/Time Group\* IST-DATE-TIME-GROUP  
Region\* BANGALORE-PHONES-REGION  
Media Resource Group List MED-RES-GROUP-LIST  
Location < None >  
Network Locale < None >  
SRST Reference\* Disable  
Connection Monitor Duration\*\*\*  
Single Button Barge\* Default  
Join Across Lines\* Default  
Physical Location < None >  
Device Mobility Group < None >  
Wireless LAN Profile Group < None > [View Details](#)

**Local Route Group Settings**  
Standard Local Route Group < None >

**Device Mobility Related Information\*\*\*\***  
Device Mobility Calling Search Space < None >  
AAR Calling Search Space < None >  
AAR Group < None >  
Calling Party Transformation CSS < None >  
Called Party Transformation CSS < None >

**Geolocation Configuration**  
Geolocation < None >  
Geolocation Filter < None >

- To test the scenario, set the Region Relation between Texas and Media Resources to G.729. Previously the Phones at Texas location were unable to join / initiate meet-me conference since we had only the Software Conference Bridge available
- Now Texas phones will be able to join or initiate Meet-Me conference bridge

```
med-res_192.168.128.252 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
med-res_192.168.128.252 x
media-res#
media-res#show sccp connections
sess_id conn_id stype mode codec sport rport ripaddr conn_id_tx
33556442 50331662 conf sendrecv g711u 16404 21812 192.168.128.3
33556442 33554436 conf sendrecv g711u 16402 17714 192.168.128.6
33556442 50331661 conf sendrecv g729 ← 16400 29384 192.168.129.1

Total number of active session(s) 1, and connection(s) 3

media-res#
media-res#
```

```
med-res_192.168.128.252 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
med-res_192.168.128.252 x
media-res#
media-res#show sccp
SCCP Admin State: UP
Gateway Local Interface: GigabitEthernet0/0
 IPv4 Address: 192.168.128.252
 Port Number: 2000
IP Precedence: 5
User Masked Codec list: None
Call Manager: 192.168.21.3, Port Number: 2000
 Priority: N/A, Version: 7.0, Identifier: 2
 Trustpoint: N/A
Call Manager: 192.168.21.2, Port Number: 2000
 Priority: N/A, Version: 7.0, Identifier: 1
 Trustpoint: N/A

Conferencing Oper State: ACTIVE - Cause Code: NONE
Active Call Manager: 192.168.21.2, Port Number: 2000
TCP Link Status: CONNECTED, Profile Identifier: 1
Reported Max Streams: 16, Reported Max OOS Streams: 0
Supported Codec: g729abr8, Maximum Packetization Period: 60
Supported Codec: g711ulaw, Maximum Packetization Period: 30
Supported Codec: g711alaw, Maximum Packetization Period: 30
Supported Codec: g729ar8, Maximum Packetization Period: 60
Supported Codec: g729r8, Maximum Packetization Period: 60
Supported Codec: g729br8, Maximum Packetization Period: 60
Supported Codec: rfc2833 dtmf, Maximum Packetization Period: 30
Supported Codec: rfc2833 pass-thru, Maximum Packetization Period: 30
Supported Codec: inband-dtmf to rfc2833 conversion, Maximum Packetization Period: 30
TLS : ENABLED

media-res#
media-res#show sccp ccm group
CCM Group Identifier: 1
Description: None
Binded Interface: GigabitEthernet0/0
 IPv4 Address: 192.168.128.252
Associated CCM Id: 1, Priority in this CCM Group: 1
Associated CCM Id: 2, Priority in this CCM Group: 2
Associated Profile: 1, Registration Name: CFB-2901
Registration Retries: 3, Registration Timeout: 10 sec
Keepalive Retries: 3, Keepalive Timeout: 30 sec
CCM Connect Retries: 3, CCM Connect Interval: 10 sec
Switchover Method: GRACEFUL, Switchback Method: GRACEFUL_GUARD
Switchback Interval: 10 sec, Switchback Timeout: 7200 sec
Signaling DSCP value: cs3, Audio DSCP value: ef

media-res#
```

Ready

ssh2: AES-256-CTR

47, 11

47 Rows, 103 Cols

Xterm

CAP NUM

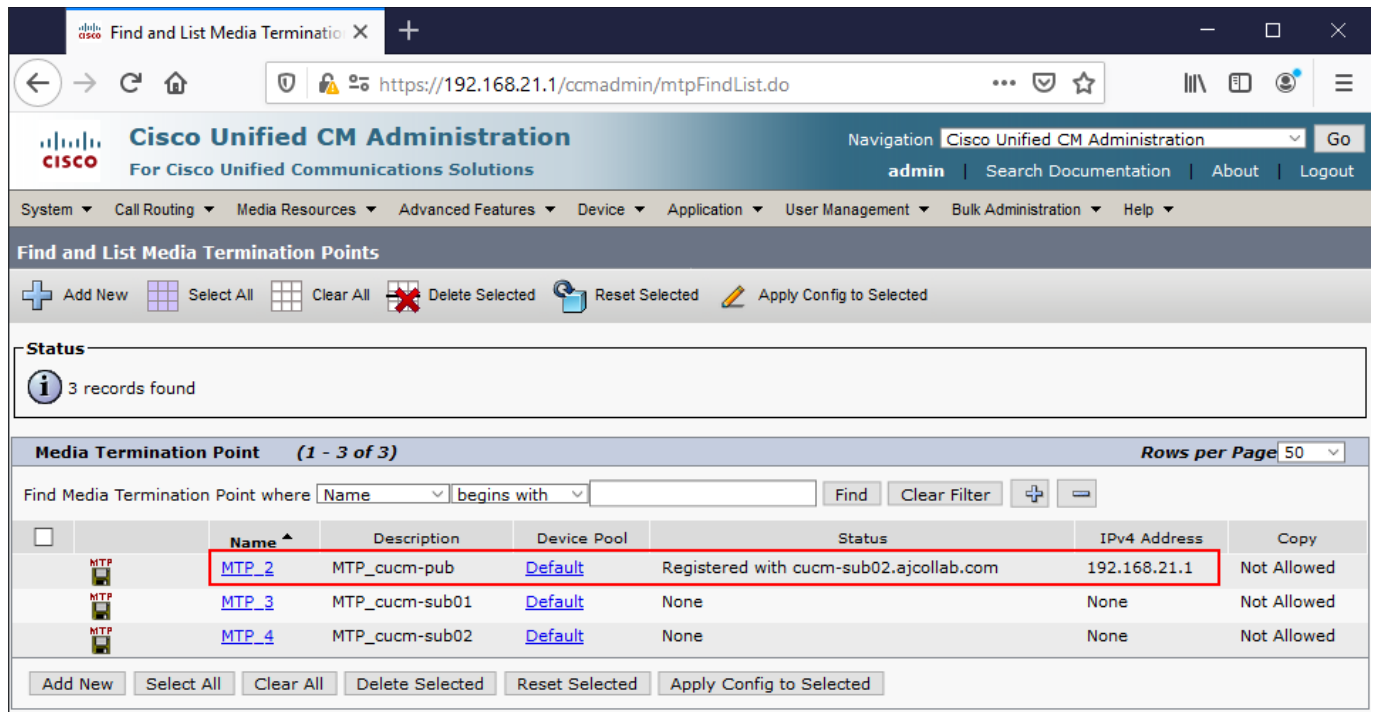
```
med-res_192.168.128.252 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
med-res_192.168.128.252 x
media-res#
media-res#show dspfarm profile 1
Dspfarm Profile Configuration

Profile ID = 1, Service = CONFERRNCING, Resource ID = 1
Profile Description :
Profile Service Mode : Non Secure
Profile Admin State : UP
Profile Operation State : ACTIVE
Application : SCCP Status : ASSOCIATED
Resource Provider : FLEX_DSPRM Status : UP
Total Number of Resources Configured : 2
Total Number of Resources Available : 2
Total Number of Resources Out of Service : 0
Total Number of Resources Active : 0
Maximum conference participants : 8
Codec Configuration: num_of_codecs:6
Codec : g729abr8, Maximum Packetization Period : 60 , Transcoder: Not Required
Codec : g711ulaw, Maximum Packetization Period : 30 , Transcoder: Not Required
Codec : g711alaw, Maximum Packetization Period : 30 , Transcoder: Not Required
Codec : g729ar8, Maximum Packetization Period : 60 , Transcoder: Not Required
Codec : g729r8, Maximum Packetization Period : 60 , Transcoder: Not Required
Codec : g729br8, Maximum Packetization Period : 60 , Transcoder: Not Required
media-res#
media-res#
```

## [Lab] Software Media Termination Point (MTP) Configuration

- IPVMS will enable Software MTP on the respective CUCM Nodes
- Software MTP used to interconnect G.711 alaw to G.711 ulaw and internetwork DTMF Relays (like SIP Notify to RTP NTE). MTP also used to interconnect the different sampling size media (G.711 alaw 20 ms to G.711 alaw 30 ms)
- We have a scenario when external users are calling the Main Line Number (CUC Auto Attendant), the DTMF inputs are not detecting, hence they are unable to navigate through the menu options

### Software MTP Configuration



The screenshot shows the Cisco Unified CM Administration interface. The page title is "Find and List Media Termination Points". The status bar indicates "3 records found". The table below shows the details of the Media Termination Points.

| Name  | Description    | Device Pool | Status                                  | IPv4 Address | Copy        |
|-------|----------------|-------------|-----------------------------------------|--------------|-------------|
| MTP_2 | MTP_cucm-pub   | Default     | Registered with cucm-sub02.ajcollab.com | 192.168.21.1 | Not Allowed |
| MTP_3 | MTP_cucm-sub01 | Default     | None                                    | None         | Not Allowed |
| MTP_4 | MTP_cucm-sub02 | Default     | None                                    | None         | Not Allowed |

Media Termination Point Config

[←](#) [→](#) [↺](#) [🏠](#)
<https://192.168.21.1/ccmadmin/mtpEdit.do?key=d1c24ac7-6cbe-4c6>

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**Media Termination Point Configuration**
Related Links: Back To Find/List Go

Save Reset Apply Config

**Status**  
Update successful

**Media Termination Point Information**  
Registration: Registered with Cisco Unified Communications Manager cucm-sub02.ajcollab.com  
IPv4 Address: 192.168.21.1  
Media Termination Point Type\* Cisco Media Termination Point Software  
Host Server\* cucm-pub.ajcollab.com  
Media Termination Point Name\* MTP\_2  
Description MTP\_cucm-pub  
Device Pool\* MED-RES-DP  
☐ Trusted Relay Point

Save Reset Apply Config

Media Resource Group Config

[←](#) [→](#) [↺](#) [🏠](#)
<https://192.168.21.1/ccmadmin/mrsrcGroupEdit.do?key=e87fafb3-1e>

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**Media Resource Group Configuration**
Related Links: Back To Find/List Go

Save Delete Copy Add New

**Status**  
Status: Ready

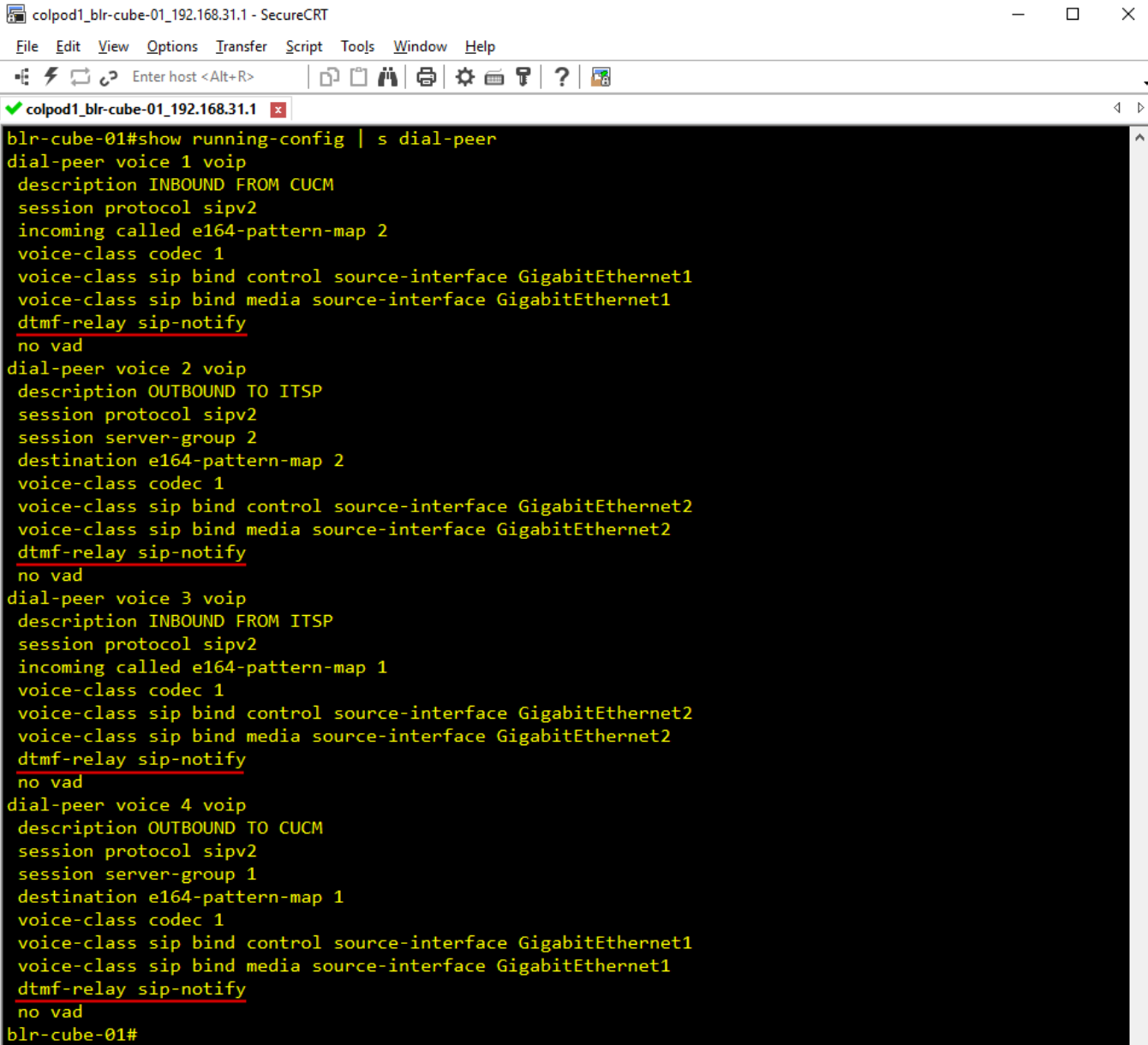
**Media Resource Group Status**  
Media Resource Group: SOFTWARE-MED-RES-GROUP (used by 10 devices)

**Media Resource Group Information**  
Name\* SOFTWARE-MED-RES-GROUP  
Description SOFTWARE-MED-RES-GROUP

**Devices for this Group**  
Available Media Resources\*\*  
ANN\_3  
ANN\_4  
CFB\_3  
CFB\_4  
IVR\_2  
Selected Media Resources\*  
ANN\_2 (ANN)  
CFB\_2 (CFB)  
MOH\_2 (MOH)  
MTP\_2 (MTP)  
☐ Use Multi-cast for MOH Audio (If at least one multi-cast MOH resource is available)

Save Delete Copy Add New

- Note: To implement this issue for the lab, I have configured dial-peers of the cube01 to use sip-notify (OOB) DTMF method. Now the DTMF won't be working from PSTN number to CUC Auto Attendant



```
colpod1_blr-cube-01_192.168.31.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
colpod1_blr-cube-01_192.168.31.1
blr-cube-01#show running-config | s dial-peer
dial-peer voice 1 voip
description INBOUND FROM CUCM
session protocol sipv2
incoming called e164-pattern-map 2
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet1
voice-class sip bind media source-interface GigabitEthernet1
dtmf-relay sip-notify
no vad
dial-peer voice 2 voip
description OUTBOUND TO ITSP
session protocol sipv2
session server-group 2
destination e164-pattern-map 2
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet2
voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay sip-notify
no vad
dial-peer voice 3 voip
description INBOUND FROM ITSP
session protocol sipv2
incoming called e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet2
voice-class sip bind media source-interface GigabitEthernet2
dtmf-relay sip-notify
no vad
dial-peer voice 4 voip
description OUTBOUND TO CUCM
session protocol sipv2
session server-group 1
destination e164-pattern-map 1
voice-class codec 1
voice-class sip bind control source-interface GigabitEthernet1
voice-class sip bind media source-interface GigabitEthernet1
dtmf-relay sip-notify
no vad
blr-cube-01#
```

- Make sure 'Accept unsolicited notification' is enabled on the CUBE SIP Trunk otherwise Call Manager itself reject the DTMF Notify from the CUBE
- Software MTP must be in the MRGL and it should be accessible for the CUC SIP Trunk since the conversion required while connecting to CUC

**SIP Trunk Security Profile Configuration**

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Save Delete Copy Reset Apply Config Add New

**Status**

Status: Ready

**SIP Trunk Security Profile Information**

Name\* BLR-AIRTEL-SIP-TRUNK-SIP-SEC-PROFILE

Description Non Secure SIP Trunk Profile authenticated by null String

Device Security Mode Non Secure

Incoming Transport Type\* TCP+UDP

Outgoing Transport Type TCP

☐ Enable Digest Authentication

Nonce Validity Time (mins)\* 600

X.509 Subject Name

Incoming Port\* 5060

☐ Enable Application level authorization

☐ Accept presence subscription

☐ Accept out-of-dialog refer\*\*

☒ Accept unsolicited notification

☐ Accept replaces header

☐ Transmit security status

☐ Allow charging header

SIP V.150 Outbound SDP Offer Filtering\* Use Default Filter

Save Delete Copy Reset Apply Config Add New

Make sure region relation between CUC and Media Resources set to G.711



---

## [Lab] Hardware Media Termination Point (MTP) Configuration

- Cisco IOS hardware MTP provides multi codec support for DTMF Internetworking, Packetization difference

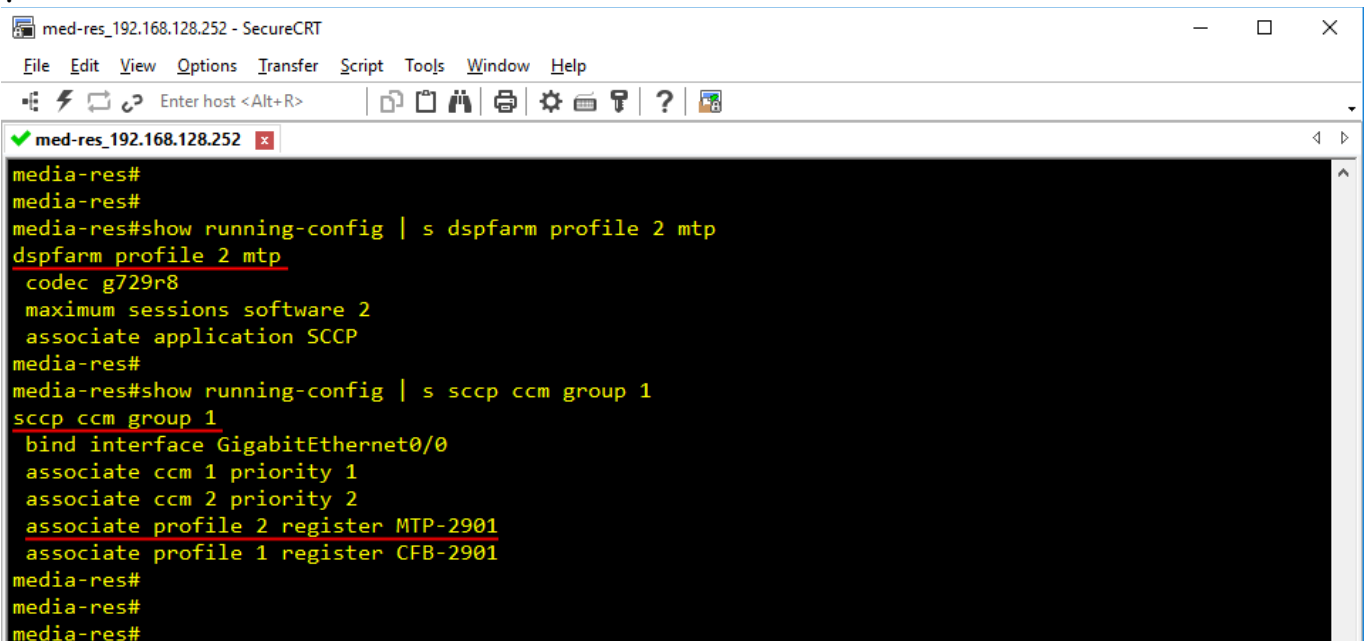
Note: We are not demonstrating the live scenario for the hardware MTP since it is difficult to set up packetization difference failures. We will look at the configurations only

We are assuming other DSP FARM configurations are already in place (we did the same for hardware conference bridge)

- g711 ulaw codec will be added to the MTP by default, hence use 'no codec g711ulaw' if you want the MTP for other codec. Only one codec supported per profile

### Hardware MTP Configuration

```
!
dspfarm profile 2 mtp
 no codec g711ulaw
 codec g729r8
 maximum sessions hardware 2
 associate application SCCP
 no shutdown
!
sccp ccm group 1
 associate profile 2 register MTP-2901
!
```



```
med-res_192.168.128.252 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
med-res_192.168.128.252
media-res#
media-res#
media-res#show running-config | s dspfarm profile 2 mtp
dspfarm profile 2 mtp
 codec g729r8
 maximum sessions software 2
 associate application SCCP
media-res#
media-res#show running-config | s sccp ccm group 1
sccp ccm group 1
 bind interface GigabitEthernet0/0
 associate ccm 1 priority 1
 associate ccm 2 priority 2
 associate profile 2 register MTP-2901
 associate profile 1 register CFB-2901
media-res#
media-res#
media-res#
```

Media Termination Point Configuration

Save Reset Apply Config

**Status**  
Status: Ready

**Media Termination Point Information**

Media Termination Point Type\* Cisco IOS Enhanced Software Media Termination Point  
Media Termination Point Name\* MTP-2901  
Description MTP-2901  
Device Pool\* MEDIA-RES-DP  
☐ Trusted Relay Point

Save Reset Apply Config

\*- indicates required item.

Media Termination Point Configuration

Save Delete Copy Reset Apply Config Add New

**Status**  
Status: Ready

**Media Termination Point Information**

Registration: Registered with Cisco Unified Communications Manager blr-cucm-sub01  
IPv4 Address: 192.168.128.252  
Media Termination Point Type\* Cisco IOS Enhanced Software Media Termination Point  
Media Termination Point Name\* MTP-2901  
Description MTP-2901  
Device Pool\* MEDIA-RES-DP  
☐ Trusted Relay Point

Save Delete Copy Reset Apply Config Add New

\*- indicates required item.

Media Resource Group

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Cisco Unified CM

Cisco Systems, Inc.

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Media Resource Group Configuration

Related Links: Back To Find/ListGo

Save

Delete

Copy

Add New

Status

Update successful

Media Resource Group Status

Media Resource Group: HARDWARE-MED-RES-GROUP (used by 12 devices)

Media Resource Group Information

Name\*HARDWARE-MED-RES-GROUP

DescriptionHARDWARE-MED-RES-GROUP

Devices for this Group

Available Media Resources\*\*ANN\_2  
ANN\_3  
ANN\_4  
CFB\_2  
CFB\_3

Selected Media Resources\*CFB-2901 (CFB)  
MTP-2901 (MTP)

☐ Use Multi-cast for MOH Audio (If at least one multi-cast MOH resource is available)

Save

Delete

Copy

Add New

ⓘ \*- indicates required item.

ⓘ \*\*Includes Annunciators (ANN), Interactive Voice Responses (IVR), Conference Bridges (CFB), Media Termination Points (MTP), Music On Hold Servers (MOH) and Transcoders (XCODE)

Media Resource Group

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Cisco Unified CM

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Media Resource Group List Configuration

Related Links: Back To Find/ListGo

Save

Delete

Copy

Add New

Status

Status: Ready

Media Resource Group List Status

Media Resource Group List: MED-RES-GROUP-LIST (used by 12 devices)

Media Resource Group List Information

Name\*MED-RES-GROUP-LIST

Media Resource Groups for this List

Available Media Resource Groups

Selected Media Resource GroupsHARDWARE-MED-RES-GROUP  
SOFTWARE-MED-RES-GROUP

Save

Delete

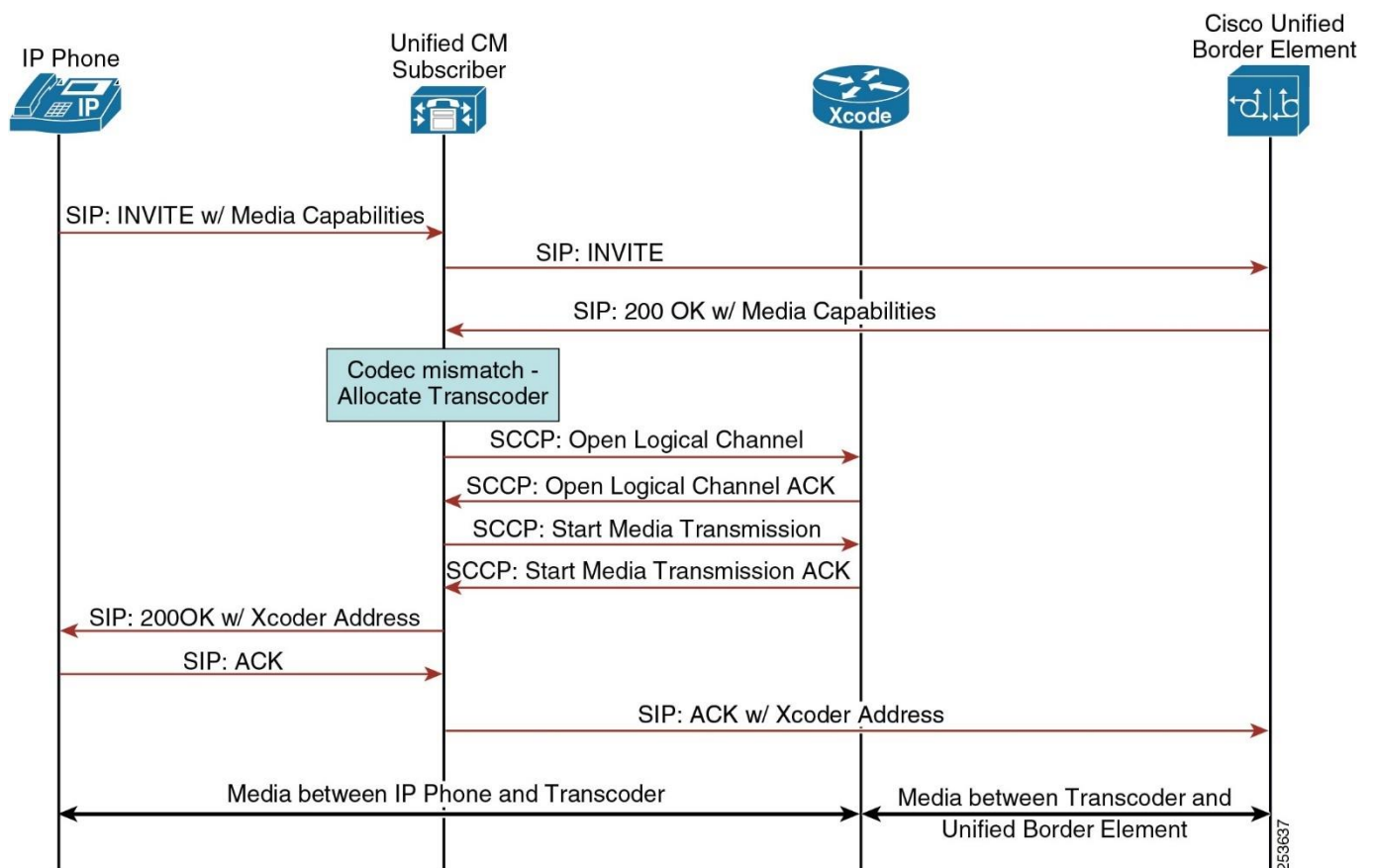
Copy

Add New

ⓘ \*- indicates required item.

## [Lab] Transcoder (XCODE) Configuration

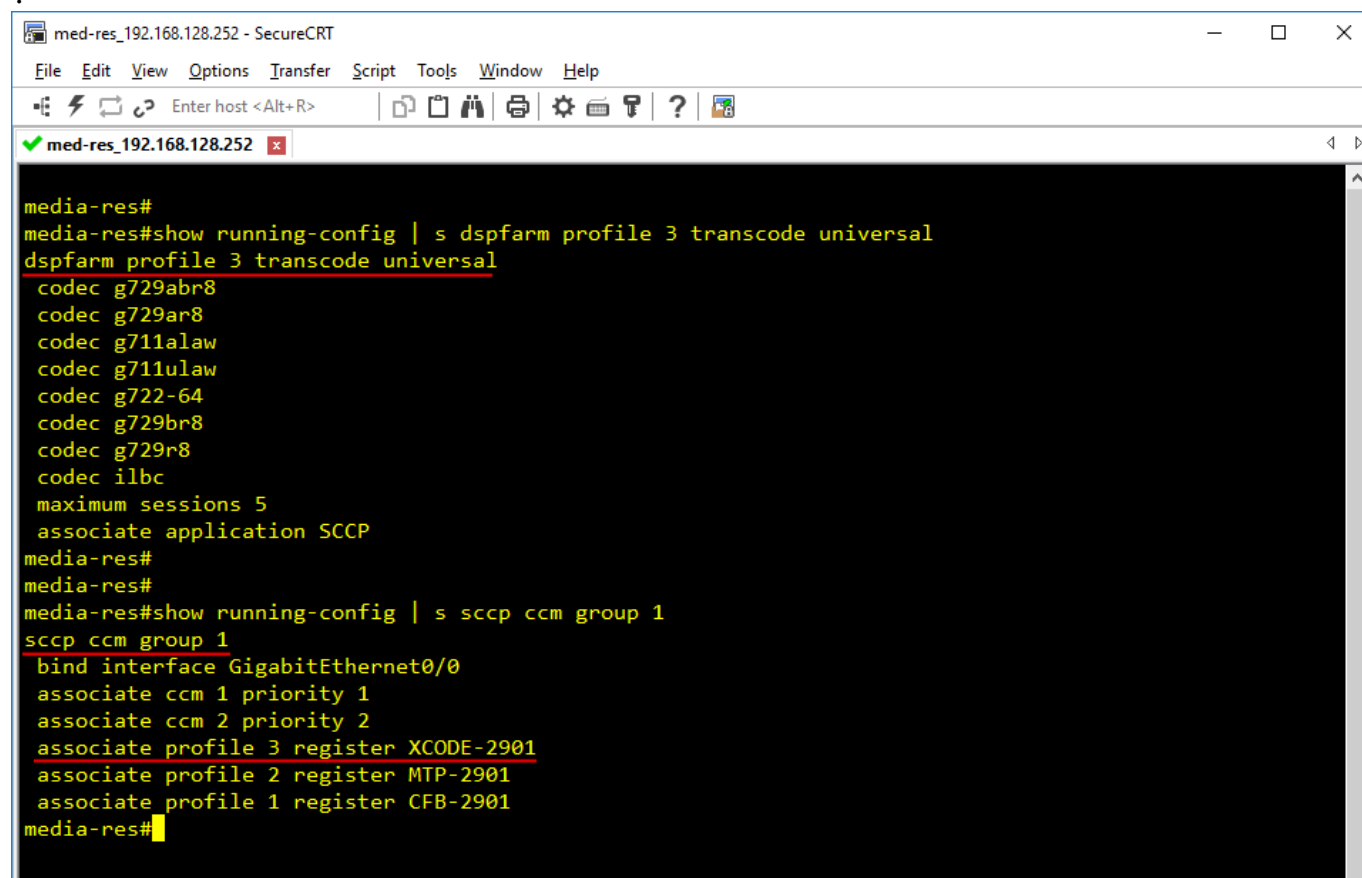
- Transcoder used to convert between two codecs G.729 to G.711; G.711 to iLBC etc.
- Transcoders also does conversion codec packetization difference (20mSec to 30mSec)
- No Software Transcoder available, transcoders are always hardware based and requires PVDM/ Hardware resources
- Traditional Transcoding: G.711 to any other codec (e.g. G.711 <-> iLBC or G.711 <-> G.729, etc.) requires less DSPs. One leg has to be G.711 here
- Universal Transcoding: Transcoding between any codec to any other codec (e.g. G.729 <-> iLBC), require more DSPs. This can also convert between G.711 to any other codec. This will an ideal fit for any complex scenarios



---

## Transcoder Configuration

```
!
dspfarm profile 3 transcode universal
 codec g729abr8
 codec g729ar8
 codec g711alaw
 codec g711ulaw
 codec g722-64
 codec g729br8
 codec g729r8
 codec ilbc
 maximum sessions 5
 associate application SCCP
 no shutdown
!
sccp ccm group 1
 associate profile 3 register XCODE-2901
!
```



```
med-res_192.168.128.252 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
med-res_192.168.128.252
media-res#
media-res#show running-config | s dspfarm profile 3 transcode universal
dspfarm profile 3 transcode universal
 codec g729abr8
 codec g729ar8
 codec g711alaw
 codec g711ulaw
 codec g722-64
 codec g729br8
 codec g729r8
 codec ilbc
 maximum sessions 5
 associate application SCCP
media-res#
media-res#
media-res#show running-config | s sccp ccm group 1
sccp ccm group 1
 bind interface GigabitEthernet0/0
 associate ccm 1 priority 1
 associate ccm 2 priority 2
 associate profile 3 register XCODE-2901
 associate profile 2 register MTP-2901
 associate profile 1 register CFB-2901
media-res#
```

Transcoder Configuration

https://blr-cucm-pub.ajcollab.com/ccmadmin/transcoderEdit.do?prod...

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**Transcoder Configuration** Related Links: Back To Find/List Go

Save

**Transcoder Information**

Transcoder: New

**IOS Transcoder Info**

Transcoder Type\* Cisco IOS Enhanced Media Termination Point

Description XCODE-2901

Device Name\* XCODE-2901

Device Pool\* MEDIA-RES-DP View Details

Common Device Configuration < None > View Details

Special Load Information Leave blank to use default

☐ Trusted Relay Point

Save

\*- indicates required item.

Transcoder Configuration

https://blr-cucm-pub.ajcollab.com/ccmadmin/transcoderEdit.do?key=...

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**Transcoder Configuration** Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Transcoder Information**

Transcoder: **XCODE-2901 (XCODE-2901)**

Registration: Registered with Cisco Unified Communications Manager blr-cucm-sub01

IPv4 Address: 192.168.128.252

**IOS Transcoder Info**

Transcoder Type\* Cisco IOS Enhanced Media Termination Point

Description XCODE-2901

Device Name\* XCODE-2901

Device Pool\* MEDIA-RES-DP View Details

Common Device Configuration < None > View Details

Special Load Information Leave blank to use default

☐ Trusted Relay Point

Save Delete Copy Reset Apply Config Add New

\*- indicates required item.

Media Resource Group Configur

https://blr-cucm-pub.ajcollab.com/ccmadmin/mrsrcGroupEdit.do?key=...

Cisco Unified CM Administration

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Media Resource Group Configuration Related Links: Back To Find/List Go

Save Delete Copy Add New

Status

Update successful

Media Resource Group Status

Media Resource Group: HARDWARE-MED-RES-GROUP (used by 13 devices)

Media Resource Group Information

Name\* HARDWARE-MED-RES-GROUP

Description HARDWARE-MED-RES-GROUP

Devices for this Group

Available Media Resources\*\*

ANN\_2

ANN\_3

ANN\_4

CFB\_2

CFB\_3

Selected Media Resources\*

CFB-2901 (CFB)

MTP-2901 (MTP)

XCODE-2901 (XCODE)

☐ Use Multi-cast for MOH Audio (If at least one multi-cast MOH resource is available)

Save Delete Copy Add New

\*- indicates required item.

\*\*Includes Annunciators (ANN), Interactive Voice Responses (IVR), Conference Bridges (CFB), Media Termination Points (MTP), Music On Hold Servers (MOH) and Transcoders (XCODE)

Media Resource Group

https://blr-cucm-pub.ajcollab.com/ccmadmin/mrsrcListEdit.do?key=...

Cisco Unified CM Administration

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Media Resource Group List Configuration Related Links: Back To Find/List Go

Save Delete Copy Add New

Status

Status: Ready

Media Resource Group List Status

Media Resource Group List: MED-RES-GROUP-LIST (used by 12 devices)

Media Resource Group List Information

Name\* MED-RES-GROUP-LIST

Media Resource Groups for this List

Available Media Resource Groups

Selected Media Resource Groups

HARDWARE-MED-RES-GROUP

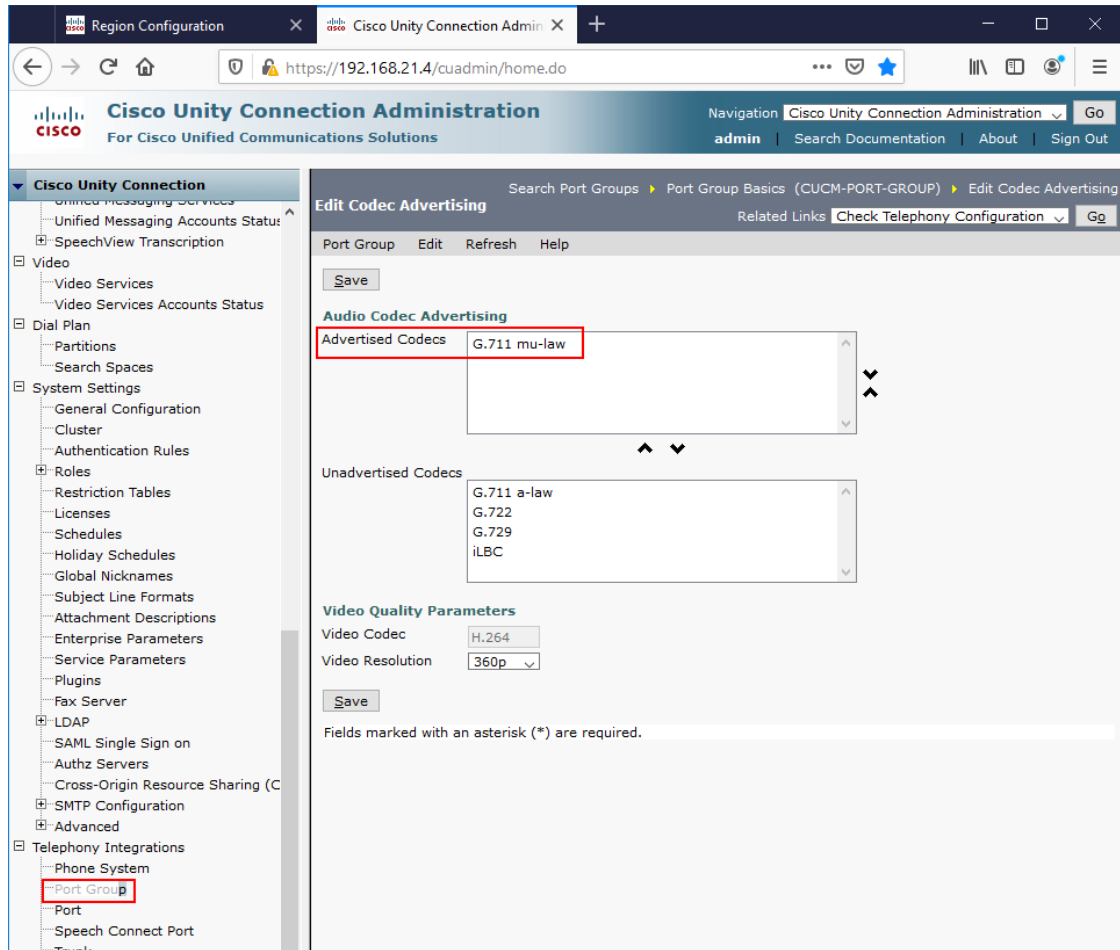
SOFTWARE-MED-RES-GROUP

Save Delete Copy Add New

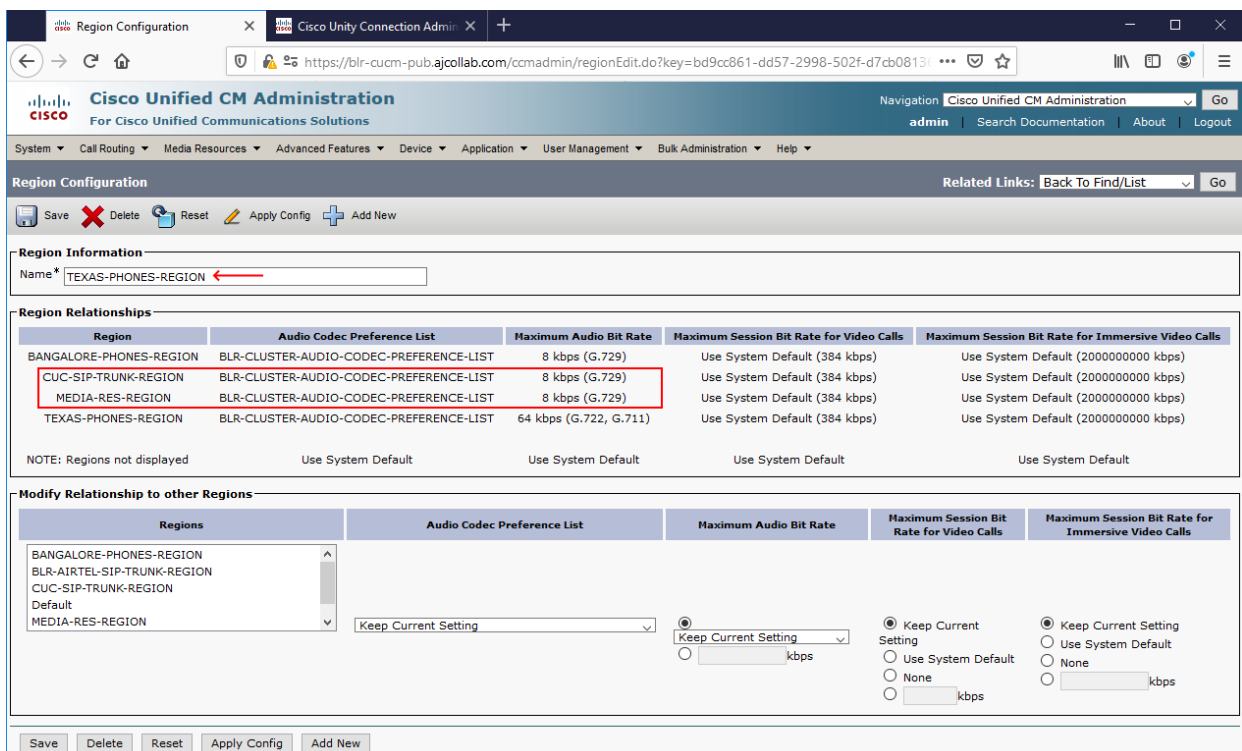
\*- indicates required item.

703

- To test the transcoding scenario, disable G.729 codec at Cisco Unity Connection



- Set the region relation between Texas Phones and CUC as G.729 and between Texas Phones and Media resources as G.792





- Try to access voicemail from the Texas Phone and you will see a failure without transcoder since CUC accepts only G.711 Codec where Texas Phones can send only 8 Kbps
- Once you insert transcoder, this issue can be sorted

The screenshot displays the Cisco Unified CM Administration web interface and a SecureCRT terminal window.

**Cisco Unified CM Administration - Device Pool Configuration**

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**Device Pool Configuration** Related Links: Back To Find/List | Go

Save | Delete | Copy | Reset | Apply Config | Add New

**Status**

- Update successful
- Click on the Reset button to have the changes take effect.

**Device Pool Information**

Device Pool: CUC-SIP-TRUNK-DP (2 members\*\*)

**Device Pool Settings**

Device Pool Name\*: CUC-SIP-TRUNK-DP

Cisco Unified Communications Manager Group\*: SUB01-SUB02-CCM-GROUP

Calling Search Space for Auto-registration: < None >

Adjunct CSS: < None >

Reverted Call Focus Priority: Default

Intercompany Media Services Enrolled Group: < None >

**Roaming Sensitive Settings**

Date/Time Group\*: IST-DATE-TIME-GROUP

Region\*: CUC-SIP-TRUNK-REGION

Media Resource Group List: MED-RES-GROUP-LIST

Location: < None >

Network Locale: < None >

SRST Reference\*: Disable

Connection Monitor Duration\*\*\*

**SecureCRT - med-res\_192.168.128.252**

File Edit View Options Transfer Script Tools Window Help

Enter host <Alt+R>

med-res\_192.168.128.252 | colpod1\_blr-cube-01\_192.168.31.1

```
media-res#
media-res#show sccp connections
sess_id conn_id stype mode codec sport rport ripaddr conn_id_tx
33557441 50331662 xcode sendrecv g711u 16414 18506 192.168.21.5 CUC
33557441 50331661 xcode sendrecv g729 16412 28332 192.168.129.1 Phone

Total number of active session(s) 1, and connection(s) 2
media-res#
```

```
med-res_192.168.128.252 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
med-res_192.168.128.252 x
media-res#
media-res#Show dspfarm dsp all
SLOT DSP VERSION STATUS CHNL USE TYPE RSC_ID BRIDGE_ID PKTS_TXED PKTS_RXED
0 1 40.2.0 UP 1 USED xcode 3 21 75 78
0 1 40.2.0 UP 1 USED xcode 3 22 73 74
0 1 40.2.0 UP N/A FREE conf 1 - - -
0 1 40.2.0 UP N/A FREE conf 1 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -

Total number of DSPFARM DSP channel(s) 7
media-res#
```

## Hardware Media Resource Verification Commands

```
med-res_192.168.128.252 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
med-res_192.168.128.252 colpod1_blr-cube-01_192.168.31.1
media-res#show sccp
SCCP Admin State: UP
Gateway Local Interface: GigabitEthernet0/0
IPv4 Address: 192.168.128.252
Port Number: 2000
IP Precedence: 5
User Masked Codec list: None
Call Manager: 192.168.21.3, Port Number: 2000
Priority: N/A, Version: 7.0, Identifier: 2
Trustpoint: N/A
Call Manager: 192.168.21.2, Port Number: 2000
Priority: N/A, Version: 7.0, Identifier: 1
Trustpoint: N/A

Conferencing Oper State: ACTIVE - Cause Code: NONE
Active Call Manager: 192.168.21.2, Port Number: 2000
TCP Link Status: CONNECTED, Profile Identifier: 1
Reported Max Streams: 16, Reported Max OOS Streams: 0
Supported Codec: g729abr8, Maximum Packetization Period: 60
Supported Codec: g711ulaw, Maximum Packetization Period: 30
Supported Codec: g711alaw, Maximum Packetization Period: 30
Supported Codec: g729ar8, Maximum Packetization Period: 60
Supported Codec: g729r8, Maximum Packetization Period: 60
Supported Codec: g729br8, Maximum Packetization Period: 60
Supported Codec: rfc2833 dtmf, Maximum Packetization Period: 30
Supported Codec: rfc2833 pass-thru, Maximum Packetization Period: 30
Supported Codec: inband-dtmf to rfc2833 conversion, Maximum Packetization Period: 30
TLS : ENABLED

MTP Oper State: ACTIVE - Cause Code: NONE
Active Call Manager: 192.168.21.2, Port Number: 2000
TCP Link Status: CONNECTED, Profile Identifier: 2
Reported Max Streams: 4, Reported Max OOS Streams: 0
Supported Codec: g729r8, Maximum Packetization Period: 60
Supported Codec: rfc2833 dtmf, Maximum Packetization Period: 30
Supported Codec: rfc2833 pass-thru, Maximum Packetization Period: 30
Supported Codec: inband-dtmf to rfc2833 conversion, Maximum Packetization Period: 30
TLS : ENABLED

Transcoding Oper State: ACTIVE - Cause Code: NONE
Active Call Manager: 192.168.21.2, Port Number: 2000
TCP Link Status: CONNECTED, Profile Identifier: 3
Reported Max Streams: 10, Reported Max OOS Streams: 0
Supported Codec: ilbc, Maximum Packetization Period: 120
Supported Codec: g729r8, Maximum Packetization Period: 60
Supported Codec: g729br8, Maximum Packetization Period: 60
Supported Codec: g722r64, Maximum Packetization Period: 30

Ready ssh2: AES-256-CTR 47, 12 47 Rows, 103 Cols Xterm CAP NUM
```

```

media-res#show dspfarm all
Dspfarm Profile Configuration

Profile ID = 3, Service =Universal TRANSCODING, Resource ID = 3
Profile Description :
Profile Service Mode : Non Secure
Profile Admin State : UP
Profile Operation State : ACTIVE
Application : SCCP Status : ASSOCIATED
Resource Provider : FLEX_DSPRM Status : UP
Total Number of Resources Configured : 5
Total Number of Resources Available : 5
Total Number of Resources Out of Service : 0
Total Number of Resources Active : 0
Codec Configuration: num_of_codecs:8
Codec : ilbc, Maximum Packetization Period : 120
Codec : g729r8, Maximum Packetization Period : 60
Codec : g729br8, Maximum Packetization Period : 60
Codec : g722-64, Maximum Packetization Period : 30
Codec : g711ulaw, Maximum Packetization Period : 30
Codec : g711alaw, Maximum Packetization Period : 30
Codec : g729ar8, Maximum Packetization Period : 60
Codec : g729abr8, Maximum Packetization Period : 60
Dspfarm Profile Configuration

Profile ID = 1, Service = CONFERENCING, Resource ID = 1
Profile Description :
Profile Service Mode : Non Secure
Profile Admin State : UP
Profile Operation State : ACTIVE
Application : SCCP Status : ASSOCIATED
Resource Provider : FLEX_DSPRM Status : UP
Total Number of Resources Configured : 2
Total Number of Resources Available : 2
Total Number of Resources Out of Service : 0
Total Number of Resources Active : 0
Maximum conference participants : 8
Codec Configuration: num_of_codecs:6
Codec : g729abr8, Maximum Packetization Period : 60 , Transcoder: Not Required
Codec : g711ulaw, Maximum Packetization Period : 30 , Transcoder: Not Required
Codec : g711alaw, Maximum Packetization Period : 30 , Transcoder: Not Required
Codec : g729ar8, Maximum Packetization Period : 60 , Transcoder: Not Required
Codec : g729r8, Maximum Packetization Period : 60 , Transcoder: Not Required
Codec : g729br8, Maximum Packetization Period : 60 , Transcoder: Not Required
Dspfarm Profile Configuration

Profile ID = 2, Service = MTP, Resource ID = 2
Profile Description :
Profile Service Mode : Non Secure
Profile Admin State : UP
Profile Operation State : ACTIVE
Application : SCCP Status : ASSOCIATED
Resource Provider : NONE Status : NONE
Total Number of Resources Configured : 2
Total Number of Resources Available : 2
Total Number of Resources Out of Service : 0
Total Number of Resources Active : 0
Hardware Configured Resources : 0
Hardware Resources Out of Service: 0
Software Configured Resources : 2

Number of Hardware Resources Active : 0
Number of Software Resources Active : 0
Codec Configuration: num_of_codecs:1
Codec : g729r8, Maximum Packetization Period : 60

SLOT DSP VERSION STATUS CHNL USE TYPE RSC_ID BRIDGE_ID PKTS_TXED PKTS_RXED
0 1 40.2.0 UP N/A FREE conf 1 - - -
0 1 40.2.0 UP N/A FREE conf 1 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -

Total number of DSPFARM DSP channel(s) 7

```

```
med-res_192.168.128.252 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
med-res_192.168.128.252 x

media-res#
media-res#Show dspfarm dsp all
SLOT DSP VERSION STATUS CHNL USE TYPE RSC_ID BRIDGE_ID PKTS_TXED PKTS_RXED
0 1 40.2.0 UP 1 USED xcode 3 21 75 78
0 1 40.2.0 UP 1 USED xcode 3 22 73 74
0 1 40.2.0 UP N/A FREE conf 1 - - -
0 1 40.2.0 UP N/A FREE conf 1 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -
0 1 40.2.0 UP N/A FREE xcode 3 - - -

Total number of DSPFARM DSP channel(s) 7

media-res#
```

## Hunt

- Hunt Group is a mechanism that helps business to manage inbound calls. It is a group of telephone lines that are associated with a common number
- When call comes to the hunt number, the call cycles through the group of lines until available line is found
- While hunting, the forwarding configuration of line group members is not considered

Call Routing >> Route/Hunt >> Line Group >> Add New

**Line Group Configuration**

Save

**Line Group Information**

Line Group Name\*

RNA Reversion Timeout\*

Distribution Algorithm\*

**Hunt Options**

No Answer\*

☐ Automatically Logout Hunt Member on No Answer

Busy\*\*

Not Available\*\*

**Line Group Member Information**

**Find Directory Numbers to Add to Line Group**

Partition

Directory Number Contains  **Find**

Available DN/Route Partition

- 10002
- 10002/BANGALORE-INTERNAL-PT
- 21001/TEXAS-INTERNAL-PT

**Add to Line Group**

**Current Line Group Members**

Reverse Order of Selected DN/Route Partitions

Selected DN/Route Partition

- 11001/BANGALORE-INTERNAL-PT
- 11002/BANGALORE-INTERNAL-PT
- 11003/BANGALORE-INTERNAL-PT
- 11004/BANGALORE-INTERNAL-PT

Removed DN/Route Partition

**Directory Numbers**

Save

Hunt List Configuration

https://192.168.21.1/ccmadmin/huntListEdit.do?key=2912cb09-a67e

Cisco

Cisco Unified CM Administration

For Cisco Unified Communications Solutions

Navigation Cisco Unified CM AdministrationGoadmin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Hunt List ConfigurationRelated Links: Back To Find/ListGo

SaveDeleteCopyResetApply ConfigAdd New

Status

Add successful

Hunt List Information

Device is trusted

Name\*AJ-LABS-HUNT-LIST

DescriptionAJ-LABS-HUNT-LIST

Cisco Unified Communications Manager Group\*SUB01-SUB02-CUCM-GROUP

Enable this Hunt List (change effective on Save; no reset required)

For Voice Mail Usage

Hunt List Member Information

Add Line Group

Selected Groups\*\*AJ-LABS-LINE-GROUP

Removed Groups\*\*\*

Hunt List Details

AJ-LABS-LINE-GROUP

SaveDeleteCopyResetApply ConfigAdd New

i

\*- indicates required item.

i

\*\*ordered by highest priority

i

\*\*\*will be removed from Hunt List when you click Save

711





---

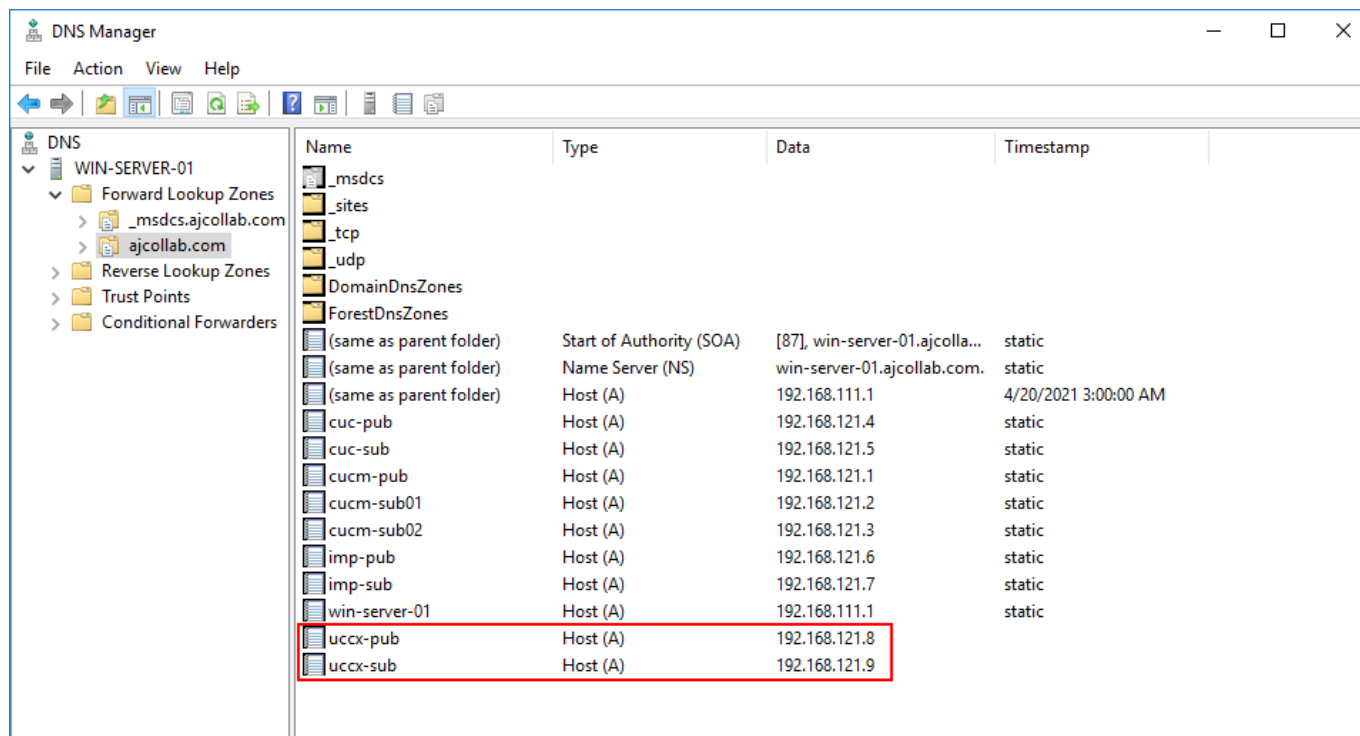
# **Chapter 1 Module 6 - UCCX**

## **Cisco On-Premise Collaboration Solution**

### **Cisco Unified Contact Center Express (UCCX)**



## UCCX Publisher Installation



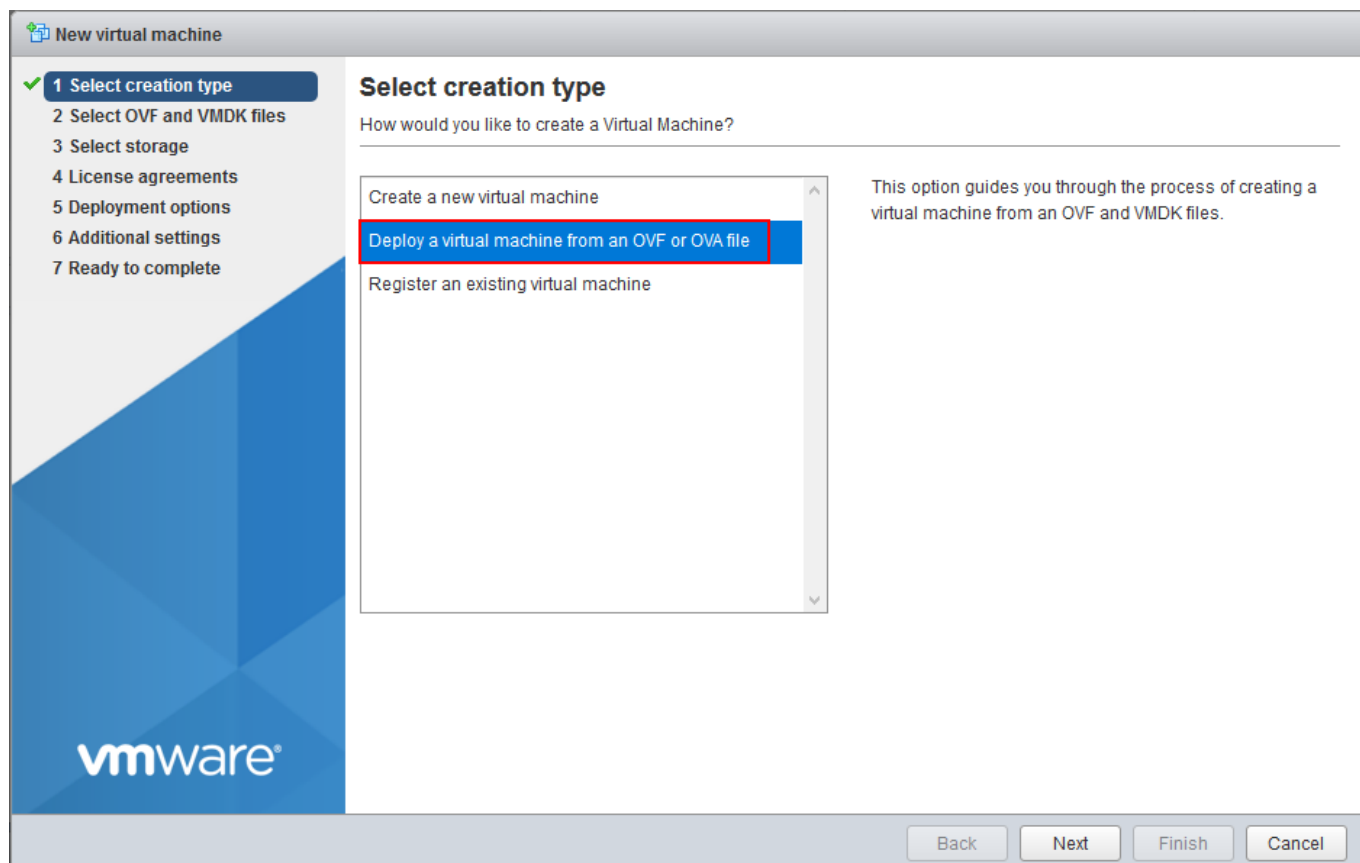
DNS Manager

File Action View Help

DNS

- WIN-SERVER-01
  - Forward Lookup Zones
    - \_msdcs.ajcollab.com
    - ajcollab.com
    - Reverse Lookup Zones
    - Trust Points
    - Conditional Forwarders

| Name                    | Type                     | Data                            | Timestamp            |
|-------------------------|--------------------------|---------------------------------|----------------------|
| _msdcs                  |                          |                                 |                      |
| _sites                  |                          |                                 |                      |
| _tcp                    |                          |                                 |                      |
| _udp                    |                          |                                 |                      |
| DomainDnsZones          |                          |                                 |                      |
| ForestDnsZones          |                          |                                 |                      |
| (same as parent folder) | Start of Authority (SOA) | [87], win-server-01.ajcollab... | static               |
| (same as parent folder) | Name Server (NS)         | win-server-01.ajcollab.com.     | static               |
| (same as parent folder) | Host (A)                 | 192.168.111.1                   | 4/20/2021 3:00:00 AM |
| cuc-pub                 | Host (A)                 | 192.168.121.4                   | static               |
| cuc-sub                 | Host (A)                 | 192.168.121.5                   | static               |
| cucm-pub                | Host (A)                 | 192.168.121.1                   | static               |
| cucm-sub01              | Host (A)                 | 192.168.121.2                   | static               |
| cucm-sub02              | Host (A)                 | 192.168.121.3                   | static               |
| imp-pub                 | Host (A)                 | 192.168.121.6                   | static               |
| imp-sub                 | Host (A)                 | 192.168.121.7                   | static               |
| win-server-01           | Host (A)                 | 192.168.111.1                   | static               |
| uccx-pub                | Host (A)                 | 192.168.121.8                   |                      |
| uccx-sub                | Host (A)                 | 192.168.121.9                   |                      |



New virtual machine

1 Select creation type

2 Select OVF and VMDK files

3 Select storage

4 License agreements

5 Deployment options

6 Additional settings

7 Ready to complete

vmware

### Select creation type

How would you like to create a Virtual Machine?

- Create a new virtual machine
- Deploy a virtual machine from an OVF or OVA file**
- Register an existing virtual machine

This option guides you through the process of creating a virtual machine from an OVF and VMDK files.

Back Next Finish Cancel

Please note, the IP Address in this demo is different from the lab topology given at the beginning of this document. I have taken this during a different deployment

New virtual machine - aj\_uccx-pub\_192.168.121.8

1 Select creation type

2 Select OVF and VMDK files

3 Select storage

4 License agreements

5 Deployment options

6 Additional settings

7 Ready to complete

### Select OVF and VMDK files

Select the OVF and VMDK files or OVA for the VM you would like to deploy

Enter a name for the virtual machine.

aj\_uccx-pub\_192.168.121.8

Virtual machine names can contain up to 80 characters and they must be unique within each ESXi instance.

x

vm

UCCX\_11.5\_vmv9\_v2.5.ova

Back

Next

Finish

Cancel

New virtual machine - aj\_uccx-pub\_192.168.121.8

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 License agreements
- 5 Deployment options
- 6 Additional settings
- 7 Ready to complete

## Select storage

Select the storage type and datastore

Standard
Persistent Memory

Select a datastore for the virtual machine's configuration files and all of its' virtual disks.

| Name       | Capacity | Free      | Type  | Thin pro... | Access |
|------------|----------|-----------|-------|-------------|--------|
| datastore1 | 1.08 TB  | 476.41 GB | VMFS5 | Supported   | Single |
| datastore2 | 1.09 TB  | 807.65 GB | VMFS5 | Supported   | Single |
| datastore3 | 556.5 GB | 488.05 GB | VMFS6 | Supported   | Single |

3 items

Back
Next
Finish
Cancel

New virtual machine - aj\_uccx-pub\_192.168.121.8

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 License agreements
- 5 Deployment options
- 6 Ready to complete

## License agreements

Read and accept the license agreements

License information...

End User License Agreement

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(i) transfer, assign or sublicense its license rights to any other person or entity (other than in complian

Back
Next
Finish
Cancel

New virtual machine - aj\_uccx-pub\_192.168.121.8

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 License agreements
- 5 **Deployment options**
- 6 Ready to complete

## Deployment options

Select deployment options

|                        |                                                                                                                                                                                                                                                                                                                            |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Network mappings       | eth0 <span>VM Network</span>                                                                                                                                                                                                                                                                                               |
| Deployment type        | <div>UCCX 100 Agent</div> <p>Cisco Unified Contact Center Express (UCCX) VM configuration that supports: up to 100 users on all VMware ESXi 6.X Hypervisor based servers. Details: Red Hat Enterprise Linux 6 (64-bit) CPU: 2 vCPU with 900 MHz reservation Memory: 10 GB with 10 GB reservation Disk: 1 X 146 GB disk</p> |
| Disk provisioning      | <input checked="" type="radio"/> Thin <input type="radio"/> Thick <i>For production cluster, use 'Thick'</i>                                                                                                                                                                                                               |
| Power on automatically | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                   |

Back

Next

Finish

Cancel

New virtual machine - aj\_uccx-pub\_192.168.121.8

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 License agreements
- 5 Deployment options
- 6 **Ready to complete**

At least one extra disk image was provided that will be ignored.

Review your settings selection before finishing the wizard

|                   |                                                                                                                                                                                                                                                                                           |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product           | Cisco Unified Contact Center Express (UCCX)                                                                                                                                                                                                                                               |
| VM Name           | aj_uccx-pub_192.168.121.8                                                                                                                                                                                                                                                                 |
| Files             | UCCX_11.5_vmv9_v2.5-disk1.vmdk<br>UCCX_11.5_vmv9_v2.5-disk2.vmdk<br>UCCX_11.5_vmv9_v2.5-disk3.vmdk<br>UCCX_11.5_vmv9_v2.5-disk4.vmdk<br>UCCX_11.5_vmv9_v2.5-disk5.vmdk                                                                                                                    |
| Datastore         | datastore2                                                                                                                                                                                                                                                                                |
| Provisioning type | Thin                                                                                                                                                                                                                                                                                      |
| Network mappings  | eth0: VM Network                                                                                                                                                                                                                                                                          |
| Guest OS Name     | Red Hat Enterprise Linux 6 (64-bit)                                                                                                                                                                                                                                                       |
| Profile           | Cisco Unified Contact Center Express (UCCX) VM configuration that supports: up to 100 users on all VMware ESXi 6.X Hypervisor based servers. Details: Red Hat Enterprise Linux 6 (64-bit) CPU: 2 vCPU with 900 MHz reservation Memory: 10 GB with 10 GB reservation Disk: 1 X 146 GB disk |

Do not refresh your browser while this VM is being deployed.

Back

Next

Finish

Cancel

esxi-primary - VMware ESXi

https://192.168.10.2/ui/#/host/vms/46

root@192.168.10.2 | Help | Search

aj\_uccx-pub\_192.168.121.8

Console Monitor Power on Power off Suspend Restart Edit Refresh

aj\_uccx-pub\_192.168.121.8

Guest OS Red Hat Enterprise Linux 6 (64...

Compatibility ESXi 5.1 virtual machine

VMware Tools No

CPU 0 MHz

CPUs 2

Memory 10 GB

MEMORY 0 B

STORAGE

Edit settings - aj\_uccx-pub\_192.168.121.8 (ESXi 5.1 virtual machine)

Memory 10240 MB

Hard disk 1 146 GB

SCSI Controller 0 LSI Logic Parallel

Network Adapter 1 VM Network ☒ Connect

Floppy drive 1

CD/DVD Drive 1 Datastore ISO file ☒ Connect

Status ☒ Connect at power on

CD/DVD Media :tail\_UCCX\_11\_5\_1\_UCOS\_11.5.1.11001-34.sgn.iso Browse...

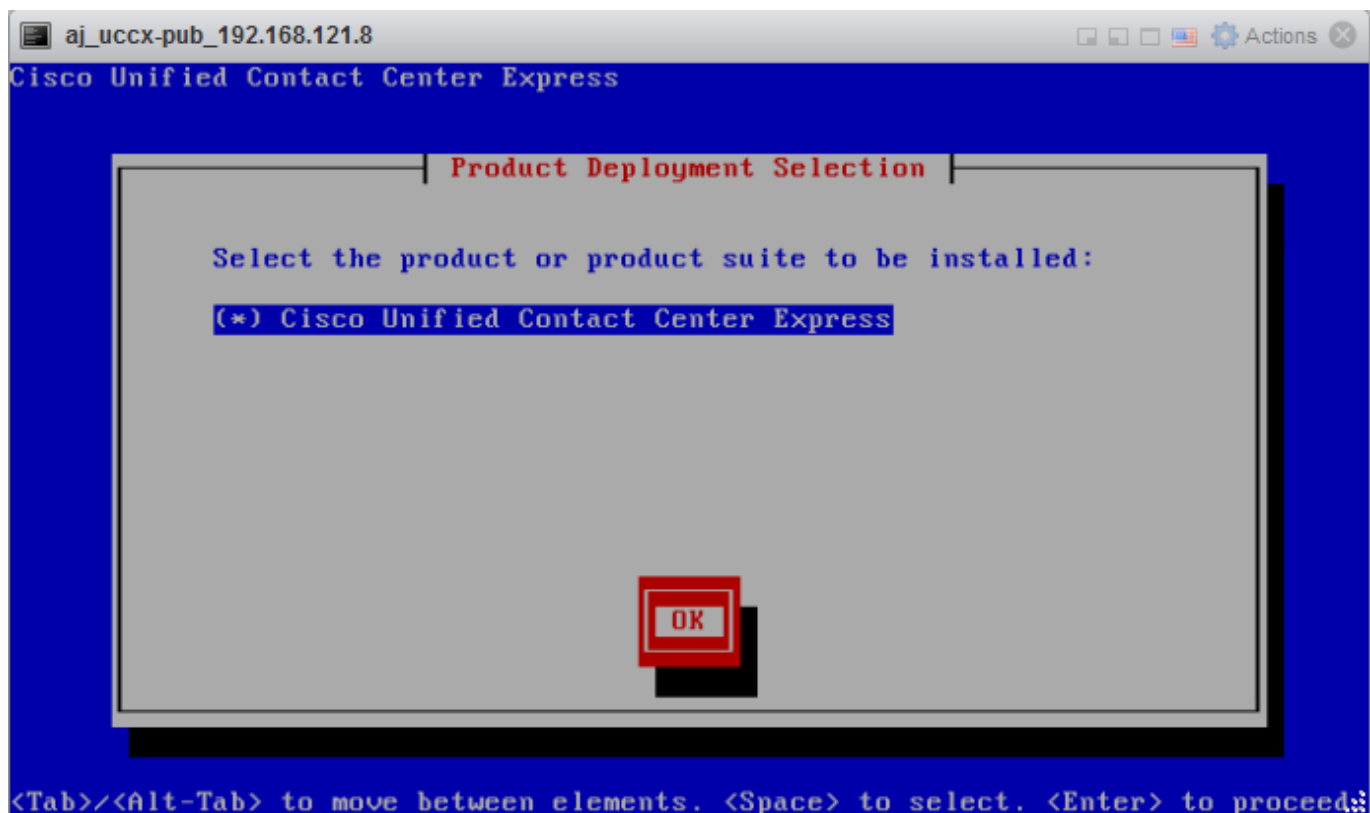
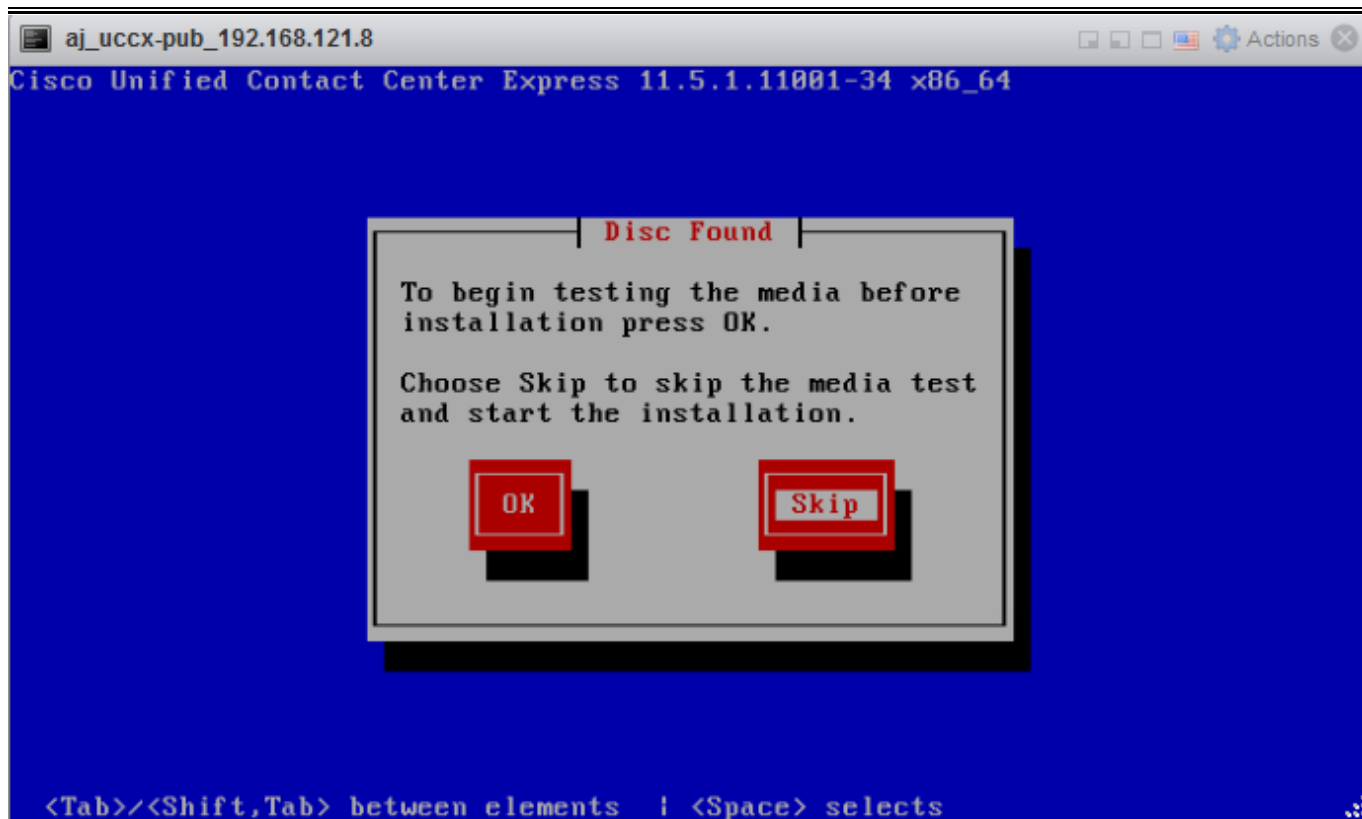
Controller location IDE controller 1 Master

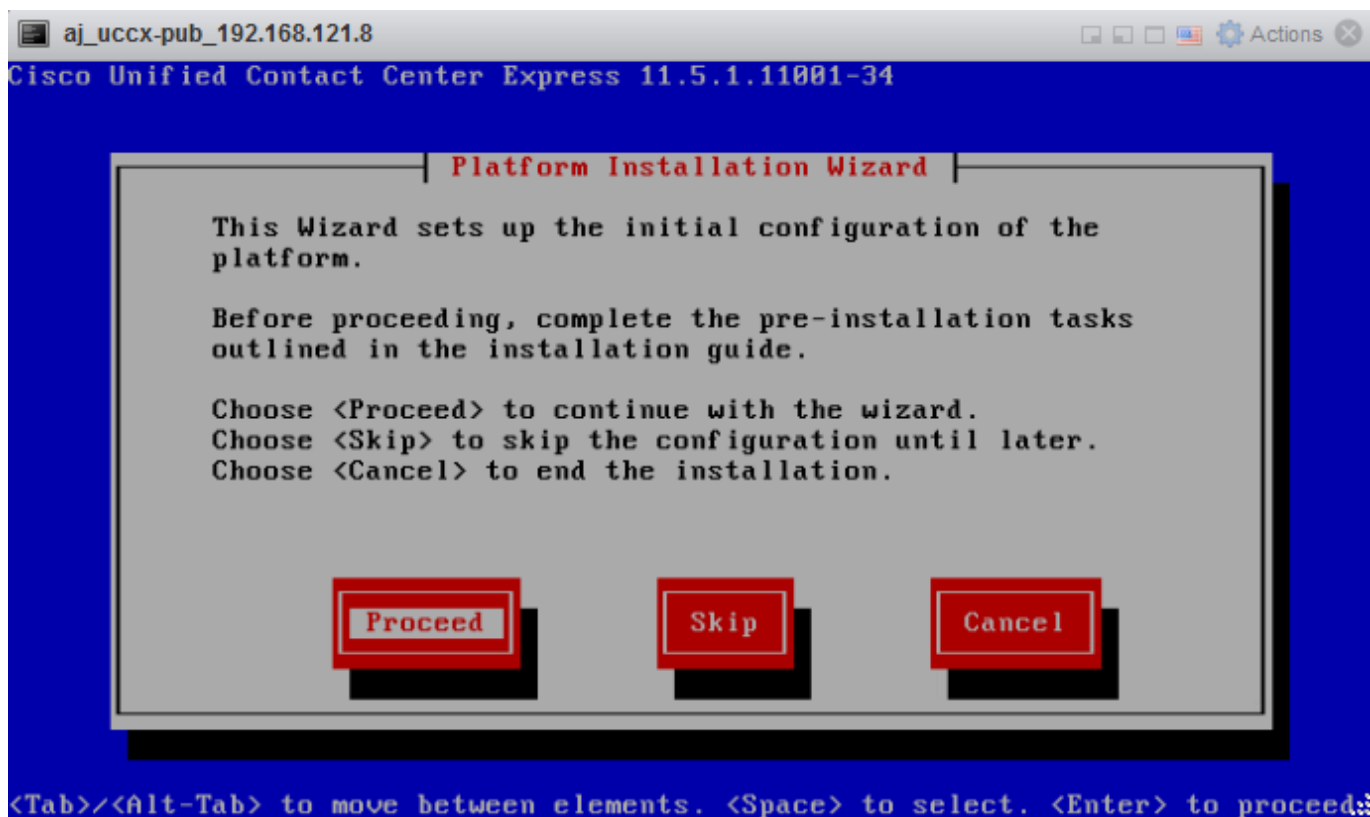
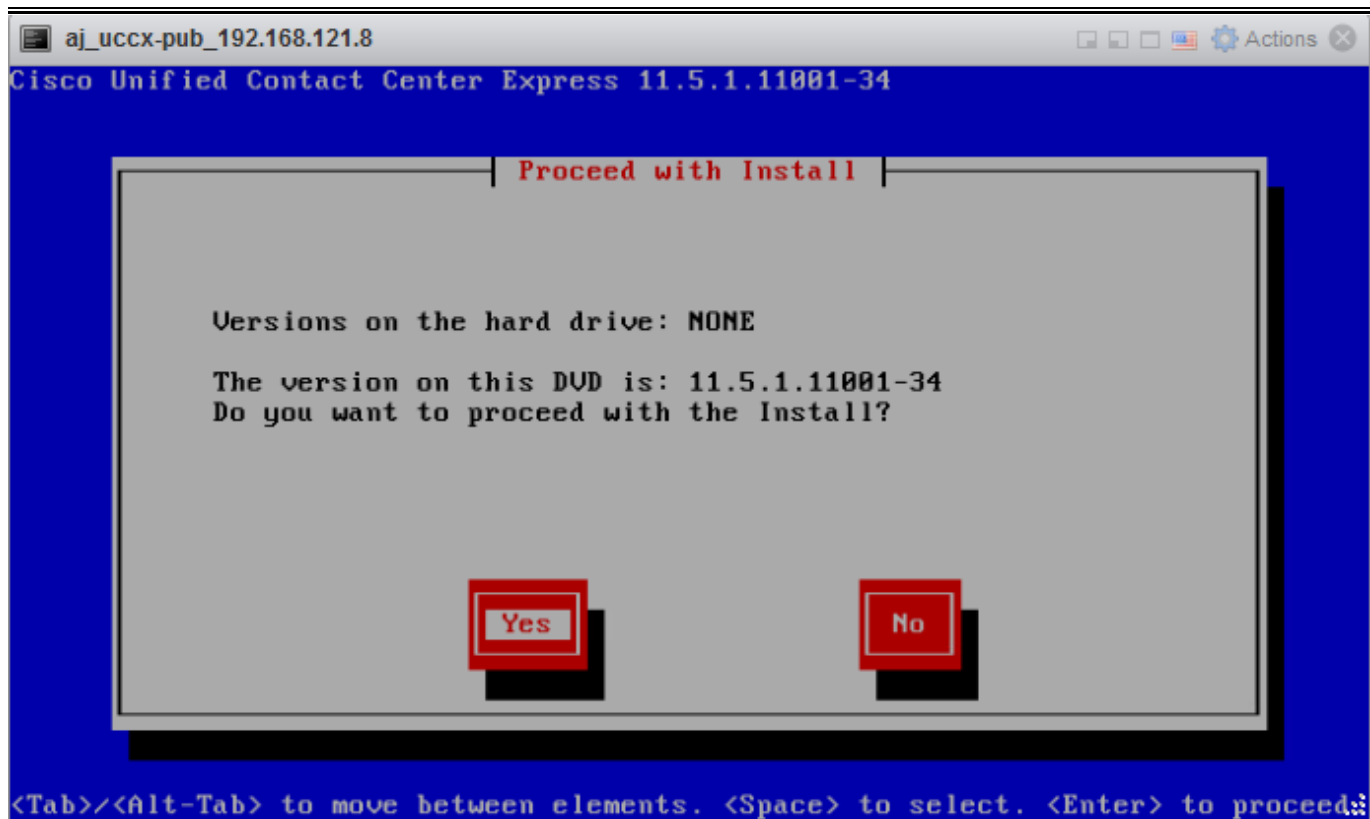
Video Card

Save Cancel

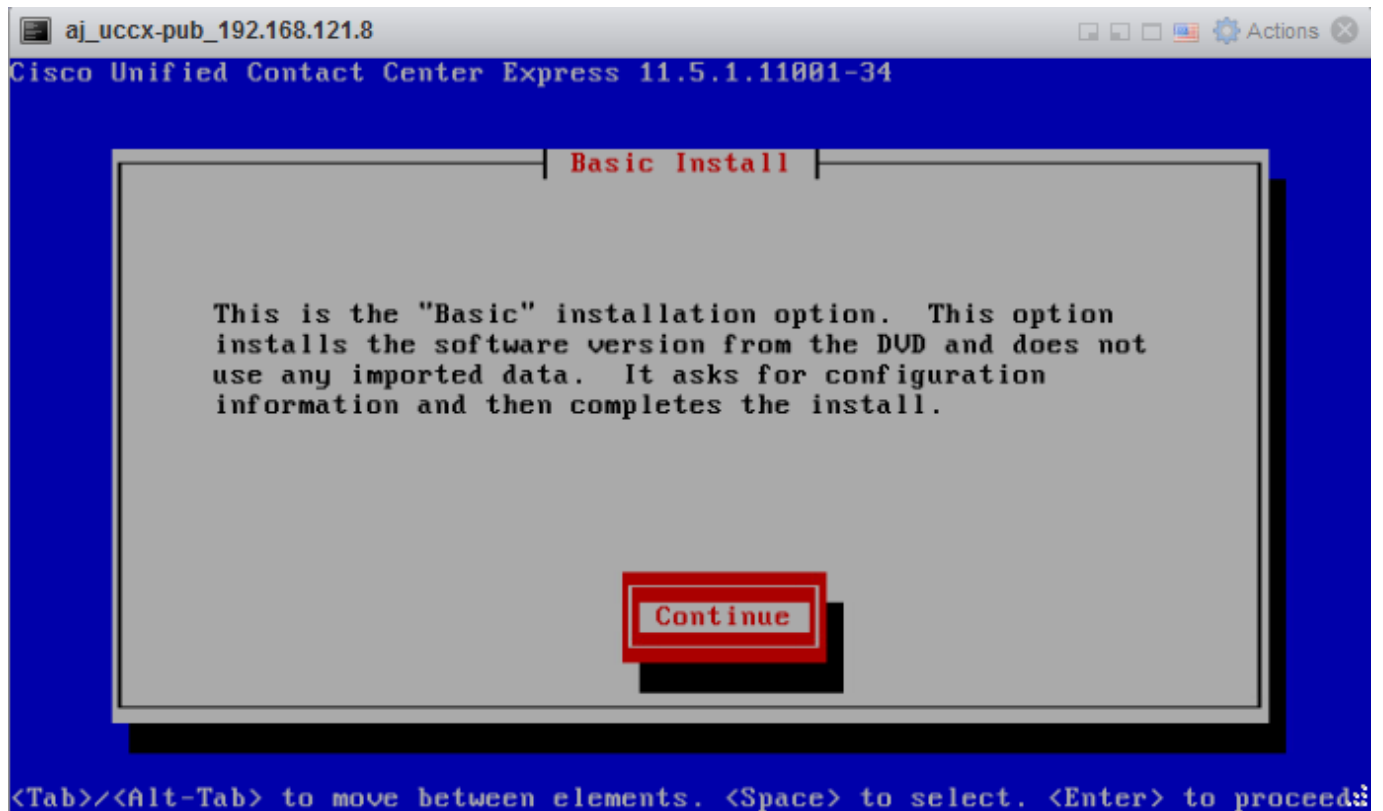
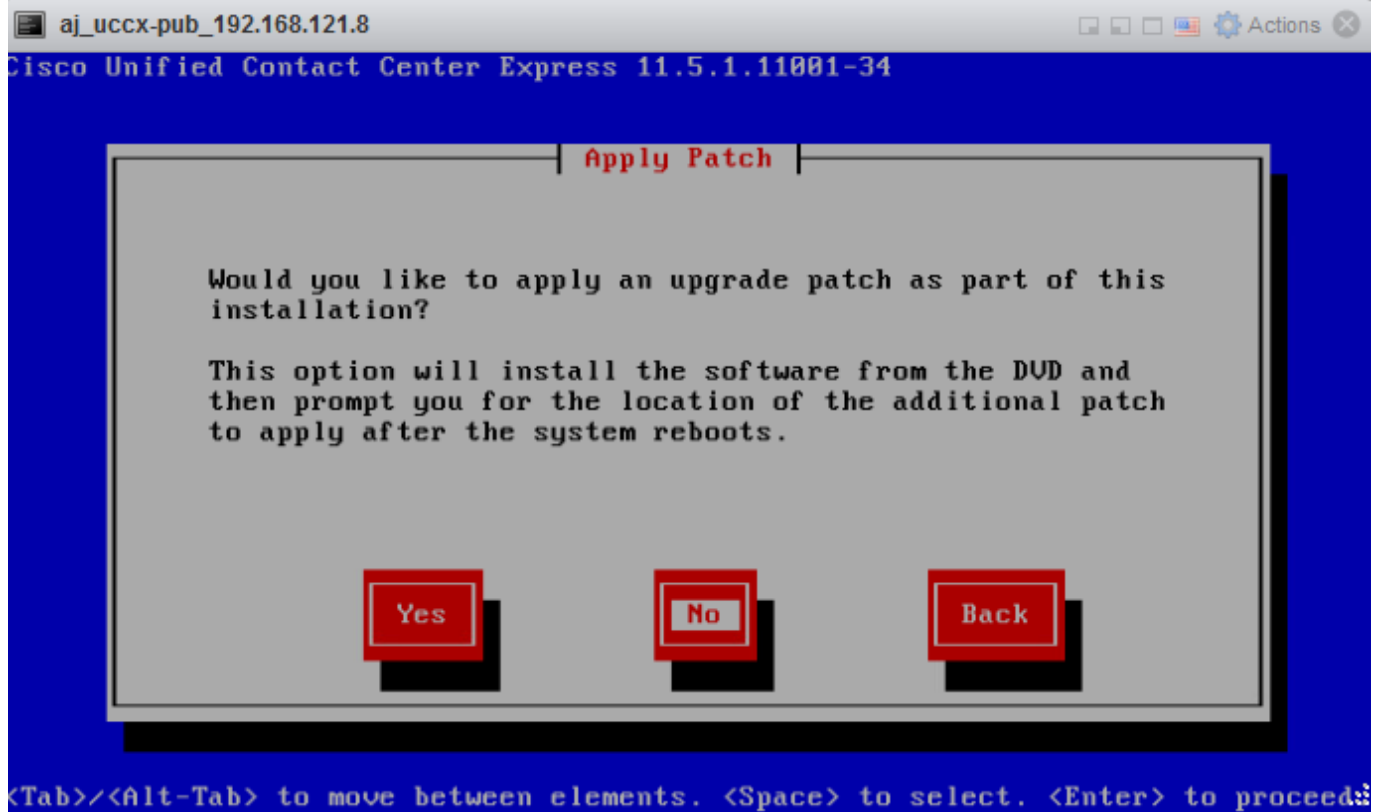
Recent tasks

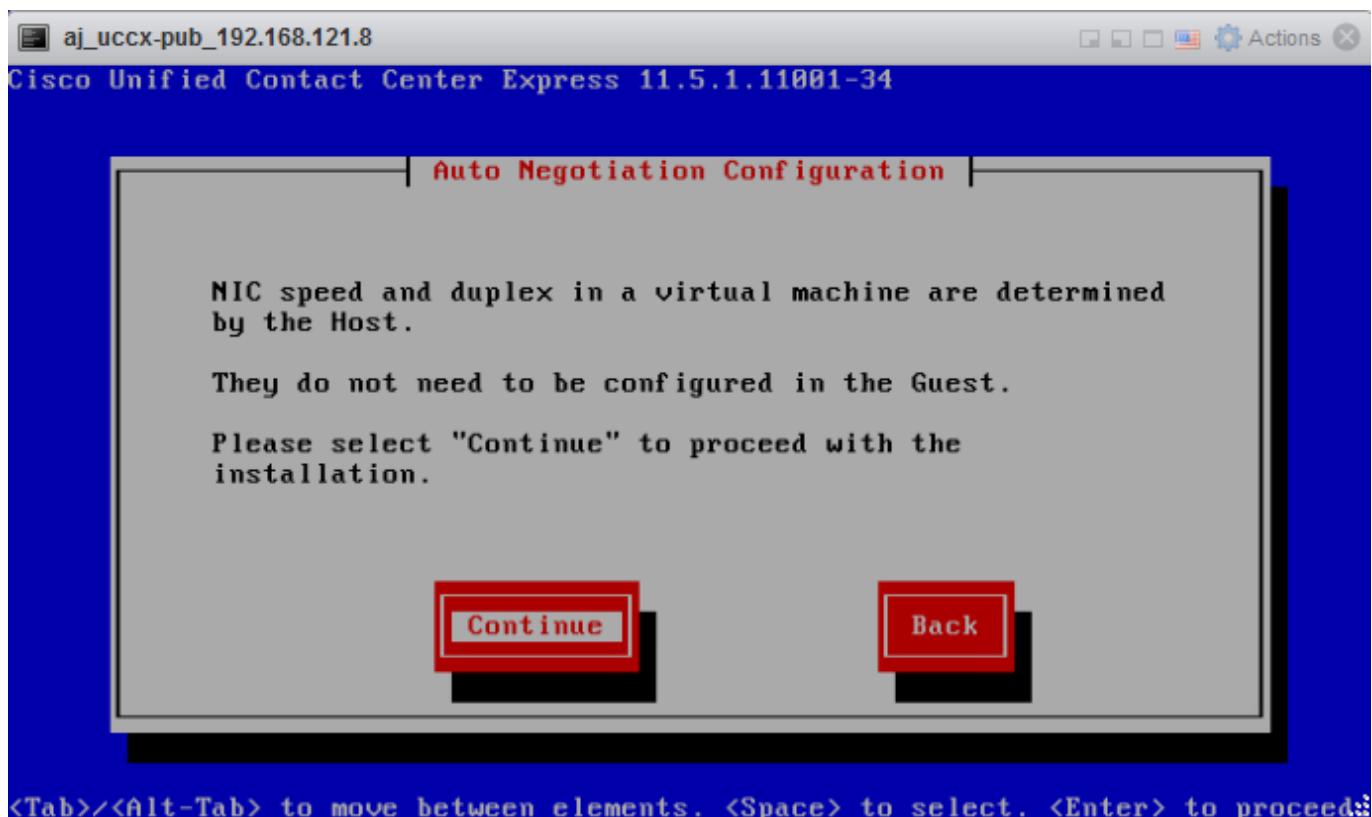
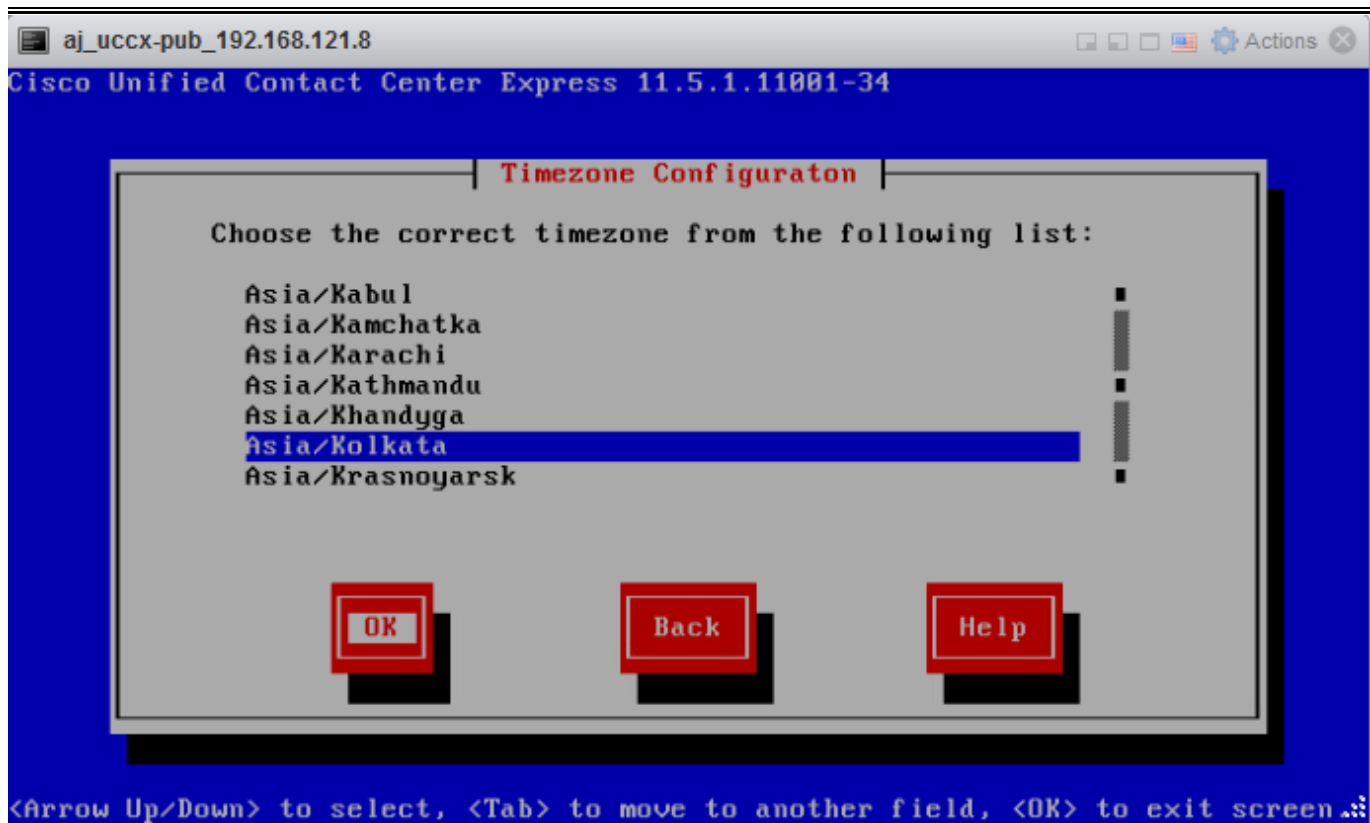
| Task                     | Target         | Initiator | Queued         | Started        | Result                | Comple...      |
|--------------------------|----------------|-----------|----------------|----------------|-----------------------|----------------|
| Upload disk - UCCX_11... | aj_uccx-pub... | root      | 04/22/2021 ... | 04/22/2021 ... | ✓ Completed succes... | 04/22/2021 ... |
| Reconfig VM              | aj_cuo-sub...  | root      | 04/22/2021 ... | 04/22/2021 ... | ✓ Completed succes... | 04/22/2021 ... |
| Reconfig VM              | aj_cuo-pub...  | root      | 04/22/2021 ... | 04/22/2021 ... | ✓ Completed succes... | 04/22/2021 ... |
| Reconfig VM              | aj_cuom-su...  | root      | 04/22/2021 ... | 04/22/2021 ... | ✓ Completed succes... | 04/22/2021 ... |
| Reconfig VM              | aj_cuom-su...  | root      | 04/22/2021 ... | 04/22/2021 ... | ✓ Completed succes... | 04/22/2021 ... |
| Reconfig VM              | aj_cuom-pu...  | root      | 04/22/2021 ... | 04/22/2021 ... | ✓ Completed succes... | 04/22/2021 ... |

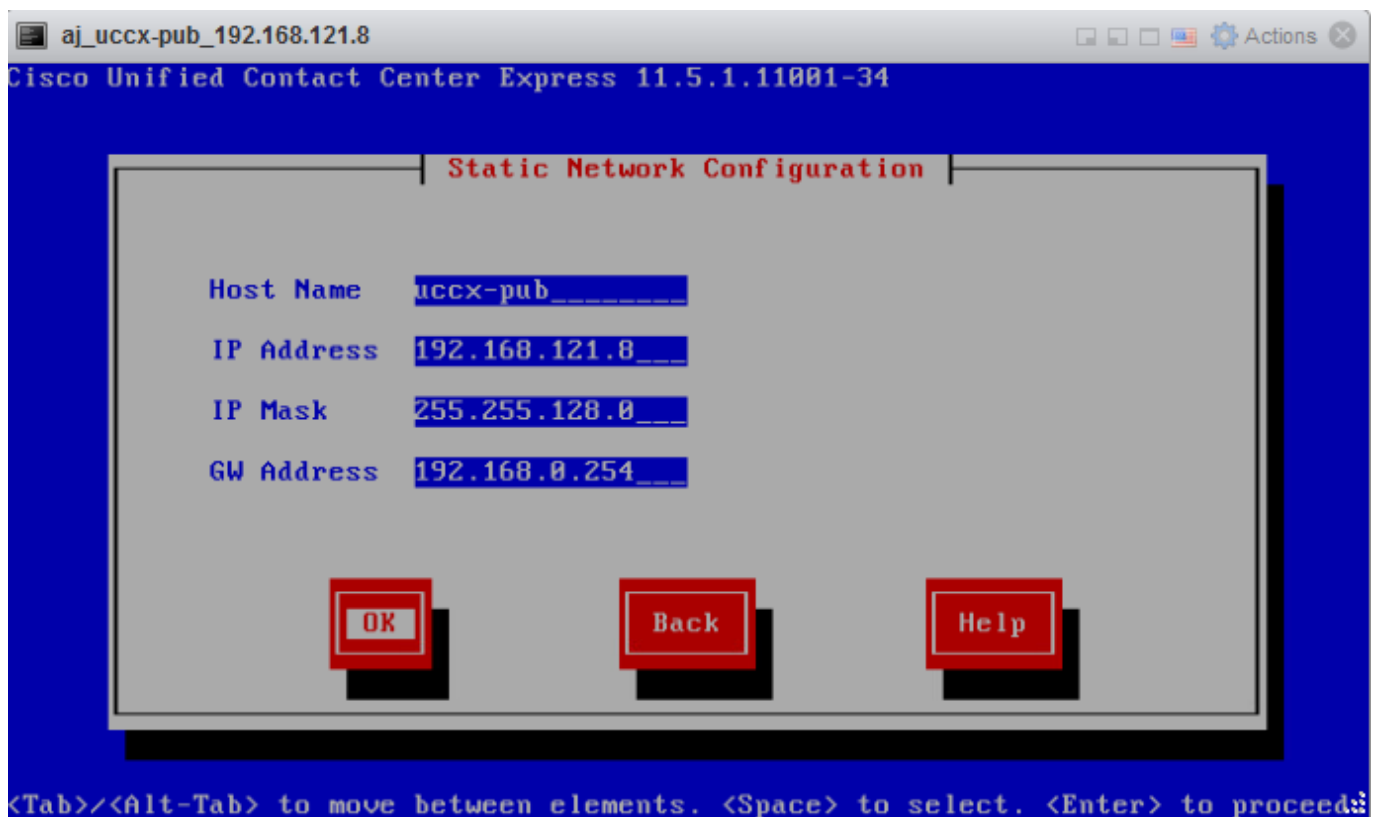
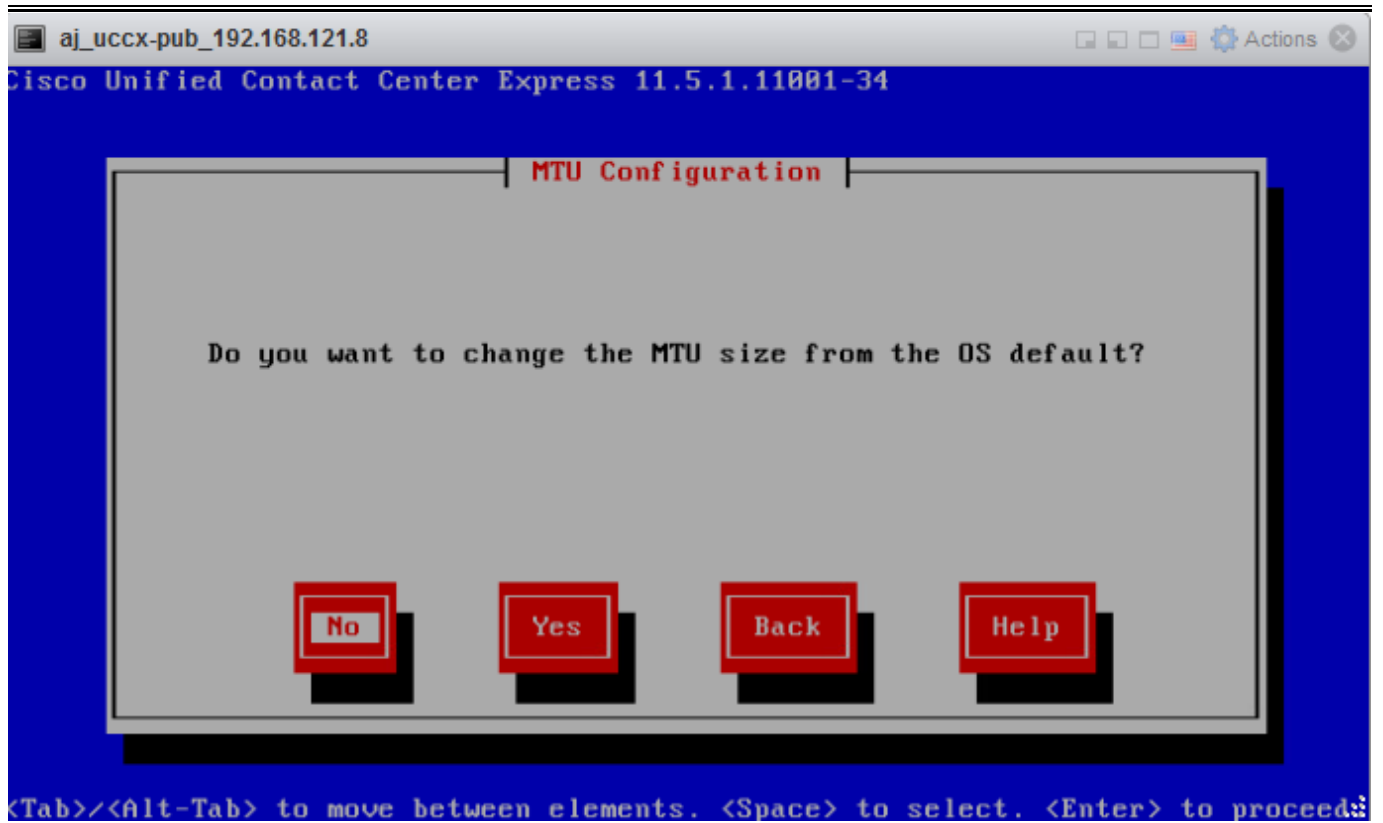












aj\_uccx-pub\_192.168.121.8 Actions

Cisco Unified Contact Center Express 11.5.1.11001-34

### DNS Client Configuration

Primary DNS 192.168.111.1

Secondary DNS (optional)

Domain ajcollab.com

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

aj\_uccx-pub\_192.168.121.8 Actions

Cisco Unified Contact Center Express 11.5.1.11001-34

### Administrator Login Configuration

Enter the Platform administration username and password.  
Choose Help for username and password guidelines.

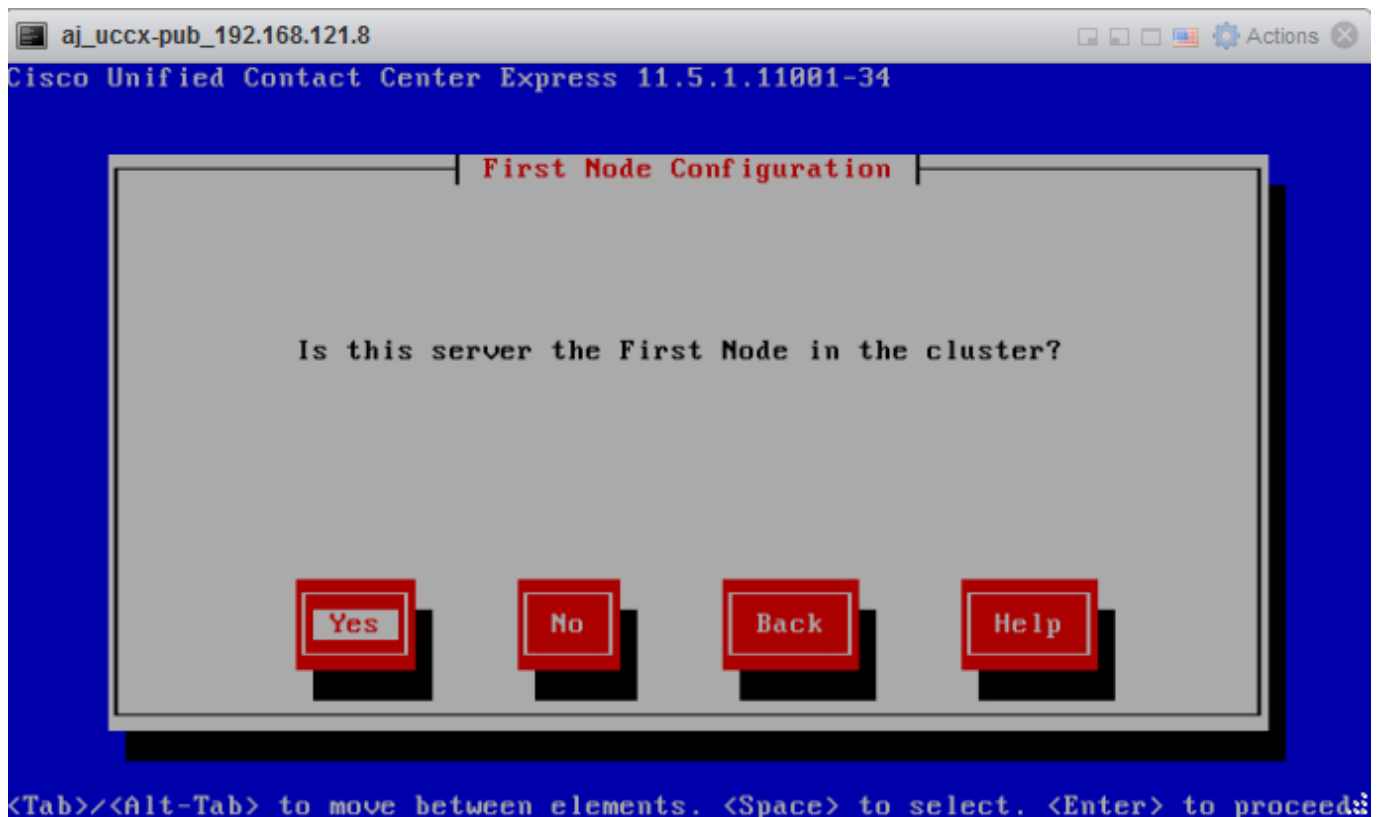
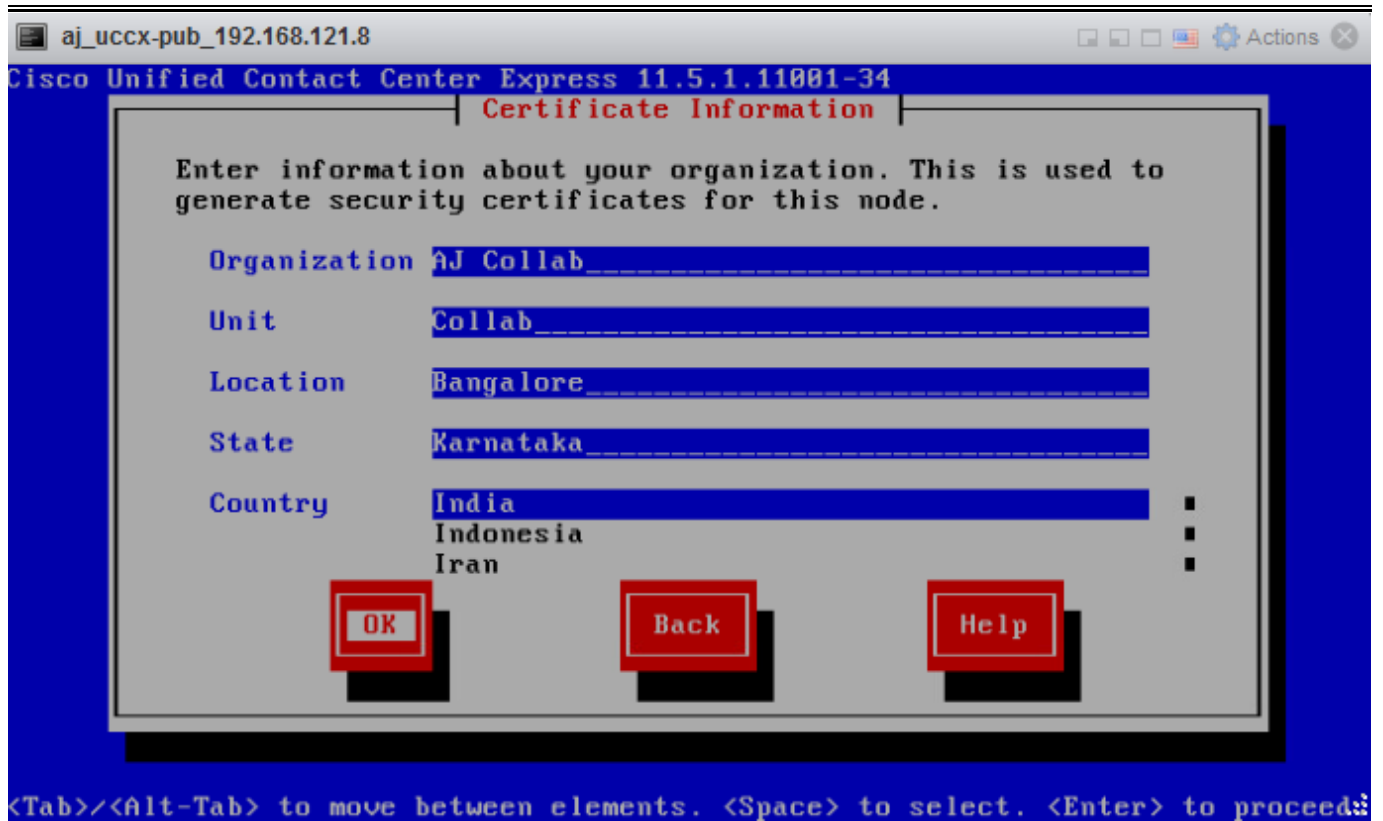
Administrator ID admin

Password \*\*\*\*\*

Confirm Password \*\*\*\*\*

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.



aj\_uccx-pub\_192.168.121.8

Actions

Cisco Unified Contact Center Express 11.5.1.11001-34

Network Time Protocol Client Configuration

NTP Server 1

192.168.31.11

NTP Server 2

NTP Server 3

NTP Server 4

NTP Server 5

OK

Back

Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

aj\_uccx-pub\_192.168.121.8

Actions

Cisco Unified Contact Center Express 11.5.1.11001-34

Security Configuration

Enter the system security password. This password is used to secure communication between cluster nodes and will also be used by DRS for encryption of backup tar files. Choose Help for username and password guidelines.

Security Password

\*\*\*\*\*

Confirm Password

\*\*\*\*\*

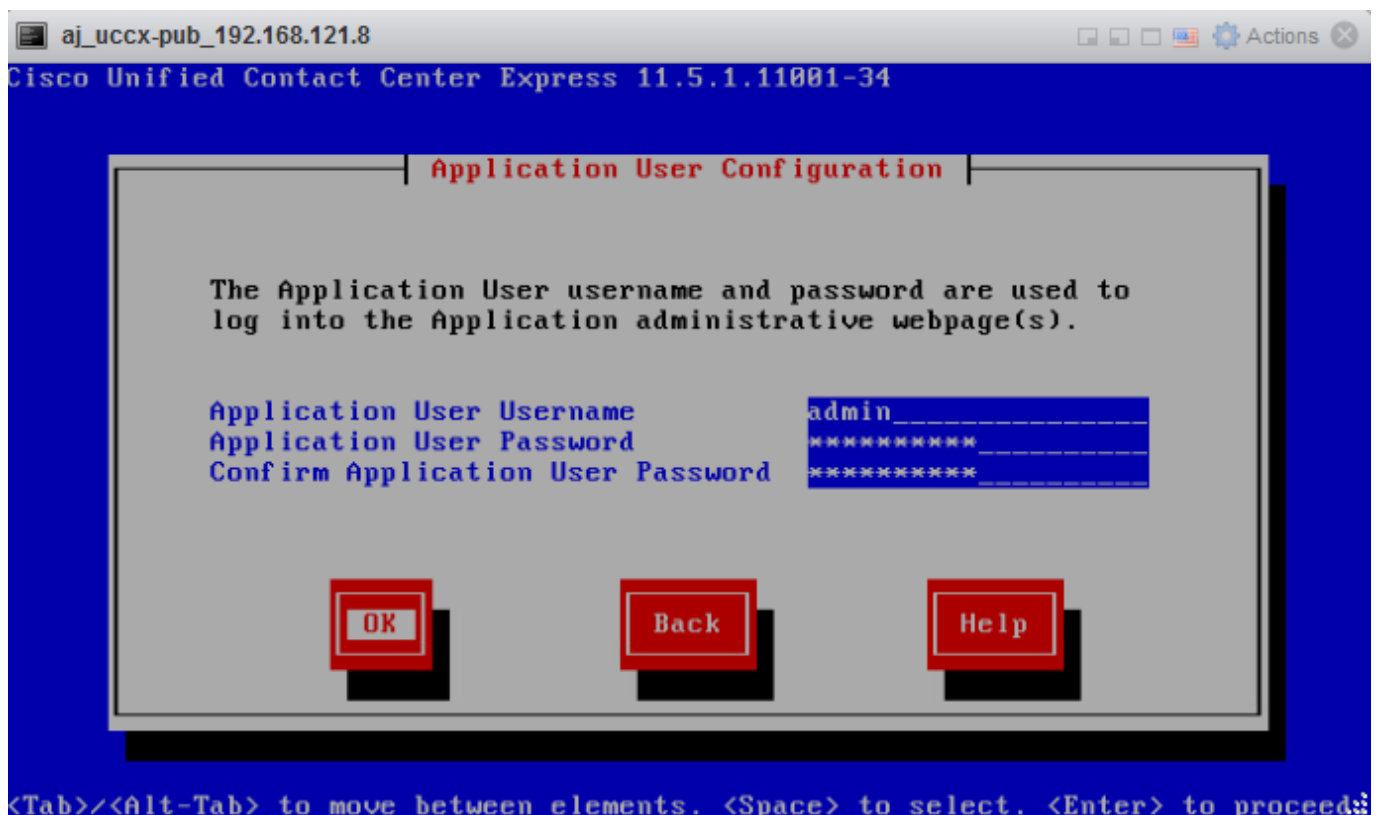
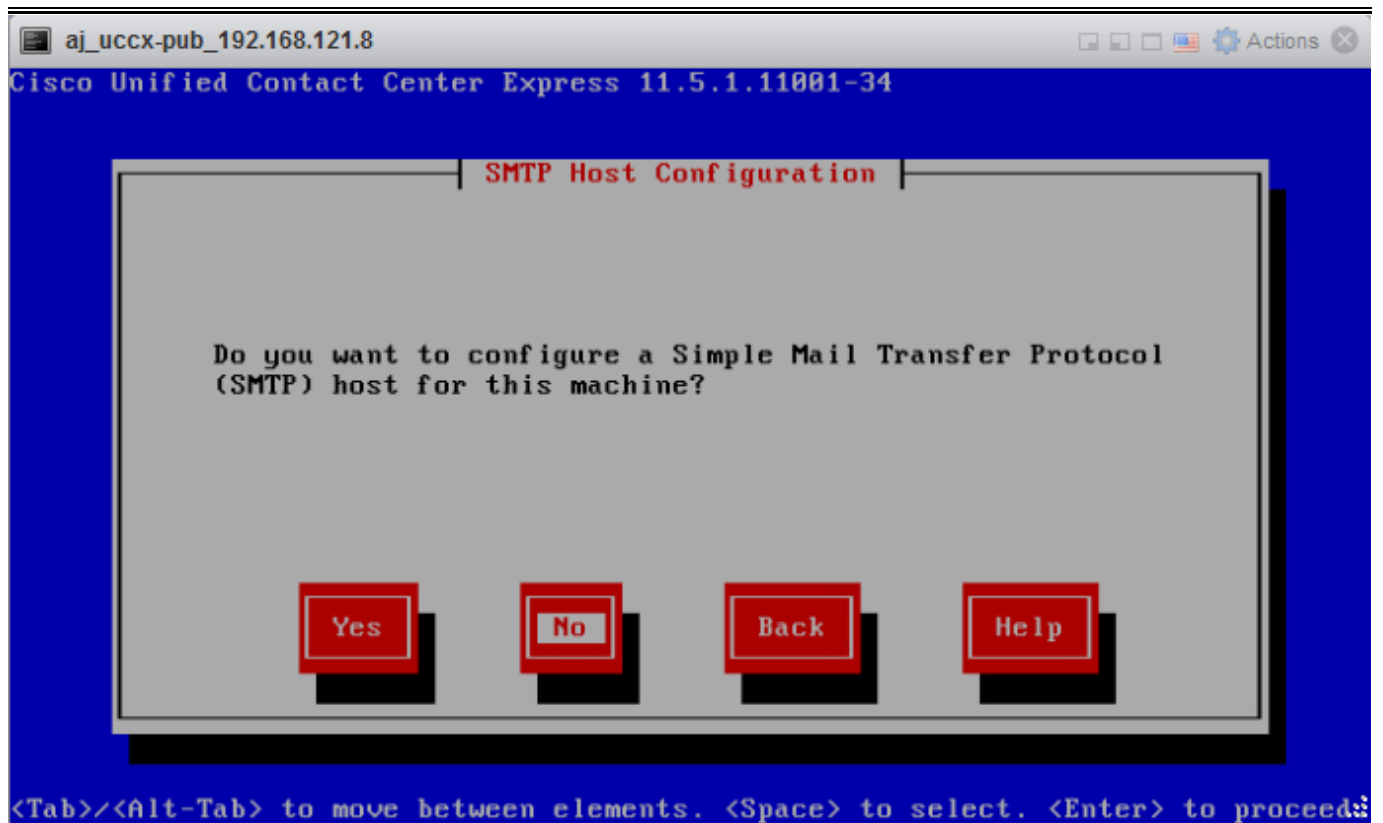
OK

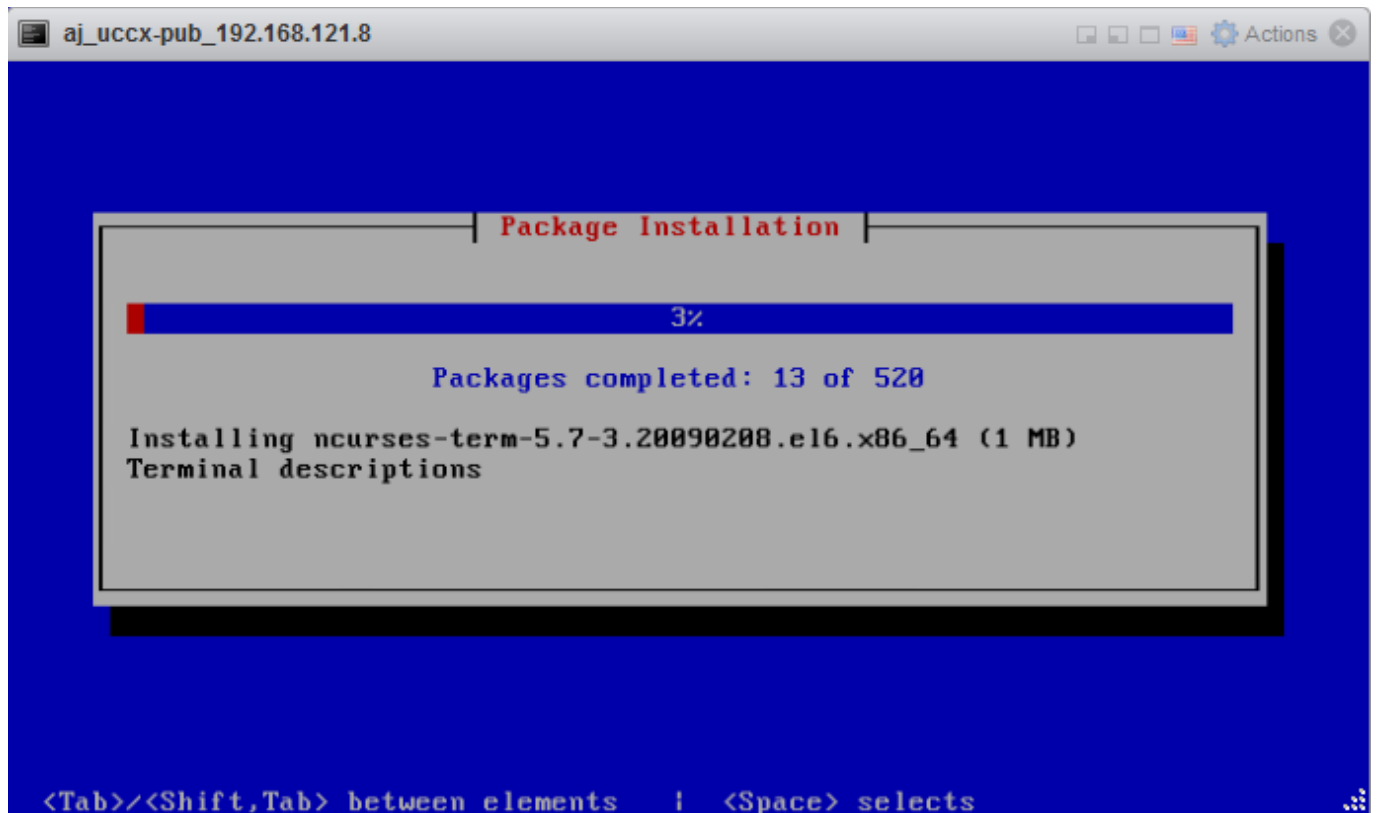
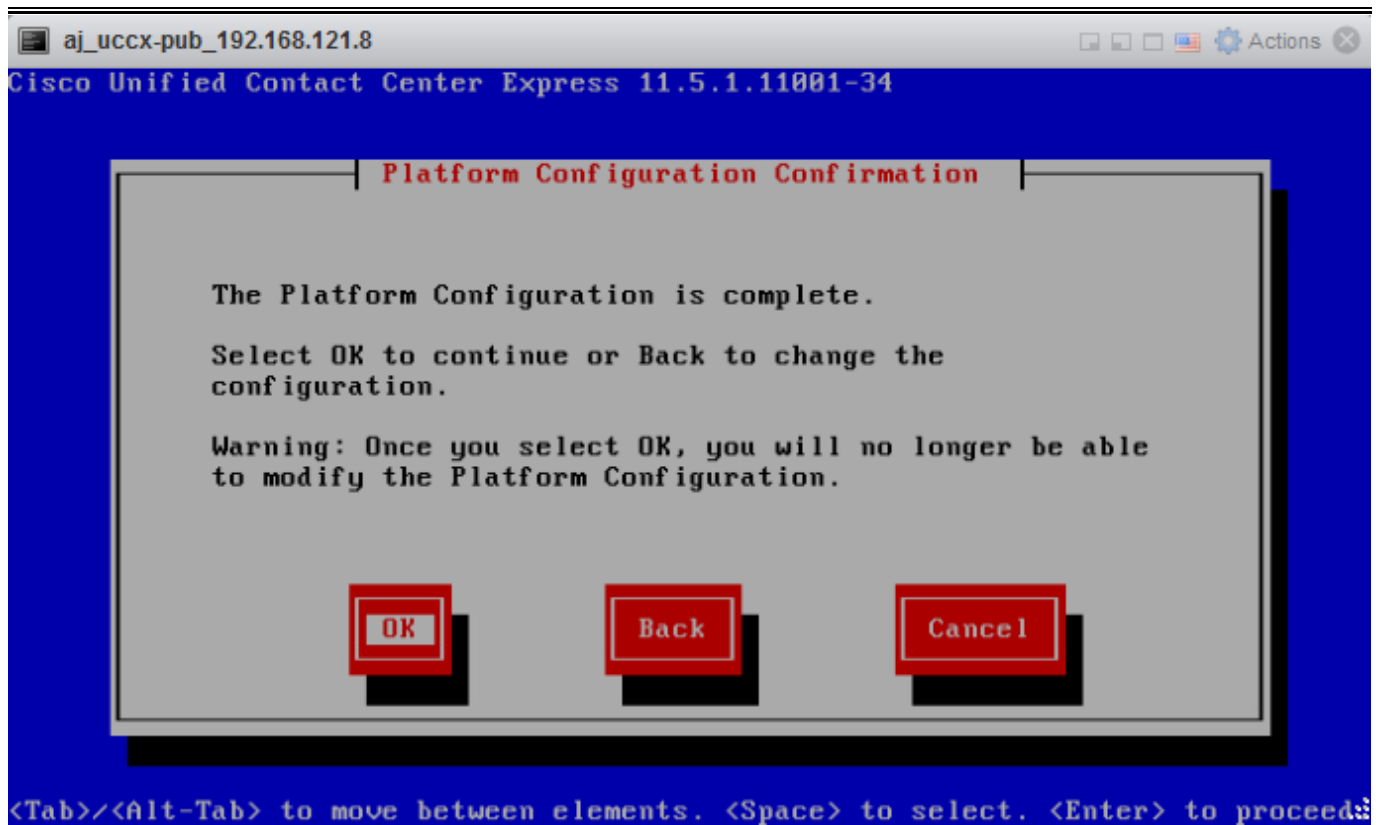
Back

Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

726





- UCCX Subscriber can be installed after UCCX Publisher has been initialized and integrated with CUCM



## UCCX Initialization, Licensing and Integration with CUCM

- Create an access control group with Standard AXL API Access Role

User Management >> User Settings >> Access Control Groups >> Add New

Access Control Group Configuration

Related Links: [Assign Role to Access Control Group](#) Go

Save Delete Copy Add New

**Status**  
Add successful

**Access Control Group Information**  
Name\* UCCX-AXL-ACG  
Available for Users with User Rank as \* 1 - Default User Rank

**User** Rows per Page 50

Find User where User ID begins with Find Clear Filter + -

No active query. Please enter your search criteria using the options above.

Add End Users to Group Add App Users to Group Select All Clear All Delete Selected

Save Delete Copy Add New

\*- indicates required item.

Access Control Group Configuration

Related Links: [Back To Find/List](#) Go

Save

**Status**  
Status: Ready

**Access Control Group Information**  
Name\* UCCX-AXL-ACG

**Role Assignment**  
Role Standard AXL API Access  
Assign Role to Group  
Delete Role Assignment

Save



- Create an Application user in CUCM (uccx-axl-user)

User Management >> Application User >> Add New >>

The screenshot displays the 'Application User Configuration' page in the Cisco Unified CM Administration interface. The page is divided into several sections:

- Application User Information:** Contains fields for 'User ID\*' (highlighted with a red box and containing 'uccx-axl-user'), 'Password', 'Confirm Password', 'Digest Credentials', 'Confirm Digest Credentials', 'BLF Presence Group\*', and 'User Rank\*'. There are also checkboxes for 'Accept Presence Subscription', 'Accept Out-of-dialog REFER', 'Accept Unsolicited Notification', and 'Accept Replaces Header'.
- Device Information:** Includes 'Available Devices' (a list box with options like 'Auto-registration Template', 'SEP08CC6831D463', etc.), 'Controlled Devices', 'Available Profiles', and 'CTI Controlled Device Profiles'.
- CAPF Information:** Contains 'Associated CAPF Profiles' and a 'View Details' link.
- Permissions Information:** Includes 'Groups' (highlighted with a red box and containing 'UCCX-AXL-ACG') and 'Roles' (containing 'Standard AXL API Access'). There are buttons for 'Add to Access Control Group', 'Remove from Access Control Group', and 'View Details'.

Cisco Unified Serviceability-Ser X Cisco Unified CCX Administration X +

https://192.168.121.1/ccmservice/serviceactivation.jsp?htxtNodeID=63d0...

**Cisco Unified Serviceability**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified Serviceability Go

admin About Logout

Alarm Trace Tools Snmp CallHome Help

**Service Activation** Related Links: Control Center - Feature Services Go

Save Set to Default Refresh

**Status:**  
Update Operation Successful

**Select Server**  
Server\* cucm-sub01--CUCM Voice/Video Go  
☐ Check All Services

**CM Services**

|                                     | Service Name                        | Activation Status |
|-------------------------------------|-------------------------------------|-------------------|
| <input checked="" type="checkbox"/> | Cisco CallManager                   | Activated         |
| <input type="checkbox"/>            | Cisco IP Voice Media Streaming App  | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco CTIManager                    | Activated         |
| <input type="checkbox"/>            | Cisco Extension Mobility            | Deactivated       |
| <input type="checkbox"/>            | Cisco Extended Functions            | Deactivated       |
| <input type="checkbox"/>            | Cisco DHCP Monitor Service          | Deactivated       |
| <input type="checkbox"/>            | Cisco Location Bandwidth Manager    | Deactivated       |
| <input type="checkbox"/>            | Cisco Directory Number Alias Lookup | Deactivated       |
| <input type="checkbox"/>            | Cisco Dialed Number Analyzer Server | Deactivated       |
| <input type="checkbox"/>            | Cisco Dialed Number Analyzer        | Deactivated       |
| <input type="checkbox"/>            | Cisco Tftp                          | Deactivated       |

Cisco Unified Serviceability-Ser X Cisco Unified CCX Administration X +

https://192.168.121.1/ccmservice/serviceactivation.jsp?htxtNodeID=85c6...

**Cisco Unified Serviceability**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified Serviceability Go

admin About Logout

Alarm Trace Tools Snmp CallHome Help

**Service Activation** Related Links: Control Center - Feature Services Go

Save Set to Default Refresh

**Status:**  
Update Operation Successful

**Select Server**  
Server\* cucm-sub02--CUCM Voice/Video Go  
☐ Check All Services

**CM Services**

|                                     | Service Name                        | Activation Status |
|-------------------------------------|-------------------------------------|-------------------|
| <input checked="" type="checkbox"/> | Cisco CallManager                   | Activated         |
| <input type="checkbox"/>            | Cisco IP Voice Media Streaming App  | Deactivated       |
| <input checked="" type="checkbox"/> | Cisco CTIManager                    | Activated         |
| <input type="checkbox"/>            | Cisco Extension Mobility            | Deactivated       |
| <input type="checkbox"/>            | Cisco Extended Functions            | Deactivated       |
| <input type="checkbox"/>            | Cisco DHCP Monitor Service          | Deactivated       |
| <input type="checkbox"/>            | Cisco Location Bandwidth Manager    | Deactivated       |
| <input type="checkbox"/>            | Cisco Directory Number Alias Lookup | Deactivated       |
| <input type="checkbox"/>            | Cisco Dialed Number Analyzer Server | Deactivated       |
| <input type="checkbox"/>            | Cisco Dialed Number Analyzer        | Deactivated       |
| <input type="checkbox"/>            | Cisco Tftp                          | Deactivated       |

Application User Configuration × Cisco Unified CCX Administration × +

← → ↻ 🏠 🔒 https://uccx-pub.ajcollab.com/appadmin/CCMConfig?request\_type=s ... 🛡️ ☆

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

### Cisco Unified CM Configuration - Service Provider Configuration

➡ Next

Unified CM Server Host Name or IP address\*  *CUCM Node where AXL Service is running*

AXL Admin User Name\*

Password\*

Next

❗ \*- indicates required item

Application User Configuration × Cisco Unified CCX Administration × +

← → ↻ 🏠 🔒 https://uccx-pub.ajcollab.com/appadmin/License?request\_type=lic.cor ... 🛡️ ☆

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

### License Information

⬅ Back ➡ Next

Status

❗ Status : Ready

Click Next to proceed with 60 days Premium demo license or Browse to select other options.

Enter a license or zip file name

License File  No file selected.

Back Next

Application User Configuration × Cisco Unified CCX Administration × +

← → × 🏠 🔒 https://uccx-pub.ajcollab.com/appadmin/License?request\_type=lic.cor ... 🛡️ ☆

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

### License Information

⬅ Back ➡ Next

Status

❗ Adding License... *← This will take some time*

Click Next to proceed with 60 days Premium demo license or Browse to select other options.

Enter a license or zip file name

License File  No file selected.

Back Next

Application User Configuration
Cisco Unified CCX Administration
+

https://uccx-pub.ajcollab.com/appadmin/License?request\_type=lic.add&...

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

### License Information

Back
Next

Status  
*i* Status : Ready

Click Next to proceed with 60 days Premium demo license or Browse to select other options.

Enter a license or zip file name

License File  No file selected.

Validating uploaded license file...

Validation completed.

Please click on Next to continue.

Back
Next

Application User Configuration
Cisco Unified CCX Administration
+

https://uccx-pub.ajcollab.com/appadmin/ServerSetup?request\_type=serve...

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

### Component Activation

Back
Next

Status  
⚙ Components Activation is in progress, please wait..... ←

| Component Name                              | Status           |
|---------------------------------------------|------------------|
| Cisco Unified CCX Config Datastore          | Activating....   |
| Cisco Unified CCX Engine                    | Activating....   |
| Cisco Unified CCX Historical Datastore      | Activating....   |
| Cisco Unified CCX Node Manager              | <b>Activated</b> |
| Cisco Unified CCX Repository Datastore      | Activating....   |
| Cisco Unified Intelligence Center Reporting | Activating....   |

Back
Next

Application User Configuration × Cisco Unified CCX Administration × +

← → ↺ 🏠 [https://uccx-pub.ajcollab.com/appadmin/ServerSetup?request\\_type=server](https://uccx-pub.ajcollab.com/appadmin/ServerSetup?request_type=server) ... 📌 ⚙

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

### Component Activation

← Back → Next

Status

**Component(s) successfully Activated.**

| Component Name                              | Status    |
|---------------------------------------------|-----------|
| Cisco Unified CCX Config Datastore          | Activated |
| Cisco Unified CCX Engine                    | Activated |
| Cisco Unified CCX Historical Datastore      | Activated |
| Cisco Unified CCX Node Manager              | Activated |
| Cisco Unified CCX Repository Datastore      | Activated |
| Cisco Unified Intelligence Center Reporting | Activated |

Back Next ←

Application User Configuration × Cisco Unified CCX Administration × +

← → ↺ 🏠 [https://uccx-pub.ajcollab.com/appadmin/ServerSetup?request\\_type=component](https://uccx-pub.ajcollab.com/appadmin/ServerSetup?request_type=component) ... 📌 ⚙

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

### Publisher Activation

← Back → Next

|                                     | Datastore Name                         | Server Name | Status        |
|-------------------------------------|----------------------------------------|-------------|---------------|
| <input checked="" type="checkbox"/> | Cisco Unified CCX Historical Datastore | uccx-pub    | Not Activated |
| <input checked="" type="checkbox"/> | Cisco Unified CCX Repository Datastore | uccx-pub    | Not Activated |

Back Next ←

**i** Datastores are auto selected as the first Node in cluster would be the Publisher by default.

Cisco Unified Serviceability-Ser
Cisco Unified CCX Administration
+

https://uccx-pub.ajcollab.com/appadmin/CCMConfig?requ
90%

Cisco Unified CCX Administration  
For Cisco Unified Communications Solutions

### Cisco Unified CM Configuration

Back
Next

**AXL Service Provider Configuration.[Cisco Unified CM Version is : 11.5.1.13901(3)]**

| Selected AXL Service Providers | Available AXL Service Providers |
|--------------------------------|---------------------------------|
| 192.168.121.1                  | 192.168.121.2<br>192.168.121.3  |

Cluster Wide Parameters

User Name\*  *We created this user in CUCM*

Password\*

**Unified CM Telephony Subsystem - Unified CM Telephony Provider Configuration**

| Selected CTI Managers          | Available CTI Managers |
|--------------------------------|------------------------|
| 192.168.121.2<br>192.168.121.3 | 192.168.121.1          |

Cluster Wide Parameters

User Prefix\*  *UCCX will create this user in CUCM*

Password\*

Confirm Password\*

**RmCm Subsystem - RmCm Provider Configuration**

| Selected CTI Managers          | Available CTI Managers |
|--------------------------------|------------------------|
| 192.168.121.2<br>192.168.121.3 | 192.168.121.1          |

Cluster Wide Parameters

User Id\*  *UCCX will create this user in CUCM*

Password\*

Confirm Password\*

Back
Next

*\*- indicates required item*  
*Only 2 CTI Managers can be selected for Unified CM Telephony and RmCm Providers*



Find and List Application Users Cisco Unified CCX Administration

https://uccx-pub.ajcollab.com/appadmin/SystemParams?request\_type=...

## Cisco Unified CCX Administration

For Cisco Unified Communications Solutions

### System Parameters Configuration

Back Next

Number of Direct Preview Outbound seats\* 100 (Maximum limit :100)

Codec G711

Back Next

\*- indicates required item

Find and List Application Users Cisco Unified CCX Administration

https://uccx-pub.ajcollab.com/appadmin/LanguagePage?request\_type=re...

## Cisco Unified CCX Administration

For Cisco Unified Communications Solutions

### Languages Configuration

Back Next

Status

Status : Ready

IVR Language Configuration

| Language Group | Group Default                                                                                                                       |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------|
| English        | <input type="radio"/> en_AU<br><input type="radio"/> en_CA<br><input type="radio"/> en_GB<br><input checked="" type="radio"/> en_US |

Back Next

The system default IVR Language is "en\_US". This can be modified after setup is done by accessing language configuration page.

- Create an end user in CUCM and promote that user as UCCX Administrator

End User Configuration

Cisco Unified CCX Administration

+

←

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🔗

https://192.168.121.1/ccmadmin/userEdit.do?key=2efe6ab7-c334-0...

...

🔖

☆

Cisco

Unified CM Administration

For Cisco Unified Communications Solutions

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💾 Save

✖ Delete

✚ Add New

Status

🔔

Add successful

User Information

User Status

Enabled Local User

User ID\*

uccx-app-admin

Password

.....

Edit Credential

Confirm Password

.....

Self-Service User ID

PIN

.....

Edit Credential

Confirm PIN

.....

Last name\*

uccx-app-admin

Middle name

First name

Display name

Title

Directory URI

Telephone Number

Home Number

Mobile Number

Pager Number

Mail ID

Manager User ID

Department

User Locale

< None >

▼

Associated PC/Site Code

Digest Credentials

Confirm Digest Credentials

User Profile

Use System Default( "Standard (Factory Default) Us

View Details

User Rank\*

1-Default User Rank

▼

Name Dialing

uccxappadmin

Number of Digits needed for the Unique AA Name

1

Service Settings

☒ Home Cluster

☐ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)

738

Find and List Users

Cisco Unified CCX Administration


+

← → ↻ 🏠

🔒 <https://uccx-pub.ajcollab.com/appadmin/LanguagePage>

⋮ 🛡️ ☆

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 **Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

### User Configuration

← Back

→ Finish

Status

📘

 Search results displayed

Search

Please add or remove the Administrators from the following list:

**Cisco Unified CCX Administrator\***

**Cisco Unified CM Users**

uccx-app-admin

Back

Finish

📘

 \*- indicates required item

📘

 If the search returns more than 75 Cisco Unified CM Users, the first 75 would be displayed. Please refine your search if needed.

Find and List Users Cisco Unified CCX Administration

https://uccx-pub.ajcollab.com/appadmin/LanguagePage

## Cisco Unified CCX Administration

For Cisco Unified Communications Solutions

### User Configuration

Back Finish

Status

Search results displayed

Search

Please add or remove the Administrators from the following list:

| Cisco Unified CCX Administrator* | Cisco Unified CM Users |
|----------------------------------|------------------------|
| uccx-app-admin                   |                        |

Back Finish

\*- indicates required item

If the search returns more than 75 Cisco Unified CM Users, the first 75 would be displayed. Please refine your search if needed.

End User Configuration Cisco Unified CCX Administration

https://uccx-pub.ajcollab.com/appadmin/LDAPSetup

## Cisco Unified CCX Administration

For Cisco Unified Communications Solutions

Navigation Cisco Unified CCX Administration Go

Search Documentation About Logout

### Cisco Unified CCX Setup Result Information

|                                                              |                                         |
|--------------------------------------------------------------|-----------------------------------------|
| Cisco Unified CCX Setup Status.                              | Cisco Unified CCX Setup completed.      |
| Cisco Unified CM Configuration Status.                       | Cisco Unified CM Configuration is done. |
| License Upload Status.                                       | License Upload is done.                 |
| System Component Activation Status.                          | Component Activation is done.           |
| Cisco Unified CCX Config Datastore                           | Activated                               |
| Cisco Unified CCX Engine                                     | Activated                               |
| Cisco Unified CCX Historical Datastore                       | Activated                               |
| Cisco Unified CCX Repository Datastore                       | Activated                               |
| Cisco Unified Intelligence Center Reporting                  | Activated                               |
| Publisher Activation Status.                                 | Publisher Activation is done.           |
| Cisco Unified CCX Historical Datastore                       | Publisher is Activated                  |
| Cisco Unified CCX Repository Datastore                       | Publisher is Activated                  |
| System Parameters update Status.                             | System Parameter Configuration is done. |
| Language update Status.                                      | Language Configuration is done.         |
| User configuration Status.                                   | User Configuration is done.             |
| Setup completed. The Cisco Unified CCX Engine is restarting. |                                         |

Please close your web browser now!

End User Configuration

Authentication

+


← → ↻ 🏠

🔒 🔑 https://uccx-pub.ajcollab.com/appadmin/main

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☰

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CCX Administration Go

# Cisco Unified CCX Administration


Username

uccx-app-admin

Password

••••••••

Login Reset



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A summary of U.S. laws governing Cisco cryptographic products may be found at: <http://www.cisco.com/wwl/export/crypto/tool/stqrg.html>.  
If you require further assistance please contact us by sending email to [export@cisco.com](mailto:export@cisco.com).

## UCCX Subscriber Installation

- UCCS Subscriber can be installed after the initialization and integration of UCCX with CUCM
- After the initialization of UCCX Pub, go to System >> Server >> Add New and then add UCCX-SUB there

**Cisco Unified CCX Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CCX Administration Go  
uccx-app-admin | Search Documentation | About | Logout

System Applications Subsystems Wizards Tools Help

### List Servers

Add New

Status  
 2 records found

| Servers |                          |         |                 |      |        |
|---------|--------------------------|---------|-----------------|------|--------|
|         | Host Name/IP Address     | Node ID | Status          | Info | Delete |
|         | <a href="#">uccx-pub</a> | 1       | PARTIAL SERVICE |      |        |
|         | <a href="#">uccx-sub</a> | 2       | UNKNOWN         |      |        |

Add New

aj\_uccx-sub\_192.168.121.8

Cisco Unified Contact Center Express

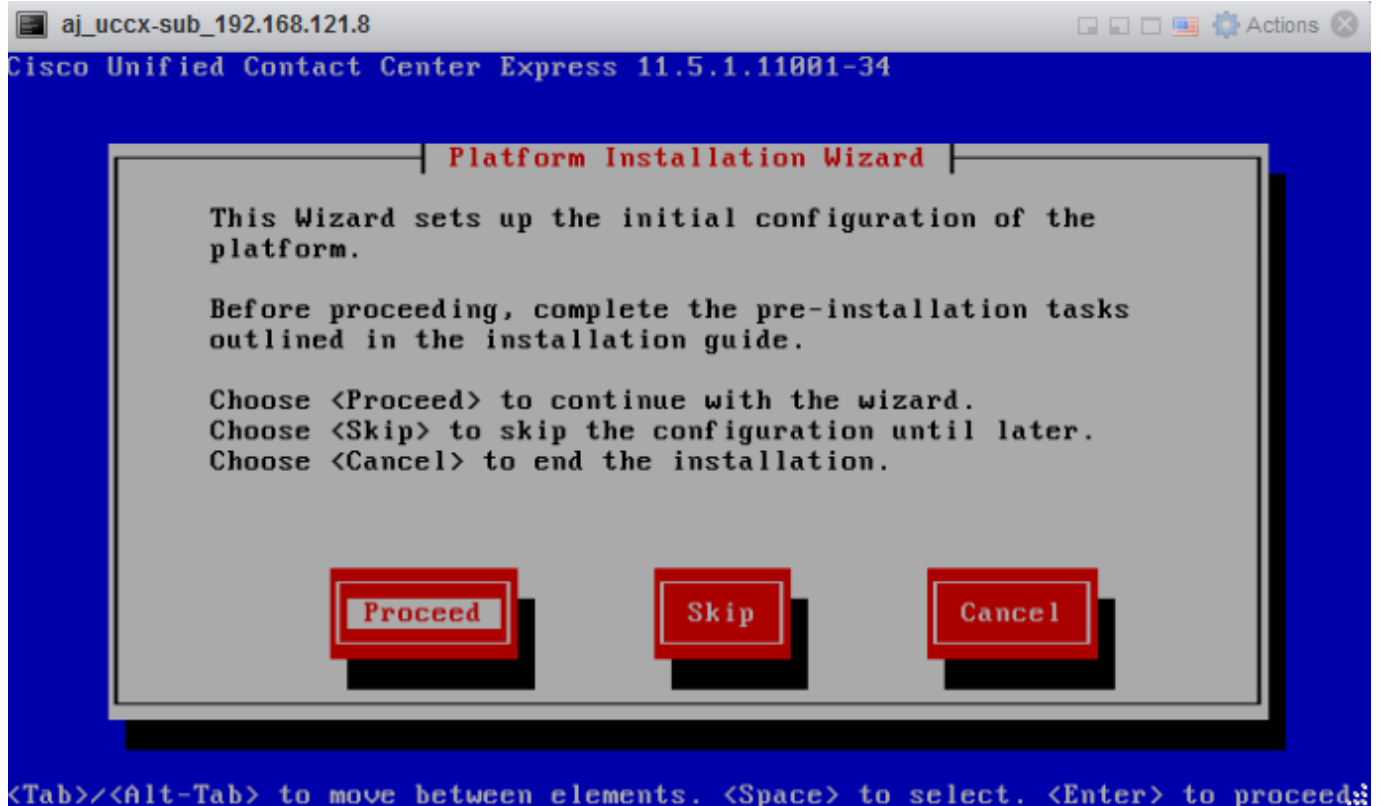
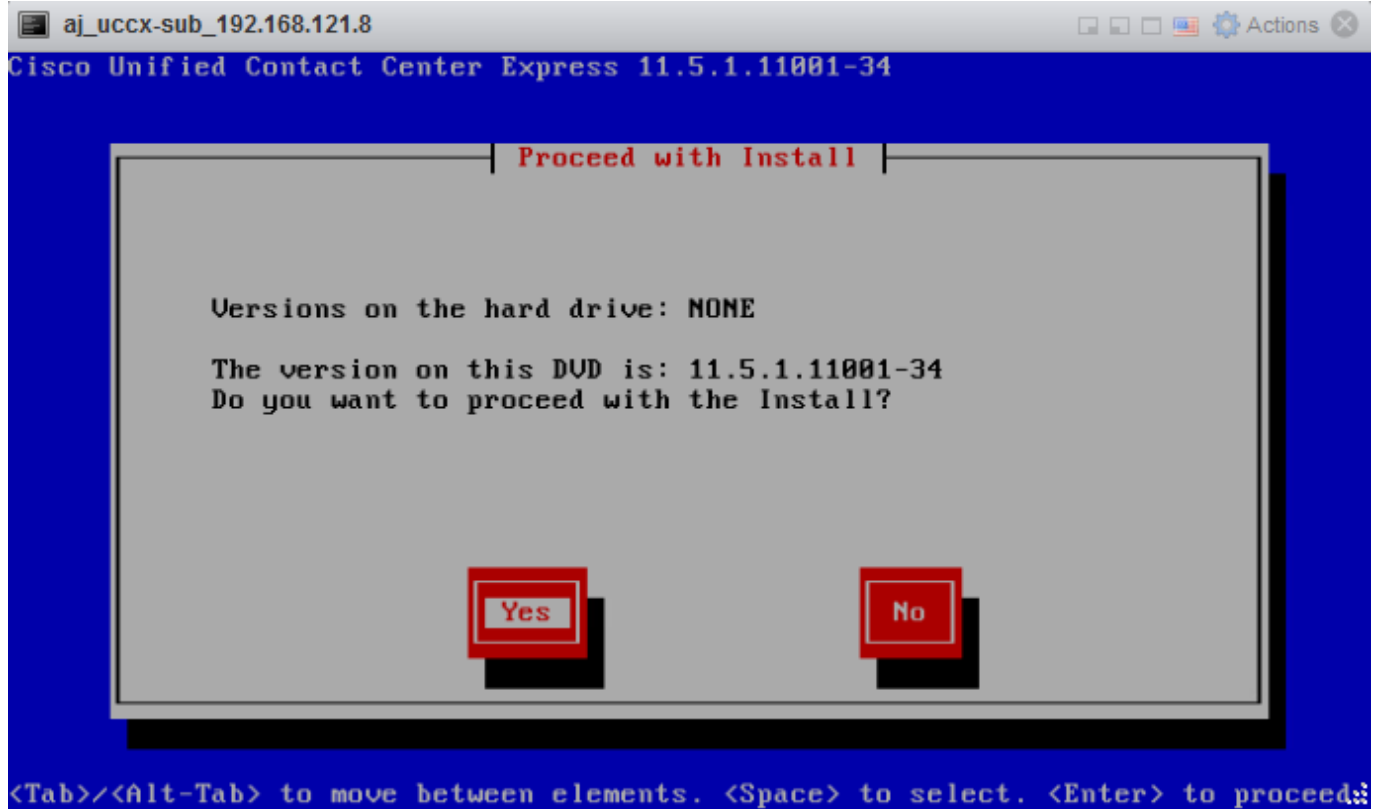
**Product Deployment Selection**

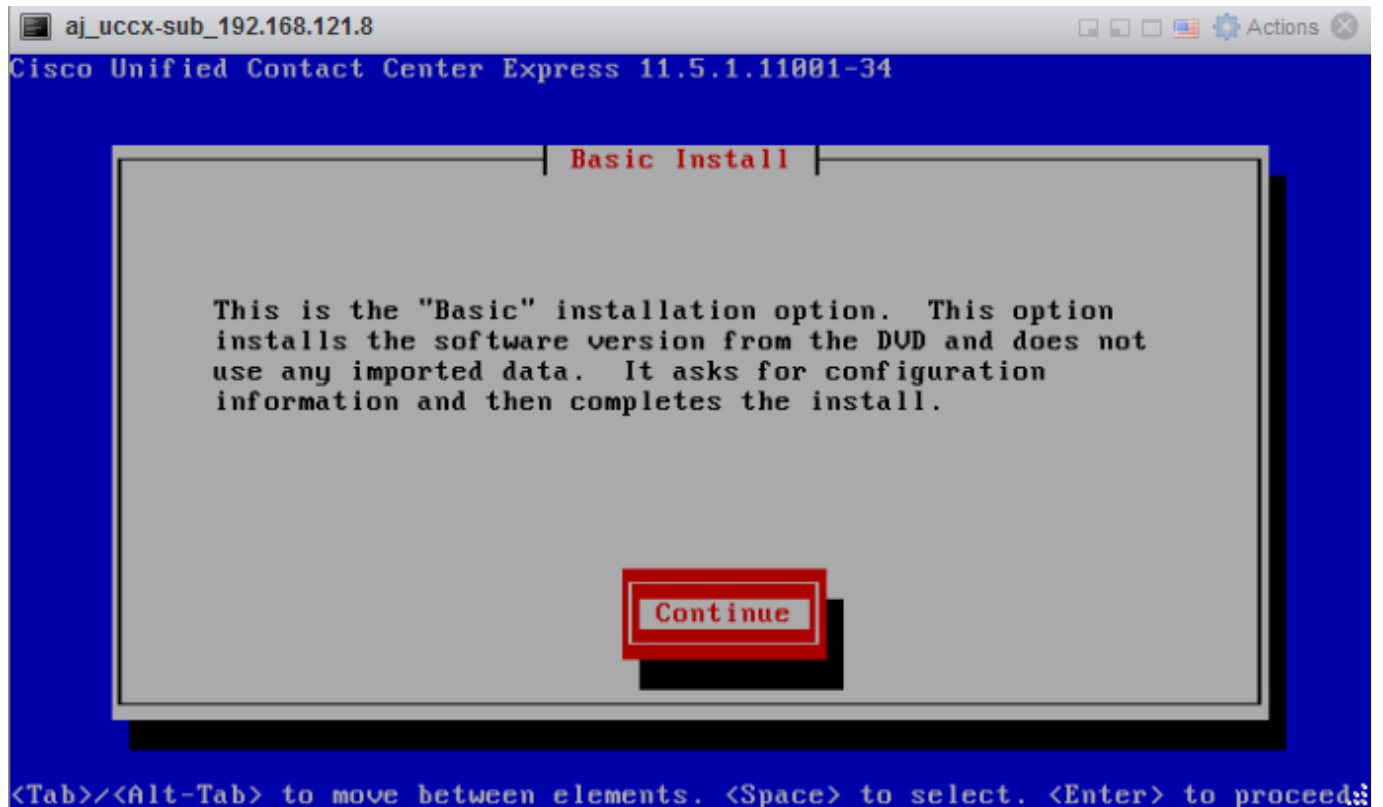
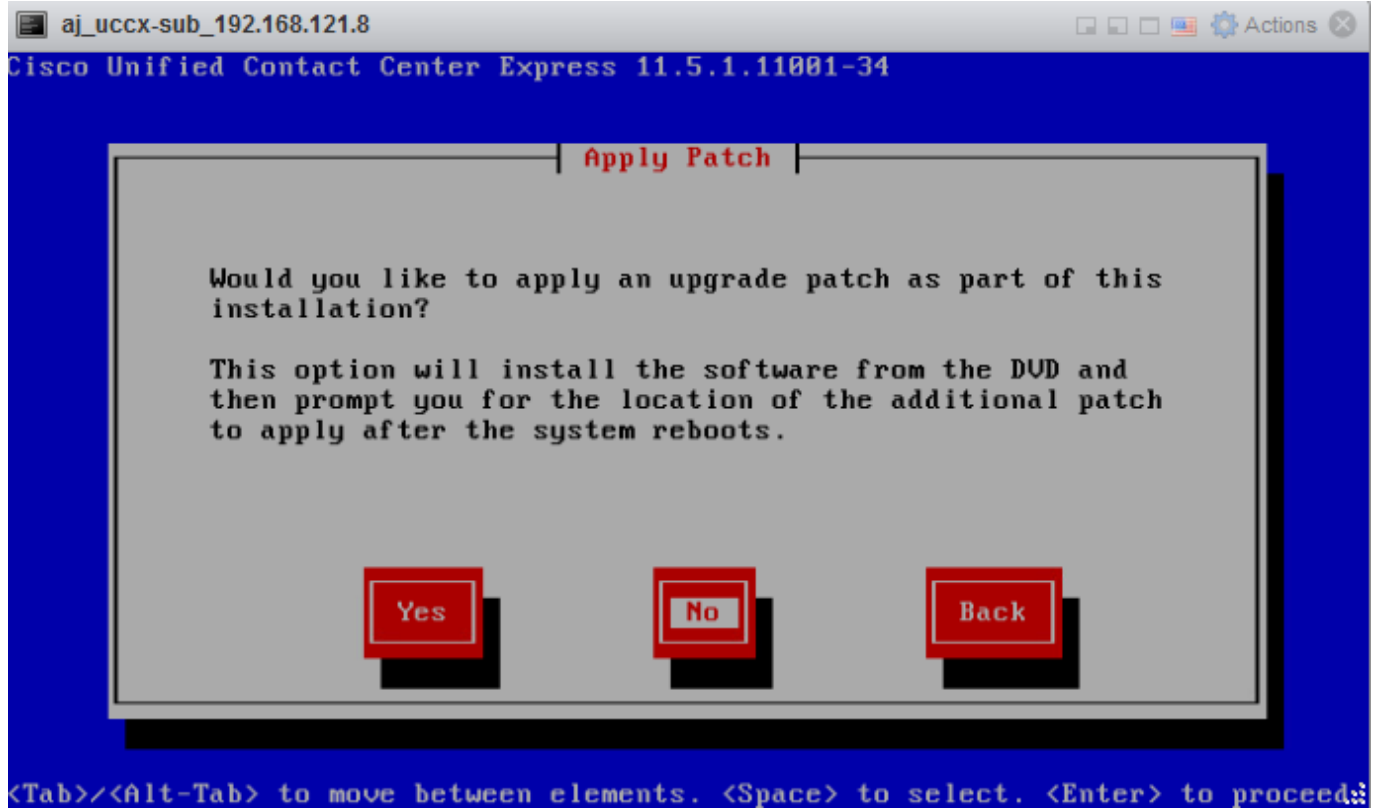
Select the product or product suite to be installed:

**(\*) Cisco Unified Contact Center Express**

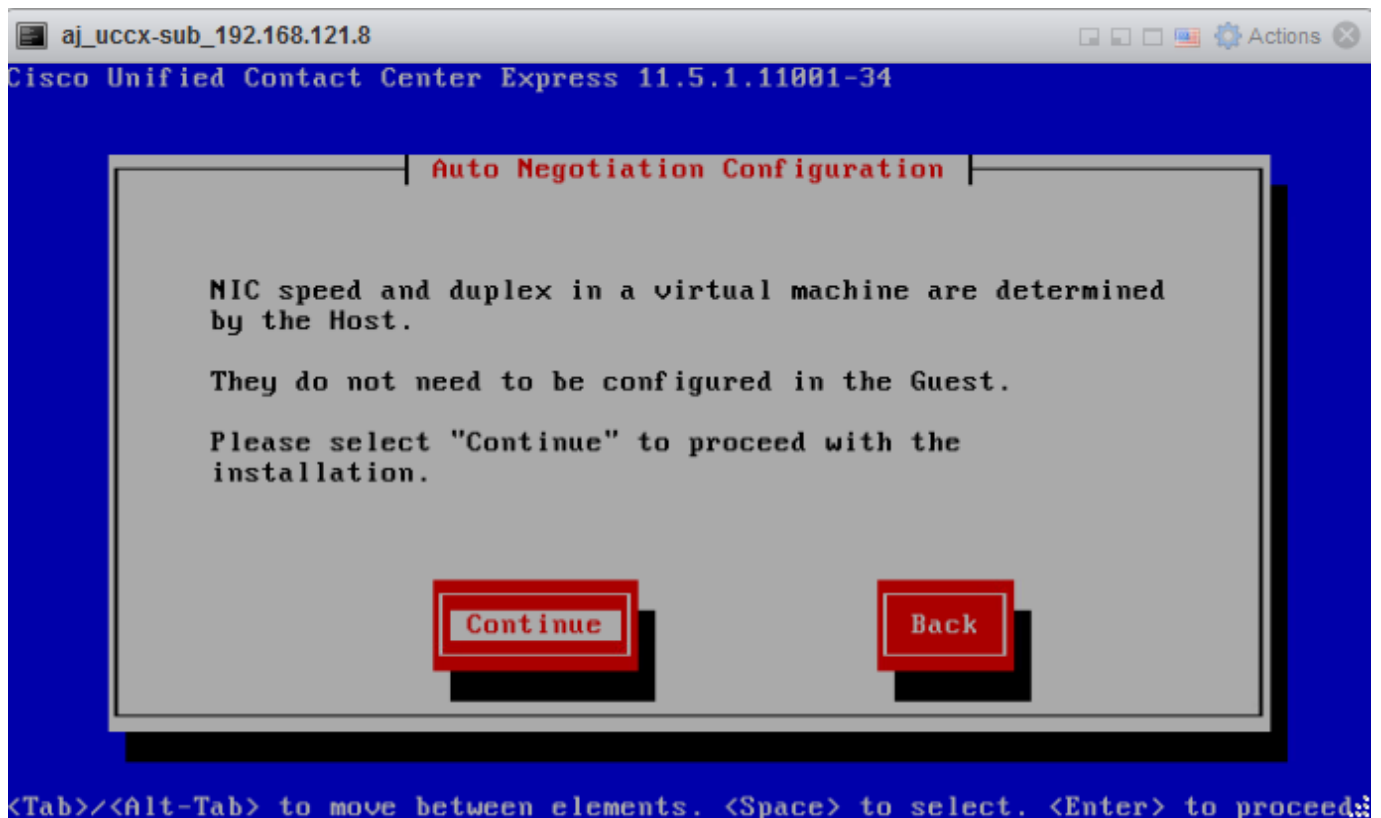
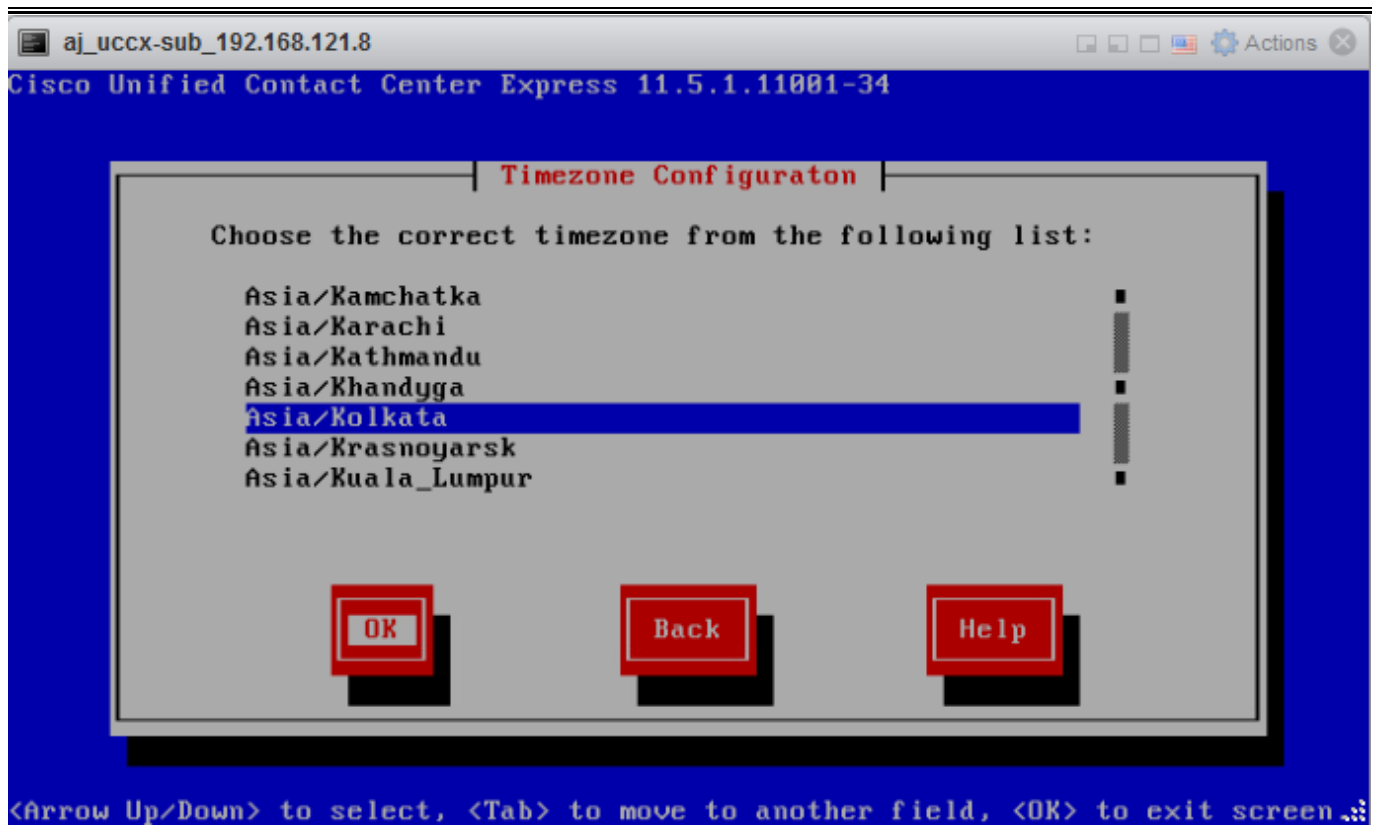
**OK**

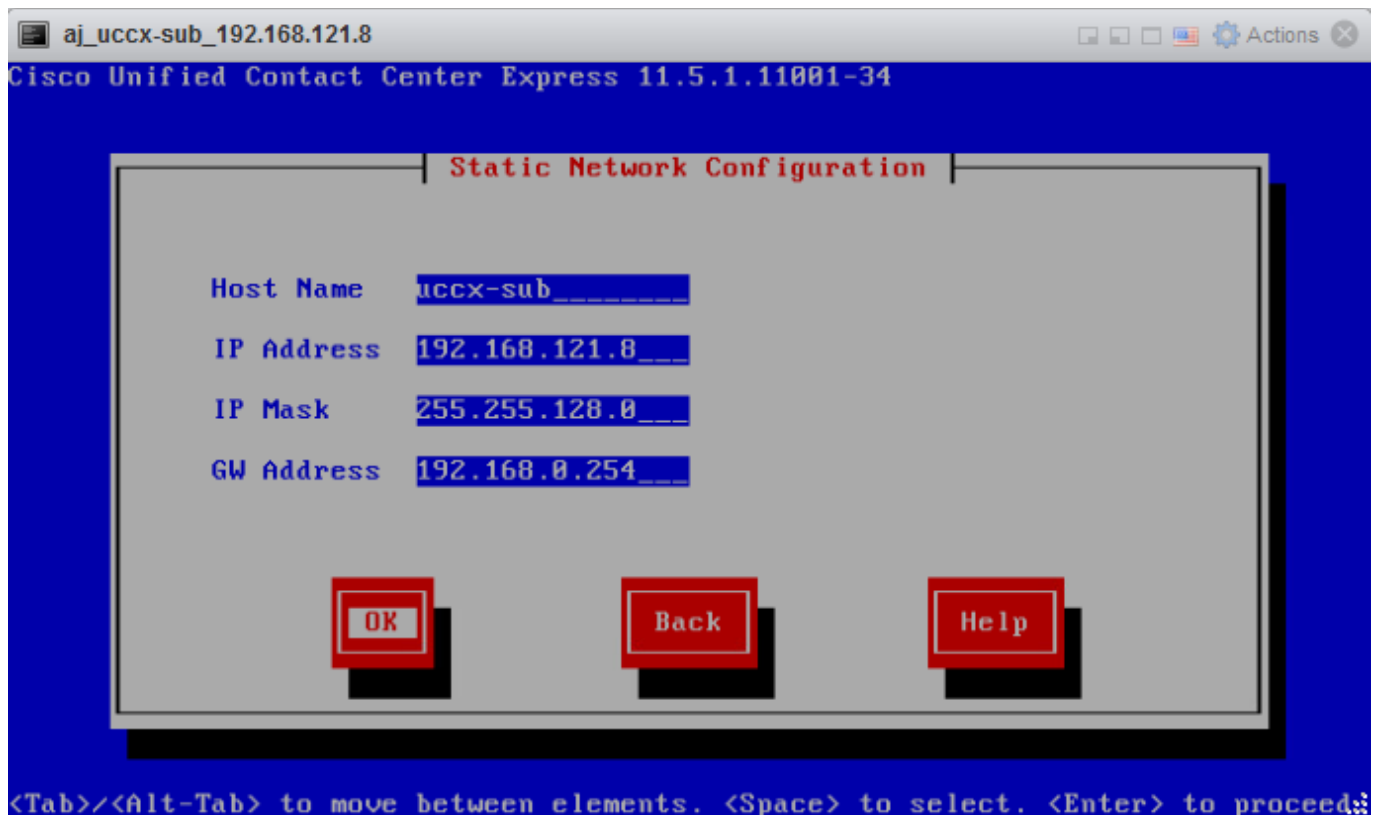
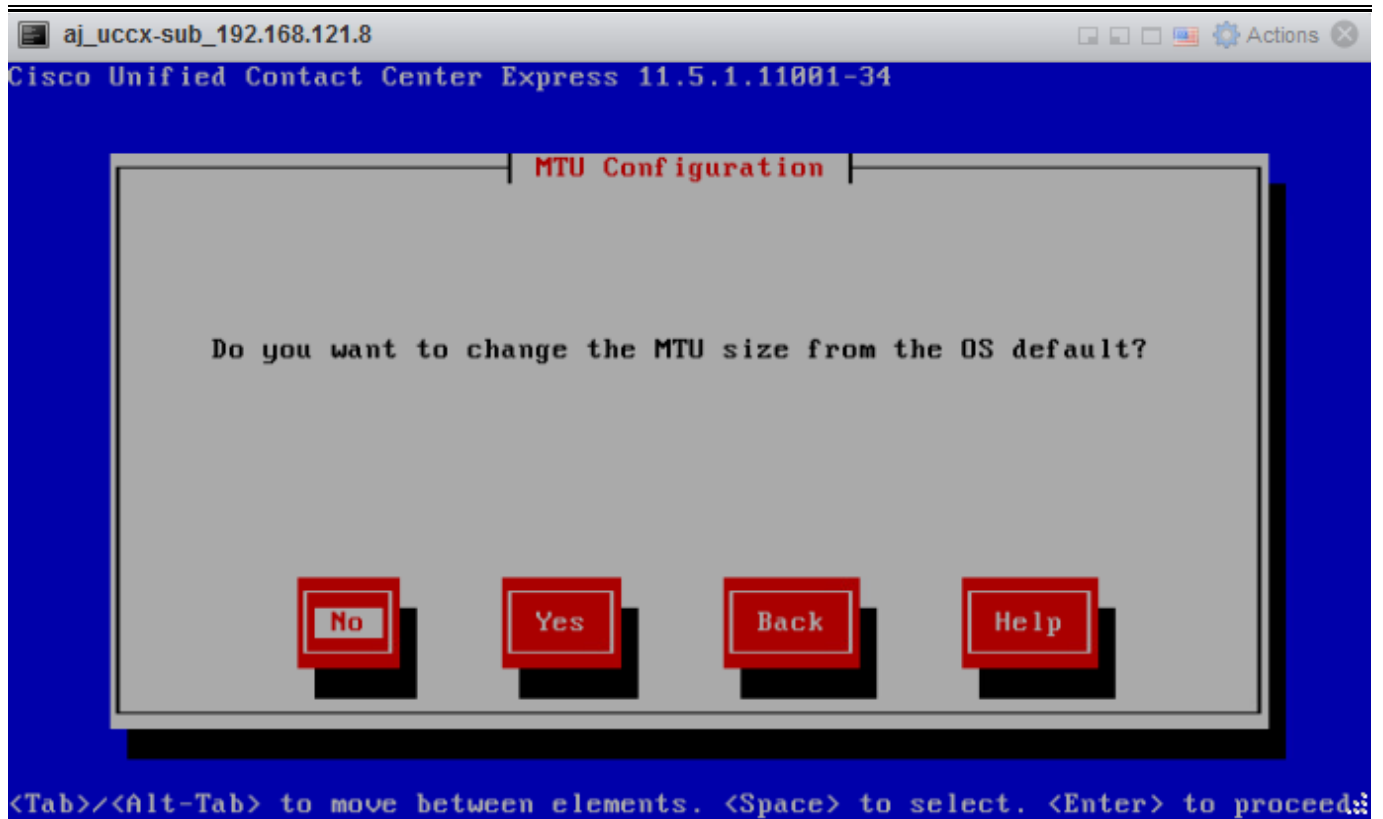
<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed:











aj\_uccx-sub\_192.168.121.8 Actions

Cisco Unified Contact Center Express 11.5.1.11001-34

### DNS Client Configuration

Primary DNS 192.168.111.1

Secondary DNS (optional)

Domain ajcollab.com

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

aj\_uccx-sub\_192.168.121.8 Actions

Cisco Unified Contact Center Express 11.5.1.11001-34

### Administrator Login Configuration

Enter the Platform administration username and password.  
Choose Help for username and password guidelines.

Administrator ID admin

Password \*\*\*\*\*

Confirm Password \*\*\*\*\*

OK Back Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

aj\_uccx-sub\_192.168.121.8 Actions

Cisco Unified Contact Center Express 11.5.1.11001-34

**Certificate Information**

Enter information about your organization. This is used to generate security certificates for this node.

Organization AJ Collab

Unit Collab

Location Bangalore

State Karnataka

Country India  
Indonesia  
Iran

**OK** **Back** **Help**

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

aj\_uccx-sub\_192.168.121.8 Actions

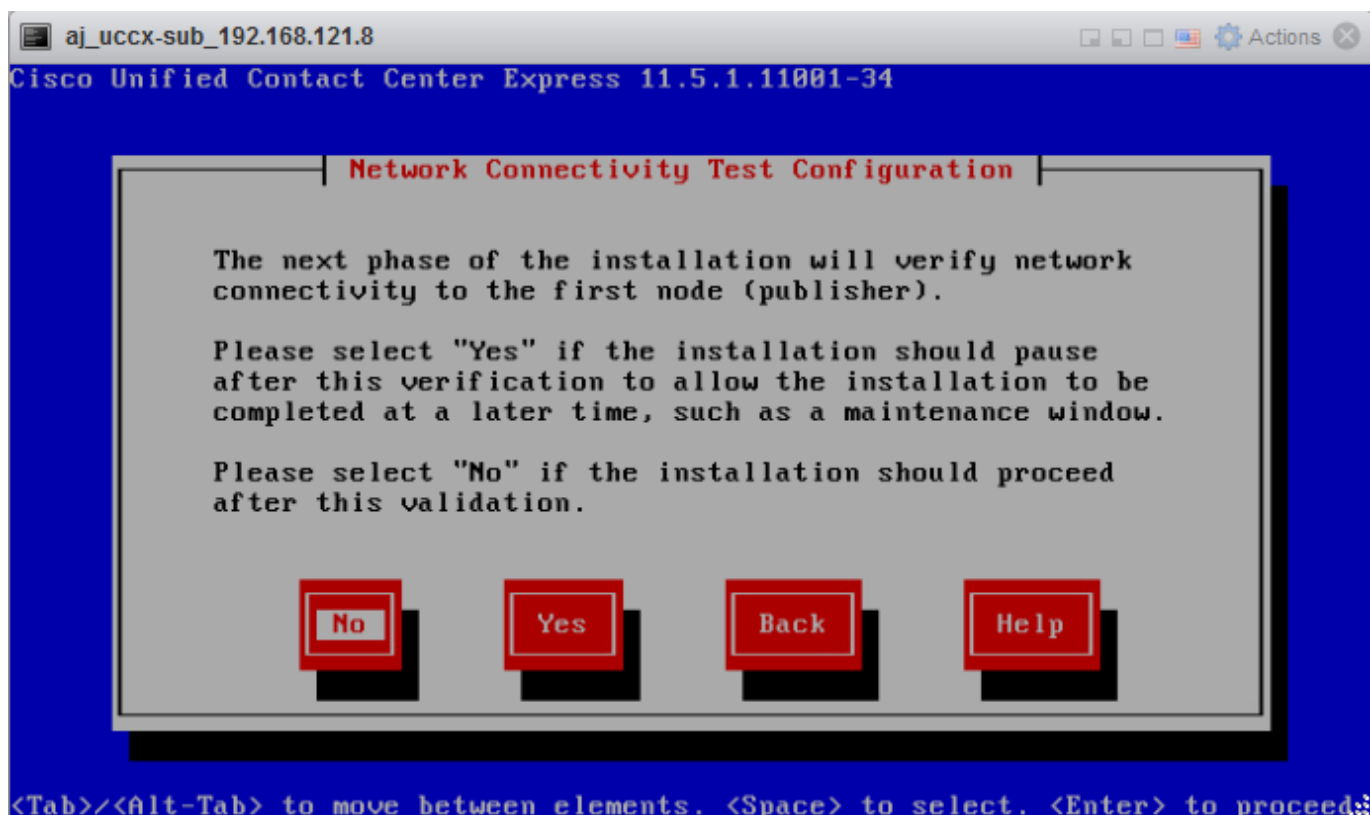
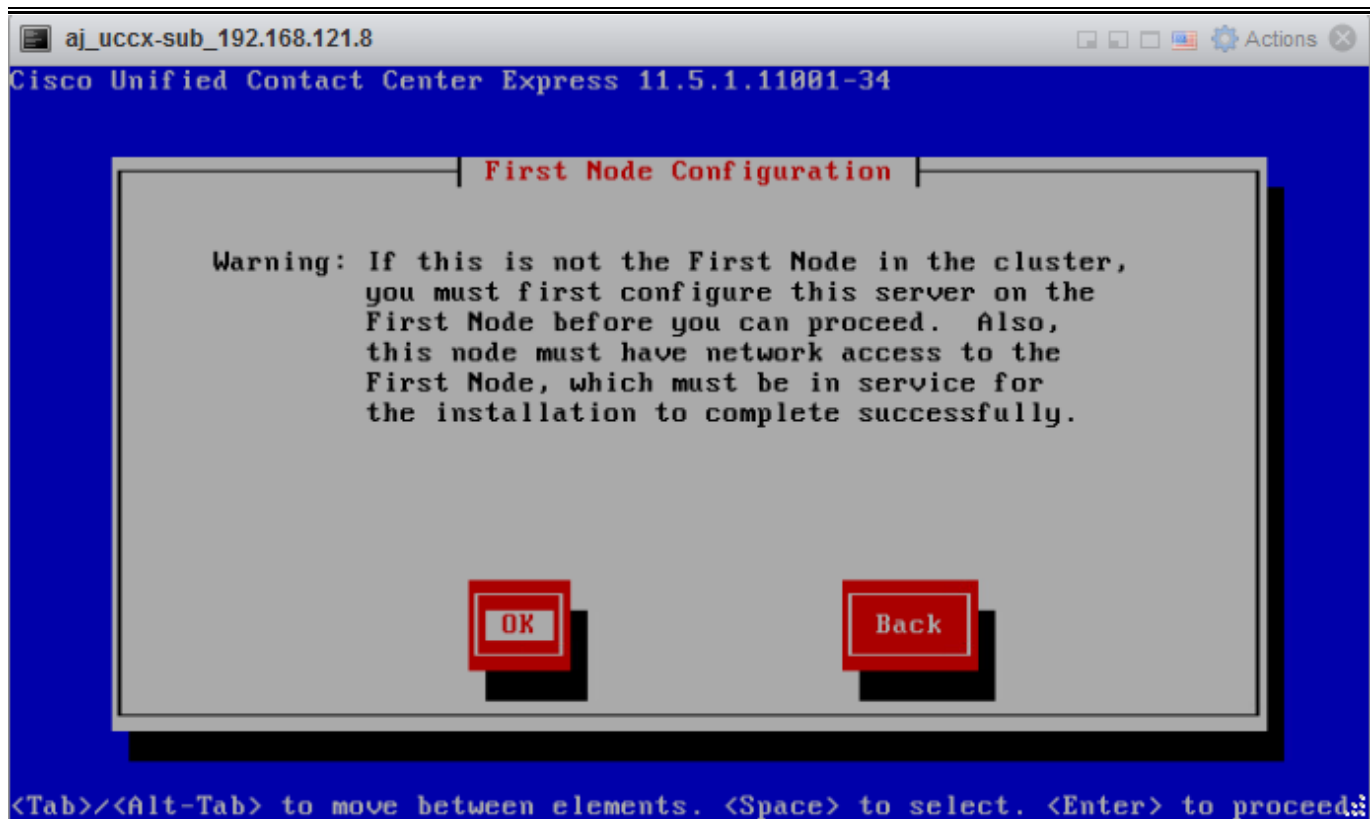
Cisco Unified Contact Center Express 11.5.1.11001-34

**First Node Configuration**

Is this server the First Node in the cluster?

**Yes** **No** **Back** **Help**

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.



aj\_uccx-sub\_192.168.121.8 Cisco Unified Contact Center Express 11.5.1.11001-34

First Node Access Configuration

Connectivity to First Node:  
Host Name uccx-pub\_\_\_\_\_  
IP Address 192.168.121.7\_\_\_\_\_  
Security Password \*\*\*\*\*  
Confirm Password \*\*\*\*\*

OK

Back

Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.

aj\_uccx-sub\_192.168.121.8 Cisco Unified Contact Center Express 11.5.1.11001-34

SMTP Host Configuration

Do you want to configure a Simple Mail Transfer Protocol (SMTP) host for this machine?

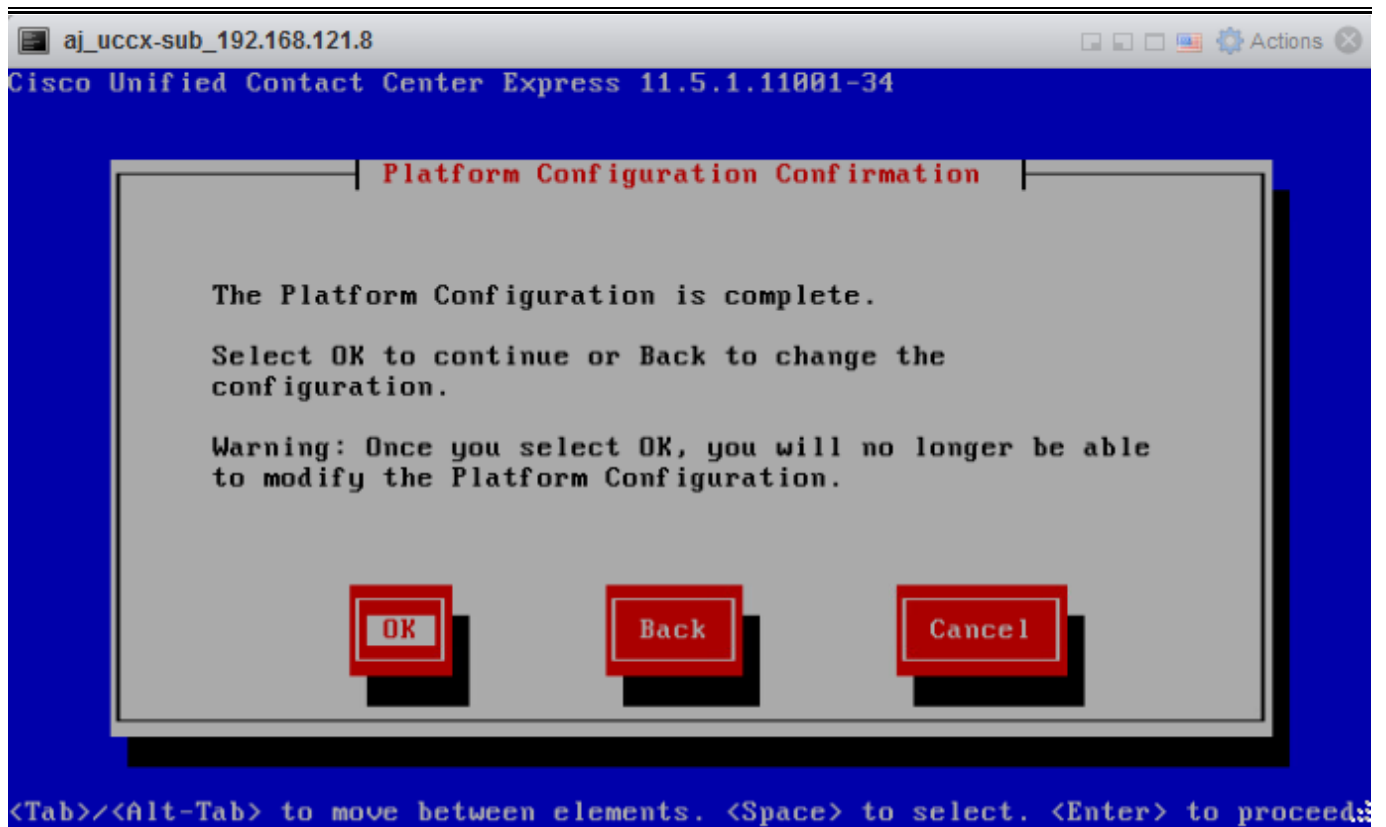
Yes

No

Back

Help

<Tab>/<Alt-Tab> to move between elements. <Space> to select. <Enter> to proceed.



Note: By the way, I made a mistake in the VM Name, it is not **aj\_uccx-sub\_192.168.121.8**, it should be **aj\_uccx-sub\_192.168.121.9**





## [Lab] UCCX Basic IVR Auto Attendant

Find and List Application Users

Cisco Unified CCX Administration

esxi-primary - VMware ESXi

https://192.168.21.1/ccmadmin/appuserFindList.do

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

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**Find and List Application Users**

+

 Add New

■

 Select All

■

 Clear All

✖

 Delete Selected

Status

i

 14 records found

Application User (1 - 14 of 14)

Rows per Page 50 ▾

Find Application User where User ID ▾ begins with ▾ Find Clear Filter + -

| <input type="checkbox"/> | User ID ^                           | Copy | User Rank |
|--------------------------|-------------------------------------|------|-----------|
|                          | <a href="#">CCMQRTSecureSysUser</a> |      | 1         |
|                          | <a href="#">CCMQRTSysUser</a>       |      | 1         |
|                          | <a href="#">CCMSysUser</a>          |      | 1         |
|                          | <a href="#">CUCService</a>          |      | 1         |
|                          | <a href="#">IPMASecureSysUser</a>   |      | 1         |
|                          | <a href="#">IPMASysUser</a>         |      | 1         |
|                          | <a href="#">TabSyncSysUser</a>      |      | 1         |
|                          | <a href="#">WDSecureSysUser</a>     |      | 1         |
|                          | <a href="#">WDSysUser</a>           |      | 1         |
|                          | <a href="#">admin</a>               |      | 1         |
|                          | <a href="#">presencevieweradmin</a> |      | 1         |
| <input type="checkbox"/> | <a href="#">uccx-axl-user</a>       |      | 1         |
| <input type="checkbox"/> | <a href="#">uccx-rtapi-user_1</a>   |      | 1         |
| <input type="checkbox"/> | <a href="#">uccx-rmcmm-user</a>     |      | 1         |

Add New

Select All

Clear All

Delete Selected

This user controls the CTI Ports and CTI Route Points

This user controls the Devices, we need to add an additional role to this user

Application User Configuration
Cisco Unified CCX Administration
3:11 until your session times out

https://192.168.21.1/ccmadmin/appuserEdit.do?key=55911bc5

Find and List Access Control Groups — Mozilla Firefox
https://192.168.21.1/ccmadmin/userGroupFindList.do?whereClause=pkid not in

### Find and List Access Control Groups

Select All
Clear All
Add Selected
Close

**Status**  
7 records found

**Access Control Group (1 - 7 of 7)** Rows per Page 50

Find Access Control Group where Name contains cti Find Clear Filter

|                                     | Name ^                                                        | Rank |
|-------------------------------------|---------------------------------------------------------------|------|
| <input type="checkbox"/>            | Standard CTI Allow Call Park Monitoring                       | 1    |
| <input type="checkbox"/>            | Standard CTI Allow Calling Number Modification                | 1    |
| <input type="checkbox"/>            | Standard CTI Allow Control of All Devices                     | 1    |
| <input checked="" type="checkbox"/> | Standard CTI Allow Control of Phones supporting Rollover Mode | 1    |
| <input type="checkbox"/>            | Standard CTI Allow Reception of SRTP Key Material             | 1    |
| <input type="checkbox"/>            | Standard CTI Secure Connection                                | 1    |
| <input type="checkbox"/>            | Standard RealtimeAndTraceCollection                           | 1    |

Select All
Clear All
Add Selected
Close

Groups
Standard CTI Allow Call Monitoring  
Standard CTI Allow Call Recording  
Standard CTI Allow Control of Phones supporting C  
Standard CTI Enabled
View Details

Roles
Standard CTI Allow Call Monitoring  
Standard CTI Allow Call Recording  
Standard CTI Allow Control of Phones supporting Contr  
Standard CTI Enabled
View Details

Add to Access Control Group  
Remove from Access Control Group

Save
Delete
Copy
Add New

*i* \*- indicates required item.

Application User Configuration
Cisco Unified CCX Administration
esxi-primary - VMware ESXi

https://192.168.21.1/ccmadmin/appuserEdit.do?key=
90%

Cisco
Cisco Unified CM Administration
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Application User Configuration
Related Links: Back To Find/List Go

Save Delete Copy Add New

User ID\* uccx-rmcm-user Edit Credential
Password .....
Confirm Password .....
Digest Credentials
Confirm Digest Credentials
BLF Presence Group\* Standard Presence group
User Rank\* 1-Default User Rank
☐ Accept Presence Subscription
☐ Accept Out-of-dialog REFER
☐ Accept Unsolicited Notification
☐ Accept Replaces Header

Device Information
Available Devices
AJ-LABS-IVR
Auto-registration Template
CIPC-JASEEM
CIPC-JASEEM2
CIPC-SHAHRUKH
Device Association
Find more Route Points
Controlled Devices
Available Profiles
CTI Controlled Device Profiles

CAPF Information
Associated CAPF Profiles
View Details

Permissions Information
Groups
Standard CTI Allow Call Monitoring
Standard CTI Allow Call Recording
Standard CTI Allow Control of Phones supporti
Standard CTI Allow Control of Phones supporti
Standard CTI Enabled
View Details
Add to Access Control Group
Remove from Access Control Group
Roles
Standard CTI Allow Call Monitoring

Partition Configuration
Cisco Unified CCX Administration
esxi-primary - VMware ESXi

https://192.168.21.1/ccmadmin/partitionEdit.do?key=ac2e73cd

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

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Partition Configuration Related Links: Back To Find/List Go

Save Delete Reset Apply Config Add New

**Status**  
Status: Ready

**Partition Information**  
Name\* UCCX-PT  
Description UCCX-PT  
Time Schedule < None >  
Time Zone ☒ Originating Device ☐ Specific Time Zone [(GMT) Etc/GMT]

Save Delete Reset Apply Config Add New

\*- indicates required item.

Calling Search Space Configure
Cisco Unified CCX Administration
Log in - VMware ESXi

https://192.168.21.1/ccmadmin/cssEdit.do?key=724603ab-fc04

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

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Calling Search Space Configuration Related Links: Back To Find/List Go

Save Delete Copy Add New

**Status**  
Update successful

**Calling Search Space Information**  
Name\* UCCX-CSS  
Description UCCX-CSS

**Route Partitions for this Calling Search Space**  
Available Partitions\*\*  
BANGALORE-DID-CALLING-TRANSFORMATION-PT  
BANGALORE-NATIONAL-PT  
BANGALORE-SHORT-DIAL-PT  
Directory URI  
Global Learned E164 Numbers  
Selected Partitions  
UCCX-PT  
BANGALORE-INTERNAL-PT  
TEXAS-INTERNAL-PT

Save Delete Copy Add New

\*- indicates required item.  
\*\*Selected Partitions are ordered by highest priority

Calling Search Space ConfigurCisco Unified CM AdministrationLog in - VMware ESXihttps://192.168.21.1/ccadmin/cssEdit.do?key=Sach1e40-7b5

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Calling Search Space ConfigurationRelated Links: Back To Find/ListGo

SaveDeleteCopyAdd New

StatusUpdate successful

Calling Search Space InformationName\*BANGALORE-PHONE-CSSDescriptionBANGALORE-PHONE-CSS

Route Partitions for this Calling Search SpaceAvailable Partitions\*\*BANGALORE-DID-CALLING-TRANSFORMATION-PTGlobal Learned E164 NumbersGlobal Learned E164 PatternsGlobal Learned Enterprise NumbersGlobal Learned Enterprise PatternsSelected PartitionsVM-PTBANGALORE-SHORT-DIAL-PTSME-PTDirectory URILUCCK-PT

SaveDeleteCopyAdd New

\*. indicates required item.

\*\*Selected Partitions are ordered by highest priority

Calling Search Space ConfigurCisco Unified CM Administrationhttps://192.168.21.1/ccadmin/cssEdit.do?key=42bcbf04-92cd-7c97-a

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Calling Search Space ConfigurationRelated Links: Back To Find/ListGo

SaveDeleteCopyAdd New

StatusUpdate successful

Calling Search Space InformationName\*TEXAS-PHONE-CSSDescriptionTEXAS-PHONE-CSS

Route Partitions for this Calling Search SpaceAvailable Partitions\*\*BANGALORE-DID-CALLING-TRANSFORMATION-PTBANGALORE-NATIONAL-PTBANGALORE-SHORT-DIAL-PTGlobal Learned E164 NumbersGlobal Learned E164 PatternsSelected PartitionsBANGALORE-INTERNAL-PTVM-PTSME-PTDirectory URILUCCK-PT

SaveDeleteCopyAdd New

\*. indicates required item.

\*\*Selected Partitions are ordered by highest priority

757

Region Configuration
Cisco Unified CCX Administration
Log in - VMware ESXi

https://192.168.21.1/ccmadmin/regionEdit.do?key=f73957ae-ai

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

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Region Configuration
Related Links: Back To Find/List Go

Save Delete Reset Apply Config Add New

**Status**  
Update successful  
Click on the Reset button to have the changes take effect.

**Region Information**  
Name\* UCCX-REGION

**Region Relationships**

| Region                      | Audio Codec Preference List                   | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|-----------------------------|-----------------------------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| AIRTEL-SIP-TRUNK-REGION     | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| BANGALORE-PHONES-REGION     | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| BLR-SME-SIP-TRUNK-REGION    | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| CUC-SIP-TRUNK-REGION        | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| Default                     | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| IMP-SIP-TRUNK-REGION        | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| MED-RES-REGION              | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| TEXAS-PHONES-REGION         | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| UCCX-REGION                 | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| VIDEO-MESH-SIP-TRUNK-REGION | Use System Default (Factory Default low loss) | 64 kbps (G.722, G.711) | Use System Default (384 kbps)            | Use System Default (2000000000 kbps)               |
| NOTE: Regions not displayed | Use System Default                            | Use System Default     | Use System Default                       | Use System Default                                 |

**Modify Relationship to other Regions**

| Regions                  | Audio Codec Preference List | Maximum Audio Bit Rate | Maximum Session Bit Rate for Video Calls | Maximum Session Bit Rate for Immersive Video Calls |
|--------------------------|-----------------------------|------------------------|------------------------------------------|----------------------------------------------------|
| AIRTEL-SIP-TRUNK-REGION  |                             |                        |                                          |                                                    |
| BANGALORE-PHONES-REGION  |                             |                        |                                          |                                                    |
| BLR-SME-SIP-TRUNK-REGION |                             |                        |                                          |                                                    |
| CUC-SIP-TRUNK-REGION     |                             |                        |                                          |                                                    |

Device Pool Configuration


Cisco Unified CCX Administration

Log in - VMware ESXi

← → ↺ 🏠

🔒 https://192.168.21.1/ccmadmin/devicePoolEdit.do?key=e5271c...

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 **Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation 

Cisco Unified CM Administration

Go

[admin](#) | [Search Documentation](#) | [About](#) | [Logout](#)







System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

**Device Pool Configuration**

Related Links: 

Back To Find/List

Go

 Save  Delete  Copy  Reset  Apply Config  Add New

**Device Pool Settings**

Device Pool Name\* 

UCCX-DEVICE-POOL

Cisco Unified Communications Manager Group\* 

SUB01-SUB02-CUCM-GROUP

Calling Search Space for Auto-registration 

< None >

Adjunct CSS 

< None >

Reverted Call Focus Priority 

Default

Intercompany Media Services Enrolled Group 

< None >

**Roaming Sensitive Settings**

Date/Time Group\* 

IST-DATE-TIME-GROUP

Region\* 

UCCX-REGION

Media Resource Group List 

< None >

Location 

< None >

Network Locale 

< None >

SRST Reference\* 

Disable

Connection Monitor Duration\*\*\*

759

## X. Create Skill

The screenshot shows the Cisco Unified CCX Administration web interface. The browser tabs include 'Partition Configuration', 'Cisco Unified CCX Administration', and 'esxi-primary - VMware ESXi'. The address bar shows 'https://uccx-pub.ajcollab.com/appadmin/ICD'. The navigation bar includes 'Cisco Unified CCX Administration' and 'Go'. The main menu has 'System', 'Applications', 'Subsystems', 'Wizards', 'Tools', and 'Help'. The 'Skills' section is active, showing a list of skills: 'Cisco Unified CM Telephony', 'RmCm', 'Chat and Email', 'Outbound', 'Database', 'HTTP', 'eMail', 'Cisco Media', 'MRCP ASR', and 'MRCP TTS'. The 'RmCm' menu is expanded, showing 'Skills' (highlighted with a red arrow), 'Resources', 'Resource Groups', 'Contact Service Queues', 'RmCm Provider', 'Assign Skills', 'Agent Based Routing Settings', and 'Teams'. The 'Skill List' table is partially visible, showing a 'Delete' button.

| Skill Name | Delete |
|------------|--------|
| PAYROLL    |        |
| TECHNICAL  |        |

The screenshot shows the same Cisco Unified CCX Administration web interface, but with the 'Skill List' table fully visible. The table has two columns: 'Skill Name' and 'Delete'. The 'Skill Name' column contains 'PAYROLL' and 'TECHNICAL', both with a small icon to the left. The 'Delete' column contains two trash can icons. The 'Add New' button is visible at the bottom left.

| Skill Name | Delete |
|------------|--------|
| PAYROLL    |        |
| TECHNICAL  |        |



## X. Create Resource Groups

The screenshot displays the Cisco Unified CCX Administration web interface. The browser tabs include 'Partition Configuration', 'Cisco Unified CCX Administration', and 'esxi-primary - VMware ESXi'. The address bar shows the URL 'https://uccx-pub.ajcollab.com/appadmin/ICD'. The page header features the Cisco logo, the title 'Cisco Unified CCX Administration', and the subtitle 'For Cisco Unified Communications Solutions'. The navigation menu includes 'System', 'Applications', 'Subsystems', 'Wizards', 'Tools', and 'Help'. The main content area is titled 'Resource Group' and contains an 'Add New' button. Below this, a status box indicates '2 records found'. A table titled 'List Resource Group' displays the following data:

| Resource Group Name                     | Delete |
|-----------------------------------------|--------|
| <a href="#">PAYROLL-GROUP</a>           |        |
| <a href="#">TECHNICAL-SUPPORT-GROUP</a> |        |

An 'Add New' button is located at the bottom left of the table.

## X. Configure Agents in CUCM

End User Configuration

Cisco Unified CCX Administration

esxi-primary - VMware ESXi

←

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https://192.168.21.1/ccadmin/userEdit.do?key=82a

90%

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☰

CISCO

Cisco Unified CM Administration

For Cisco Unified Communications Solutions

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System

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Device

▼

Application

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User Management

▼

Bulk Administration

▼

Help

▼

End User Configuration

Related Links:

Back to Find List Users

Go

💾 Save

✖ Delete

➕ Add New

User Information

User Status

Enabled Local User

User ID\*

deepika.padukone

Password

.....

Edit Credential

Confirm Password

.....

Self-Service User ID

11001

PIN

.....

Edit Credential

Confirm PIN

.....

Last name\*

Padukone

Middle name

First name

Deepika

Display name

Deepika Padukone

Title

Directory URI

deepika.padukone@ajcollab.com

Telephone Number

11001

Home Number

Mobile Number

Pager Number

Mail ID

deepika.padukone@ajcollab.com

Manager User ID

Department

User Locale

< None >

Associated PC/Site Code

Digest Credentials

Confirm Digest Credentials

User Profile

Use System Default( "Standard (Factory Defaul

View Details

User Rank\*

1-Default User Rank

Name Dialing

Service Settings

☒ Home Cluster

☒ Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)

☒ Include meeting information in presence(Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)

[Presence Viewer for User](#)

UC Service Profile

JABBER-SERVICE-PROFILE

View Details

Device Information

Controlled Devices

SEP501CB00C71D5

Device Association

Line Appearance Association for Presence

End User Configuration | Cisco Unified CCX Administration | 3:28 until your session times out

https://192.168.21.1/ccadmin/userEdit.do?key=82a 90%

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration | Go  
admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

**End User Configuration** | Related Links: Back to Find List Users | Go

Save | Delete | Add New

CTI Controlled Device Profiles

**Extension Mobility**

Available Profiles

Controlled Profiles

Default Profile: -- Not Selected --

BLF Presence Group\*: Standard Presence group

SUBSCRIBE Calling Search Space: < None >

☒ Allow Control of Device from CTI

☐ Enable Extension Mobility Cross Cluster

**Directory Number Associations**

Primary Extension: 11001 in BANGALORE-INTERNAL-PT

IPCC Extension: 11001 in BANGALORE-INTERNAL-PT

**Mobility Information**

☐ Enable Mobility

☐ Enable Mobile Voice Access

Maximum Wait Time for Desk Pickup\*: 10000

Remote Destination Limit\*: 4

Remote Destination Profiles

[View Details](#)

**Multilevel Precedence and Preemption Authorization**

MLPP User Identification Number

MLPP Password

Confirm MLPP Password

MLPP Precedence Authorization Level: Default

**CAPF Information**

Associated CAPF Profiles

Once you add, IPCC Extension, those users will be automatically replicated to UCCX Resources

Find and List Users Cisco Unified CCX Administration 2:37 until your session times out

https://uccx-pub.ajcollab.com/appadmin/ICD?request\_type=

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### Resources

☒ Open Resources Summary Report

Status

**2 records found**

| Resources List |                                  |                             |                             |                   |
|----------------|----------------------------------|-----------------------------|-----------------------------|-------------------|
|                | Resource Name <sup>Δ</sup>       | Resource Group <sup>Δ</sup> | IPCC Extension <sup>Δ</sup> | Team <sup>Δ</sup> |
|                | <a href="#">Deepika Padukone</a> |                             | 11001                       | Default           |
|                | <a href="#">Abdul Jaseem</a>     |                             | 11002                       | Default           |

**\* Supervisor**

## X. Configure the resource now

Find and List Users Cisco Unified CCX Administration 0:39 until your session times out

https://uccx-pub.ajcollab.com/appadmin/ICD?request\_type=

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### Resource Configuration

☒ Open Printable Report of this Resource Configuration

Resource Name Deepika Padukone

Resource ID deepika.padukone

IPCC Extension 11001

Resource Group PAYROLL-GROUP

Automatic Available\* ☒ Enabled ☐ Disabled

Assigned Skills

PAYROLL(5)  
TECHNICAL(10)

Unassigned Skills

Competence Level 5 (1-Beginner, 10-Expert)

Team Default

Agent Alias

**\*- indicates required item**

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD?request\_type=

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For Cisco Unified Communications Solutions

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### Resource Configuration

Update Cancel Open Printable Report of this Resource Configuration

Resource Name Abdul Jaseem  
 Resource ID abdul.jaseem  
 IPCC Extension 11002  
 Resource Group TECHNICAL-SUPPORT-GR  
 Automatic Available\* ☒ Enabled ☐ Disabled  
 Assigned Skills  
 PAYROLL(10)  
 TECHNICAL(5)  
 Unassigned Skills  
 Competence Level 5 (1-Beginner, 10-Expert)  
 Team Default  
 Agent Alias

Update Cancel

\*- indicates required item

## X. Create Contact Service Queues

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD?request\_type=

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### Contact Service Queue Configuration

Next Cancel

Status  
 Status : Ready

Contact Service Queue Name\* PAYROLL-GROUP-CSQ  
 Contact Service Queue Type Voice  
 Contact Queuing Criteria FIFO  
 Automatic Work\* ☐ Enabled ☒ Disabled  
 Wrapup Time\* ☐ Enabled  Second(s) ☒ Disabled  
 Resource Pool Selection Model\* Resource Group  
 Service Level\* 5  
 Service Level Percentage\* 70  
 Prompt - No Selection -

Next Cancel

\*- indicates required item

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD

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For Cisco Unified Communications Solutions

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### Contact Service Queue Configuration

Add Cancel

Contact Service Queue Name PAYROLL-GROUP-CSQ

Resource Selection Criteria\* Longest Available

Resource Group\* PAYROLL-GROUP

Order Assigned Resources#

Deepika Padukone

Show Resources

Add Cancel

\*- indicates required item

# Order applies to Linear and Circular Resource Pool Selection Model

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD?request\_type=c

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### Contact Service Queue Configuration

Next Cancel

Status

Status : Ready

Contact Service Queue Name\* TECHNICAL-GROUP-CSQ

Contact Service Queue Type Voice

Contact Queuing Criteria FIFO

Automatic Work\* ☐ Enabled ☒ Disabled

Wrapup Time\* ☐ Enabled  Second(s) ☒ Disabled

Resource Pool Selection Model\* Resource Group

Service Level\* 5

Service Level Percentage\* 70

Prompt - No Selection -

Next Cancel

\*- indicates required item

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD

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### Contact Service Queue Configuration

Add Cancel

Contact Service Queue Name TECHNICAL-GROUP-CSQ

Resource Selection Criteria\* Longest Available

Resource Group\* TECHNICAL-SUPPORT-GR

Abdul Jaseem

Order Assigned Resources#

Show Resources

Add Cancel

\*- indicates required item

# Order applies to Linear and Circular Resource Pool Selection Model

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD?request\_type=

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### Contact Service Queue Configuration

Next Cancel

Status

Status : Ready

Contact Service Queue Name\* PAYROLL-SKILL-CSQ

Contact Service Queue Type Voice

Contact Queuing Criteria FIFO

Automatic Work\* ☐ Enabled ☒ Disabled

Wrapup Time\* ☐ Enabled  Second(s) ☒ Disabled

Resource Pool Selection Model\* Resource Skills

Service Level\* 5

Service Level Percentage\* 70

Prompt - No Selection -

Next Cancel

\*- indicates required item

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD

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### Contact Service Queue Configuration

Update Cancel Show Resources Open Printable Report of this CSQ configuration

Contact Service Queue Name PAYROLL-SKILL-CSQ

Resource Selection Criteria Longest Available

Select Required Skills

PAYROLL  
TECHNICAL

Add

| Skills    | Minimum Competence | Delete |
|-----------|--------------------|--------|
| PAYROLL   | 5                  |        |
| TECHNICAL | 10                 |        |

Update Cancel

1-Beginner, 10-Expert

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD?request\_type=c

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### Contact Service Queue Configuration

Next Cancel

Status

Status : Ready

Contact Service Queue Name\* TECHNICAL-SKILL-CSQ

Contact Service Queue Type Voice

Contact Queuing Criteria FIFO

Automatic Work\* ☐ Enabled ☒ Disabled

Wrapup Time\* ☐ Enabled  Second(s) ☒ Disabled

Resource Pool Selection Model\* Resource Skills

Service Level\* 5

Service Level Percentage\* 70

Prompt - No Selection -

Next Cancel

\*- indicates required item



Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD

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### Contact Service Queue Configuration

Add Cancel Show Resources

Contact Service Queue Name **TECHNICAL-SKILL-CSQ**

Resource Selection Criteria Longest Available

Select Required Skills

PAYROLL  
TECHNICAL

Add

| Skills    | Minimum Competence | Delete |
|-----------|--------------------|--------|
| TECHNICAL | 5                  |        |
| PAYROLL   | 10                 |        |

Add Cancel

1-Beginner, 10-Expert

Find and List Users Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/ICD

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### Contact Service Queues

Add New

Status

4 records found

| Contact Service queues              |                          |                               |                           |          |        |  |
|-------------------------------------|--------------------------|-------------------------------|---------------------------|----------|--------|--|
| Name                                | Contact Queuing Criteria | Resource Pool Selection Model | Resource Pool             | CSQ Type | Delete |  |
| <a href="#">PAYROLL-GROUP-CSQ</a>   | FIFO                     | Resource Group                | PAYROLL-GROUP             | Voice    |        |  |
| <a href="#">TECHNICAL-GROUP-CSQ</a> | FIFO                     | Resource Group                | TECHNICAL-SUPPORT-GROUP   | Voice    |        |  |
| <a href="#">PAYROLL-SKILL-CSQ</a>   | FIFO                     | Resource Skill                | PAYROLL(5), TECHNICAL(10) | Voice    |        |  |
| <a href="#">TECHNICAL-SKILL-CSQ</a> | FIFO                     | Resource Skill                | PAYROLL(10), TECHNICAL(5) | Voice    |        |  |

Add New


X. Configure Call Control Group

Find and List Users

Cisco Unified CCX Administration

Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/JTAPICTIGroup?req

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Cisco Unified CM

Add New

status

0 records found

Ports List

Group ID Δ

Add New

Refresh All

Cisco Unified CM Telephony ▶

RmCm ▶

Chat and Email ▶

Outbound ▶

Database ▶

HTTP

eMail

Cisco Media

MRCP ASR ▶

MRCP TTS ▶

Provider

Call Control Group ←

Triggers

Data Synchronization

Cisco JTAPI Resync

Advanced Settings

CTI Ports Δ

Group Type Δ

Copy

Delete

Refresh

Number Of Licensed IVR Ports:100

Number Of Licensed Outbound IVR Ports:100

Device Pool Configuration
Cisco Unified CCX Administration
Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/JTAPICTIGroup

Cisco
**Cisco Unified CCX Administration**
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### Cisco Unified CM Telephony Call Control Group Configuration

Add
Cancel

**Group Information**

Description\* CUSTOMER-SUPPORT
Number Of CTI Ports\* 5
Media Termination Support\* ☐ Yes ☒ No
Group Type\* ☒ Inbound ☐ Outbound

**Directory Number Information**

Device Name Prefix\* CUSTO
Starting Directory Number\* 11011
Device Pool UCCX-DEVICE-POOL
DN Calling Search Space None
Location Hub\_None
Partition UCCX-PT
Show Less...

**Advanced Directory Number Information**

Alerting Name ASCII
Redirect Calling Search Space Redirect Party
Media Resource Group List None

**Directory Number Setting**

Voice Mail Profile None
Presence Group Standard Presence group
Require DTMF Reception ☒ Yes ☐ No
AAR Group None
User Hold Audio Source\*\* None
Network Hold Audio Source\*\* None

**Call Forward and Pickup Settings**

Call Pickup Group None
Display
External Phone Number Mask

Add
Cancel

\*. indicates required item

Find and List Phones Cisco Unified CM Administration Log in - VMware ESXi

https://192.168.21.1/ccmadmin/phoneFindList.do?lookup=false

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**Find and List Phones** Related Links: [Actively Logged In Device Report](#) Go

+ Add New Select All Clear All Delete Selected Reset Selected Apply Config to Selected

**Status**  
5 records found *These CTI Ports are created automatically when you create CCG in UCCX*

**Phone (1 - 5 of 5)** Rows per Page 50

Find Phone where Device Name begins with CUS Find Clear Filter Select item or enter search text

|                          | Device Name(Line)           | Description        | Device Pool                      | Device Protocol | Status                                  | IPv4 Address | Copy | Super Copy |
|--------------------------|-----------------------------|--------------------|----------------------------------|-----------------|-----------------------------------------|--------------|------|------------|
| <input type="checkbox"/> | <a href="#">CUSTO_11011</a> | CUSTOMER-SUPPORT-1 | <a href="#">UCCX-DEVICE-POOL</a> | SCCP            | Registered with cucm-sub01.ajcollab.com | 192.168.21.8 |      |            |
| <input type="checkbox"/> | <a href="#">CUSTO_11012</a> | CUSTOMER-SUPPORT-1 | <a href="#">UCCX-DEVICE-POOL</a> | SCCP            | Registered with cucm-sub01.ajcollab.com | 192.168.21.8 |      |            |
| <input type="checkbox"/> | <a href="#">CUSTO_11013</a> | CUSTOMER-SUPPORT-1 | <a href="#">UCCX-DEVICE-POOL</a> | SCCP            | Registered with cucm-sub01.ajcollab.com | 192.168.21.8 |      |            |
| <input type="checkbox"/> | <a href="#">CUSTO_11014</a> | CUSTOMER-SUPPORT-1 | <a href="#">UCCX-DEVICE-POOL</a> | SCCP            | Registered with cucm-sub01.ajcollab.com | 192.168.21.8 |      |            |
| <input type="checkbox"/> | <a href="#">CUSTO_11015</a> | CUSTOMER-SUPPORT-1 | <a href="#">UCCX-DEVICE-POOL</a> | SCCP            | Registered with cucm-sub01.ajcollab.com | 192.168.21.8 |      |            |

Add New Select All Clear All Delete Selected Reset Selected Apply Config to Selected

## X. Create Application

Phone Configuration Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/App?request\_type=list

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**Applications**

- Application Management
- Applications
- Script Management
- Prompt Management
- Grammar Management
- Document Management
- AAR Management

**Application List**

| Name | ID | Sessions | Enabled | Delete | Copy | Refresh | Summary |
|------|----|----------|---------|--------|------|---------|---------|
|------|----|----------|---------|--------|------|---------|---------|

Add New Refresh All

Phone Configuration Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/App?request\_type=

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### Add A New Application

Next Cancel

Select the type of application you would like to create:

Application Type\* Cisco Script Application

Next Cancel

\*- indicates required item

Phone Configuration Cisco Unified CCX Administration Log in - VMware ESXi

https://uccx-pub.ajcollab.com/appadmin/App

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### Cisco Script Application

Update Delete Cancel Back to Application List

Status

The operation has been executed successfully.

[Add new trigger](#)

|                                        |                                                               |
|----------------------------------------|---------------------------------------------------------------|
| Name                                   | CUSTOMER-SUPPORT-APP                                          |
| ID*                                    | 0                                                             |
| Maximum Number of Sessions*            | 5                                                             |
| Script*                                | SSCRIPT[aa.aef] <i>This is for testing</i> Edit               |
| <input type="checkbox"/> welcomePrompt | AAVAAWelcor Show Prompts                                      |
| <input type="checkbox"/> MaxRetry      | 3                                                             |
| <input type="checkbox"/> operExtn      |                                                               |
| Description                            | CUSTOMER-SUPPOR                                               |
| Enabled                                | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Default Script                         | - System Default - Edit                                       |


Update Delete Cancel Back to Application List


\*- indicates required item


Cisco Unified CCX Administration — Mozilla Firefox

https://uccx-pub.ajcollab.com/appadmin/Trigger?request\_type=new\_configuration8

### Add a New Trigger

Trigger Type\* Unified CM Telephony Trigger 

 Next Cancel

 \*- indicates required item

Cisco Unified CCX Administration — Mozilla Firefox
https://uccx-pub.ajcollab.com/appadmin/JTAPITrigger?request\_type=new\_trig

## Cisco Unified CM Telephony Trigger Configuration

Add
Cancel

### Directory Information

Directory Number\* 11010

### Trigger Information

Language\* - System Default - Edit

Application Name\* CUSTOMER-SUPPORT-APP

Device Name\* CUSTOMER-CARE

Description\* CUSTOMER-CARE

Call Control Group\* CUSTOMER-SUPPORT(2)

### Advanced Trigger Information

Enabled ☒ Yes ☐ No

Maximum Number Of Sessions Default  
☐ Unchecked: Default value is same as Number of Sessions set on the Application

Idle Timeout (in ms) 5000

Override Media Termination ☐ Yes ☒ No

### CTI Route Point Information

Alerting Name ASCII

Device Pool UCCX-DEVICE-POOL

Location Hub\_None

### Directory Number Settings

Partition UCCX-PT

Voice Mail Profile None

Calling Search Space None

Calling Search Space for Redirect Default Calling Search Space

Presence Group Standard Presence group

### Call Forward and Pickup Settings

|              | Voice Mail               | Destination | Calling Search Space |
|--------------|--------------------------|-------------|----------------------|
| Forward Busy | <input type="checkbox"/> |             | None                 |

### Line Settings

Display

External Phone Number Mask

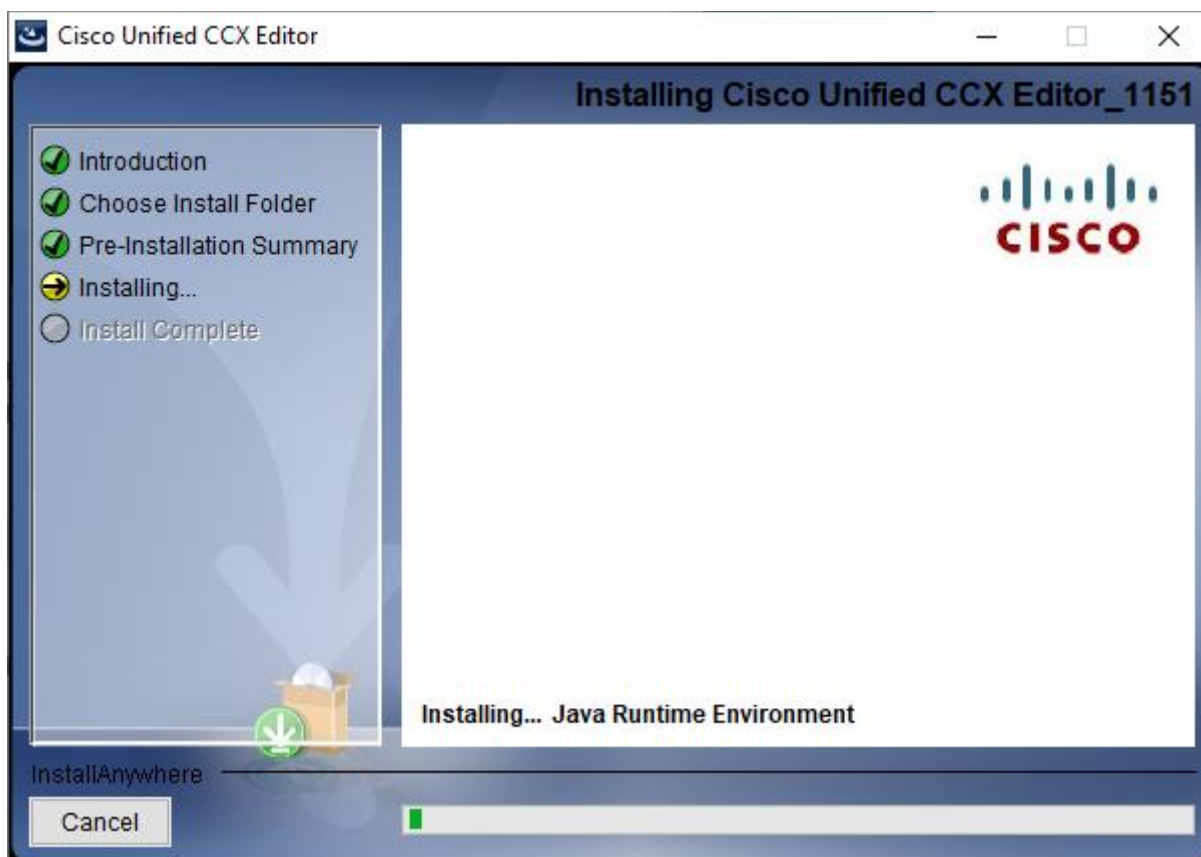
- 
- At this point when you dial 11010, you will be able to hear the Automated Attendant IVR. You can try navigating through the different options



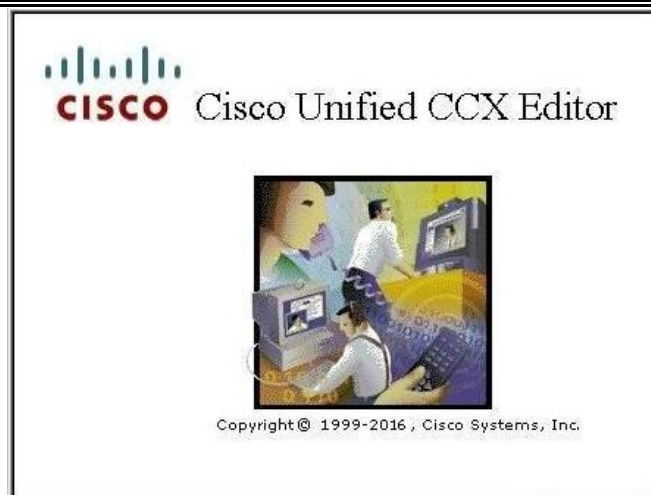
## Accessing CCX Script Editor



- Download and install the CCX Editor



- We use the CUCM Promoted UCCX Administrator Account to login to CCX Editor. You can use the other 'admin' account as well, but some features (Reactive Debugging) won't be available



**Authentication**

User Identification:

Password:

Unified CCX Server:

Cisco Unified CCX Editor

File Edit Tools Debug Window Settings Help

General

- Annotate
- Call Subflow
- Day of Week
- Decrement
- Delay
- Do
- End
- Goto
- If
- Increment
- Label
- On Exception Clear
- On Exception Goto
- Set
- Switch
- Time of Day

Trigger

Session

Contact

Call Contact

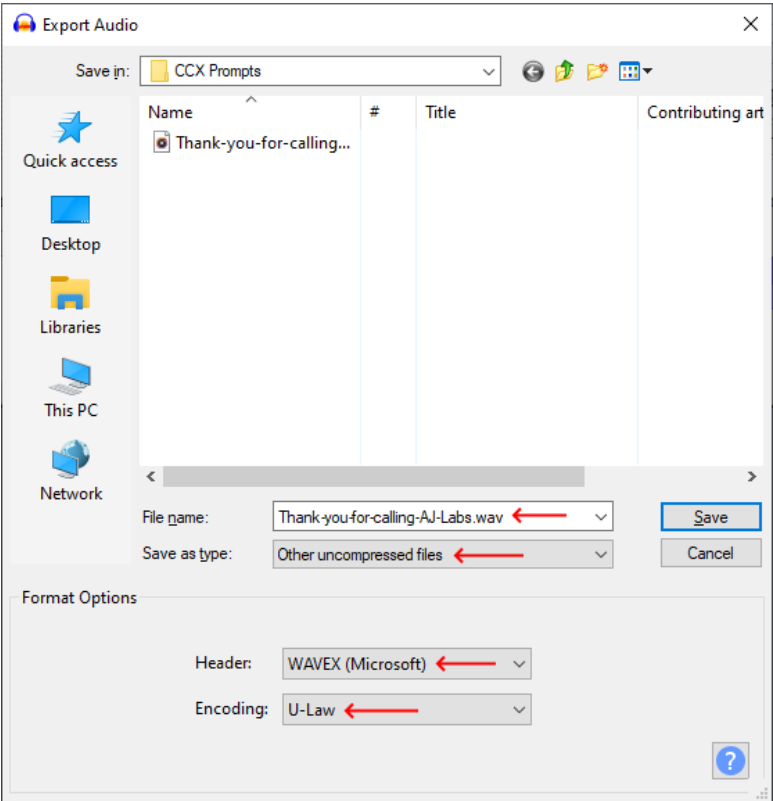
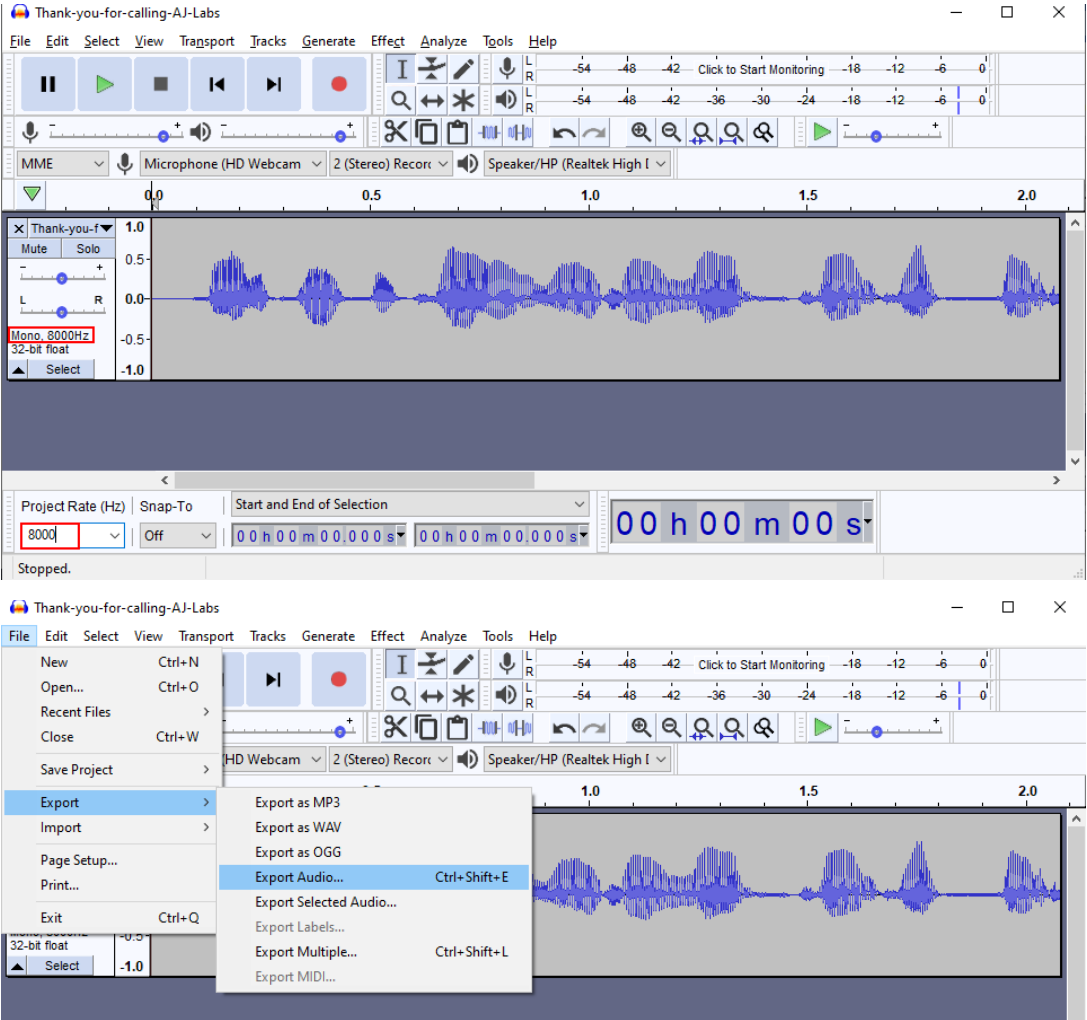
eMail Contact

Search Reset

| Name | Type | Value | Attributes |
|------|------|-------|------------|
|------|------|-------|------------|

Step | Ln | default | **uccx-app-admin** | 13.30MB of 92.81MB

# UCCX Prompt Format



## [Lab] UCCX Scripting IVR and ACD

- Some Sample Scripts will be available in 'C:\Program Files (x86)\wfavvid\_1151\Scripts\system\default'
- I have copied the icd.aef and renamed to AJ-LABS-CUSTOMER-CARE.aef
- Uploaded this to UCCX Script Repository

The screenshot shows the Cisco Unified CCX Administration web interface. The 'Script Management' menu is open, showing options like Application Management, Script Management, Prompt Management, Grammar Management, Document Management, and AAR Management. The 'Script Management' option is highlighted. Below the menu, there is a 'Folder path: ..' field and a table with columns: Name, Size, Date Modified, Modified By, Delete, Rename, and Refresh. At the bottom, there are buttons for 'Create New Folder' and 'Upload Scripts', with a red arrow pointing to the 'Upload Scripts' button.

The screenshot shows the Cisco Unified CCX Administration web interface, specifically the 'Script Management' page. The 'Status' is 'Ready'. Below the status, there is a 'Folder path: ..' field and a table with columns: Name, Size, Date Modified, Modified By, Delete, Rename, and Refresh. The table contains one entry: 'AJ-LABS-CUSTOMER-CARE.aef' with a size of '10.31 KB', modified on '04/24/2021 11:01:34 PM India Standard Time' by 'uccx-app-admin'. A red arrow points to the file name. Below the table, there is a pagination bar showing 'First Previous Next Last Page 1 of 1'. At the bottom, there are buttons for 'Create New Folder' and 'Upload Scripts'.

Cisco Unified CCX Administration

Navigation Cisco Unified CCX Administration Go

uccx-app-admin | Search Documentation | About | Logout

System Applications Subsystems Wizards Tools Help

### Cisco Script Application

Update Delete Cancel Back to Application List

Status

Status : Ready

Unified CM Telephony  
Trigger: 11010  
[Add new trigger](#)

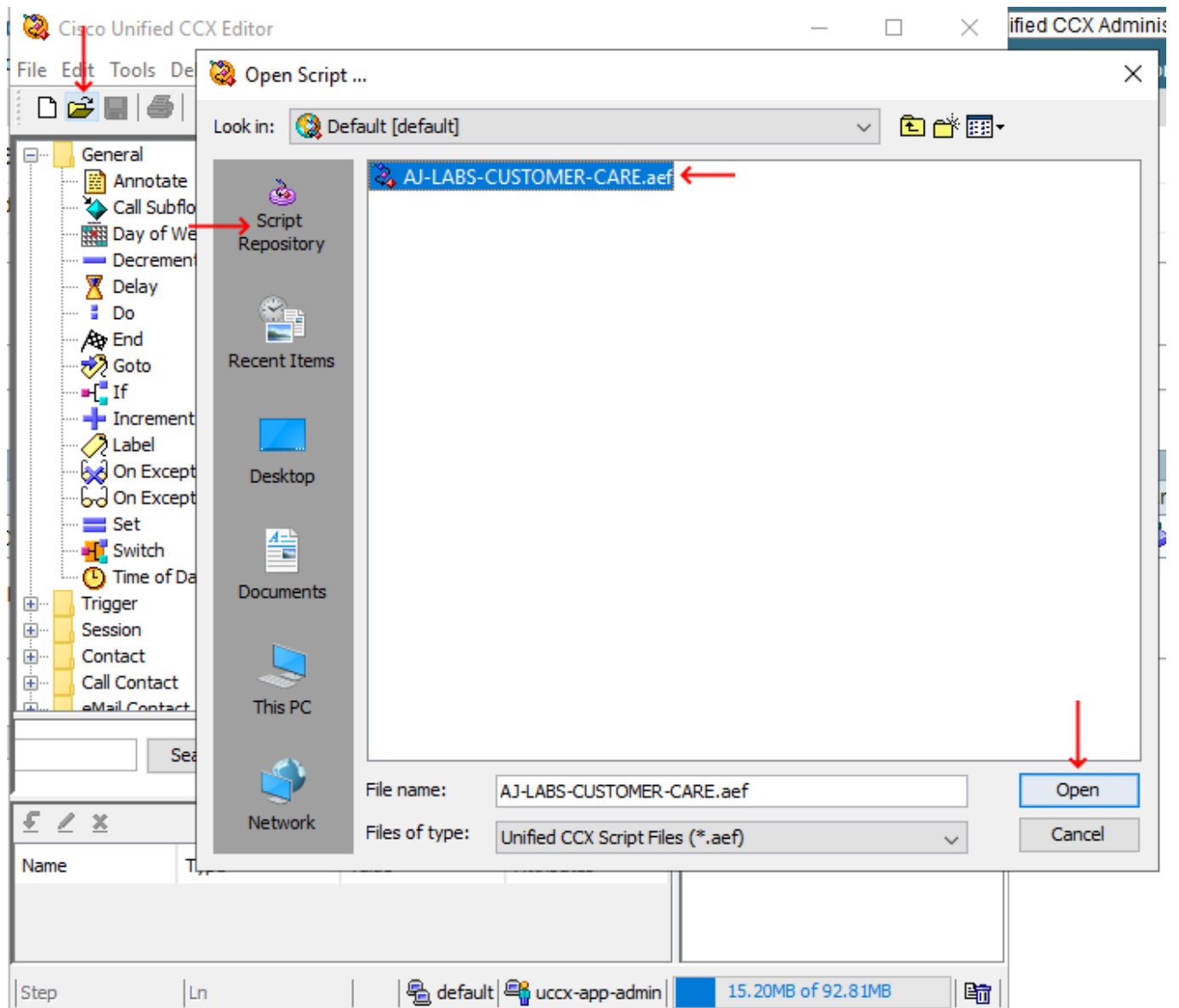
|                                           |                                                               |
|-------------------------------------------|---------------------------------------------------------------|
| Name                                      | CUSTOMER-SUPPORT-APP                                          |
| ID*                                       | 0                                                             |
| Maximum Number of Sessions*               | 5                                                             |
| Script*                                   | SCRIPT[AJ-LABS-CUSTOMER-CARE.aef] Edit                        |
| <input type="checkbox"/> CSQ              |                                                               |
| <input type="checkbox"/> DelayWhileQueued | 30                                                            |
| <input type="checkbox"/> WelcomePrompt    | ICD\CDWelc Show Prompts                                       |
| <input type="checkbox"/> QueuePrompt      | ICD\CDQuei Show Prompts                                       |
| Description                               | CUSTOMER-SUPPOF                                               |
| Enabled                                   | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Default Script                            | - System Default - Edit                                       |

Update Delete Cancel Back to Application List

\*- indicates required item

- This is just for testing; I will be editing this script to build my own

- Complete Script and Prompt for this project can be downloaded from here



Cisco Unified CCX Editor

File Edit Tools Debug Window Settings Help

General Trigger Session Contact Accept Get Contact Info Reject Set Contact Info Terminate Call Contact eMail Contact Http Contact Media User Prompt Grammar Document Database ACD ICM Java Context Service

\default\AJ-LABS-CUSTOMER-CARE.aef

```

/* Simple Queuing Template */
Start
Accept (--Triggering Contact--)
Play Prompt (--Triggering Contact--, WelcomePrompt)
authenticationStart:
userAuthPIN = Get Digit String (--Triggering Contact--)
Successful
If (userAuthPIN == authPIN) Then
True
Play Prompt (--Triggering Contact--, P[Successfully-authenticated.wav])
Goto mainMenu
False
Play Prompt (--Triggering Contact--, P[Wrong-PIN.wav])
Goto authenticationStart
Timeout
Unsuccessful
mainMenu:
userMenuInput = Get Digit String (--Triggering Contact--)
Successful
Switch String (userMenuInput)
payrollSupport
Select Resource (--Triggering Contact-- from payrollCSQ)
techSupport
Select Resource (--Triggering Contact-- from techCSQ)
operator
Call Consult Transfer (--Triggering Contact-- to "21001")
Successful
Busy
Invalid
Timeout
Unsuccessful
Play Prompt (--Triggering Contact--, P[Operator-not-available.wav])
Terminate (--Triggering Contact--)
Default
Timeout
Unsuccessful
End

```

cc Search Reset

| Name          | Type   | Value      | Attributes |
|---------------|--------|------------|------------|
| WelcomePrompt | Prompt | P[]        | Parameter  |
| authPIN       | String | "12345678" | Parameter  |
| authPrompt    | Prompt | P[]        | Parameter  |
| payrollCSQ    | String | ""         | Parameter  |
| queueDelay    | int    | 10         | Parameter  |
| techCSQ       | String | ""         | Parameter  |
| userAuthPIN   | String | ""         |            |
| userMenuInput | String | ""         |            |

DEBUGGING :  
Begin Debugging \default\AJ-LABS-CUSTOMER-CARE.aef...  
Done Debugging \default\AJ-LABS-CUSTOMER-CARE.aef.

Step 14 / 27 | Ln 24 / 36 | default | uccx-app-admin | 26.62MB of 92.81MB

| Variable      | Data Type | Default Value                | Customizable over web |
|---------------|-----------|------------------------------|-----------------------|
| WelcomePrompt | Prompt    | P[]                          | Yes                   |
| authPIN       | String    | 12345678                     | Yes                   |
| userAuthPIN   | String    | Dynamic (Accept from caller) | No                    |
| authPrompt    | Prompt    | P[]                          | Yes                   |
| userMenuInput | String    | Dynamic (Accept from caller) | No                    |
| payrollCSQ    | String    | ""                           | Admin should provide  |
| techCSQ       | String    | ""                           | Admin should provide  |
| queueDelay    | Int       | 10                           | Yes                   |
| operator      | String    | ""                           | Admin should provide  |





---

## Accept

- Here we accept the call that came to the Trigger

## Play Prompt:

- Play the welcome prompt that is pulled from a variable **WelcomePrompt** “Thank you for calling AJ Labs Contact Center, we are happy to help you”
- The value of **WelcomePrompt** can be customized from the UCCX web portal

## Get Digit String

- Plays a greeting that is pulled from a variable **authPrompt** “Please enter your PIN followed by pound key to authenticate”
- Accept the digits from user and saves to a variable **userAuthPIN**

## If

- Check whether **userAuthPIN == authPIN** that is provided in the UCCX web portal
- True > Play prompt ‘Successfully-authenticated.wav’ and go to Main Menu
- False > Play prompt ‘Wrong-PIN.wav’ and go to Get Digit String again

## mainMenu

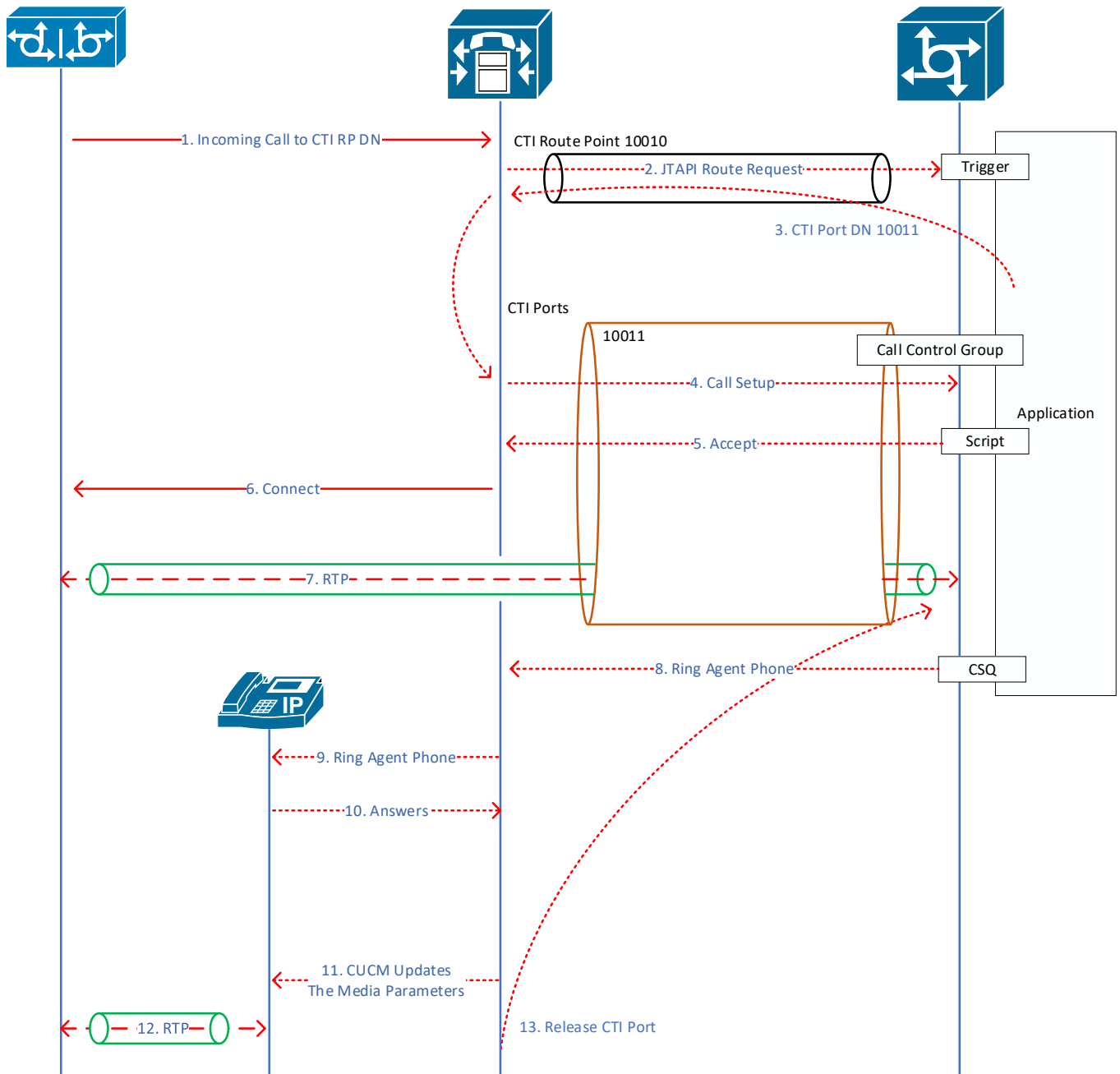
- Plays a prompt “Press 1 for Payroll support, Press 2 for technical support. For any other help, press 9”
- Accept digit from user and saves to a variable **userMenuInput**

## Switch

- If user presses 1, route the call to **payrollCSQ**, if none of the agents are available stay in the queue. Value of **payrollCSQ** can be customized from UCCX web portal
- If user presses 2, route the call to **techCSQ**, if none of the agents are available stay in the queue. Value of **techCSQ** can be customized from UCCX web portal
- If user presses 3, Transfer the call to an **operator** variable whose value can be set from the UCCX web portal. If operator is not available, play a prompt saying that ‘Sorry, the operator is not available now, please call us back later’

**Note:** Agent must login to <https://<UCCX server>:8445/desktop> and make the status available to get the calls.

## UCCX Call Flow



1. Call comes from CUBE / Voice gateway to CUCM with CTI Route point DN
2. CUCM sends JTAPI Route Request to UCCX and that reaches to UCCX Application. Application interconnects Trigger, Call Control Group, Script and CSQ
3. Application identifies free CTI Port DN and sends JTAPI response with CTI Port Number
4. CUCM Sends call setup to the CTI Port Number and UCCX will execute the Script
5. Script Accepts the call
6. CUCM Connects the CUBE leg to UCCX
7. RTP flows from CUBE to UCCX

- 
8. Based on the caller interaction, UCCX identify a Contact Service Queue (CSQ) to route the call to an agent based on Agent's availability
  9. Agent phone rings
  10. Agent answers the call
  11. CUCM Updates the media parameters to establish media from CUBE to the Phone
  12. RTP flows from CUBE to Agent's IP Phone
  13. CUCM releases the CTI Port and that will be available to serve upcoming calls

---

## **Chapter 1 Module 7 - Upgrade**

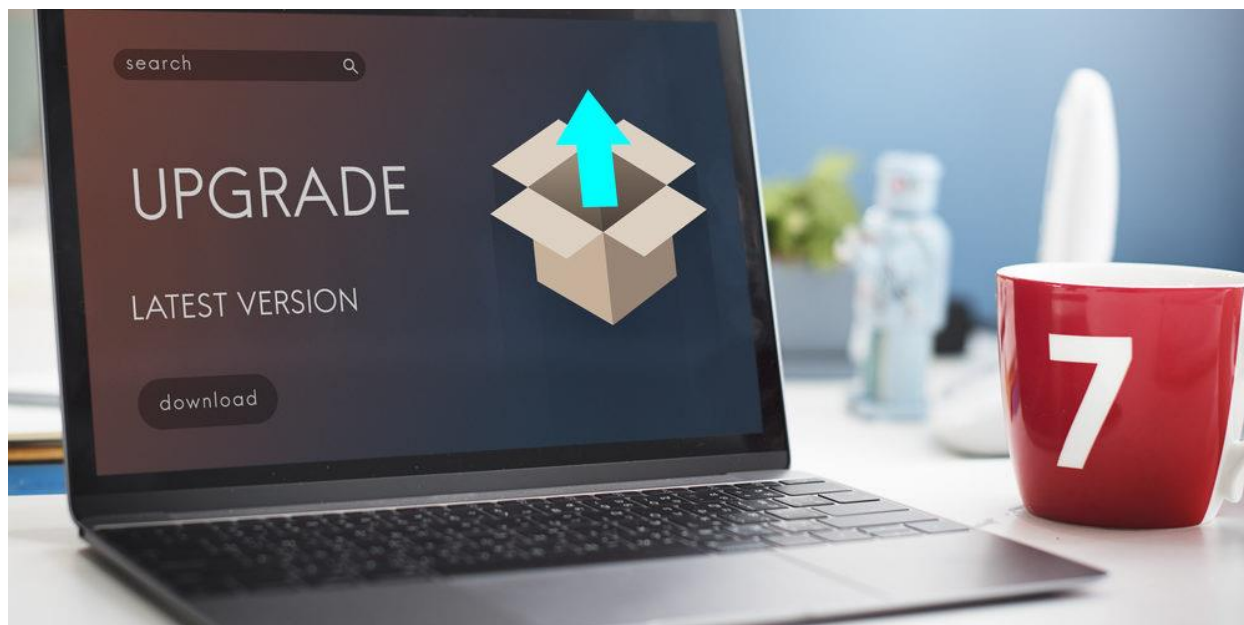
### **Cisco On-Premise Collaboration Solution**

### **UC Upgrade, Device Pack & Firmware Upgrade**



---

## CUCM Upgrade 11.5 to 12.5



- CUCM 11.5 and 12.5 has some major differences. CUCM 11.5 platform is based on RedHat Linux, it was RedHat Linux ever since version 5 came out (first Linux version of CUCM)
- CUCM 12.5 is built on CentOS platform
- Other change is about Licensing, 12.5 uses Smart License whereas 11.5 uses Prime License Manager
- Perform upgrade from vmware Console since 12.5 upgrade goes via OS new OS installation where you lose the connectivity for a long time
- It is always recommended to go through the Cisco official upgrade document before starting any upgrade

### 1. Pre-Upgrade Tasks

- 1.1 Take a full DRF cluster backup (we discussed already)
- 1.2 Create Smart Licensing Account
- 1.3 Convert Prime License to Smart License
- 1.4 Pre-Upgrade Check COP File
- 1.5 Free Common Space COP File
- 1.6 Delete Unused Firmware Files
- 1.7 Update Virtual Hardware (CPU, RMA, HDD, NIC)
- 1.8 Take Output of TFTP Content
- 1.9 Take output of show version active

---

## **2. Upgrade Tasks**

- 2.1 Upgrade UCM Publisher
- 2.2 Upgrade CUCM Subscribers
- 2.3 Upgrade IMP Publisher
- 2.4 Upgrade IMP Subscriber
- 2.5 Verify Database Replication
- 2.6 Switch Version CUCM Publisher
- 2.7 Switch Version CUCM Subscribers, IMP Publisher and IMP Subscribers
- 2.8 Change VM Compatibility and Guest OS Version
- 2.9 Install Post-Upgrade COP File
- 2.10 Register CUCM 12.5 to Smart License Manager

## **3. Post Upgrade Task**

- 3.1 Perform health check
- 3.2. Update TFTP Contents (Optional)
- 3.3 Install COP Files (Optional)

---

## **Post Upgrade Tasks**

3.1 Install the Post-Upgrade Check COP File

3.2 Perform Regular Health Check that we covered in the beginning of the course

3.3 Update the TFTP Server

The custom file content (Custom Firmware, Ring Tones, Backgrounds, etc.) of TFTP server won't be replicated to new TFTP Node after the upgrade

Install required files that was existed before

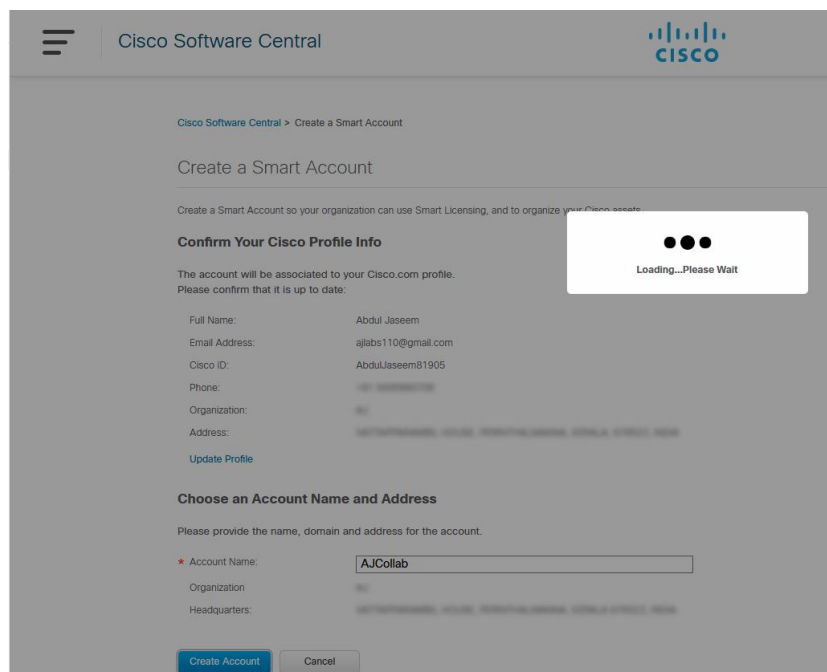
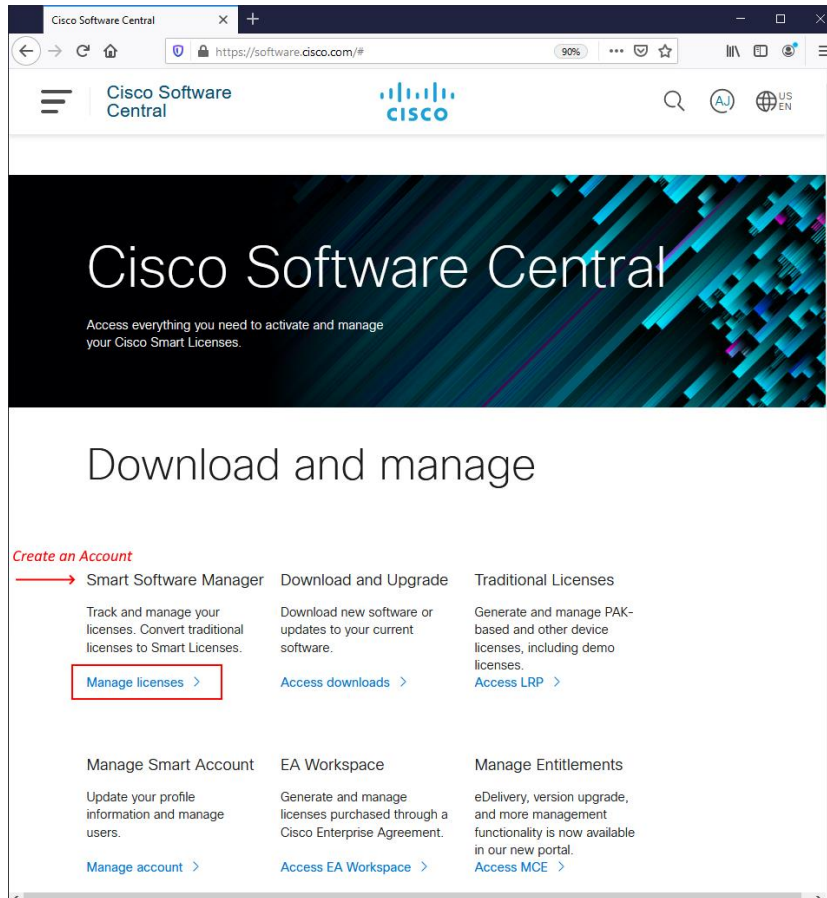
---

## 1.1 Take a full DRF cluster backup

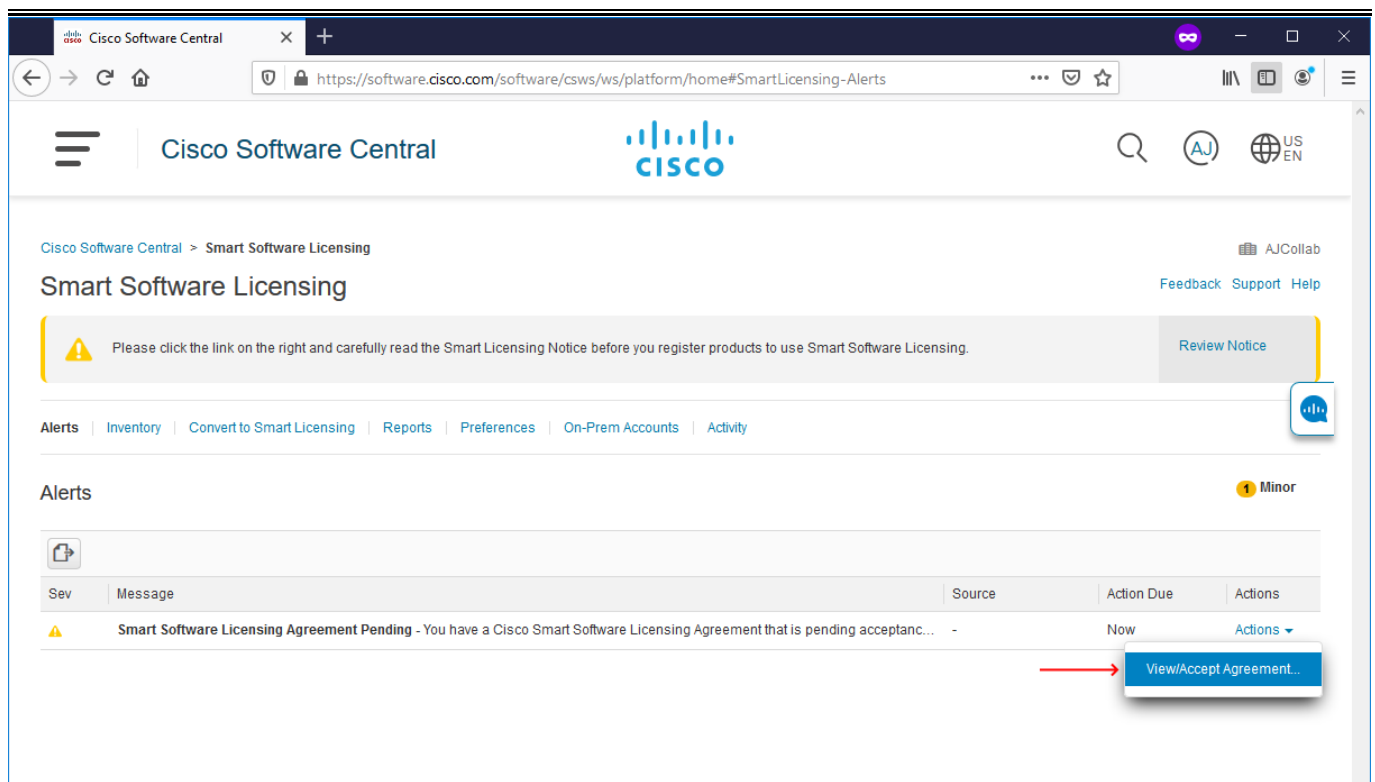
- We have already discussed how to take a cluster backup to SFTP server in previous class

## 1.2 Creating Smart License Account

- Go to Cisco Software Central and create an account
- It will take some time to activate the account

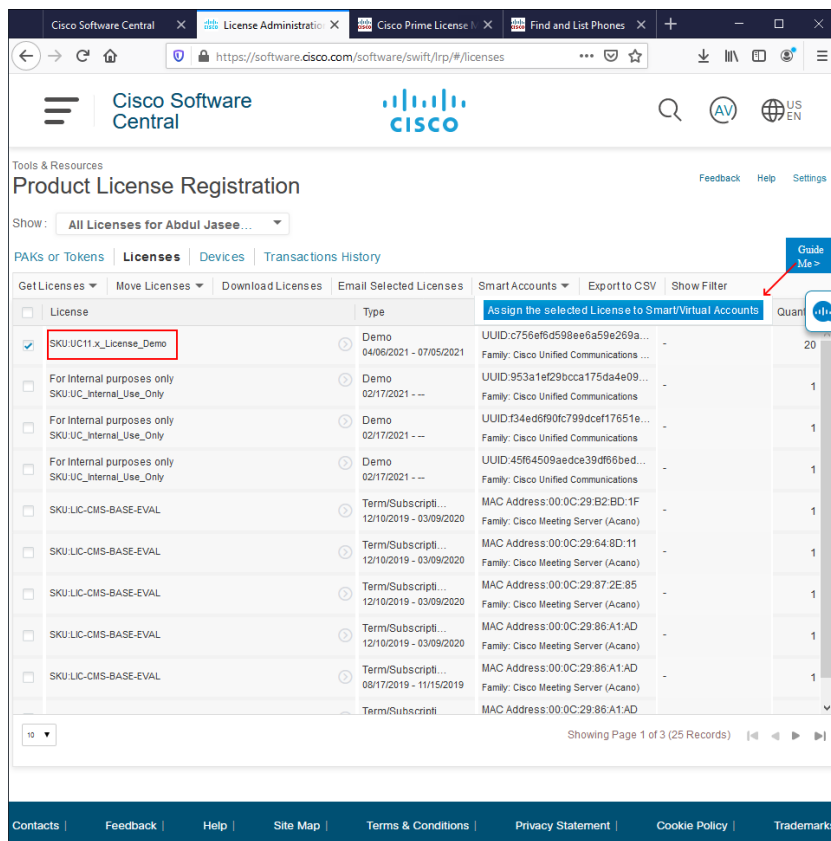
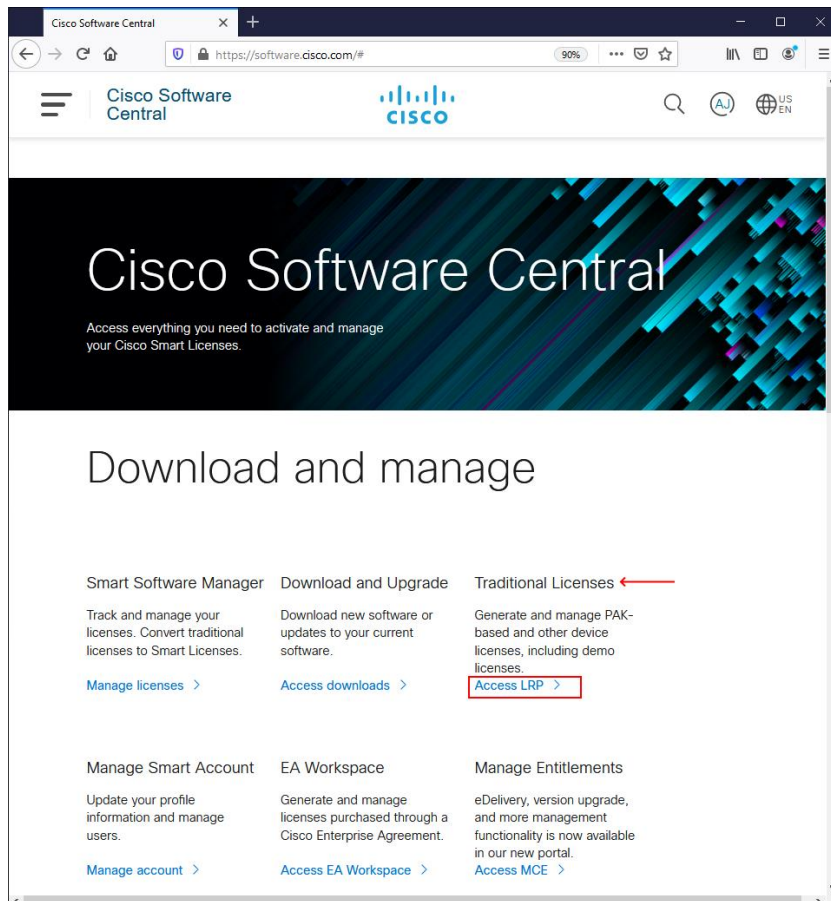






## 1.3 Convert Traditional License to Smart Licenses

- Login to Traditional License Portal and convert your old licenses to Smart Licenses



CustomersToolsCCIE OLSM

Cisco Software Central

US EN

Tools & Resources

Product License Registration

FeedbackHelpSettings

Show Smart Account: Virtual Account: DEFAULT

PAKs or TokensLicensesDevisesTransactions History

Get LicensesAdd New PAKs/TokensSmart AccountsManage PaksExport to CSVShow Filter

| PAK/Token                      | Virtual Account                 | Order Number | Product                       | Status      | Licenses Used | Available |
|--------------------------------|---------------------------------|--------------|-------------------------------|-------------|---------------|-----------|
| Family: Cisco TelePresence ... |                                 |              | SKU: LIC-EXP-E-PAK            |             |               |           |
|                                |                                 |              | Enable GW Feature (H323-SIP)  | UNFULFILLED | 0             | 1         |
|                                |                                 |              | SKU: LIC-EXP-GW               |             |               |           |
|                                |                                 |              | Enable Expressway Series F... | UNFULFILLED | 0             | 1         |
|                                |                                 |              | SKU: LIC-EXP-SERIES           |             |               |           |
| 6854Z4XTFJR                    | DEFAULT                         | 111402912    | Expressway Series, Express... | UNFULFILLED | 0             | 1         |
| Family: Cisco TelePresence ... |                                 |              | SKU: LIC-EXP-E-PAK            |             |               |           |
|                                |                                 |              | Enable TURN Relay Option      | UNFULFILLED | 0             | 1         |
|                                |                                 |              | SKU: LIC-EXP-TURN             |             |               |           |
|                                |                                 |              | Enable GW Feature (H323-SIP)  | UNFULFILLED | 0             | 1         |
|                                |                                 |              | SKU: LIC-EXP-GW +3            |             |               |           |
| 6856MAXJFBM                    | DEFAULT                         | 111402912    | Expressway Series, Express... | UNFULFILLED | 0             | 1         |
| Family: Cisco TelePresence ... |                                 |              | SKU: LIC-EXP-E-PAK            |             |               |           |
|                                |                                 |              | Enable GW Feature (H323-SIP)  | UNFULFILLED | 0             | 1         |
|                                |                                 |              | SKU: LIC-EXP-GW               |             |               |           |
|                                |                                 |              | Enable Expressway Series F... | UNFULFILLED | 0             | 1         |
|                                |                                 |              | SKU: LIC-EXP-SERIES           |             |               |           |
| 6857GEOYTHV                    | Get PAK or Token Information... | 2912         | Expressway Series, Express... | UNFULFILLED | 0             | 1         |
| Family: Cisco TelePresence ... |                                 |              | SKU: LIC-EXP-E-PAK            |             |               |           |
|                                |                                 |              | Enable Expressway Series F... | UNFULFILLED | 0             | 1         |
|                                |                                 |              | SKU: LIC-EXP-SERIES           |             |               |           |
|                                |                                 |              | Enable GW Feature (H323-SIP)  |             |               |           |

10 Showing Page 1 of 11 (106 Records)

Some licenses are eligible to convert to Smart Licensing

## 1.4 Pre-Upgrade Check COP File

- Download the Pre-Upgrade COP file (ciscocm.preUpgradeCheck-00024.cop.sgn) from the link

The screenshot shows a web browser window with the Cisco Software Download page. The URL is <https://software.cisco.com/download/home/286322286/>. The page displays a list of COP files for download. The file 'ciscocm.preUpgradeCheck-00024.cop.sgn' is highlighted with a red box.

| File Name                                                                                                                                                                                                                                                      | Release Date | Size    | Download Link            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------|--------------------------|
| Upgrade Readiness COP file to run post upgrade tests.<br><a href="#">ciscocm.postUpgradeCheck-00025.cop.sha512</a>                                                                                                                                             | 30-Mar-2021  | 0.19 MB | <a href="#">Download</a> |
| Upgrade Readiness COP file to run pre upgrade tests.<br><a href="#">ciscocm.preUpgradeCheck-00025.cop.sha512</a>                                                                                                                                               | 30-Mar-2021  | 0.19 MB | <a href="#">Download</a> |
| COP file to provide fix for CSCvv65634 - SSO DB connections are not handled properly. Can be installed on CUCM and CUC 12.5.1SU1, 12.5.1SU2 or 12.5.1SU3 only.<br><a href="#">ciscocm.V12.5.1_CSCvv65634.C0084-2.zip</a>                                       | 20-Jan-2021  | 0.29 MB | <a href="#">Download</a> |
| COP file to fix CSCvw70770 for CUCM, CUC, and IM&P 12.5 versions.<br><a href="#">ciscocm.V12-5-1_CSCvw70770_fix-ui-passwd_C0095-2.cop.sgn</a>                                                                                                                  | 21-Dec-2020  | 0.17 MB | <a href="#">Download</a> |
| COP file to provide fix for CSCvv65634 - SSO DB connections are not handled properly. Can be installed on 12.5.1SU1, 12.5.1SU2 or 12.5.1SU3 only.<br><a href="#">ciscocm.V12.5.1_CSCvv65634.C0084-1.zip</a>                                                    | 28-Oct-2020  | 0.29 MB | <a href="#">Download</a> |
| Upgrade Readiness COP file to run post upgrade tests.<br><a href="#">ciscocm.postUpgradeCheck-00024.cop.sgn</a>                                                                                                                                                | 13-Aug-2020  | 0.19 MB | <a href="#">Download</a> |
| Upgrade Readiness COP file to run pre upgrade tests.<br><a href="#">ciscocm.preUpgradeCheck-00024.cop.sgn</a>                                                                                                                                                  | 13-Aug-2020  | 0.19 MB | <a href="#">Download</a> |
| COP file to address Real Time Data issues in the 12.5 RTMT client caused by CSCvt63366. This COP file is applicable for all 12.5 CUCM versions between 12.5.1.12900-115 and 12.5.1.13025-1.<br><a href="#">ciscocm.V12-5-1_CSCvt63366-rtmt_C0060-1.cop.sgn</a> | 07-May-2020  | 0.46 MB | <a href="#">Download</a> |
| COP file to address Smart License Manager issues in 12.5 caused by CSCvt61579. This COP file is applicable for all 12.5 CUCM versions between 12.5.1.12900-115 and 12.5.1.13026-1<br><a href="#">ciscocm.V12-5-1_CSCvt61579-slm-proxy_C0055-1.cop.sgn</a>      | 28-Apr-2020  | 0.24 MB | <a href="#">Download</a> |
| COP file to address simple upgrade issues in 12.5 caused by CSCvq22312. This COP file is applicable for all 12.5 CUCM and IM&P versions before SI12                                                                                                            | 19-Mar-2020  | 8.01 MB | <a href="#">Download</a> |

- Copy the file to SFTP Server
- Go to OS Administration of CUCM PUB >> Software Upgrades >> Install/ Upgrade

Software Download - Cisco Sys x Software Installation/Upgrade x +

https://192.168.126.1/cmplatform/install.do

Cisco Unified Operating System Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go  
admin Search Documentation About Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Cancel Next

Status  
Status: Ready

Software Location

Source\* Remote Filesystem  
Directory\* /upgrades I have the Pre-Upgrade COP File here  
Server\* 192.168.11.1  
User Name\* sftp.admin  
User Password\*   
Transfer Protocol\* SFTP  
SMTP Server  
Email Destination

Cancel Next

\*- indicates required item.

Software Download - Cisco Sys x Software Installation/Upgrade x +

https://192.168.126.1/cmplatform/installOptions.do

Cisco Unified Operating System Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go  
admin Search Documentation About Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Cancel Next

Status  
Status: Ready

Software Location

Options/Upgrades\* ciscocm.preUpgradeCheck-00024.cop.sgn

Cancel Next

\*- indicates required item.

Software Download - Cisco Sys x Software Installation/Upgrade x +

https://192.168.126.1/cmplatform/installConfirm.do

Cisco Unified Operating System Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go  
admin Search Documentation About Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Cancel Next

Status

Warning: To ensure the integrity of the installation file, please verify the MD5 hash value against the Cisco Systems web site

Warning: To ensure the integrity of the installation file, please verify the SHA512 value against the Cisco Systems web site

Warning: You may need to stop some services before you install a locale. You may then restart those services after you complete the locale installation. Refer to your product-specific online help for locale installation details.

File Checksum Details

| File                                  | MD5 Hash Value                                  | SHA512 Value |
|---------------------------------------|-------------------------------------------------|--------------|
| ciscocm.preUpgradeCheck-00024.cop.sgn | de:d6:4c:9f:8c:12:59:b2:89:33:c5:64:29:11:6a:e6 |              |

Cancel Next

\*- indicates required item.

The screenshot shows the Cisco Unified Operating System Administration web interface. The browser address bar displays `https://192.168.126.1/cmplatform/installStatus.do`. The page title is "Cisco Unified Operating System Administration" with the Cisco logo. The navigation bar includes "admin", "Search Documentation", "About", and "Logout". The main menu shows "Show", "Settings", "Security", "Software Upgrades", "Services", and "Help". The "Software Installation/Upgrade" section is active, showing a "Cancel" button and the "Installation Status" section. The "Installation Status" section displays the file `ciscocm.preUpgradeCheck-00024.cop.sgn`, the start time `Tue Apr 06 04:31:53 PDT 2021`, and the status `Running` with a green progress bar. Below the status section is the "Installation Log" section, which contains a list of log entries. The log entries show the process `upgrade_get_file.sh` performing various tasks, including file authentication, downloading, and processing. The log entries are as follows:

```

04/06/2021 04:31:04 upgrade_get_file.sh|Create md5 complete|<LVL::Info>
04/06/2021 04:31:04 upgrade_get_file.sh|Authenticate file "/common/download/ciscocm.preUpgradeCheck-00024.cop.sgn"|<LVL::Info>
04/06/2021 04:31:05 upgrade_get_file.sh|File authentication complete|<LVL::Debug>
04/06/2021 04:31:05 upgrade_get_file.sh|Download of iso file RTMIFinish|<LVL::Notice>
04/06/2021 04:31:05 upgrade_get_file.sh|Process preflight|<LVL::Info>
04/06/2021 04:31:05 upgrade_get_file.sh|Skipping preflight since file type is COP|<LVL::Debug>
04/06/2021 04:31:05 upgrade_get_file.sh|success|<LVL::Info>
04/06/2021 04:31:05 upgrade_get_file.sh|upgrade_get_file.sh complete (rc=0)|<LVL::Info>
04/06/2021 04:31:05 upgrade_get_file.sh|is_upgrade_lock_available: Upgrade lock is not available.|<LVL::Debug>
04/06/2021 04:31:05 upgrade_get_file.sh|is_upgrade_in_progress: Already locked by this process (pid: 2084).|<LVL::Debug>
04/06/2021 04:31:05 upgrade_get_file.sh|release_upgrade_lock: Releasing lock (pid: 2084)|<LVL::Debug>

```

Below the log section is a "Cancel" button and a note: `*- indicates required item.`

- It is going to take some time. You have to perform this in each node in the cluster
- This will give upgrade readiness summary, make sure you go through the summary and fix the failures and address the warnings

```
//
=====
Pre Upgrade Test Date: 04/06/2021 11:32:00
=====
Active Version: 11.5.1.13901-3
Server: up-cucm-pub , CUCM Publisher
=====

Result Test

1.1 PASS Filesystem Checks

*) 11.5
Passed: You have 31 GB of required 22 GB common partition space required for L2 upgrade to 11.5.

12.0
Passed: You have 31 GB of required 22 GB common partition space required for L2 upgrade to 12.0.

12.5
Passed: You have 31 GB of required 28 GB common partition space required for RU upgrade to 12.5.

1.2 PASS PLM License Status
1.3 PASS Common Security Password Length
System not in FIPS mode, Common Security Password's Minimum length requirement not enforced

1.4 PASS Cluster Database Status
1.5 FAIL Network status (NTP, DNS & Cluster node connectivity)
Check network reach ability. Use 'utils diagnose test' for more details
ntp_reachability : Warning
The NTP service is restarting, it can take about 5 minutes.

ntp_clock_drift : Warning
The local clock is not synchronised.
None of the designated NTP servers are reachable/functioning or legitimate.

ntp_stratum : Warning
The local clock is not synchronised.
None of the designated NTP servers are reachable/functioning or legitimate.

1.6 PASS Deprecated Phone Models
1.7 PASS Test dataBase Sanity
1.8 PASS Network Adapter Type
1.9 WARN DRS backup status
WARNING: No backup device is configured. This is required to recover your system in case of failure.

=====

System Status List

2.1 Cops Installed (PASS)
No Installed Software Options Found.

2.2 Version VMTools Type (WARN)
10.3.21.249 native vm-tools
WARNING: Update the native vmtools to latest for optimal system
performance.

2.3 Upgrade Checks (WARN)

*) Smart Licensing requires you to have a Smart Account created and configured before you upgrade or migrate the Cisco Unified Communications
Manager server to 12.0 or higher releases.

2.4 Count Phone Status (PASS)
0 Registered
0 Unregistered

2.5 Status Service Name (PASS)
No Issues Found

=====

Summary:
Total Test Run : 14
Total Passed : 10
Total Warnings : 3
Total Failed : 1

Note: Please refer to the readme of Pre Upgrade cop for test details and
pass/fail/warn/criteria

Duration for running tests: 0:08:00
=====
Use "file view install PreUpgradeReport.txt" to view the report

04/06/2021:04:40:09 /common/download/TestManager/agents/CliAgent.py:119 - INFO - Quitting CLI session and Destroying the CLI agent
//
```

- I have got NTP error and DRF Warning, I have corrected the NTP and ran the pre-upgrade cop file again. There was no errors for the second time

## 1.5 Free Common Space COP File (Optional)

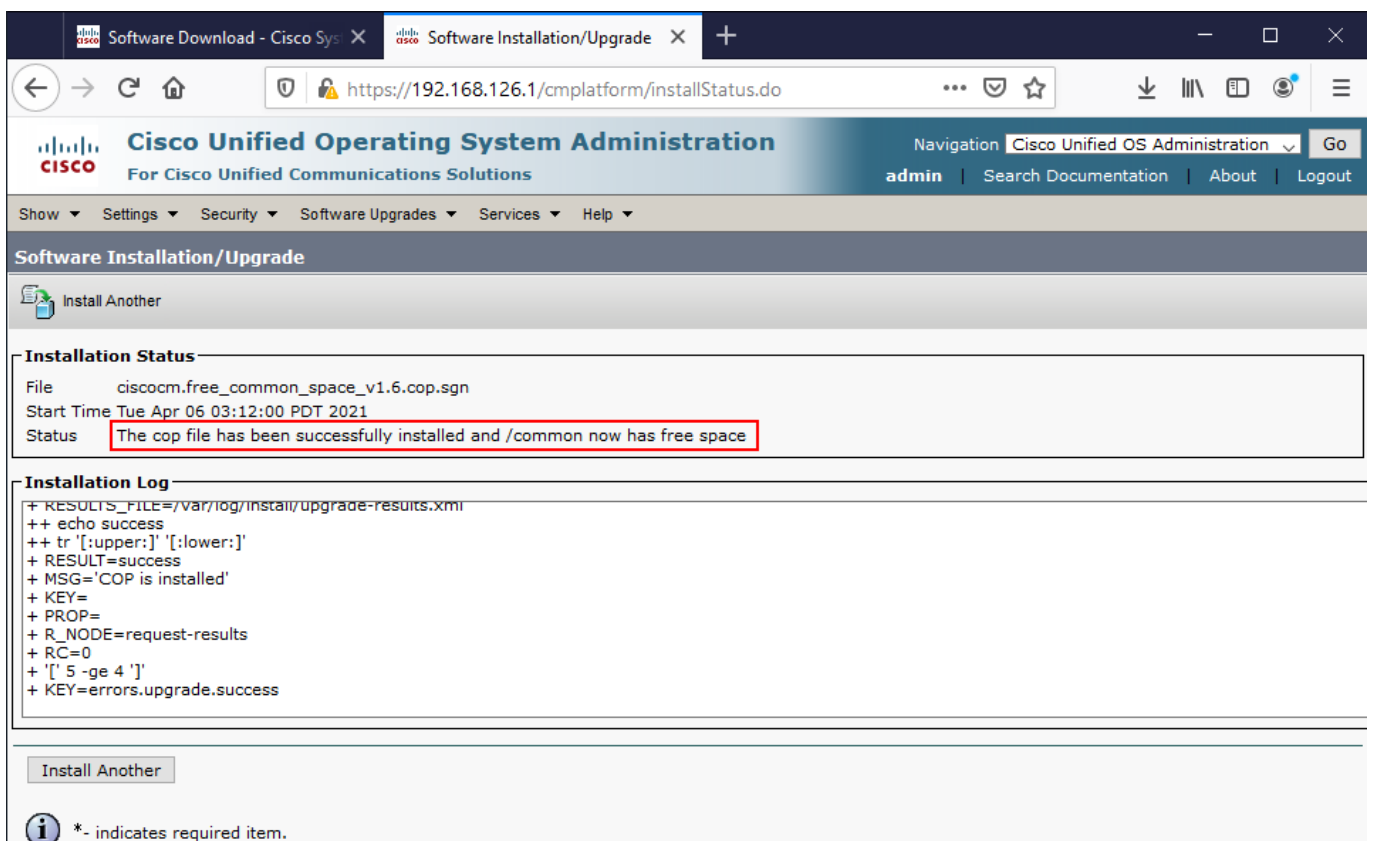
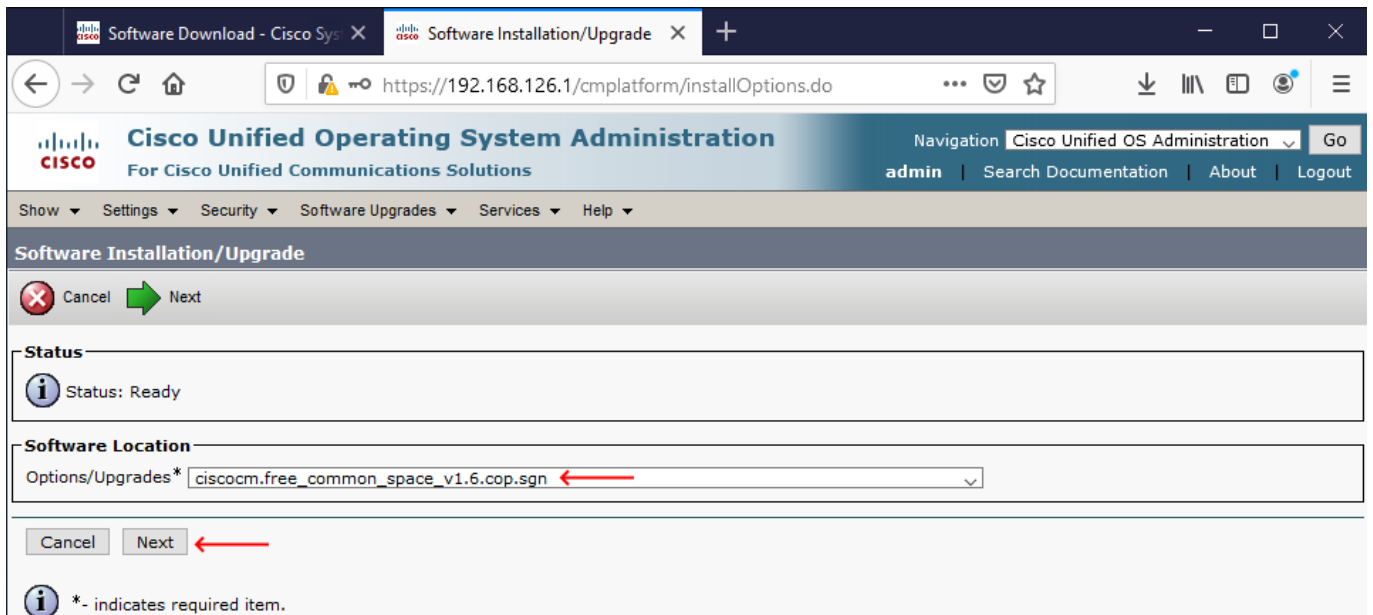
- If you face issues in the file system check, you can install the Free Common Space COP File (ciscocm.free\_common\_space\_v1.6.cop.sgn) from the link

The screenshot shows the Cisco Software Download page for the 'Free Common Space COP File'. The page lists several COP files with their descriptions, release dates, and sizes. The file 'ciscocm.free\_common\_space\_v1.6.cop.sgn' is highlighted with a red box.

| File Name                                                     | Description                                                                                                                                     | Release Date | Size    | Download                 |
|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------|--------------------------|
| ciscocm.rollback.V12-5-1-10000-22_CSCv070834_C0003-1.cop.sgn  | COP file for enabling Specific License Reservation in CUCM 12.5                                                                                 | 08-Mar-2019  | 0.00 MB | <a href="#">Download</a> |
| <b>Related Software</b>                                       |                                                                                                                                                 |              |         |                          |
| ciscocm.enable-sha512sum-2021-signing-key-v1.0.cop.sgn        | This COP file can be used to add support for files signed with sha512 to versions that don't support it natively. See the readme for specifics. | 30-Mar-2021  | 0.05 MB | <a href="#">Download</a> |
| ciscocm.CSCvq17528_vmttools_initramfs_v1.3.cop.sgn            | This COP file can be used to address the issues caused by CSCvq17528, CSCvh55176, CSCvm52977, and CSCvb21486. See readme for specifics.         | 17-Aug-2020  | 0.05 MB | <a href="#">Download</a> |
| ciscocm.free_common_space_v1.6.cop.sgn                        | The Cisco Free Common Space COP file can be used to free up space when the upgrade runs out of space.                                           | 20-May-2020  | 0.00 MB | <a href="#">Download</a> |
| ciscocm.CSCvq19683_TCP_SACK_C0043-1.cop.sgn                   | This COP file provides a workaround for CSCvq19683                                                                                              | 09-Apr-2020  | 0.34 MB | <a href="#">Download</a> |
| ciscocm.CSCvs52000_TCP_SACK_workaround-revert_C0048-1.cop.sgn | This COP file provides a workaround for CSCvs52000.                                                                                             | 23-Dec-2019  | 0.00 MB | <a href="#">Download</a> |
| ciscocm.CSCvq17528_vmttools_initramfs_v1.2.cop.sgn            | This COP file can be used to address the issues caused by CSCvq17528, CSCvh55176, CSCvm52977, and CSCvb21486. See readme for specifics.         | 24-Oct-2019  | 0.05 MB | <a href="#">Download</a> |
| ciscocm.CSCvp79158_C0039-3.cop.sgn                            | This COP file can be used to address CSCvp79158 for UCM 11.5, 12.0 and 12.5                                                                     | 09-Oct-2019  | 0.01 MB | <a href="#">Download</a> |
|                                                               | This COP file can be used to address the following CDETS for the current calendar year: CSCvr51242, CSCvo62469, CSCvo26979                      | 03-Oct-2019  | 0.00 MB | <a href="#">Download</a> |



- Upload the file to SFTP Server just like you did before and install it from OS Admin Page
- This should be done on all the nodes



- Post the Free Space COP tile, run the Pre-Upgrade Check COP File (Step 1.4) again and make sure you have enough space available

## 1.6 Delete Unused Firmware Files (Optional)

- Go to CM Administration >> Device >> Device Settings >> Firmware Load Information
- Find out the phones those are not using the default load and upgrade those phones to use the one that is available in Device Defaults
- This will free-up some space

The screenshot displays two side-by-side windows from the Cisco Unified CM Administration interface.

**Left Window: Firmware Load Information**

This window shows a table of device types and their current load information. The table has two columns: "Device Type" and "Device Not Using Default Load".

| Device Type                          | Device Not Using Default Load |
|--------------------------------------|-------------------------------|
| 7914 14-Button Line Expansion Module | None                          |
| 7915 12-Button Line Expansion Module | None                          |
| 7915 24-Button Line Expansion Module | None                          |
| 7916 12-Button Line Expansion Module | None                          |
| 7916 24-Button Line Expansion Module | None                          |
| Analog Access                        | None                          |
| Analog Access WS-X6624               | None                          |
| Analog Phone                         | None                          |
| CTI Remote Device                    | None                          |
| Carrier-integrated Mobile            | None                          |
| Cisco 12 S                           | None                          |
| Cisco 12 SP                          | None                          |
| Cisco 12 SP+                         | None                          |
| Cisco 30 SP+                         | None                          |
| Cisco 30 VIP                         | None                          |
| Cisco 3905                           | None                          |
| Cisco 3911                           | None                          |
| Cisco 3951                           | None                          |
| Cisco 6901                           | None                          |
| Cisco 6911                           | None                          |
| Cisco 6921                           | None                          |
| Cisco 6941                           | None                          |
| Cisco 6945                           | None                          |
| Cisco 6961                           | None                          |
| Cisco 7811                           | None                          |
| Cisco 7821                           | None                          |
| Cisco 7841                           | None                          |
| Cisco 7861                           | None                          |
| Cisco 7902                           | None                          |
| Cisco 7905                           | None                          |
| Cisco 7906                           | None                          |
| Cisco 7910                           | None                          |
| Cisco 7911                           | None                          |
| Cisco 7912                           | None                          |
| Cisco 7920                           | None                          |
| Cisco 7921                           | None                          |
| Cisco 7925                           | None                          |
| Cisco 7926                           | None                          |
| Cisco 7931                           | None                          |
| Cisco 7935                           | None                          |
| Cisco 7936                           | None                          |
| Cisco 7937                           | None                          |

**Right Window: Device Defaults Configuration**

This window shows the configuration for device defaults. It includes a "Status" section (Ready) and a "Device Defaults Information" table.

| Device Type                          | Protocol               | Load Information     | Device Pool | Phone Template                     |
|--------------------------------------|------------------------|----------------------|-------------|------------------------------------|
| 7914 14-Button Line Expansion Module | SCCP                   | S00105000400         | Default     | NONE                               |
| 7915 12-Button Line Expansion Module | Protocol Not Specified | B015-1-0-4-2         | Default     | NONE                               |
| 7915 24-Button Line Expansion Module | Protocol Not Specified | B015-1-0-4-2         | Default     | NONE                               |
| 7916 12-Button Line Expansion Module | Protocol Not Specified | B016-1-0-4-2         | Default     | NONE                               |
| 7916 24-Button Line Expansion Module | Protocol Not Specified | B016-1-0-4-2         | Default     | NONE                               |
| Analog Access                        | Protocol Not Specified | NONE                 | Default     | NONE                               |
| Analog Access WS-X6624               | Protocol Not Specified | A00204000013         | Default     | NONE                               |
| Analog Phone                         | SCCP                   | NONE                 | Default     | Standard Analog                    |
| CTI Remote Device                    | CTI Remote Device      | NONE                 | Default     | NONE                               |
| Carrier-integrated Mobile            | SIP                    | NONE                 | Default     | Standard Carrier-integrated Mobile |
| Cisco 12 S                           | SCCP                   |                      | Default     | Standard 12 S                      |
| Cisco 12 SP                          | SCCP                   |                      | Default     | Standard 12 SP                     |
| Cisco 12 SP+                         | SCCP                   |                      | Default     | Standard 12 SP+                    |
| Cisco 30 SP+                         | SCCP                   |                      | Default     | Standard 30 SP+                    |
| Cisco 30 VIP                         | SCCP                   |                      | Default     | Standard 30 VIP                    |
| Cisco 3905                           | SIP                    | CP3905.9-4-1-SR2-2   | Default     | Standard 3905 SIP                  |
| Cisco 3911                           | SIP                    | SIP3951.8-1-4a       | Default     | Standard 3911 SIP                  |
| Cisco 3951                           | SIP                    | SIP3951.8-1-4a       | Default     | Standard 3951 SIP                  |
| Cisco 6901                           | SCCP                   | SCCP6901.9-3-1-SR2-2 | Default     | Standard 6901 SCCP                 |
| Cisco 6901                           | SIP                    | SIP6901.9-3-1-SR2-3  | Default     | Standard 6901 SIP                  |
| Cisco 6911                           | SCCP                   | SCCP6911.9-3-1-SR2-3 | Default     | Standard 6911 SCCP                 |
| Cisco 6911                           | SIP                    | SIP6911.9-3-1-SR2-4  | Default     | Standard 6911 SIP                  |
| Cisco 6921                           | SCCP                   | SCCP69xx.9-4-1-3SR3  | Default     | Standard 6921 SCCP                 |
| Cisco 6921                           | SIP                    | SIP69xx.9-4-1-3SR3   | Default     | Standard 6921 SIP                  |
| Cisco 6941                           | SIP                    | SIP69xx.9-4-1-3SR3   | Default     | Standard 6941 SIP                  |
| Cisco 6941                           | SCCP                   | SCCP69xx.9-4-1-3SR3  | Default     | Standard 6941 SCCP                 |
| Cisco 6945                           | SIP                    | SIP6945.9-4-1-3SR3   | Default     | Standard 6945 SIP                  |
| Cisco 6945                           | SCCP                   | SCCP6945.9-4-1-3SR3  | Default     | Standard 6945 SCCP                 |

- Post deleting the unused firmware, run the Pre-Upgrade Check COP File (Step 1.4) again and make sure you have enough space available



```
//
admin:show status

Host Name : up-cucm-pub
Date : Tue Apr 6, 2021 03:29:34
Time Zone : Pacific Daylight Time (America/Los_Angeles)
Locale : en_US.UTF-8
Product Ver : 11.5.1.13901-3
Unified OS Version : 6.0.0.0-2

Uptime:
03:29:35 up 2:31, 1 user, load average: 0.07, 0.03, 0.06

CPU Idle: 92.93% System: 02.02% User: 05.05%
IOWAIT: 00.00% IRQ: 00.00% Soft: 00.00%

Memory Total: 3925468K
Free: 326072K
Used: 3599396K
Cached: 618540K
Shared: 364500K
Buffers: 24984K

Disk/active Total Free Used
Disk/active 14154228K 1108608K 12900492K (93%)
Disk/inactive 14154228K 13393148K 35424K (1%)
Disk/logging 49573612K 33404808K 13643876K (29%)

admin:show hardware

HW Platform : VMware Virtual Machine
Processors : 2
Type : Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
CPU Speed : 3500
Memory : 4096 MBytes
Object ID : 1.3.6.1.4.1.9.1.1348
OS Version : UCOS 6.0.0.0-2.i386
Serial Number : VMware-56 4d b5 09 5c 07 5f 30-45 b2 70 56 e0 12 cd 46

RAID Version :
No RAID controller information is available

BIOS Information :
PhoenixTechnologiesLTD 6.00 12/12/2018

RAID Details :
No RAID information is available

Physical device information

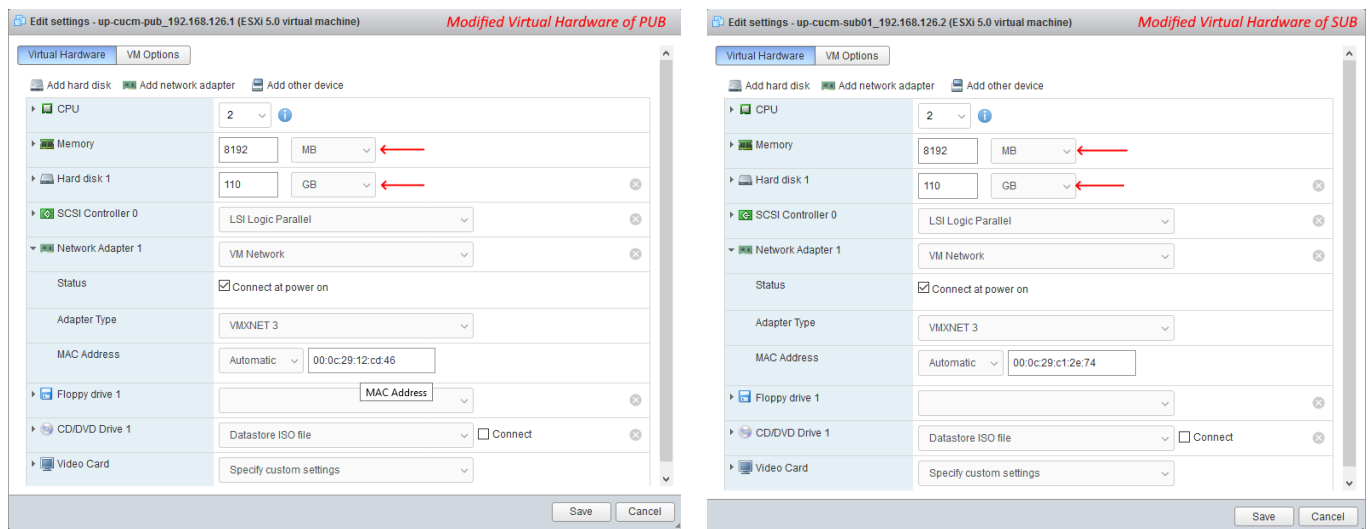
Number of Disks : 1
Hard Disk #1
Size (in GB) : 80

Partition Details :

Disk /dev/sda: 10443 cylinders, 255 heads, 63 sectors/track
Units = sectors of 512 bytes, counting from 0

Device Boot Start End #sectors Id System
/dev/sda1 * 2048 29028351 29026304 83 Linux
/dev/sda2 29028352 58054655 29026304 83 Linux
/dev/sda3 58054656 58578943 524288 83 Linux
/dev/sda4 58578944 167772159 109193216 5 Extended
/dev/sda5 58580992 66772991 8192000 82 Linux swap / Solaris
/dev/sda6 66775040 167772159 100997120 83 Linux
//
```

- Here I would need a virtual hardware upgrade, for that shutdown the VM (utils system shutdown) from CLI and edit the VM Settings from vCenter or ESXi



- Now power on the VM, the Hard Disk will automatically expand to 110 GB
- Verify the new Virtual Hardware has been updated after powering on using below commands

```
//
admin:show status

Host Name : up-cucm-pub
Date : Tue Apr 6, 2021 03:46:38
Time Zone : Pacific Daylight Time (America/Los_Angeles)
Locale : en_US.UTF-8
Product Ver : 11.5.1.13901-3
Unified OS Version : 6.0.0.0-2

Uptime:
03:46:39 up 2 min, 1 user, load average: 1.01, 0.68, 0.28

CPU Idle: 46.73% System: 26.13% User: 27.14%
IOWAIT: 00.00% IRQ: 00.00% Soft: 00.00%

Memory Total: 8062404K
Free: 6902008K
Used: 1160396K
Cached: 542632K
Shared: 172984K
Buffers: 94692K

Disk/active Total Free Used
Disk/active 14154228K 1157112K 12851988K (92%)
Disk/inactive 14154228K 13393148K 35424K (1%)
Disk/logging 80537376K 62841832K 13602896K (18%)

admin:show hardware

HW Platform : VMware Virtual Machine
Processors : 2
Type : Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
CPU Speed : 3500
Memory : 8192 MBytes
Object ID : 1.3.6.1.4.1.9.1.1348
OS Version : UCOS 6.0.0.0-2.i386
Serial Number : VMware-56 4d b5 09 5c 07 5f 30-45 b2 70 56 e0 12 cd 46

RAID Version :
No RAID controller information is available

BIOS Information :
PhoenixTechnologiesLTD 6.00 12/12/2018

RAID Details :
No RAID information is available

Physical device information

Number of Disks : 1
Hard Disk #1
Size (in GB) : 110

Partition Details :

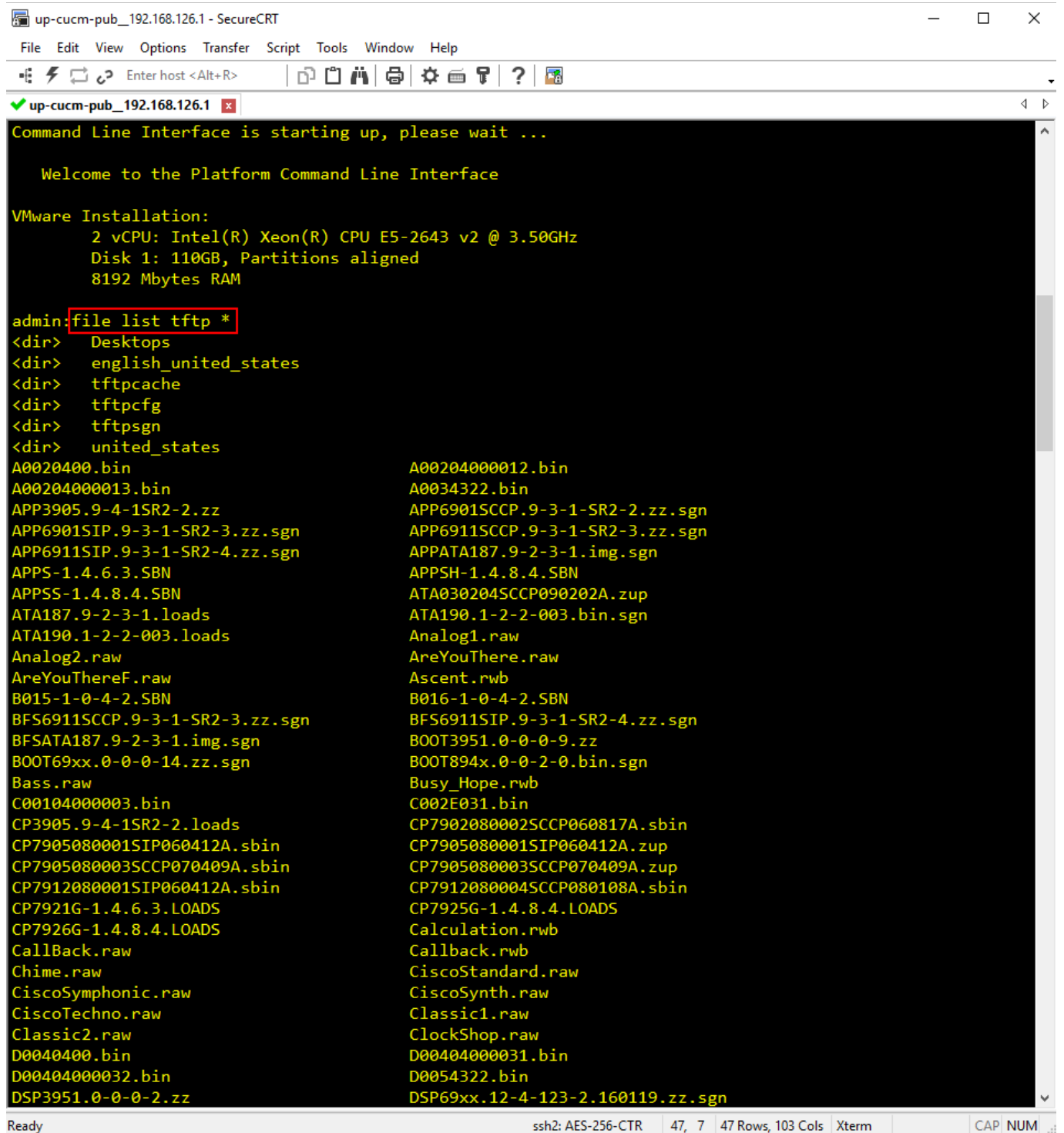
Disk /dev/sda: 14359 cylinders, 255 heads, 63 sectors/track
Units = sectors of 512 bytes, counting from 0

Device Boot Start End #sectors Id System
/dev/sda1 * 2048 29028351 29026304 83 Linux
/dev/sda2 29028352 58054655 29026304 83 Linux
/dev/sda3 58054656 58578943 524288 83 Linux
/dev/sda4 58578944 230686719 172107776 5 Extended
/dev/sda5 58580992 66772991 8192000 82 Linux swap / Solaris
/dev/sda6 66775040 230686719 163911680 83 Linux
//
```

- I could see that the virtual hardware is updated and match with 7500-user node of CUCM 12.5

## 1.8 Take the output of TFTP Contents

- This is applicable to TFTP Servers only
- It is just for a reference; we can compare the result after the upgrade if needed



The screenshot shows a SecureCRT terminal window titled "up-cucm-pub\_192.168.126.1 - SecureCRT". The terminal displays the following text:

```
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 110GB, Partitions aligned
 8192 Mbytes RAM

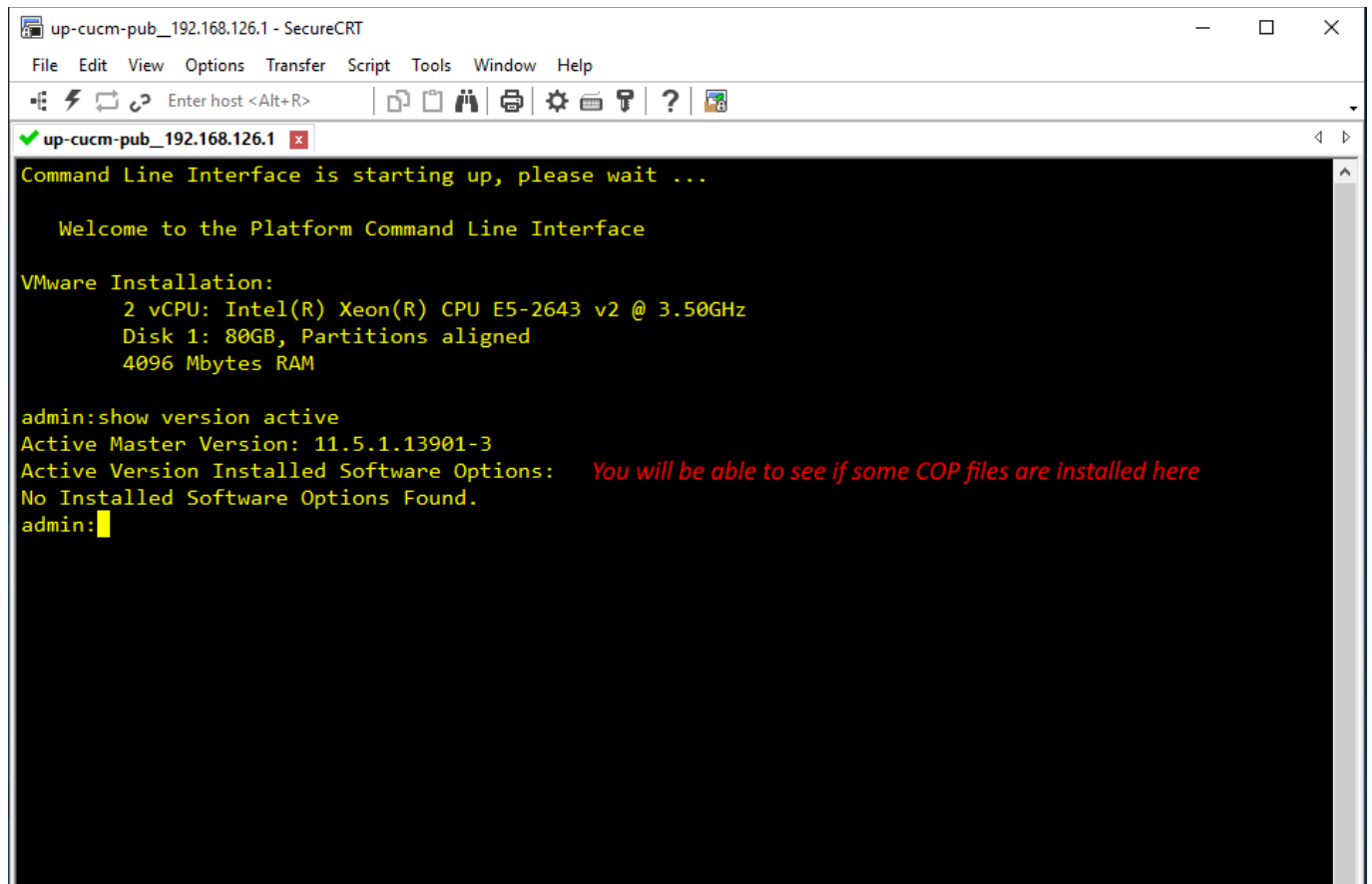
admin: file list tftp *
<dir> Desktops
<dir> english_united_states
<dir> tftpcache
<dir> tftpcfg
<dir> tftpsgn
<dir> united_states
A0020400.bin
A00204000013.bin
APP3905.9-4-1SR2-2.zz
APP6901SIP.9-3-1-SR2-3.zz.sgn
APP6911SIP.9-3-1-SR2-4.zz.sgn
APPS-1.4.6.3.SBN
APPSS-1.4.8.4.SBN
ATA187.9-2-3-1.loads
ATA190.1-2-2-003.loads
Analog2.raw
AreYouThereF.raw
B015-1-0-4-2.SBN
BFS6911SCCP.9-3-1-SR2-3.zz.sgn
BFSATA187.9-2-3-1.img.sgn
BOOT69xx.0-0-0-14.zz.sgn
Bass.raw
C00104000003.bin
CP3905.9-4-1SR2-2.loads
CP7905080001SIP060412A.sbin
CP7905080003SCCP070409A.sbin
CP7912080001SIP060412A.sbin
CP7921G-1.4.6.3.LOADS
CP7926G-1.4.8.4.LOADS
CallBack.raw
Chime.raw
CiscoSymphonic.raw
CiscoTechno.raw
Classic2.raw
D0040400.bin
D00404000032.bin
DSP3951.0-0-0-2.zz
A00204000012.bin
A0034322.bin
APP6901SCCP.9-3-1-SR2-2.zz.sgn
APP6911SCCP.9-3-1-SR2-3.zz.sgn
APPATA187.9-2-3-1.img.sgn
APPSH-1.4.8.4.SBN
ATA030204SCCP090202A.zup
ATA190.1-2-2-003.bin.sgn
Analog1.raw
AreYouThere.raw
Ascent.rwb
B016-1-0-4-2.SBN
BFS6911SIP.9-3-1-SR2-4.zz.sgn
B00T3951.0-0-0-9.zz
B00T894x.0-0-2-0.bin.sgn
Busy_Hope.rwb
C002E031.bin
CP7902080002SCCP060817A.sbin
CP7905080001SIP060412A.zup
CP7905080003SCCP070409A.zup
CP7912080004SCCP080108A.sbin
CP7925G-1.4.8.4.LOADS
Calculation.rwb
Callback.rwb
CiscoStandard.raw
CiscoSynth.raw
Classic1.raw
ClockShop.raw
D00404000031.bin
D0054322.bin
DSP69xx.12-4-123-2.160119.zz.sgn
```

The terminal window has a status bar at the bottom showing "Ready", "ssh2: AES-256-CTR", "47, 7", "47 Rows, 103 Cols", "Xterm", "CAP", and "NUM".

---

## 1.9 Take the output of show version active

- Any COP files, or device packages, etc. will be listed in *show version active*
- This becomes handy if you want to install those files post the upgrade
- Upgrade will never install the custom COP files
- Collect the output from all the nodes in the cluster



```
up-cucm-pub_192.168.126.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
up-cucm-pub_192.168.126.1 x
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 80GB, Partitions aligned
 4096 Mbytes RAM

admin:show version active
Active Master Version: 11.5.1.13901-3
Active Version Installed Software Options: You will be able to see if some COP files are installed here
No Installed Software Options Found.
admin:
```

- In my case, I don't have any COP files here, but you do see that in production cluster
- Take note of this output for future reference



## 2.1 Upgrade CUCM Publisher

- Before starting anything, go ahead and reboot the entire cluster (utils system restart). This is not documented anywhere but it is my recommendation
- Download the CUCM 12.5 Upgrade file from the link
- This file will be non-bootable, we can use this only to upgrade not for fresh install
- For bootable CUCM ISO File, you need to get in touch with your Accounts Team or TAC

The screenshot shows the Cisco Software Download page for Unified Communications Manager Version 12.5. The breadcrumb trail is: Downloads Home / Unified Communications / Call Control / Unified Communications Manager (CallManager) / Unified Communications Manager Version 12.5 / Unified Communications Manager Updates- 12.5(1)SU4. The page title is 'Unified Communications Manager Version 12.5'. The release is 'Release 12.5(1)SU4'. There is a warning box stating: 'UNRST releases support fewer encryption capabilities and are classified as US export unrestricted. UNRST releases are intended for customers for which US export and-or foreign import encryption regulations apply. Once installed, UNRST releases can NEVER be converted or upgraded to releases which support full encryption capabilities.' The table below lists the software files:

File Information	Release Date	Size	Download
US Export Restricted. Full encryption capabilities (non-bootable). If upgrading from a version other than 12.x, make sure you have the appropriate licenses. UCSInstall_UCOS_12.5.1.14900-63.sgn.iso	22-Feb-2021	4360.06 MB	<a href="#">Download</a> <a href="#">Cart</a> <a href="#">File</a>
US Export Unrestricted. Fewer encryption capabilities (non-bootable). If upgrading from a version other than 12.x, make sure you have the appropriate licenses. UCSInstall_UCOS_UNRST_12.5.1.14900-63.sgn.iso	22-Feb-2021	4360.11 MB	<a href="#">Download</a> <a href="#">Cart</a> <a href="#">File</a>

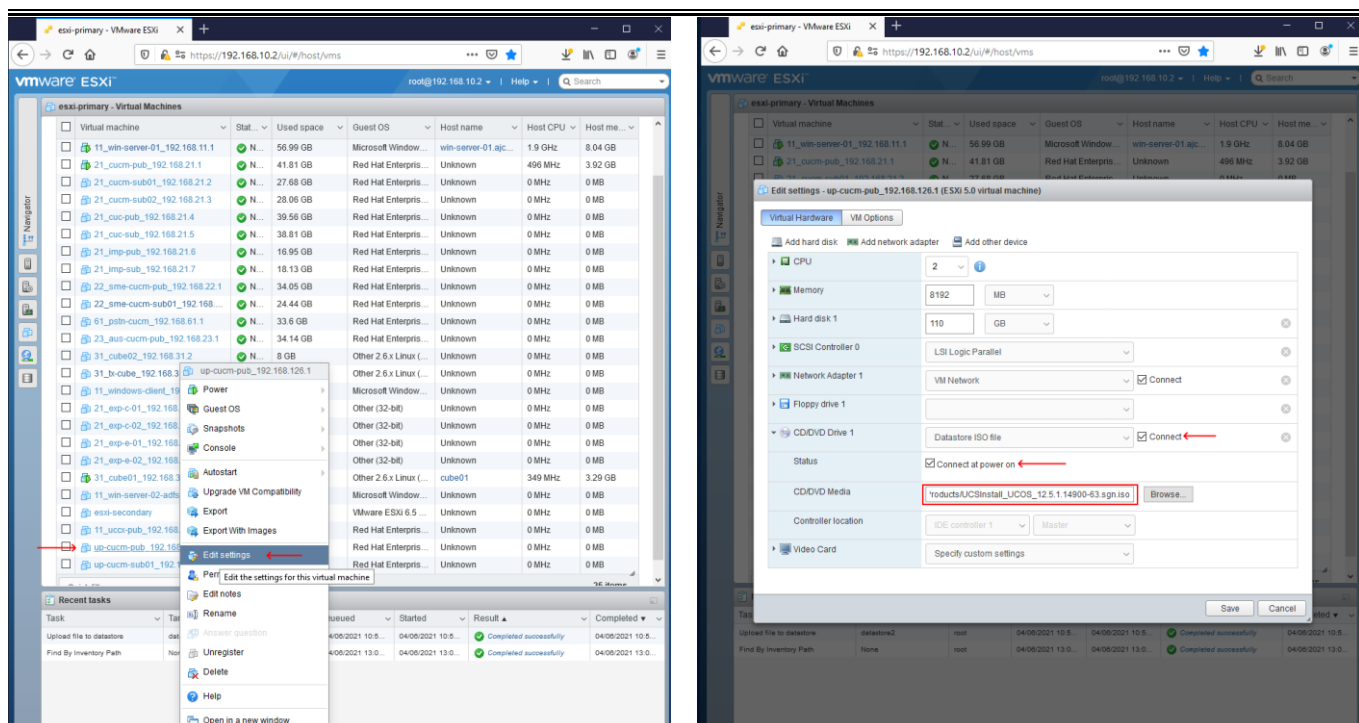
Related Software

File Information	Release Date	Size	Download
COP file to fix CSCvx74275 in 12.5.1SU4. The COP file must be installed via the CLI. ciscocm.V12.5.1SU4_CSCvx74275_em-headset_C0111-1.zip	05-Apr-2021	0.01 MB	<a href="#">Download</a> <a href="#">Cart</a> <a href="#">File</a>

- Upload the non-bootable ISO File to the ESXi Data Store and mount to the CD/DVD of the CUCM 11.5 PUB VM
- Note: We can use bootable ISO as well for the upgrade, but bootable ISO is not directly available to download

The screenshot shows the VMware ESXi web interface. The top navigation bar includes the ESXi logo, a search bar, and a user profile. The main content area displays the 'datastore2' details, including its type (VMFS5), location, and storage usage (93.78 GB used, 1.022.72 GB free). Below this, the 'Datastore browser' window is open, showing a hierarchical view of files and folders. The 'ISO Files' folder is selected, and the file 'UCSInstall\_UCOS\_12.5.1.14900-63.sgn.iso' is highlighted. A red arrow points to this file. At the bottom of the browser window, a status bar shows the file path: '[datastore2] ISO Files/UC Products/UCSInstall\_UCOS\_12.5.1.14900-63.sgn.iso'. Below the browser window, the 'Recent tasks' table is visible, showing a list of tasks and their completion status.

Task	Target	Initiator	Queued	Started	Result	Completed
Reconfig VM	up-cucm-pub_192...	root	04/06/2021 13:1...	04/06/2021 13:1...	Completed successfully	04/06/2021 13:1...
Find By Inventory Path	None	root	04/06/2021 13:0...	04/06/2021 13:0...	Completed successfully	04/06/2021 13:0...
Upload file to datastore	datastore2	root	04/06/2021 10:5...	04/06/2021 10:5...	Completed successfully	04/06/2021 10:5...
Power On VM	up-cucm-pub_192...	root	04/06/2021 13:1...	04/06/2021 13:1...	Completed successfully	04/06/2021 13:1...



- Instead of connecting to CD/DVD to CUCM 12.5 ISO, you can place it in an SFTP server and use Install/Upgrade option in OS Administration page (like the way you installed COP files)
- You can use CLI to perform upgrade, but I recommend using vmware Console for upgrade task since you lose network connectivity for a long time while upgrading
- Enter *utils system upgrade initiate* on the vmware Console CLI

```

up-cucm-pub_192.168.126.1
Last login: Tue Apr 6 13:21:13 on tty1
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 110GB, Partitions aligned
 8192 Mbytes RAM

admin:utils system upgrade initiate

Warning: Do not close this window without first canceling the upgrade.

Source:

1) Remote Filesystem via SFTP
2) Remote Filesystem via FTP
3) Local DVD/CD
q) quit

Please select an option (1 - 3 or "q") : 3
Please enter SMTP Host Server (optional):
Checking for valid upgrades. Please wait...

```

```
up-cucm-pub_192.168.126.1 8192 Mbytes RAM
admin:utils system upgrade initiate
Warning: Do not close this window without first canceling the upgrade.
Source:
 1) Remote Filesystem via SFTP
 2) Remote Filesystem via FTP
 3) Local DVD/CD
 q) quit
Please select an option (1 - 3 or "q"): 3
Please enter SMTP Host Server (optional):
Checking for valid upgrades. Please wait...
Available options and upgrades in "upgrade" directory:
 1) UCSInstall_UCOS_12.5.1.14900-63.sgn.iso
 q) quit
Please select an option (1 - 1 or "q"): 1
Accessing the file. Please wait...
```

```
up-cucm-pub_192.168.126.1
This is a Refresh Upgrade. Refresh Upgrades require an extended service outage and multiple reboots. Please refer to the Software Upgrades section of the Cisco Unified Communication Operating System Administration Guide for more information.

If there exists any weak ciphers (like 1DES,null_encryption, blowfish448, rijndael, md5) in IPSEC policies then they will be converted, 1DES as encryption cipher will be converted to AES128 , MD5 as hash will be converted to SHA256 and null_encryption,blowfish448, rijndael as ESP to AES128.

In order to use Certificate-based authentication with IPsec both sides of the connection must use certificates signed by the same root CA in the trust chain. Self-signed IPsec certificates are no longer supported and IPsec connections using self-signed certificates will fail.

Switch to new version if the upgrade is successful (yes/no): no
Start Refresh Upgrade (yes/no): yes
The upgrade log is install_log_2021-04-06.13.31.32.log
Upgrading the system. Please wait...
```

```
up-cucm-pub_192.168.126.1
04/06/2021 13:37:22 component_install!Got version 12.5.1.14900-63!<LVL::Debug>
04/06/2021 13:37:22 component_install!Initialize ucplatform_cluster "to" side ve
rsion complete!<LVL::Info>
04/06/2021 13:37:22 component_install!Initialize ucplatform_cluster "from" side
version!<LVL::Info>
04/06/2021 13:37:22 component_install!Component ucplatform_cluster available on
active side!<LVL::Debug>
04/06/2021 13:37:22 component_install!Access "from" side API!<LVL::Debug>
04/06/2021 13:37:22 component_install!Got version 11.5.1.13901-3!<LVL::Debug>
04/06/2021 13:37:22 component_install!Initialize ucplatform_cluster "from" side
version complete!<LVL::Info>
04/06/2021 13:37:22 component_install!Initialize global data complete!<LVL::Info
>
04/06/2021 13:37:22 component_install!Build the command list for ucplatform_clus
ter!<LVL::Info>
04/06/2021 13:37:22 component_install!Initialize command list!<LVL::Debug>
04/06/2021 13:37:22 component_install!Build ucplatform_cluster export phase comm
ands!<LVL::Debug>
04/06/2021 13:37:22 component_install!Processing ucplatform_cluster export eleme
nt!<LVL::Debug>
04/06/2021 13:37:22 component_install!Processing ucplatform_cluster script eleme
nt!<LVL::Debug>
04/06/2021 13:37:22 component_install!calculating timeout from script!<LVL::Deb
ug>
```

- Upgrade has started, you will see most of the time the screen like above and some other times the Blue-Red windows just like you seen in the new installation
- Sit back and relax until the installation finish

up-cucm-pub\_192.168.126.1

Cisco Unified Communications Manager 12.5.1.14900-63

**Populate RPM archive**

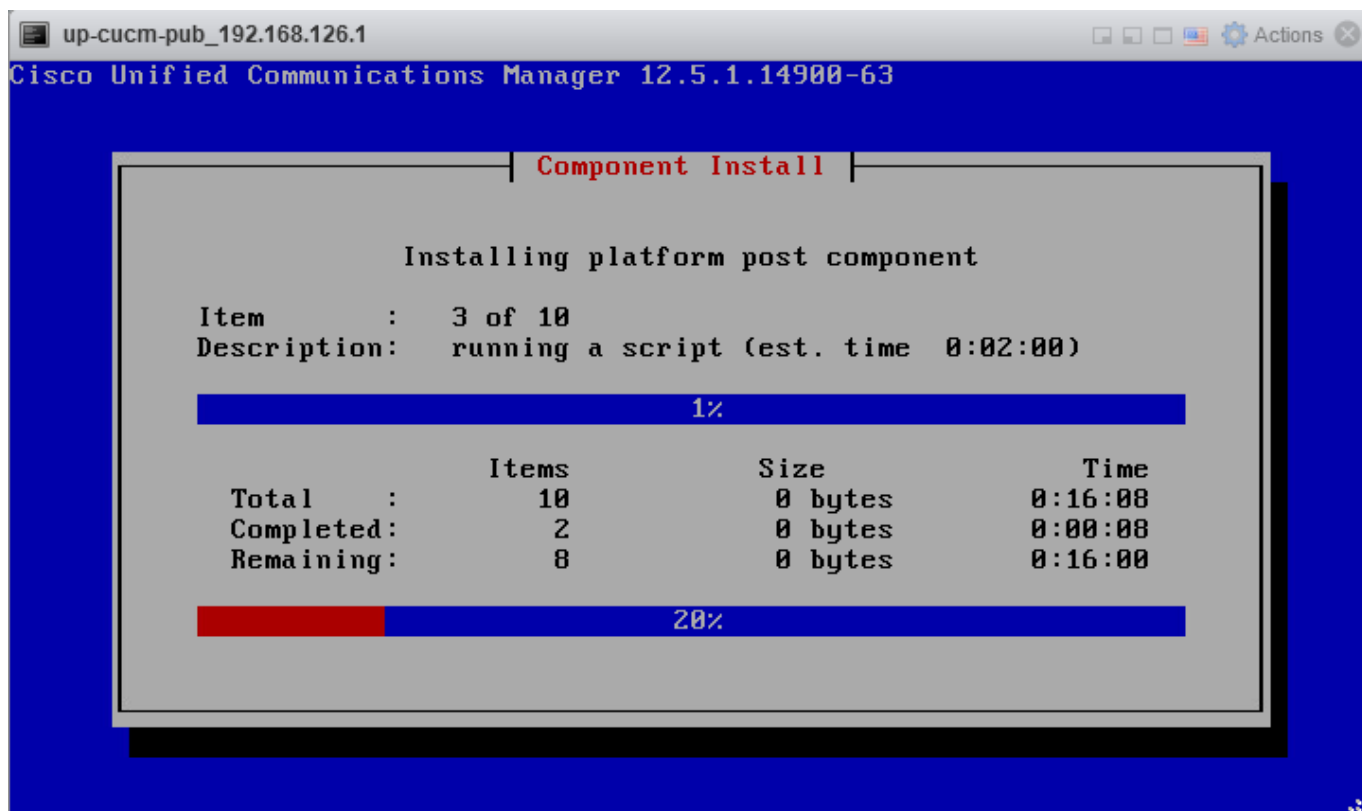
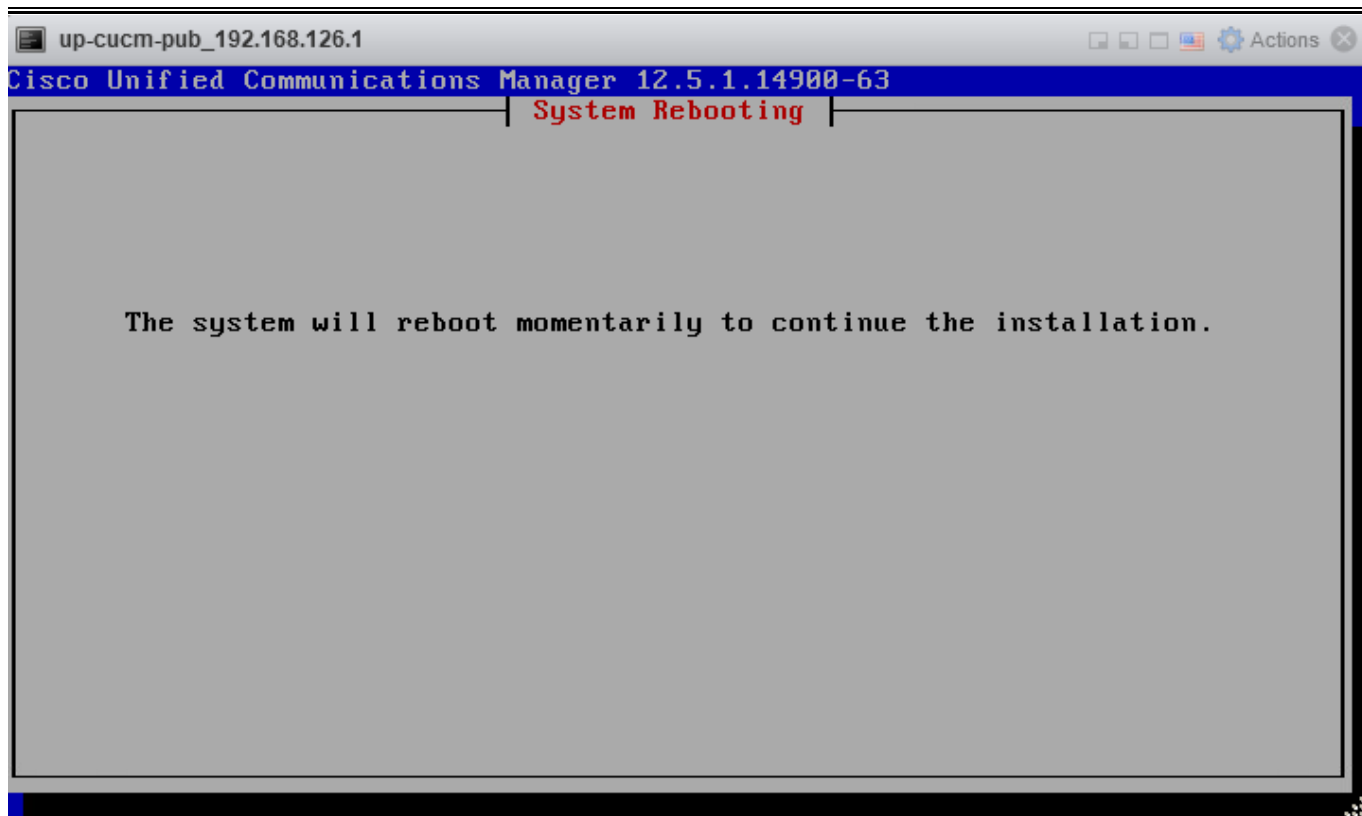
Populating component RPMs in RPM archive

Item : 95 of 168  
Description: moving 1 file (2.57 Mbytes)

1%

	Items	Size	Time
Total :	168	3323 Mbytes	0:00:41
Completed:	94	963 Mbytes	0:00:12
Remaining:	74	2359 Mbytes	0:00:29

56%



```
up-cucm-pub_192.168.126.1

Cisco Unified Communications Manager 12.5.1.14900-63
up-cucm-pub login: _
```

```
up-cucm-pub_192.168.126.1

Cisco Unified Communications Manager 11.5.1.13901-3
up-cucm-pub login: admin
Password:
Last login: Tue Apr 6 14:50:59 on tty1
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 110GB, Partitions aligned
 8192 Mbytes RAM

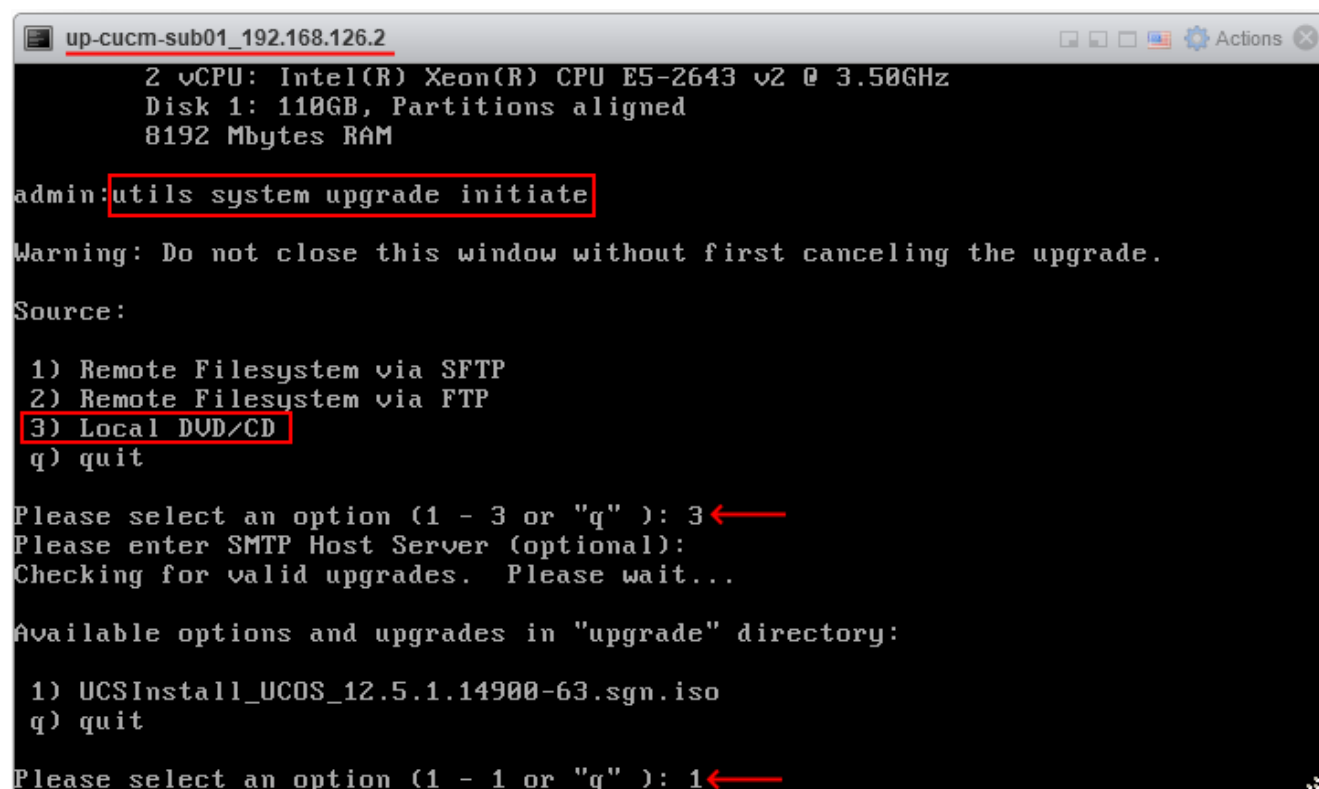
admin:show version inactive
Inactive Master Version: 12.5.1.14900-63
Inactive Version Installed Software Options:
No Installed Software Options Found.
admin:
admin:show version active
Active Master Version: 11.5.1.13901-3
Active Version Installed Software Options:
ciscocm.preUpgradeCheck-00024.cop
ciscocm.free_common_space_v1.6.cop
admin:
```

- The active version is still 11.5 because 12.5 installed at the inactive partition, we perform switch version after some task and that will make the active version as 12.5
- It is not recommended to perform any switch version of CUCM PUB until all the nodes are upgraded (Even if you do switch version, there won't be a problem)

---

## 2.2 Upgrade CUCM Subscribers

- Perform the same steps on CUCM Subscriber servers. You can upgrade all subscribers at one time



The terminal window shows the command `utils system upgrade initiate` being executed. It displays system information (2 vCPU, 110GB disk, 8192 Mbytes RAM) and a warning not to close the window. The user is prompted to select a source for the upgrade, with option 3 (Local DVD/CD) being chosen. Then, the user is prompted to select an option from the available upgrades in the "upgrade" directory, with option 1 (UCSInstall\_UCOS\_12.5.1.14900-63.sgn.iso) being chosen.

```
up-cucm-sub01_192.168.126.2
2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
Disk 1: 110GB, Partitions aligned
8192 Mbytes RAM

admin:utils system upgrade initiate

Warning: Do not close this window without first canceling the upgrade.

Source:

1) Remote Filesystem via SFTP
2) Remote Filesystem via FTP
3) Local DVD/CD
q) quit

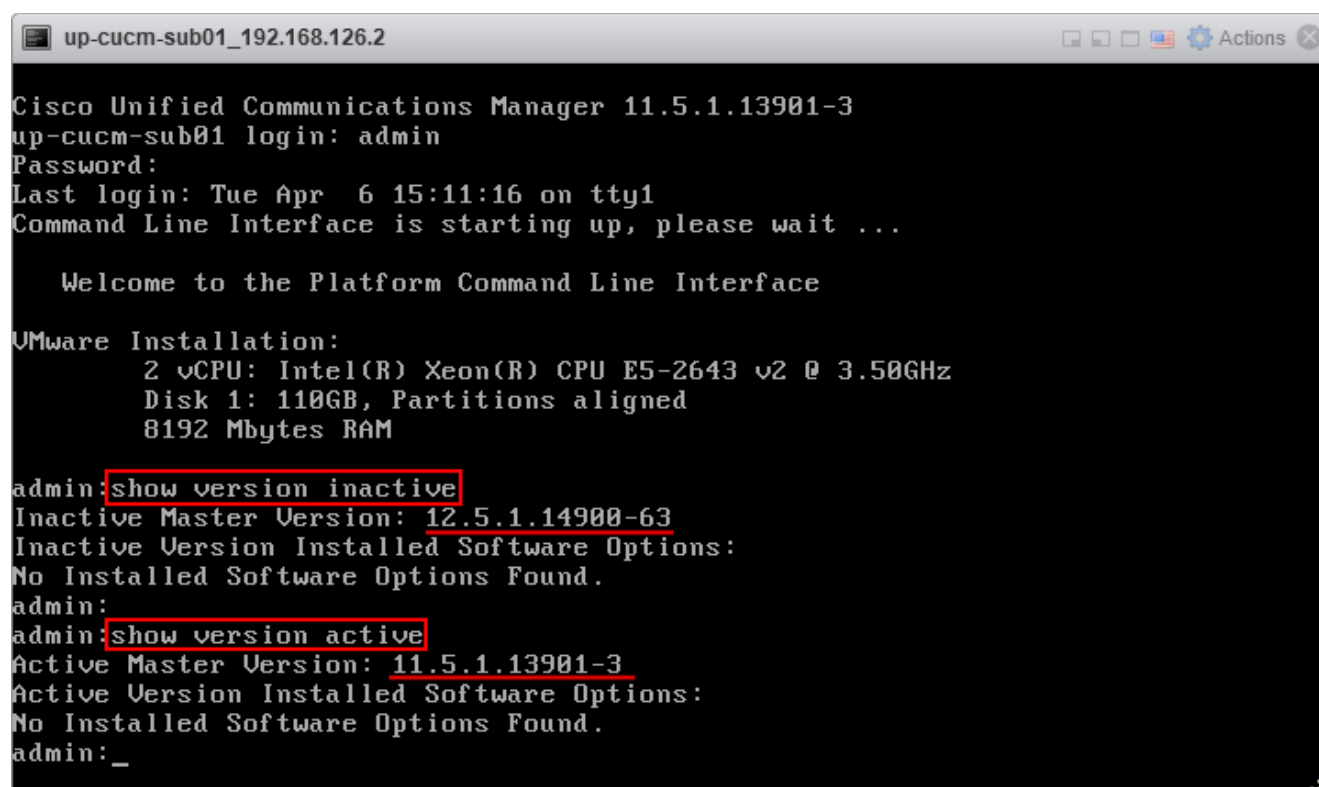
Please select an option (1 - 3 or "q"): 3
Please enter SMTP Host Server (optional):
Checking for valid upgrades. Please wait...

Available options and upgrades in "upgrade" directory:

1) UCSInstall_UCOS_12.5.1.14900-63.sgn.iso
q) quit

Please select an option (1 - 1 or "q"): 1
```

- Since the steps are similar, I'm not going to repeat it here



The terminal window shows the login process for the CUCM subscriber. The user logs in as 'admin' and is prompted for a password. After a successful login, the user is greeted with a welcome message and system information. The user then enters the command `show version inactive`, which displays the inactive master version (12.5.1.14900-63) and the inactive version installed software options. Finally, the user enters the command `show version active`, which displays the active master version (11.5.1.13901-3) and the active version installed software options.

```
up-cucm-sub01_192.168.126.2

Cisco Unified Communications Manager 11.5.1.13901-3
up-cucm-sub01 login: admin
Password:
Last login: Tue Apr 6 15:11:16 on tty1
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
Disk 1: 110GB, Partitions aligned
8192 Mbytes RAM

admin:show version inactive
Inactive Master Version: 12.5.1.14900-63
Inactive Version Installed Software Options:
No Installed Software Options Found.
admin:
admin:show version active
Active Master Version: 11.5.1.13901-3
Active Version Installed Software Options:
No Installed Software Options Found.
admin:_
```

- Now the subscriber also having 11.5 in the active partition and 12.5 in the inactive partition



---

## 2.3 Upgrade IMP Publisher

- Use the CUP Upgrade file to upgrade IM and Presence Server, steps are exactly the same
- You must upgrade IMP Pub first and then IMP SUB
- IMP Pub Upgrade can be parallelly done during CUCM Subscriber upgrades
- Do not perform Switch version

## 2.4 Upgrade IMP Subscriber

- Perform the similar steps to upgrade IMP Subscriber
- Do not perform switch version

## 2.5 Verify Database Replication

- Make sure the database replication is complete on all the nodes
- There shouldn't be any issues in DB replication

```
up-cucm-pub_192.168.126.1 (1) - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
up-cucm-pub_192.168.126.1 (1)
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 110GB, Partitions aligned
 8192 Mbytes RAM

admin:utils dbrepli
admin:utils dbreplication run
admin:utils dbreplication runtimestate

Server Time: Tue Apr 6 16:41:52 PDT 2021

Cluster Replication State: BROADCAST SYNC ended at: 2021-04-06-03-27
 Sync Result: SYNC COMPLETED on 706 tables out of 706
 Sync Status: All Tables are in sync
 Use CLI to see detail: 'file view activelog cm/trace/dbl/20210406_032549_dbl_repl_output_Broadcast
.log'

DB Version: ccm11_5_1_13901_3

Repltimeout set to: 300s
PROCESS option set to: 1

Cluster Detailed View from up-cucm-pub (2 Servers):

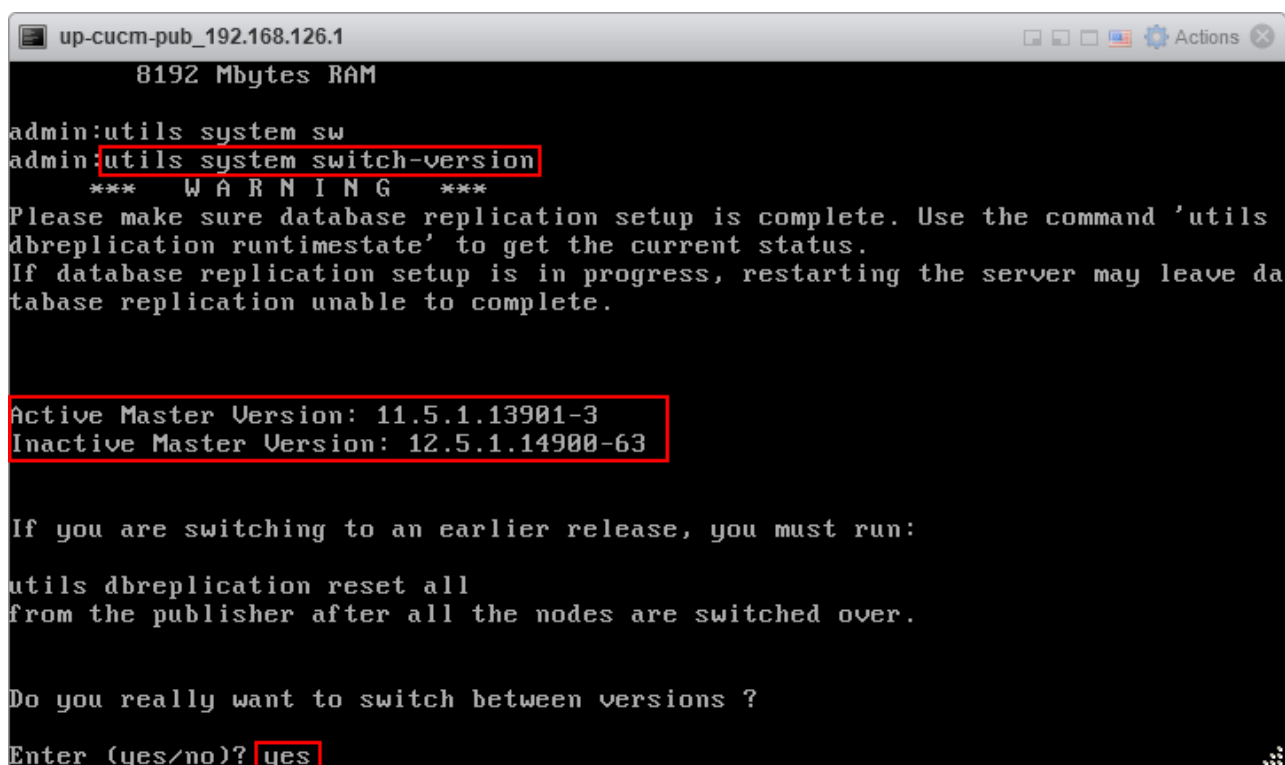
SERVER-NAME IP ADDRESS PING DB/RPC/ REPL. Replication REPLICATION SETUP
----- ----- ---- DbMon? QUEUE Group ID (RTMT) & Details
----- ----- ---- ----- ----- ----- -----
up-cucm-pub 192.168.126.1 0.015 Y/Y/Y 0 (g_2) (2) Setup Completed
up-cucm-sub01 192.168.126.2 0.105 Y/Y/Y 0 (g_3) (2) Setup Completed

admin:
```

---

## 2.6 Switch Version CUCM Publisher

- After all Subscribers are upgraded, switch CUCM PUB 11.5 to 12.5 using *utils system switch-version* command
- You can do this from SSH session, since we are doing everything from the vmware Console, I prefer the same for this as well. Wait for all the services to come up in CUCM Publisher

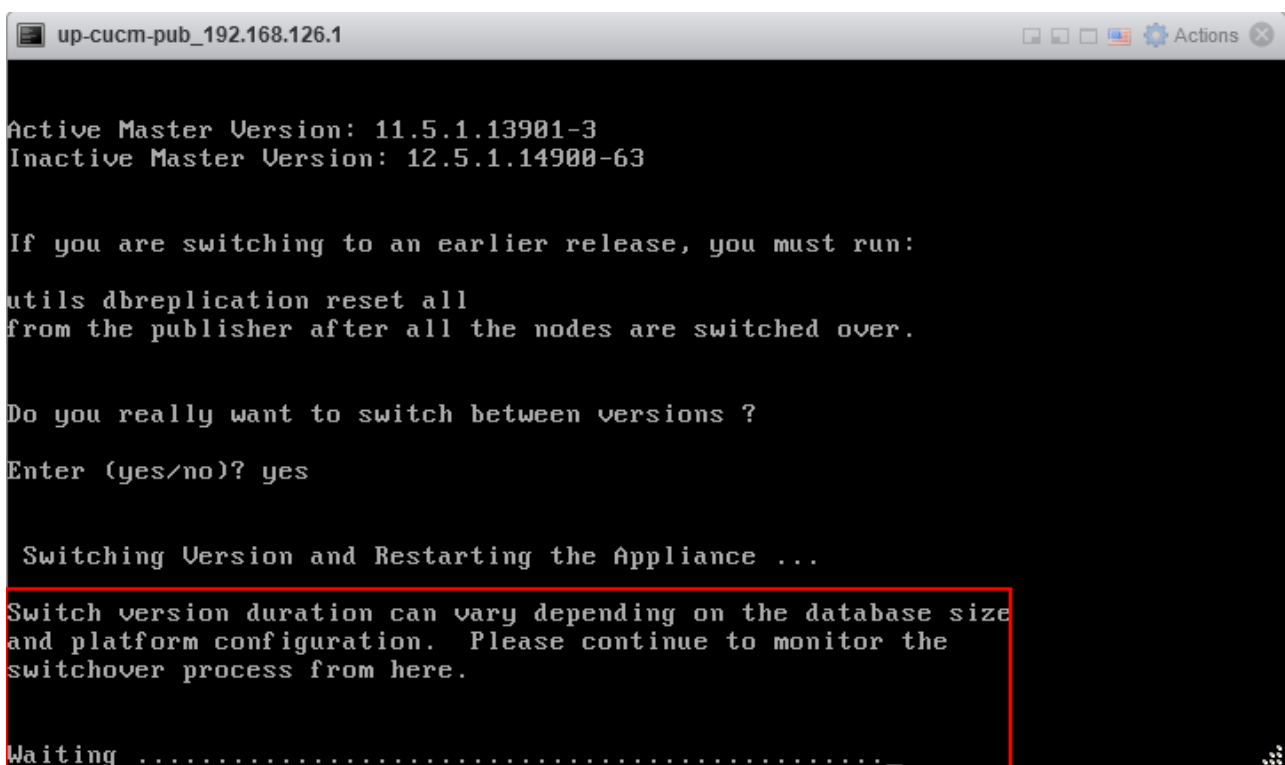


```
up-cucm-pub_192.168.126.1
8192 Mbytes RAM
admin:utils system sw
admin:utils system switch-version
*** WARNING ***
Please make sure database replication setup is complete. Use the command 'utils
dbreplication runtimestate' to get the current status.
If database replication setup is in progress, restarting the server may leave da
tabase replication unable to complete.

Active Master Version: 11.5.1.13901-3
Inactive Master Version: 12.5.1.14900-63

If you are switching to an earlier release, you must run:
utils dbreplication reset all
from the publisher after all the nodes are switched over.

Do you really want to switch between versions ?
Enter (yes/no)? yes
```



```
up-cucm-pub_192.168.126.1
Active Master Version: 11.5.1.13901-3
Inactive Master Version: 12.5.1.14900-63

If you are switching to an earlier release, you must run:
utils dbreplication reset all
from the publisher after all the nodes are switched over.

Do you really want to switch between versions ?
Enter (yes/no)? yes

Switching Version and Restarting the Appliance ...

Switch version duration can vary depending on the database size
and platform configuration. Please continue to monitor the
switchover process from here.

Waiting
```

```
up-cucm-pub_192.168.126.1

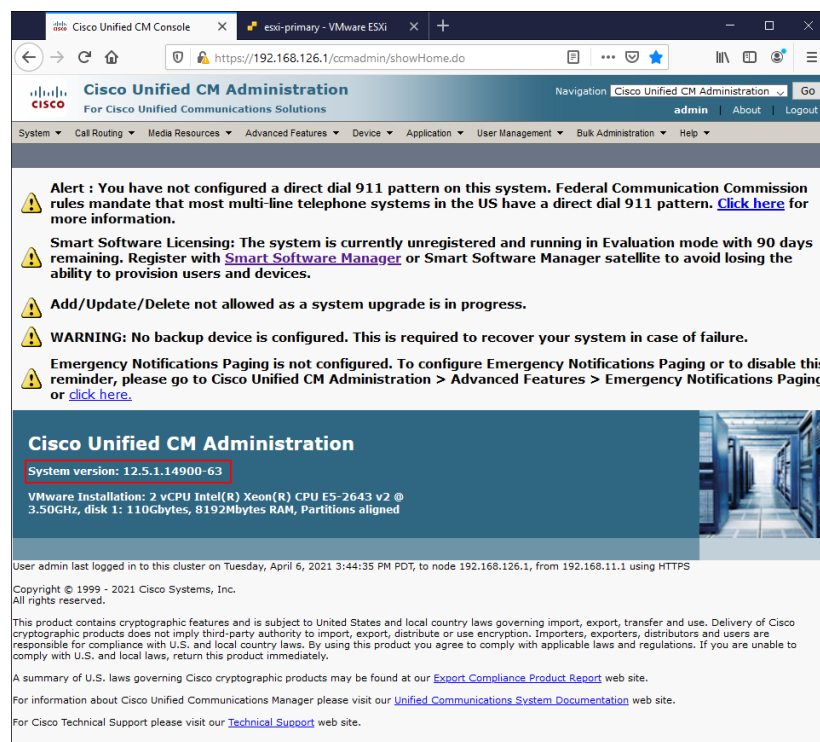
Cisco Unified Communications Manager 12.5.1.14900-63
up-cucm-pub login: admin
Password:
Last login: Wed Apr 7 00:34:13 from win-server-01.ajcollab.com
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 110GB, Partitions aligned
 8192 Mbytes RAM

admin: show version active
Active Master Version: 12.5.1.14900-63
Active Version Installed Software Options:
No Installed Software Options Found.
admin:
admin: show version inactive
Inactive Master Version: 11.5.1.13901-3
Inactive Version Installed Software Options:
ciscocm.preUpgradeCheck-00024.cop
ciscocm.free_common_space_v1.6.cop
admin:
```

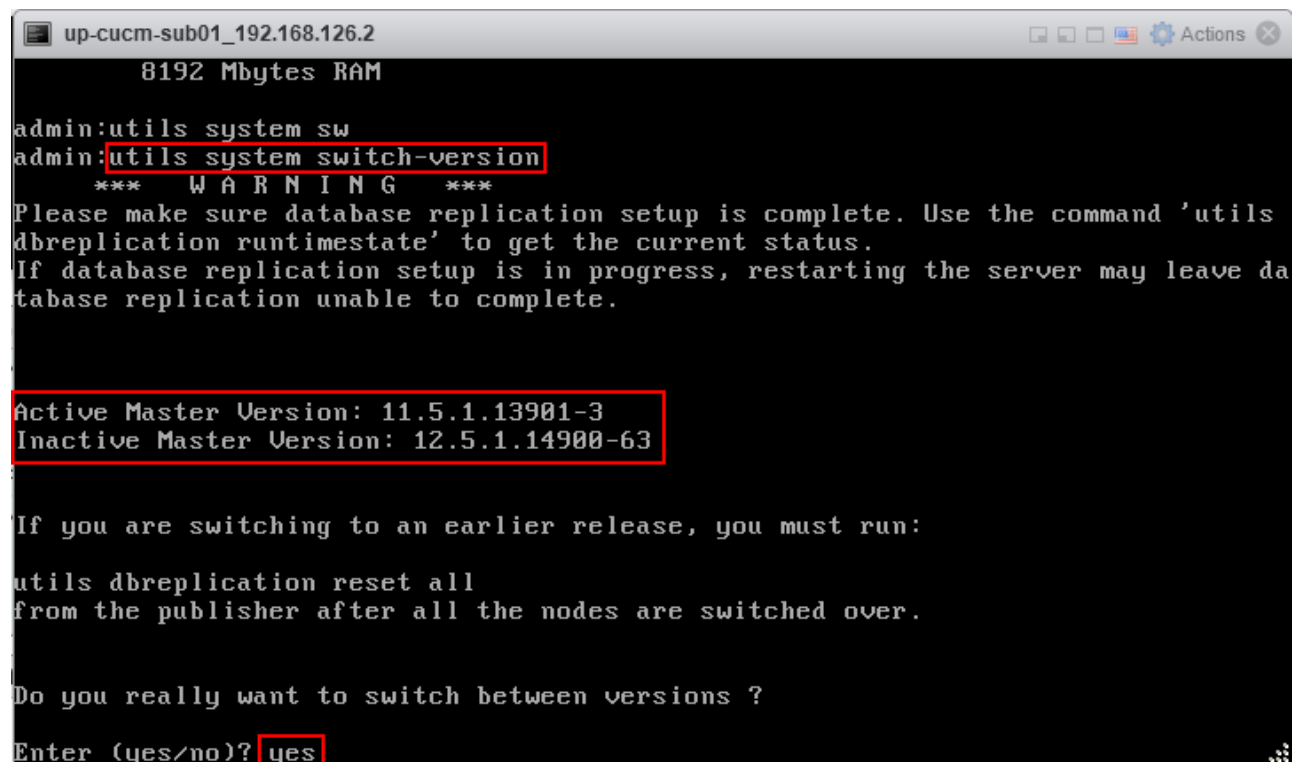
- Now the active version is 12.5. You still have the version 11.5 on the inactive partition. For some reason if we want to go back to 11.5, do one more switch version
- Switch version will flip the files between active and inactive partitions
- You should wait for some time to get all the services are up, Cisco Tomcat Service will take quite some time to come up. Make sure you can to the Web GUI and login before proceeding to the next step



---

## 2.7 Switch Version CUCM Subscribers, IMP Publisher and IMP Subscribers

- Once the CUCM Publisher is completely up and running, perform the switch version of CUCM Subscribers, IMP Publisher and IMP Subscriber

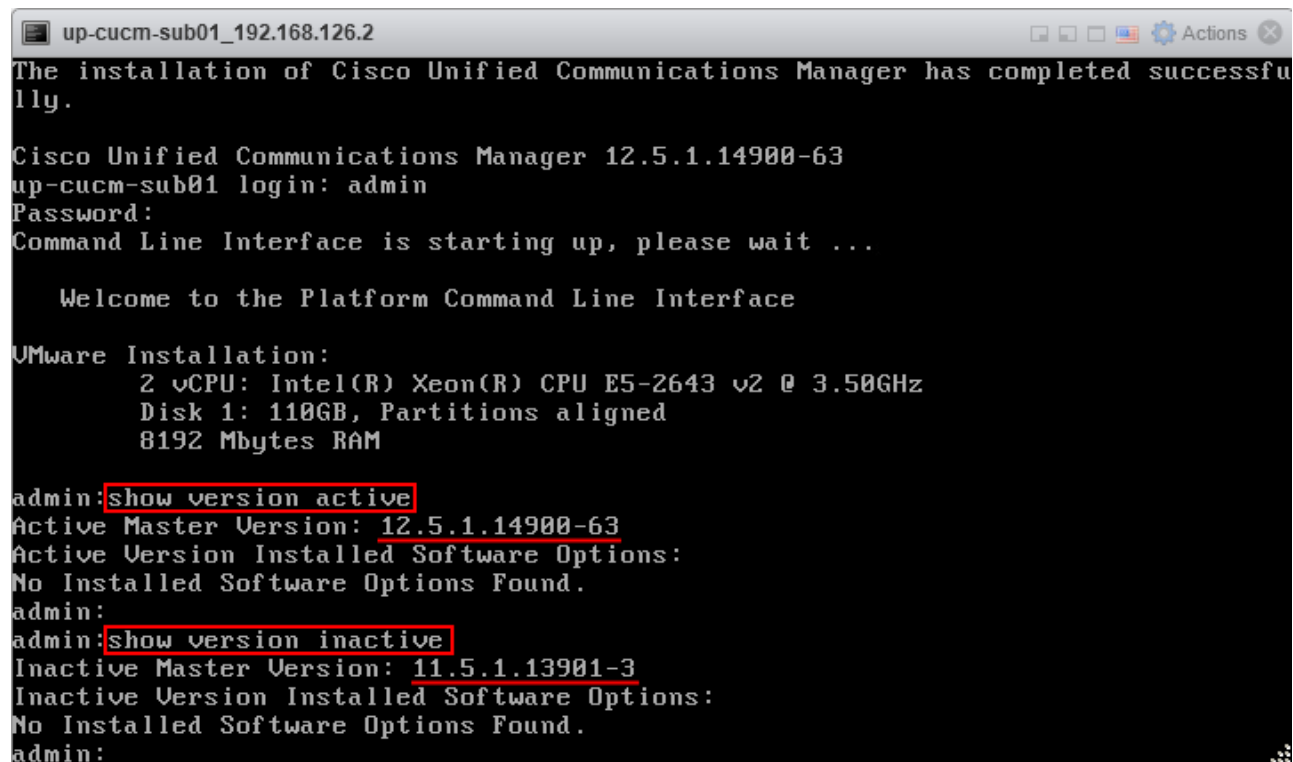


```
up-cucm-sub01_192.168.126.2
8192 Mbytes RAM
admin:utils system sw
admin:utils system switch-version
*** WARNING ***
Please make sure database replication setup is complete. Use the command 'utils
dbreplication runtimestate' to get the current status.
If database replication setup is in progress, restarting the server may leave da
tabase replication unable to complete.

Active Master Version: 11.5.1.13901-3
Inactive Master Version: 12.5.1.14900-63

If you are switching to an earlier release, you must run:
utils dbreplication reset all
from the publisher after all the nodes are switched over.

Do you really want to switch between versions ?
Enter (yes/no)? yes
```



```
up-cucm-sub01_192.168.126.2
The installation of Cisco Unified Communications Manager has completed successfu
lly.

Cisco Unified Communications Manager 12.5.1.14900-63
up-cucm-sub01 login: admin
Password:
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 110GB, Partitions aligned
 8192 Mbytes RAM

admin:show version active
Active Master Version: 12.5.1.14900-63
Active Version Installed Software Options:
No Installed Software Options Found.
admin:
admin:show version inactive
Inactive Master Version: 11.5.1.13901-3
Inactive Version Installed Software Options:
No Installed Software Options Found.
admin:
```

- You can do it all at once for CUCM Subscribers along with IMP Publisher. IMP Subscribers can be switched after the IMP Publisher is up
- I do not have IMP as part of the cluster hence not adding the screenshot

## 2.8 Change VM Compatibility and Guest OS Version

- After the complete switch version of the cluster, power off each node and change VM Compatibility to ESXi 6.5 virtual machine and Guest OS is CentOS 4/5 one by one starting from CUCM Publisher

The screenshot displays the VMware ESXi web interface for a virtual machine named 'up-cucm-pub\_192.168.126.1'. The interface is in the 'Before' state. The main configuration area shows the following details:

- Guest OS:** Red Hat Enterprise Linux 6 (64-bit)
- Compatibility:** ESXi 5.0 virtual machine
- VMware Tools:** Yes
- CPU:** 2
- Memory:** 8 GB

On the right side, resource usage is shown:

- CPU:** 0 MHz
- MEMORY:** 0 B
- STORAGE:** 70.95 GB

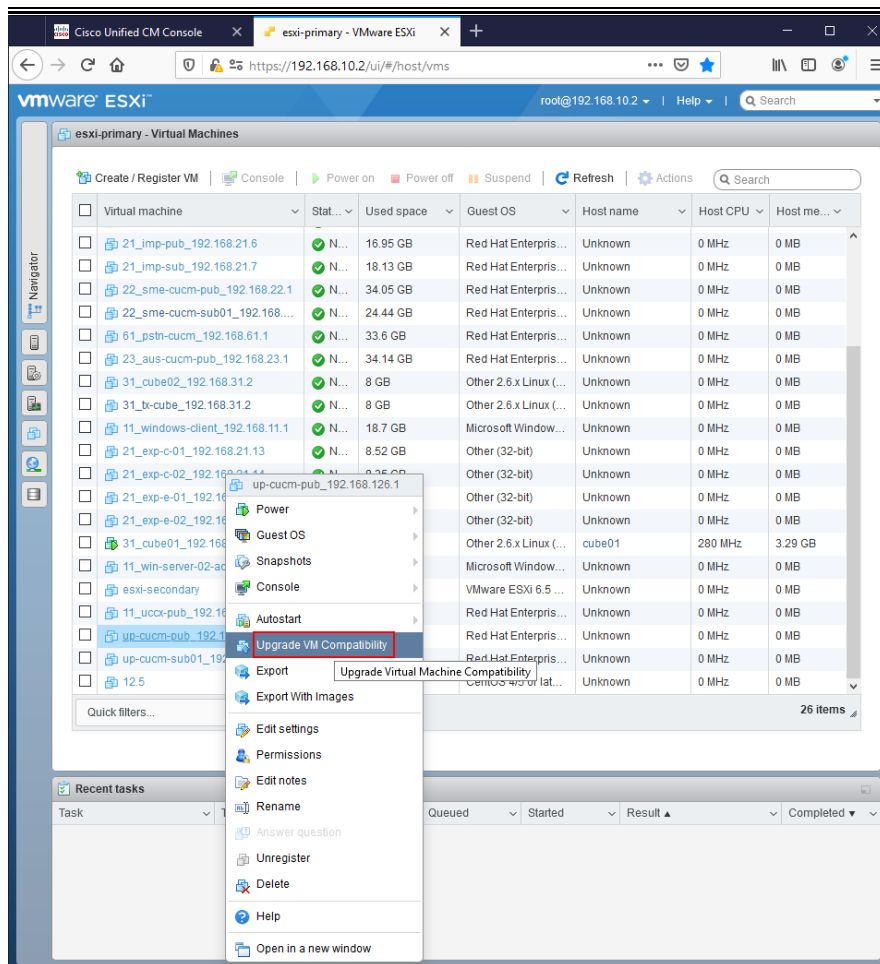
Below the configuration, there is a 'General Information' section with expandable tabs for Networking, VMware Tools, Storage, and Notes. The Notes section contains the following text:

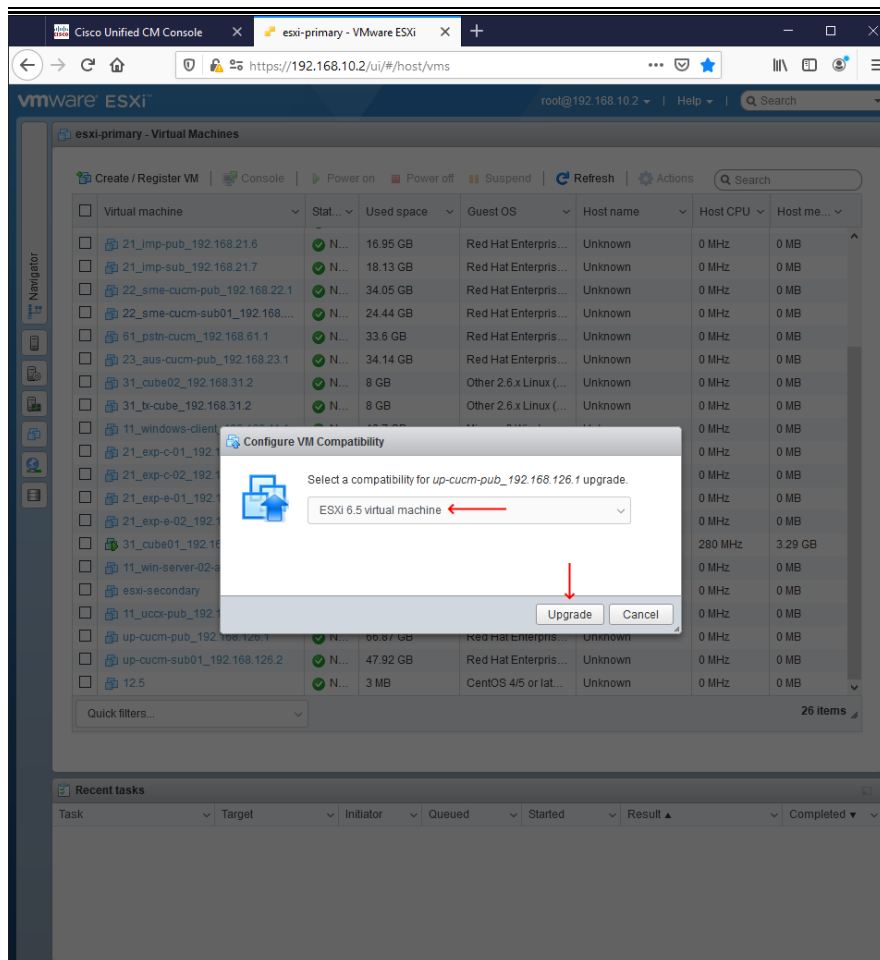
Application Version: CUCM 11.5  
Original VM Version: 8  
OVA Version: 1.1

Below the notes is a 'Performance summary last hour' graph. The graph shows 'Consumed host CPU' (green line) and 'Consumed host memory' (blue line) over time. The CPU usage peaks at approximately 80%, and the memory usage peaks at approximately 4 GB.

At the bottom, there is a 'Recent tasks' table:

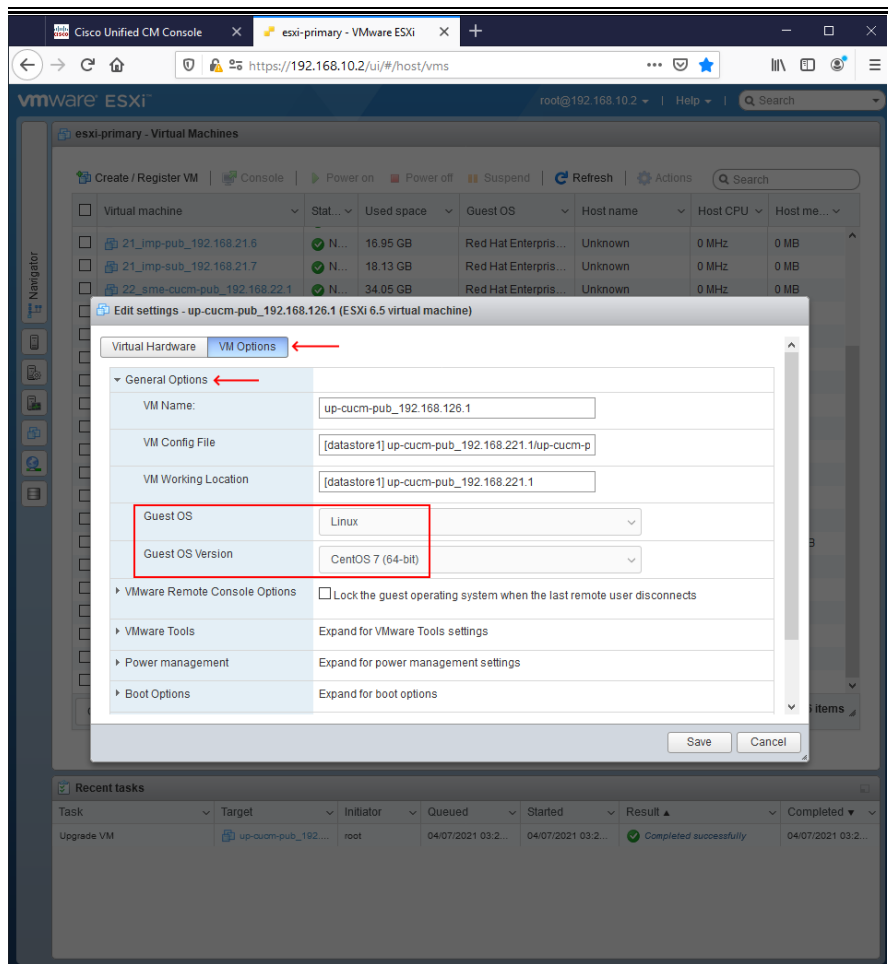
Task	Target	Initiator	Queued	Started	Result	Completed
Upload disk - cucm_12.5_vmv1...	12.5	root	04/06/2021 23:2...	04/06/2021 23:2...	Completed successfully	04/06/2021 23:2...
Power On VM	up-cucm-pub_192...	root	04/07/2021 01:3...	04/07/2021 01:3...	Completed successfully	04/07/2021 01:3...
Power On VM	up-cucm-sub01_19...	root	04/07/2021 01:3...	04/07/2021 01:3...	Completed successfully	04/07/2021 01:3...
Import VApp	Resources	root	04/07/2021 01:3...	04/07/2021 01:3...	Completed successfully	04/07/2021 01:3...












Cisco Unified CM Console | esxi-primary - VMware ESXi | +

https://192.168.10.2/ui/#/host/vms/28

vmware ESXi™ | root@192.168.10.2 | Help | Search

up-cucm-pub\_192.168.126.1 After

Console | Monitor | Power on | Power off | Suspend | Restart | Edit | Refresh | Actions



**up-cucm-pub 192.168.126.1**

Guest OS	CentOS 7 (64-bit)
Compatibility	ESXi 6.5 virtual machine
VMware Tools	Yes
CPU	2
Memory	8 GB

CPU 0 MHz

MEMORY 0 B

STORAGE 67.41 GB

**General Information**

- Networking
- VMware Tools: VMware Tools version is compliant.
- Storage: 1 disk
- Notes: Application Version: CUCM 11.5, Original VM Version: 8, OVA Version: 1.1 Edit notes

**Hardware Configuration**

- CPU: 2 vCPUs
- Memory: 8 GB
- Hard disk 1: 110 GB
- Network adapter 1: VM Network (Connected)
- Floppy drive 1: Floppy 0
- Video card: 8 MB
- CD/DVD drive 1: ATAPI
- Others: Additional Hardware

**Recent tasks**

Task	Target	Initiator	Queued	Started	Result	Completed
Reconfig VM	up-cucm-sub01_19...	root	04/07/2021 03:3...	04/07/2021 03:3...	Completed successfully	04/07/2021 03:3...
Upgrade VM	up-cucm-sub01_19...	root	04/07/2021 03:2...	04/07/2021 03:2...	Completed successfully	04/07/2021 03:2...
Reconfig VM	up-cucm-pub_192...	root	04/07/2021 03:2...	04/07/2021 03:2...	Completed successfully	04/07/2021 03:2...
Upgrade VM	up-cucm-pub_192...	root	04/07/2021 03:2...	04/07/2021 03:2...	Completed successfully	04/07/2021 03:2...

- Also, disconnect the Iso from the VM

- Power on all the VM and wait for DB Replication to come up

```

up-cucm-pub_192.168.126.1 (1) - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
up-cucm-pub_192.168.126.1 (1)
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
 Disk 1: 110GB, Partitions aligned
 8192 Mbytes RAM

admin:utils dbrepli
admin:utils dbreplication run
admin:utils dbreplication runtimestate

Server Time: Tue Apr 6 16:41:52 PDT 2021

Cluster Replication State: BROADCAST SYNC ended at: 2021-04-06-03-27
 Sync Result: SYNC COMPLETED on 706 tables out of 706
 Sync Status: All Tables are in sync
 Use CLI to see detail: 'file view activelog cm/trace/db1/20210406_032549_db1_repl_output_Broadcast.log'

DB Version: ccm11_5_1_13901_3

Repltimeout set to: 300s
PROCESS option set to: 1

Cluster Detailed View from up-cucm-pub (2 Servers):

SERVER-NAME IP ADDRESS PING DB/RPC/ REPL. Replication REPLICATION SETUP
----- ----- ---- -
up-cucm-pub 192.168.126.1 0.015 Y/Y/Y 0 (g_2) (2) Setup Completed
up-cucm-sub01 192.168.126.2 0.105 Y/Y/Y 0 (g_3) (2) Setup Completed

admin:

```

## 2.9 Install the Post-Upgrade Check COP File

- Download the Post-Upgrade readiness COP file from the link
- Install it on the new CUCM 12.5 Node one by one via SFTP

The screenshot shows a web browser window with the Cisco Software Download page. The address bar shows the URL: <https://software.cisco.com/download/home/286322286/>. The page displays a list of COP files for download. The file 'ciscocm.postUpgradeCheck-00024.cop.sgn' is highlighted with a red box.

Description	Date	Size	Download Link
COP file to provide fix for CSCvv65634 - SSO DB connections are not handled properly. Can be installed on CUCM and CUC 12.5.1SU1, 12.5.1SU2 or 12.5.1SU3 only. <a href="#">ciscocm.V12.5.1_CSCvv65634.C0084-2.zip</a>	20-Jan-2021	0.29 MB	<a href="#">Download</a>
COP file to fix CSCvw70770 for CUCM, CUC, and IM&P 12.5 versions. <a href="#">ciscocm.V12-5-1_CSCvw70770_fix-ui-passwd_C0095-2.cop.sgn</a>	21-Dec-2020	0.17 MB	<a href="#">Download</a>
COP file to provide fix for CSCvv65634 - SSO DB connections are not handled properly. Can be installed on 12.5.1SU1, 12.5.1SU2 or 12.5.1SU3 only. <a href="#">ciscocm.V12.5.1_CSCvv65634.C0084-1.zip</a>	28-Oct-2020	0.29 MB	<a href="#">Download</a>
<b>Upgrade Readiness COP file to run post upgrade tests. <a href="#">ciscocm.postUpgradeCheck-00024.cop.sgn</a></b>	13-Aug-2020	0.19 MB	<a href="#">Download</a>
Upgrade Readiness COP file to run pre upgrade tests. <a href="#">ciscocm.preUpgradeCheck-00024.cop.sgn</a>	13-Aug-2020	0.19 MB	<a href="#">Download</a>
COP file to address Real Time Data issues in the 12.5 RTMT client caused by CSCvt63366. This COP file is applicable for all 12.5 CUCM versions between 12.5.1.12900-115 and 12.5.1.13025-1. <a href="#">ciscocm.V12-5-1_CSCvt63366-rtmt_C0060-1.cop.sgn</a>	07-May-2020	0.46 MB	<a href="#">Download</a>
COP file to address Smart License Manager issues in 12.5 caused by CSCvt61579. This COP file is applicable for all 12.5 CUCM versions between 12.5.1.12900-115 and 12.5.1.13026-1 <a href="#">ciscocm.V12-5-1_CSCvt61579-slm-proxy_C0055-1.cop.sgn</a>	28-Apr-2020	0.24 MB	<a href="#">Download</a>
COP file to address simple upgrade issues in 12.5 caused by CSCvq22312. This COP file is applicable for all 12.5 CUCM and IM&P	19-Mar-2020	8.01 MB	<a href="#">Download</a>

Software Installation/Upgrade

esxi-primary - VMware ESXi

+


← → ↺ 🏠

🔒 <https://192.168.126.1/cmplatform/install.do>

⋮ 🛡️ ☆

📁 📄 🌐

☰

 **Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation **Cisco Unified OS Administration** Go

admin | About | Logout

Show ▾ Settings ▾ Security ▾ Software Upgrades ▾ Services ▾ Help ▾

**Software Installation/Upgrade**

✖ Cancel ➡ Next

**Status**

⚠️ Before upgrading the cluster Cisco recommends installing the latest Upgrade Readiness COP file. Refer to the Upgrade Guide on cisco.com for details.

📘 Status: Ready

**Software Location**

Source\* Remote Filesystem ←

Directory\* /upgrades ←

Server\* 192.168.11.1 ←

User Name\* sftp.admin

User Password\* ••••••••

Transfer Protocol\* SFTP

SMTP Server

Email Destination

**Upgrade Options**

☒ continue with upgrade after download ←

☐ switch-version server after upgrade(valid only for ISO)

Cancel Next

📘 \*- indicates required item.

Software Installation/Upgrade

Warning: Potential Security Risk

esxi-primary - VMware ESXi

+


← → ↺ 🏠

🔒 <https://192.168.126.1/cmplatform/installOptions.do>

⋮ 🛡️ ☆

📁 📄 🌐

☰

 **Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation **Cisco Unified OS Administration** Go

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Show ▾ Settings ▾ Security ▾ Software Upgrades ▾ Services ▾ Help ▾

**Software Installation/Upgrade**

✖ Cancel ➡ Next

**Status**

📘 Status: Ready

**Software Location**

Options/Upgrades\* ciscocm.postUpgradeCheck-00024.cop.sgn

Cancel Next

📘 \*- indicates required item.

```

//
=====
Post Upgrade Test Date: 04/08/2021 10:15:49
=====
Active Version: 12.5.1.14900-63
Inactive Version: 11.5.1.13901-3
Server: up-cucm-pub.ajcollab.com , CUCM Publisher
Pre Upgrade Date: 04/06/2021 10:01:00
=====

Result Test

1.1 WARN SLM License Status
License Status is UNREGISTERED.Register the system with Cisco Smart
Software Manager or satellite. Evaluation Period Remaining: 89 days, 18 hr,
0 min, 0 sec.

1.2 PASS Cluster Database Status
1.3 FAIL Network status (NTP, DNS & Cluster node connectivity)
Check network reach ability. Use 'utils diagnose test' for more
detailsntp_reachability : Warning
The NTP service is restarting, it can take about 5 minutes.

ntp_clock_drift : Warning
The local clock is not synchronised.
None of the designated NTP servers are reachable/functioning or legitimate.

ntp_stratum : Warning
The local clock is not synchronised.
None of the designated NTP servers are reachable/functioning or legitimate.

1.4 PASS Test dataBase Sanity
1.5 PASS Network Adapter Type
=====

System Status List

2.1 Cops Installed (PASS)
ciscocm.postUpgradeCheck-00024.cop

2.2 Version VMTools Type (WARN)
10.3.21.249 native vm-tools
WARNING: Update the native vmttools to latest for optimal system
performance.
=====

Tests Comparison

Active Inactive Test

3.1 Value Value Enterprise Parameter (FAIL)
60 Unknown DeviceTokenExpiryTimer
NULL Unknown HloginAccessNumber
None Unknown FeaturePreviewEnablement
1 Unknown PhoneMigrationUserIdentificationPrompt
1 Unknown PhoneTemplateSelection
F Unknown ForceIVRtoNonSecure
NULL Unknown TrustedServers
5 Unknown headsetBasedEMAutoLogoutTimer
1 Unknown EnableAutoRecoveryForICPeerPeriodicSyncingFa...
1 Unknown TerminateUserSession
T Unknown CCMUserShowPhonesReadyToActivate
12 2 CDRPurgeWindow
21999 22001 ServicePort
T Unknown EnableAutoRegistrationforFXSsports
0 Unknown AuthenticatedPhoneRecording
5131abbb-... 122e40ba-... softkeyManager
0 Unknown makeCallProxyAPI
c5172a6e-... d48ba279-... softkeyAssistant
0 Unknown RealTimeMonitoringToolDisplayPreference
0 Unknown EndpointEncryptionAlgorithms
30 Unknown EnableSettingOfICPeerPeriodicSyncing
1 Unknown SecurityProfileforMigratedPhone
1 Unknown EnableUserSearchWithCustomer

```

1	Unknown	G7221andG7222CodecEnabled
0	Unknown	autoLoginForHeadsetBasedEM
0	Unknown	ProvisioningReplacementPhoneforEndUser
0	Unknown	HeadsetAssociation
30	Unknown	headsetBasedAutoLoginTimer
1	Unknown	headsetBasedEM
0000-00-0...	Unknown	UserCustomerMapAuditTime
b27df280-...	9092b14d-...	softkeyManagerShared
8003	8002	SdLListeningPort
0	Unknown	EnableDirectoryPartitionSearch
F	Unknown	DisplayExternalPresentationNameandNumber
30	Unknown	QuietClearReleaseStopTimer
1	Unknown	DisableCertSyncForPeriodicSync
0	Unknown	FIPSMoDEExchangeServerAuthentication
NULL	Unknown	HlogoutAccessNumber
F	Unknown	MOHPortAssignmentBasedOnAudioSource
168	Unknown	ActivationCodeExpiry
0	Unknown	ClusterSIPOAuthMode

3.2 Value Value CTI EndPoint Registration Status (PASS)  
No Issues Found

3.3 Value Value Service Parameter (PASS)  
No Issues Found in: MaximumServingThreadCount/Cisco Tftp

3.4 Value Value Trunk Status (PASS)  
No Issues Found

3.5 Count Count Phone Status (PASS)  
0 0 Unregistered  
0 0 Registered

3.6 Status Status Service Name (FAIL)  
STARTED STOPPED Cisco CallManager  
STARTED Unknown Cisco Device Activation Service  
STARTED STOPPED Cisco Dialed Number Analyzer  
STARTED Unknown \*Cisco Smart License Manager  
STARTED Unknown \*Platform Communication Web Service  
STARTED STOPPED Cisco Dialed Number Analyzer Server  
STARTED STOPPED Cisco Tftp  
(\* Network Services)

#### Summary:

Total Test Run : 13  
Total Passed : 8  
Total Warnings : 2  
Total Failed : 3

Note: Please refer to the readme of Post Upgrade cop for test details and pass/fail/warn/criteria

Phones and services take time finish setting up.  
Rerunning the COP will give latest status.

Some values may be truncated due to column width size. Please refer the pre\_upgrade\_readiness\_cmds.log/post\_upgrade\_readiness\_cmds.log for exact values.  
Use "file view install pre\_upgrade\_readiness\_cmds.log/post\_upgrade\_readiness\_cmds.log" to view the command output with exact values.

Duration for running tests: 0:07:26

//

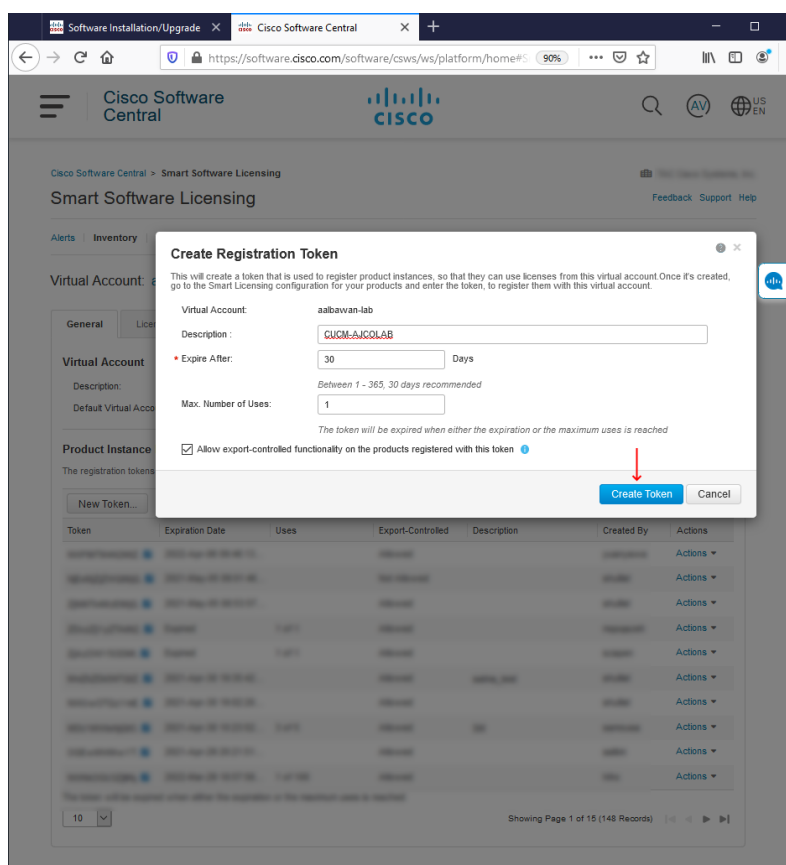
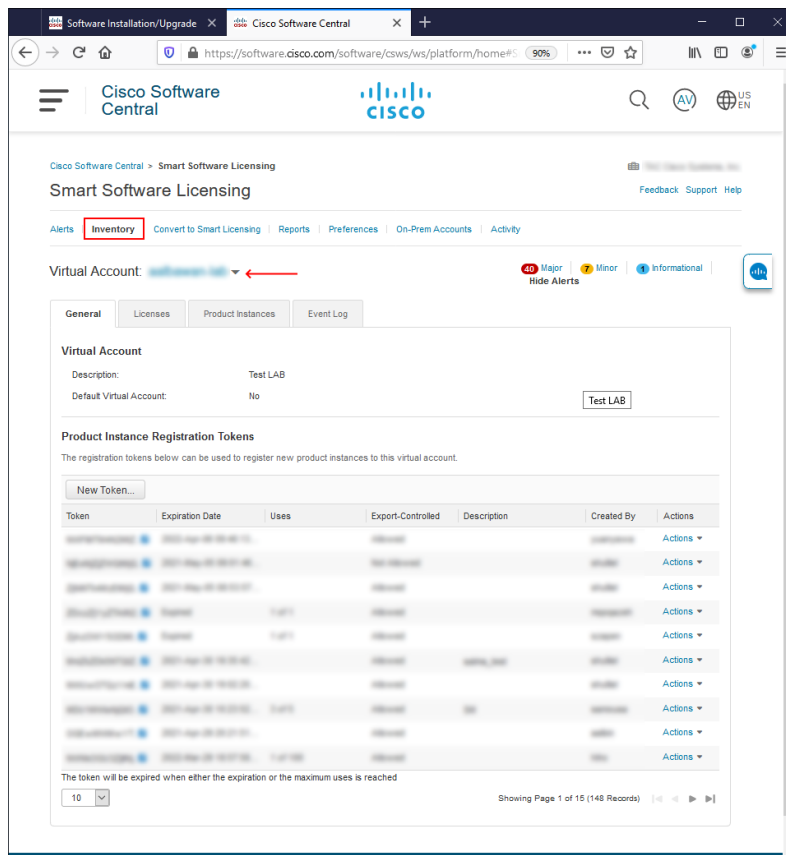
- I have fixed all the Failed section
- The failure 3.1 Enterprise Parameter is expected, looks like a cosmetic bug, you can ignore this





## 2.10 Register CUCM 12.5 to Smart License Manager

- Login to Smart License Account and create Token
- You CUCM must have internet connectivity to use Smart Licensing



Software Installation/Upgrade

Cisco Software Central

https://software.cisco.com/software/csws/ws/platform/h...90%

Central

CISCO

Cisco Software Central > Smart Software Licensing

Feedback Support Help

Alerts | Inventory | Convert to Smart Licensing | Reports | Preferences | On-Prem Accounts | Activity

Virtual Account: 

Test LAB

40 Major

7 Minor

1 Informational

Hide Alerts

General | Licenses | Product Instances | Event Log

Virtual Account

Description: Test LAB

Default Virtual Account: No

Product Instance Registration Tokens

The registration tokens below can be used to register new product instances to this virtual account.

New Token...

Token	Expiration Date	Uses	Export-Controlled	Description	Created By	Actions
M2EwZDyYmZ...	2021-May-08 09:55:00...	0 of 1	Allowed	CUCM-AJCOLAB	...	<div>CopyDownload...Revoke...</div>
...	...	...	...	...	...	Actions
...	...	...	...	...	...	Actions
...	...	...	...	...	...	Actions
...	...	...	...	...	...	Actions
...	...	...	...	...	...	Actions
...	...	...	...	...	...	Actions
...	...	...	...	...	...	Actions
...	...	...	...	...	...	Actions
...	...	...	...	...	...	Actions

The token will be expired when either the expiration or the maximum uses is reached

10

Showing Page 1 of 15 (149 Records)

Contacts | Feedback | Help | Site Map | Terms & Conditions | Privacy Statement | Cookie Policy | Trademarks

- Go to CUCM >> System >> License Management

The screenshot shows the Cisco Unified CM Administration interface for License Management. The system is in Evaluation mode, indicated by a yellow warning icon and the text "You are currently running in Evaluation mode. To register your system with Cisco, ensure your system has access to the internet or a Smart Software Manager satellite." The "Smart Software Licensing" section shows the "Registration Status" as "Unregistered" and the "Licensing Mode" as "Evaluation Mode (89 days)". A red box highlights the "Unregistered" status and the "Register" button. The "License Usage Report" section shows a summary of current license usage, with a table of "License Requirements by Type". The "Users and Unassigned devices" section shows 0 users and 3 unassigned devices. The "Smart Licensing Product Registration" section shows the system is managed by Smart Software Manager.

**Smart Software Licensing**

Registration Status: **Unregistered**

License Authorization Status: Evaluation Mode (89 days)

Export-Controlled Functionality: Not Allowed

Transport Settings: Direct View/Edit the Licensing settings

Licensing Mode: Enterprise

**Register**

**License Usage Report**

Below is a summary of current license usage on the system. Current usage details for each type are available by pressing "Update Usage Details". Note that collecting these data is a resource intensive process and may take several minutes to complete, depending on the size of your deployment.

Update Usage Details | Usage Details Last Updated: 2021-04-08 02:48:18

License Type	Current Usage	Status	Report
CUWL	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )
Enhanced Plus	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )
Enhanced	3	Evaluation	Users( 0 )   Unassigned Devices( 3 )
Basic	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )
Essential	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )
TelePresence Room	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )

**Users and Unassigned devices**

Users: 0 | View Usage Report

Unassigned Devices: 3 | View Usage Report

**Smart Licensing Product Registration**

The licenses for this system are managed by Smart Software Manager

The screenshot shows the Cisco Unified CM Administration interface for License Management after registration. The system is now "Registered", indicated by a green checkmark and the text "Smart Software Licensing: The system is operating with an insufficient number of licenses. Configure additional licenses in Smart Software Manager within 90 days to avoid losing the ability to provision users and devices." The "Smart Software Licensing" section shows the "Registration Status" as "Registered" and the "Licensing Mode" as "Enterprise". The "License Usage Report" section shows a summary of current license usage, with a table of "License Requirements by Type". The "Users and Unassigned devices" section shows 0 users and 3 unassigned devices. The "Smart Licensing Product Registration" section shows the system is managed by Smart Software Manager.

**Smart Software Licensing**

Registration Status: **Registered**

License Authorization Status: Out of Compliance (Thursday, April 8, 2021 3:00:45 AM PDT)

Smart Account: [Redacted]

Virtual Account: [Redacted]

Product Instance Name: up-cucm-pub.ajcollab.com

Export-Controlled Functionality: Allowed

Transport Settings: Direct View/Edit the Licensing Smart Call Home settings

Licensing Mode: Enterprise

**License Usage Report**

Below is a summary of current license usage on the system. Current usage details for each type are available by pressing "Update Usage Details". Note that collecting these data is a resource intensive process and may take several minutes to complete, depending on the size of your deployment.

Update Usage Details | Usage Details Last Updated: 2021-04-08 03:01:07

License Type	Current Usage	Status	Report
CUWL	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )
Enhanced Plus	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )
Enhanced	3	Out of Compliance	Users( 0 )   Unassigned Devices( 3 )
Basic	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )
Essential	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )
TelePresence Room	0	No Licenses in Use	Users( 0 )   Unassigned Devices( 0 )

**Users and Unassigned devices**

Users: 0 | View Usage Report

Unassigned Devices: 3 | View Usage Report

**Smart Licensing Product Registration**

The licenses for this system are managed by Smart Software Manager

- If you are not able provide internet access to CUCM, you can install Stellate server as a proxy for Smart License. CUCM talks to Satellite Server internally and Satellite Server talks to internet
- If the above options are not available, License Reservation can be used (customer like Govt. Security, etc.). They can generate a string from the Smart License account and enter it in CUCM to get the license reserved. If there is any change, we have to regenerate new string and do update CUCM

### 3.1 Perform Health Check

- We covered UC Health check in the beginning of the course
- Make sure DB replication is fine

```

up-cucm-pub_192.168.126.1 - SecureCRT
File Edit View Options Transfer Script Tools Window Help
Enter host <Alt+R>
up-cucm-pub_192.168.126.1
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
Disk 1: 110GB, Partitions aligned
8192 Mbytes RAM

admin:utils dbrepl
admin:utils dbreplication run
admin:utils dbreplication runtimestate

Server Time: Thu Apr 8 03:04:02 PDT 2021

Cluster Replication State: BROADCAST SYNC ended at: 2021-04-07-01-03
 Sync Result: SYNC COMPLETED on 743 tables out of 743
 Sync Status: All Tables are in sync
 Use CLI to see detail: 'file view activelog cm/trace/dbl/20210407_010100_dbl_repl_output_Broadcast.log'

DB Version: ccm12_5_1_14900_63

Repltimeout set to: 300s
PROCESS option set to: 1

Cluster Detailed View from up-cucm-pub.ajcollab.com (2 Servers):

SERVER-NAME IP ADDRESS PING DB/RPC/ REPL. Replication REPLICATION SETUP

up-cucm-pub 192.168.126.1 0.017 Y/Y/Y 0 (g_2) (2) Setup Completed
up-cucm-sub01 192.168.126.2 0.328 Y/Y/Y 148 (g_3) (2) Setup Completed

admin:

```



---

### **3.2 Update the TFTP Server**

- The custom file content (Custom Firmware, Ring Tones, Backgrounds, etc.) of TFTP server won't be replicated to new TFTP Node after the upgrade
- Upload required files that was existed before in the cluster
- If you have two TFTP Server, you have to manually upload files to both nodes, DB Replication will not replicate Custom TFTP Files
- We know the previous TFTP contents from Step 1.8

### **3.3 Install other COP Files if needed**

- If you find some COP files are needed post the upgrade, you can go ahead and install it
- We know the previous COP file details from Step 1.9

# IP Phone Firmware Upgrade

The image shows two side-by-side browser windows. The left window is the 'Cisco Unified CM Administration' interface, displaying the configuration for a Cisco 9971 IP phone. The 'Phone Type' section shows 'Product Type: Cisco 9971' and 'Device Protocol: SIP'. The 'Real-time Device Status' section shows 'Registration: Registered with Cisco Unified Communications Manager' and 'Active Load ID: sip9971.9-4-2SR4-2'. The 'Device Information' section shows 'Device is Active' and 'Device is trusted'. The right window is the 'Cisco Software Download' page for 'Unified IP Phone 9971'. It shows the 'Release 9.4(2)SR4' and lists two firmware files: '9971 SIP IP Phone load signed COP file - Compatible CUCM Versions: 7.1(5)' and '9971 SIP IP firmware files only - Compatible CUCM Versions: 7.1(5)'. The first file is highlighted with a red box.

- On Cisco Downloads you will see 2 types of firmware files. '9971 SIP IP Phone load signed COP file' and '9971 SIP IP firmware files only'
- The first file is the standard firmware COP (Cisco Options Package) file that uses SFTP method of installation
- Second file is just the firmware files and uses manual upload method to CUCM TFTP Server

## COP File Based Firmware Upgrade

- Please note the Device Default Firmware from Device >> Device Settings >> Device Defaults
- COP Files must be installed on all CUCM TFTP Servers

The screenshot shows the Cisco Unified CM Administration console. The browser address bar indicates the URL is <https://192.168.21.1/ccmadmin/deviceDefaultsEdit.d>. The page title is "Cisco Unified CM Administration" and the user is logged in as "admin". The navigation menu includes System, Call Routing, Media Resources, Advanced Features, Device, Application, User Management, Bulk Administration, and Help. The "Device Defaults Configuration" page is active, showing a list of device models and their default SIP configurations. The row for "Cisco 9971" is highlighted with a red box.

Device Model	Protocol	Default SIP	Default	Standard
Cisco 8851	SIP	sip88xx.11-7-1-17	Default	Standard 8851 SIP
Cisco 8851NR	SIP	sip88xx.11-7-1-17	Default	Standard 8851NR SIP
Cisco 8861	SIP	sip88xx.11-7-1-17	Default	Standard 8861 SIP
Cisco 8865	SIP	sip8845_65.11-7-1-17	Default	Standard 8865 SIP
Cisco 8865NR	SIP	sip8845_65.11-7-1-17	Default	Standard 8865NR SIP
Cisco 8961	SIP	sip8961.9-4-2SR2-2	Default	Standard 8961 SIP
Cisco 9951	SIP	sip9951.9-4-2SR2-2	Default	Standard 9951 SIP
Cisco 9971	SIP	sip9971.9-4-2SR2-2	Default	Standard 9971 SIP
Cisco Cius	SIP		Default	Standard Cius SIP
Cisco Cius SP	SIP		Default	Standard Cius SP SIP
Cisco DX650	SIP		Default	Cisco DX650 SIP
Cisco DX70	SIP		Default	Cisco DX70 SIP
Cisco DX80	SIP		Default	Cisco DX80 SIP
Cisco TelePresence IX5000	SIP		Default	Cisco_TelePresence SIP

- COP Files or Device Pack installation on CUCM Publisher will override the default firmware, hence when the phone reboots, all the Phones will go for upgrade
- Here our CUCM PUB and TFTP are the same server, hence recommended to return the device default to old firmware after installing COP file on CUCM Publisher



- Only change the device default if it is necessary
- ***show tech devdefaults*** will give the complete list of default firmware from CLI

```

21_cucm-pub_192.168.21.1
VMware Installation:
 2 vCPU: Intel(R) Xeon(R) CPU E5-2643 v2 @ 3.50GHz
Disk 1: 80GB, Partitions aligned
4096 Mbytes RAM

admin:
admin:sho
admin:show tec
admin:show tech de
admin:show tech devdefaults
-----Show tech device defaults-----

Device Defaults
model_number loadinformation model_name protocol_name device_pool_name phone_template_name

1 Cisco 30 SP+ SCCP Default Standard 30 SP+
2 Cisco 12 SP+ SCCP Default Standard 12 SP+
3 Cisco 12 SP SCCP Default Standard 12 SP
4 Cisco 12 S SCCP Default Standard 12 S
5 Cisco 30 VIP SCCP Default Standard 30 VIP
6 P00405000700 Cisco 7910 SCCP Default Standard 7910
7 P0030801SR02 Cisco 7960 SCCP Default Standard 7960 SCCP
8 P053-8-12-00 Cisco 7960 SIP Default Standard 7960 SIP
9 P0030801SR02 Cisco 7940 SCCP Default Standard 7940 SCCP
10 P053-8-12-00 Cisco 7940 SIP Default Standard 7940 SIP
11 P00503021900 Cisco 7935 SCCP Default Standard 7935
12 Cisco VGC Phone SCCP Default Standard VGC Phone
13 Cisco VGC Virtual Phone SCCP Default Default VGC Virtual Phone Template
14 Cisco ATA 186 SCCP Default Standard ATA 186
15 A001C030 Analog Access Protocol Not Specified Default NULL
16 D001M022 Digital Access Protocol Not Specified Default NULL
17 D00303010033 Digital Access+ Protocol Not Specified Default NULL
18 D00404000032 Digital Access WS-X6608 Protocol Not Specified Default NULL
19 A00204000013 Analog Access WS-X6624 Protocol Not Specified Default NULL
20 Conference Bridge Protocol Not Specified Default NULL
21 C00104000003 Conference Bridge WS-X6608 Protocol Not Specified Default NULL
22 H.323 Phone SCCP Default NULL
23 Load Simulator Protocol Not Specified Default NULL
24 Media Termination Point Protocol Not Specified Default NULL
25 Media Termination Point Hardware Protocol Not Specified Default NULL
26 SCCP41.9-4-2SR3-15 Cisco 7941 SIP Default Standard 7941 SCCP
27 SIP41.9-4-2SR3-15 Cisco 7941 SIP Default Standard 7941 SIP
28 SCCP70.9-4-2SR3-15 Cisco 7971 SCCP Default Standard 7971 SCCP
29 SIP70.9-4-2SR3-15 Cisco 7971 SIP Default Standard 7971 SIP
30 MGCP Station Protocol Not Specified Default NULL
31 MGCP Trunk Protocol Not Specified Default NULL

```

Cisco Software Installation/Upgrade

<https://192.168.21.1/cmplatform/install.do>

Cisco Unified Operating System Administration
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go
admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

Software Installation/Upgrade

Cancel Next

Status

Status: Ready

Software Location

Source\* Remote Filesystem
Directory\* /upgrades
Server\* 192.168.11.1
User Name\* sftp.admin
User Password\*
Transfer Protocol\* SFTP
SMTP Server
Email Destination

Cancel Next

\*- indicates required item.

Software Installation/Upgrade X +

https://192.168.21.1/cmplatform/installOptions.do

**Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go

admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

**Software Installation/Upgrade**

Cancel Next

**Status**

Status: Ready

**Software Location**

Options/Upgrades\* cmterm-9971.9-4-2SR4-1.k3.cop.sgn

Cancel Next

\*- indicates required item.

Software Installation/Upgrade X +

https://192.168.21.1/cmplatform/installDownload.do

**Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go

admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

**Software Installation/Upgrade**

Cancel

**Status**

Downloading the file

**Download File**

File	cmterm-9971.9-4-2SR4-1.k3.cop.sgn
Directory	/upgrades
Server	192.168.11.1
User Name	sftp.admin
Download Status	34 MBytes

Cancel

\*- indicates required item.

Software Installation/Upgrade X +

https://192.168.21.1/cmplatform/installConfirm.do

**Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go

admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

**Software Installation/Upgrade**

Cancel Next

**Status**

**Warning:** To ensure the integrity of the installation file, please verify the MD5 hash value against the Cisco Systems web site

**Warning:** To ensure the integrity of the installation file, please verify the SHA512 value against the Cisco Systems web site

**Warning:** You may need to stop some services before you install a locale. You may then restart those services after you complete the locale installation. Refer to your product-specific online help for locale installation details.

**File Checksum Details**

File cmterm-9971.9-4-2SR4-1.k3.cop.sgn  
MD5 Hash Value c3:a7:c8:c3:9e:d4:b4:d8:a4:2a:7f:7f:d6:a9:92:55  
SHA512 Value

Cancel Next

i \*- indicates required item.

Software Installation/Upgrade X +

https://192.168.21.1/cmplatform/installStatus.do

**Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go

admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

**Software Installation/Upgrade**

Cancel

**Installation Status**

File cmterm-9971.9-4-2SR4-1.k3.cop.sgn  
Start Time Sat Apr 17 22:56:44 IST 2021  
Status Running

**Installation Log**

```
04/17/2021 22:55:49 upgrade_get_file.sh[Create md5 complete]<LVL::Info>
04/17/2021 22:55:49 upgrade_get_file.sh[Authenticate file "/common/download/cmterm-9971.9-4-2SR4-1.k3.cop.sgn"]<LVL::Info>
04/17/2021 22:55:50 upgrade_get_file.sh[File authentication complete]<LVL::Debug>
04/17/2021 22:55:50 upgrade_get_file.sh[Download of iso file RTMTFinish]<LVL::Notice>
04/17/2021 22:55:50 upgrade_get_file.sh[Process preflight]<LVL::Info>
04/17/2021 22:55:50 upgrade_get_file.sh[Skipping preflight since file type is COP]<LVL::Debug>
04/17/2021 22:55:51 upgrade_get_file.sh[success]<LVL::Info>
04/17/2021 22:55:51 upgrade_get_file.sh[upgrade_get_file.sh complete (rc=0)]<LVL::Info>
04/17/2021 22:55:51 upgrade_get_file.sh[is_upgrade_lock_available: Upgrade lock is not available.]<LVL::Debug>
04/17/2021 22:55:51 upgrade_get_file.sh[is_upgrade_in_progress: Already locked by this process (pid: 8483).]<LVL::Debug>
04/17/2021 22:55:51 upgrade_get_file.sh[release_upgrade_lock: Releasing lock (pid: 8483)]<LVL::Debug>
```

Cancel

i \*- indicates required item.

Software Installation/Upgrade

https://192.168.21.1/cmplatform/installStatus.do

Cisco

**Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation

Cisco Unified OS Administration

Go

admin

Search Documentation

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Show ▾ Settings ▾ Security ▾ Software Upgrades ▾ Services ▾ Help ▾

Software Installation/Upgrade

Install Another

Installation Status

File

cmterm-9971.9-4-2SR4-1.k3.cop.sgn

Start Time

Sat Apr 17 22:56:44 IST 2021

Status

Complete

Installation Log

/cm/db/loadinfo/load493.txt

UpdateLoadInfo: DSN=ccm\_super file:/usr/local/cm/db/loadinfo/load493.txt

updateLoadInfo rc[0]

installdb Success[-l]

[21/04/17\_22:56:53] locale\_install.sh: Publisher: Starting installdb...

/bin/su -l informix -s /bin/sh -c

"source /usr/local/cm/db/dblenv.bash /usr/local/cm ;

source /usr/local/cm/db/informix/local/ids.env ;

nice /usr/local/cm/bin/installdb -x /usr/local/cm/db/xml/xml"

Install Another

i

\*- indicates required item.

Device Defaults Configuration

Navigation Cisco Unified CM Administration Go

admin Search Documentation About Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

### Device Defaults Configuration

Save

Cisco 8845	SIP	sip8845_65.11-7-1-17		Default	Standard 8845 SIP
Cisco 8851	SIP	sip88xx.11-7-1-17		Default	Standard 8851 SIP
Cisco 8851NR	SIP	sip88xx.11-7-1-17		Default	Standard 8851NR SIP
Cisco 8861	SIP	sip88xx.11-7-1-17		Default	Standard 8861 SIP
Cisco 8865	SIP	sip8845_65.11-7-1-17		Default	Standard 8865 SIP
Cisco 8865NR	SIP	sip8845_65.11-7-1-17		Default	Standard 8865NR SIP
Cisco 8961	SIP	sip8961.9-4-2SR2-2		Default	Standard 8961 SIP
Cisco 9951	SIP	sip9951.9-4-2SR2-2		Default	Standard 9951 SIP
Cisco 9971	SIP	<div> <div>New firmware</div> <div> sip9971.9-4-2SR4-1 <div>Old firmware</div> </div> </div>		Default	Standard 9971 SIP
Cisco Cius	SIP			Default	Standard Cius SIP
Cisco Cius SP	SIP			Default	Standard Cius SP SIP
Cisco DX650	SIP			Default	Cisco DX650 SIP
Cisco DX70	SIP			Default	Cisco DX70 SIP
Cisco DX80	SIP			Default	Cisco DX80 SIP
Cisco TelePresence IX5000	SIP			Default	Cisco TelePresence IX5000

Save

\*- indicates required item.

- We could see that the Active Load ID is new firmware and inactive is old firmware. At this moment any 9971 Phone reboots, it goes for an upgrade. Let's flip the active and inactive load to make sure Active is always the old firmware



- Install the COP file on other CUCM TFTP Node

Device Defaults Configuration | Software Installation/Upgrade | Cisco Unified Operating System

https://192.168.21.2:8443/cmplatform/install.do

**Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified OS Administration | Go | admin | Search Documentation | About | Logout

Show | Settings | Security | Software Upgrades | Services | Help

### Software Installation/Upgrade

Cancel Next

**Status**

Status: Ready

**Software Location**

Source\*: Remote Filesystem  
 Directory\*: /upgrades  
 Server\*: 192.168.11.1  
 User Name\*: sftp.admin  
 User Password\*: .....  
 Transfer Protocol\*: SFTP  
 SMTP Server:  
 Email Destination:

Cancel Next

\*- indicates required item.

Device Defaults Configuration | Software Installation/Upgrade

https://192.168.21.2:8443/cmplatform/installStatus.do

**Cisco Unified Operating System Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified OS Administration | Go | admin | Search Documentation | About | Logout

Show | Settings | Security | Software Upgrades | Services | Help

### Software Installation/Upgrade

Install Another

**Installation Status**

File: cmterm-9971.9-4-2SR4-1.k3.cop.sgn  
 Start Time: Sat Apr 17 23:06:54 IST 2021  
 Status: Complete

**Installation Log**

```
/bin/chmod 770 dkern9971.100609R2-9-4-2SR4-1.sebn kern9971.9-4-2SR4-1.sebn roots9971.9-4-2SR4-1.sebn sboot9971.031610R1-9-4-2SR4-1.sebn
sip9971.9-4-2SR4-1.loads skern9971.022809R2-9-4-2SR4-1.sebn
/bin/chown ctfp:cmdbase dkern9971.100609R2-9-4-2SR4-1.sebn kern9971.9-4-2SR4-1.sebn roots9971.9-4-2SR4-1.sebn sboot9971.031610R1-9-4-2SR4-1.sebn
sip9971.9-4-2SR4-1.loads skern9971.022809R2-9-4-2SR4-1.sebn
/bin/cp -fp dkern9971.100609R2-9-4-2SR4-1.sebn kern9971.9-4-2SR4-1.sebn roots9971.9-4-2SR4-1.sebn sboot9971.031610R1-9-4-2SR4-1.sebn sip9971.9-4-2SR4-1.loads
skern9971.022809R2-9-4-2SR4-1.sebn /usr/local/cm/tftp

/bin/chmod 770 load493.txt
/bin/chown database:cmdbase load493.txt
/bin/cp -fp load493.txt /usr/local/cm/db/loadinfo
```

Install Another

\*- indicates required item.

- Now copy the new load name 'sip9971.9-4-2SR4-1' and populate in the 'Phone Load Name' of device page
- Save configurations and reboot the Phone to get the updated firmware

The screenshot shows the Cisco Unified CM Administration web interface. The top navigation bar includes the Cisco logo, the title 'Cisco Unified CM Administration', and a navigation dropdown menu. Below this is a breadcrumb trail: System > Call Routing > Media Resources > Advanced Features > Device > Application > User Management > Bulk Administration > Help. The main header area displays 'Phone Configuration' and 'Related Links: Back To Find/List'. A toolbar contains icons for Save, Delete, Copy, Reset, Apply Config, and Add New.

The left sidebar lists 31 configuration options, including 'Line [2] - Add a new DN', '98044260389', 'ryan.kwanten@ajcollab.com', '1450401304@abvp-gax1e-sandbox.webex.com', 'Add a new SD', 'Unassigned Associated Items', 'Add a new SD', 'All Calls', 'Add a new BLF Directed Call Park', 'Call Park', 'Call Pickup', 'CallBack', 'Group Call Pickup', 'Hunt Group Logout', 'Intercom [1] - Add a new Intercom', 'Malicious Call Identification', 'Meet Me Conference', 'Mobility', 'Other Pickup', 'Quality Reporting Tool', 'Redial', 'Add a new SURL', 'Add a new BLF SD', 'Answer Oldest', 'Do Not Disturb', 'Services', 'Record', 'Alerting Calls', 'Queue Status', 'Privacy', and 'None'.

The main content area is divided into two sections: 'Real-time Device Status' and 'Device Information'. The 'Real-time Device Status' section shows the device is registered with Cisco Unified Communications Manager cucm-sub01.ajcollab, with an IPv4 Address of 192.168.128.6, Active Load ID of sip9971.9-4-2SR2-2, Inactive Load ID of sip9971.9-4-2SR4-1, and Download Status of None. The 'Device Information' section shows the device is active and trusted, with a MAC Address of 84B517AF4C43, Description of 11002 - Abdul Jaseem, Device Pool of BANGALORE-PHONES-DEVICE-POOL, Common Device Configuration of < None >, Phone Button Template of Standard 9971 SIP, Softkey Template of Standard User, Common Phone Profile of Standard Common Phone Profile, Calling Search Space of BANGALORE-PHONE-CSS, AAR Calling Search Space of < None >, Media Resource Group List of SOFTWARE-MED-RES-GROUP-LIST, User Hold MOH Audio Source of 2-Dil-Kehta-Hai-MoH, Network Hold MOH Audio Source of 2-Dil-Kehta-Hai-MoH, Location of Hub\_None, AAR Group of < None >, User Locale of < None >, Network Locale of < None >, Built In Bridge of Default, Privacy of Default, Device Mobility Mode of Default, Owner of User, Owner User ID of abdul.jaseem, Mobility User ID of < None >, Phone Personalization of Default, Services Provisioning of Default, Phone Load Name of sip9971.9-4-2SR4-1 (highlighted with a red box), Use Trusted Relay Point of Default, BLF Audible Alert Setting (Phone Idle) of Default, and BLF Audible Alert Setting of Default.



Phone Configuration

https://192.168.21.1/ccmadmin/phoneEdit.do?key=7c8b24eb-b...

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration Go

admin | Search Documentation | About | Logout

System | Call Routing | Media Resources | Advanced Features | Device | Application | User Management | Bulk Administration | Help

Phone Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

1 Line [1] - 11002 in BANGALORE-INTERNAL-PT  
2 Line [2] - Add a new DN  
3 98044260389  
4 ryan.kwanten@ajcollab.com  
5 1450401304@abvp-gax1e-sandbox.webex.com  
6 Add a new SD  
----- Unassigned Associated Items -----  
7 Add a new SD  
8 All Calls  
9 Add a new BLF Directed Call Park  
10 Call Park  
11 Call Pickup  
12 CallBack  
13 Group Call Pickup  
14 Hunt Group Logout  
15 Intercom [1] - Add a new Intercom  
16 Malicious Call Identification  
17 Meet Me Conference  
18 Mobility  
19 Other Pickup

**Device Protocol: SIP**

**Real-time Device Status**

Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcollab.  
IPv4 Address: 192.168.128.6  
**Active Load ID: sip9971.9-4-2SR4-1**  
Inactive Load ID: sip9971.9-4-2SR2-2  
Download Status: None

**Device Information**

☒ Device is Active  
☒ Device is trusted  
MAC Address\*: 84B517AF4C43  
Description: 11002 - Abdul Jaseem  
Device Pool\*: BANGALORE-PHONES-DEVICE-POOL View Details  
Common Device Configuration: < None > View Details  
Phone Button Template\*: Standard 9971 SIP  
Softkey Template: Standard User  
Common Phone Profile\*: Standard Common Phone Profile View Details  
Calling Search Space: BANGALORE-PHONE-CSS  
AAR Calling Search Space: < None >  
Media Resource Group List: SOFTWARE-MED-RES-GROUP-LIST  
User Hold MOH Audio Source: 2-Dil-Kehta-Hai-MoH  
Network Hold MOH Audio Source: 2-Dil-Kehta-Hai-MoH  
Location\*: Hub None

17-04-2021 11:15 PM | 8056311002

**Phone Information**

Model Number: CP-9971 (Video)  
IPv4 Address: 192.168.128.6  
Host Name: SEP84B517AF4C43  
**Active Load: sip9971.9-4-2SR4-1**  
**Last Upgrade: 17-04-21 11:12p**  
Active Server: cucm-sub01.ajcollab.com  
Stand-by Server: cucm-sub02.ajcollab.com

Exit

- Now you can delete the values in the 'Phone Load Name' if needed
- The 'Phone Load Name' take preference over Device Default firmware name
- You can downgrade the firmware by giving the old firmware name on 'Phone Load Name'

## Firmware Files only Upgrade

- If you do not prefer this method, we can go for TFTP based firmware upgrade process. It doesn't require any SFTP Server
- This method never affects anything on the Device Defaults. Individual firmware files must be installed on all the CUCM TFTP Nodes

The image shows two side-by-side browser windows. The left window is the Cisco Unified CM Administration interface, displaying the configuration for a phone (Line 11001). The 'Device Information' tab is selected, showing details like MAC Address (501CB00C71D5), Description (11001 - Deepika Padukone), and various configuration options. The right window is the Cisco Software Download page for IP Phone 8865, showing the release 12.8(1)SR1. A red box highlights the download link for the file 'cmterm-8845\_65.12-8-1-0101-482.k3.cop.sgn'.

- The firmware files will be a Zipped folder, extract it and you will find multiple firmware file components. Each file must be uploaded one by one to all CUCM TFTP Servers

The image shows a Windows File Explorer window displaying the contents of a folder named 'cmterm-8845\_65.12-8-1-0101-482'. The files listed are:

Name	Date modified	Type	Size
fbi8845_65.BEV-01-006.sbn	12/10/2020 2:53 AM	SBN File	98 KB
kern8845_65.12-8-1-0101-482.sbn	12/10/2020 2:52 AM	SBN File	4,064 KB
rootfs8845_65.12-8-1-0101-482.sbn	12/10/2020 2:53 AM	SBN File	66,633 KB
sb28845_65.BEV-01-015.sbn	12/10/2020 2:52 AM	SBN File	423 KB
sip8845_65.12-8-1-0101-482.loads	12/10/2020 2:53 AM	LOADS File	2 KB
vc48845_65.12-8-1-0101-482.sbn	12/10/2020 2:53 AM	SBN File	4,938 KB

## Go to OS Administration >> Software Upgrades >> TFTP File Management

The screenshot shows the Cisco Unified Operating System Administration web interface. The browser address bar displays the URL: `https://192.168.21.1/cmplatform/tftpFindList.do?recCnt=0&colK...`. The page title is "Cisco Unified Operating System Administration" with the Cisco logo. The navigation bar includes "admin", "Search Documentation", "About", and "Logout". The main menu shows "Show", "Settings", "Security", "Software Upgrades", "Services", and "Help".

The "TFTP File Management" section is active, showing a status message: "1 records found". Below this, the "TFTP Files (1 - 1 of 1)" section displays a search filter. The filter is set to "File Name" contains "8845\_65" and "File Name" ends with ".loads". The "Find" button is highlighted. The search results table shows one file: "sip8845\_65.11-7-1-17.loads". The file name is highlighted in red, and a red text message "Only one Firmware Load Available as of now" is displayed next to it. The table also includes a "Directory" column with a "/" symbol. At the bottom, there are buttons for "Select All", "Clear All", "Delete Selected", and "Upload File".

**Status**  
1 records found

**TFTP Files (1 - 1 of 1)** Rows per Page: 50

Find TFTP Files where: File Name contains 8845\_65  
File Name ends with .loads Find Clear Filter + -

	File Name ^	Directory
<input type="checkbox"/>	sip8845_65.11-7-1-17.loads <i>Only one Firmware Load Available as of now</i>	/

Select All Clear All Delete Selected Upload File

TFTP File Management

https://192.168.21.1/cmplatform/tftpFindList.do?recCnt=0&col=...

Cisco Unified Operating System Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified OS Administration Go  
admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

TFTP File Management

Select All Clear All Delete Selected Upload File

Status  
1 records for

TFTP Files

Find TFTP Files wh

Select All

Upload File — Mozilla Firefox

https://192.168.21.1/cmplatform/tftpFileUpload.do

Upload File

Upload File Close

Status

Status: Ready

Upload File

Upload File Browse... No file selected

Directory

Upload File Close

File Upload

< > << Win-... > cmterm-8845\_65...

Search cmterm-8845\_65.12-8-...

Organize New folder

Name	Date modified	Type
fbi8845_65.BEV-01-006.sbn	12/10/2020 2:53 AM	SBN File
kern8845_65.12-8-1-0101-482.sbn	12/10/2020 2:52 AM	SBN File
rootfs8845_65.12-8-1-0101-482.sbn	12/10/2020 2:53 AM	SBN File
sb28845_65.BEV-01-015.sbn	12/10/2020 2:52 AM	SBN File
sip8845_65.12-8-1-0101-482.loads	12/10/2020 2:53 AM	LOADS F
vc48845_65.12-8-1-0101-482.sbn	12/10/2020 2:53 AM	SBN File

Select one by one and upload all files

File name: All Files (\*.\*)

Open Cancel

TFTP File Management

https://192.168.21.1/cmplatform/tftpFindList.do?recCnt=1&colCnt=...

Cisco Unified Operating System Administration

Navigation Cisco Unified OS Administration Go

admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

TFTP File Management

Select All Clear All Delete Selected Upload File

Status

2 records found

TFTP Files (1 - 2 of 2) Rows per Page 50

Find TFTP Files where

File Name contains 8845\_65

File Name ends with .loads

Find Clear Filter

	File Name	Directory
<input type="checkbox"/>	File Name	Directory
<input type="checkbox"/>	sip8845_65.11-7-1-17.loads	/
<input type="checkbox"/>	sip8845_65.12-8-1-0101-482.loads	/

New load available now

Select All Clear All Delete Selected Upload File

TFTP File Management

TFTP File Management

https://192.168.21.1/cmplatform/tftpFindList.do?recCnt=1&colCnt=...

Cisco Unified Operating System Administration

Navigation Cisco Unified OS Administration Go

admin | Search Documentation | About | Logout

Show Settings Security Software Upgrades Services Help

TFTP File Management

Select All Clear All Delete Selected Upload File

Status

2 records found

TFTP Files (1 - 2 of 2) Rows per Page 50

Find TFTP Files where

File Name contains 8845\_65

File Name ends with .loads

Find Clear Filter

	File Name	Directory
<input type="checkbox"/>	File Name	Directory
<input type="checkbox"/>	sip8845_65.11-7-1-17.loads	/
<input type="checkbox"/>	sip8845_65.12-8-1-0101-482.loads	/

Select All Clear All Delete Selected Upload File

- Restart Cisco TFTP Service on all TFTP Servers

Cisco Unified Serviceability - Control Center

Navigation: Cisco Unified Serviceability

admin | About | Logout

Alarm | Trace | Tools | Snmp | CallHome | Help

Control Center - Feature Services

Related Links: Service Activation

Start | Stop | Restart | Refresh Page

Status:

Cisco Tftp Service Restart Operation was Successful

Select Server:

Server: cucm-pub.ajcollab.com--CUCM Voice/Video

Performance and Monitoring Services

Service Name	Status:	Activation Status	Start Time	Up Time
Cisco Serviceability Reporter	Not Running	Deactivated		
Cisco CallManager SNMP Service	Not Running	Deactivated		

Directory Services

Service Name	Status:	Activation Status	Start Time	Up Time
Cisco DirSync	Started	Activated	Sat Apr 17 19:21:36 2021	0 days 04:22:31

CM Services

Service Name	Status:	Activation Status	Start Time	Up Time
Cisco CallManager	Not Running	Deactivated		
Cisco Unified Mobile Voice Access Service	Not Running	Deactivated		
Cisco IP Voice Media Streaming App	Started	Activated	Sat Apr 17 19:21:33 2021	0 days 04:22:34
Cisco CTIManager	Not Running	Deactivated		
Cisco Extension Mobility	Not Running	Deactivated		
Cisco DHCP Monitor Service	Not Running	Deactivated		
Cisco Intercluster Lookup Service	Started	Activated	Sat Apr 17 19:21:37 2021	0 days 04:22:30
Cisco Location Bandwidth Manager	Not Running	Deactivated		
Cisco Directory Number Alias Sync	Not Running	Deactivated		
Cisco Directory Number Alias Lookup	Not Running	Deactivated		
Cisco Dialed Number Analyzer Server	Started	Activated	Sat Apr 17 19:21:38 2021	0 days 04:22:29
Cisco Dialed Number Analyzer	Started	Activated	Sat Apr 17 19:25:08 2021	0 days 04:18:59
Cisco Tftp	Started	Activated	Sat Apr 17 23:43:57 2021	0 days 00:00:10

CTI Services

Service Name	Status:	Activation Status	Start Time	Up Time
Cisco IP Manager Assistant	Not Running	Deactivated		
Cisco WebDialer Web Service	Not Running	Deactivated		
Self Provisioning IVR	Not Running	Deactivated		

Voice Quality Reporter Services

- Now copy the load name without '.loads' and update in the Phone Load Name

The screenshot shows the Cisco Unified CM Administration web interface. The left sidebar contains a list of configuration options, including 'Line [1] - Add a new DN', 'Add a new SD', 'hrithik.roshan@abvp-gax1e-sandbox.webex.com', '1450401304@abvp-gax1e-sandbox.webex.com', 'Add a new SD', 'Alerting Calls', 'All Calls', 'Answer Oldest', 'Add a new BLF Directed Call Park', 'Call Park', 'Call Pickup', 'CallBack', 'Do Not Disturb', 'Group Call Pickup', 'Hunt Group Logout', 'Intercom [1] - Add a new Intercom', 'Malicious Call Identification', 'Meet Me Conference', 'Mobility', 'Other Pickup', 'Quality Reporting Tool', 'Queue Status', 'Redial', 'Add a new SURL', 'Services', 'Add a new BLF SD', and 'Privacy'.

The main content area displays the configuration for a specific line. The 'Registration' section shows the line is registered with Cisco Unified Communications Manager cucm-sub01.ajcolla. The 'Device Information' section shows the device is active and trusted, with a MAC address of 501CB00C71D5. The 'Phone Load Name' field is highlighted with a red box and contains the value 'sip8845\_65.12-8-1-0101-482'.

**Registration:** Registered with Cisco Unified Communications Manager cucm-sub01.ajcolla  
**IPv4 Address:** 192.168.128.2  
**Active Load ID:** sip8845\_65.11-7-1-17  
**Inactive Load ID:** sip8845\_65.12-8-1-0001-455  
**Download Status:** None

**Device Information**

- ☒ Device is Active
- ☒ Device is trusted
- MAC Address\*: 501CB00C71D5
- Description: 11001 - Deepika Padukone
- Device Pool\*: BANGALORE-PHONES-DEVICE-POOL [View Details](#)
- Common Device Configuration: < None > [View Details](#)
- Phone Button Template\*: Standard 8865 SIP
- Softkey Template: Standard User
- Common Phone Profile\*: Standard Common Phone Profile [View Details](#)
- Calling Search Space: BANGALORE-PHONE-CSS
- AAR Calling Search Space: < None >
- Media Resource Group List: SOFTWARE-MED-RES-GROUP-LIST
- User Hold MOH Audio Source: 2-Dil-Kehta-Hai-MoH
- Network Hold MOH Audio Source: 2-Dil-Kehta-Hai-MoH
- Location\*: Hub\_None
- AAR Group: < None >
- User Locale: < None >
- Network Locale: < None >
- Built In Bridge\*: Default
- Privacy\*: Default
- Device Mobility Mode\*: Default [View Current Device Mobility Settings](#)
- Wireless LAN Profile Group: < None > [View Details](#)
- Owner: ☒ User ☐ Anonymous (Public/Shared Space)
- Owner User ID\*: deepika.padukone
- Mobility User ID: < None >
- Phone Personalization\*: Default
- Services Provisioning\*: Default
- Phone Load Name: sip8845\_65.12-8-1-0101-482
- Use Trusted Relay Point\*: Default
- BLF Audible Alert Setting (Phone Idle)\*: Default
- BLF Audible Alert Setting: Default



Cisco Phone Configuration

<https://192.168.21.1/ccmadmin/phoneEdit.do?key=064a0b1f-e>

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Phone Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**  
Status: Ready

**Association**  
Modify Button Items  
1 Line [1] - 11001 in BANGALORE-INTERNAL-PT  
2 Line [2] - Add a new DN  
3 Add a new SD  
4 hrithik.roshan@abvp-gax1e-sandbox.webex.com  
5 1450401304@abvp-gax1e-sandbox.webex.com  
6 Add a new SD  
7 Add a new SD  
8 Add a new SD  
9 Add a new SD  
10 Add a new SD  
----- Unassigned Associated Items -----  
11 Add a new SD  
12 Alerting Calls  
13 All Calls  
14 Answer Oldest  
15 Add a new BLF Directed Call Park  
16 Call Park  
17 Call Pickup  
18 CallBack  
19 Do Not Disturb  
20 Group Call Pickup  
21 Hunt Group Logout  
22 Intercom [1] - Add a new Intercom  
23 Malicious Call Identification  
24 Meet Me Conference  
25 Mobility  
26 Other Pickup

**Phone Type**  
Product Type: Cisco 8865  
Device Protocol: SIP

**Real-time Device Status**  
Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcolla  
IPv4 Address: 192.168.128.2  
Active Load ID: sip8845\_65.12-8-1-0101-482  
Inactive Load ID: sip8845\_65.11-7-1-17  
Download Status: Successful

**Device Information**  
☒ Device is Active  
☒ Device is trusted  
MAC Address\* 501CB00C71D5  
Description 11001 - Deepika Padukone  
Device Pool\* BANGALORE-PHONES-DEVICE-POOL View Details  
Common Device Configuration < None > View Details  
Phone Button Template\* Standard 8865 SIP  
Softkey Template Standard User  
Common Phone Profile\* Standard Common Phone Profile View Details  
Calling Search Space BANGALORE-PHONE-CSS  
AAR Calling Search Space < None >  
Media Resource Group List SOFTWARE-MED-RES-GROUP-LIST  
User Hold MOH Audio Source 2-Dil-Kehta-Hai-MoH  
Network Hold MOH Audio Source 2-Dil-Kehta-Hai-MoH  
Location\* Hub\_None  
AAR Group < None >  
User Locale < None >  
Network Locale < None >  
Built In Bridge\* Default  
Privacy\* Default  
Device Mobility Mode\* Default View Current Device Mobility Settings  
Wireless LAN Profile Group < None > View Details  
Owner ☒ User ☐ Anonymous (Public/Shared Space)

Before Upgrade

Phone information  
Model number CP-8865  
IPv4 address 192.168.128.2  
Host name SEP501CB00C71D5  
Active load sip8845\_65.11-7-1-17  
Last upgrade 19-03-21 11:11am  
Exit Report problem

During Upgrade

DP 8056311001 17 Apr 11:53 PM  
11001 - Deepika Padukone  
Ready to upgrade  
Device will restart in 10 seconds.  
Now Delay

After Upgrade

Phone information  
Model number CP-8865  
IPv4 address 192.168.128.2  
Host name SEP501CB00C71D5  
Active load sip8845\_65.12-8-1-0101-482  
Last upgrade 17-04-21 11:53pm  
Exit Report problem



---

## Installing Device Packs

- CUCM Device Pack is a packaged firmware for multiple devices, some old versions of CUCM, it enables latest phone model support as well
- This can be installed only via SFTP method, make sure you take the Device Default values before installing Device Pack since Device Pack will update many default firmware
- Device Pack has to be installed on all CUCM Nodes (Publisher and Subscribers) and a Cluster wide reboot is also need in many situations (Read the documentation of Device Pack to know more about the Reboot)
- It is just like another COP file installation; I'm not adding the steps here since we are much familiar with COP file installation
- List Device Pack for CUCM 11.5 available here: [CUCM 11.5 Device Packs](#)

---

## **Chapter 2 - Expressway**

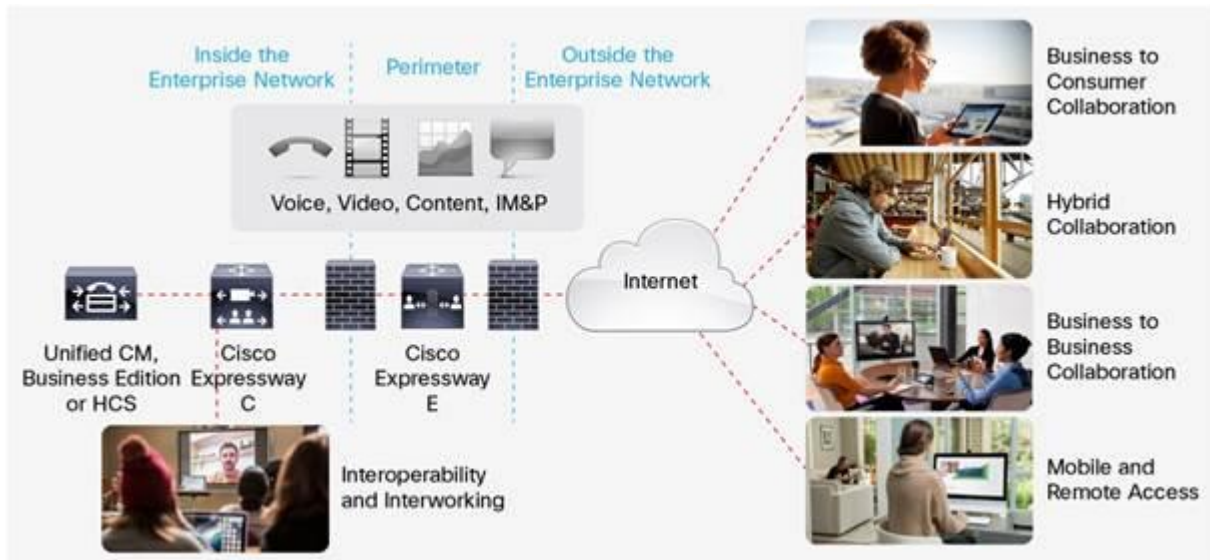
### **Cisco Edge Collaboration Solution**

### **Cisco VCS or Expressway Series**



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## Cisco Expressway



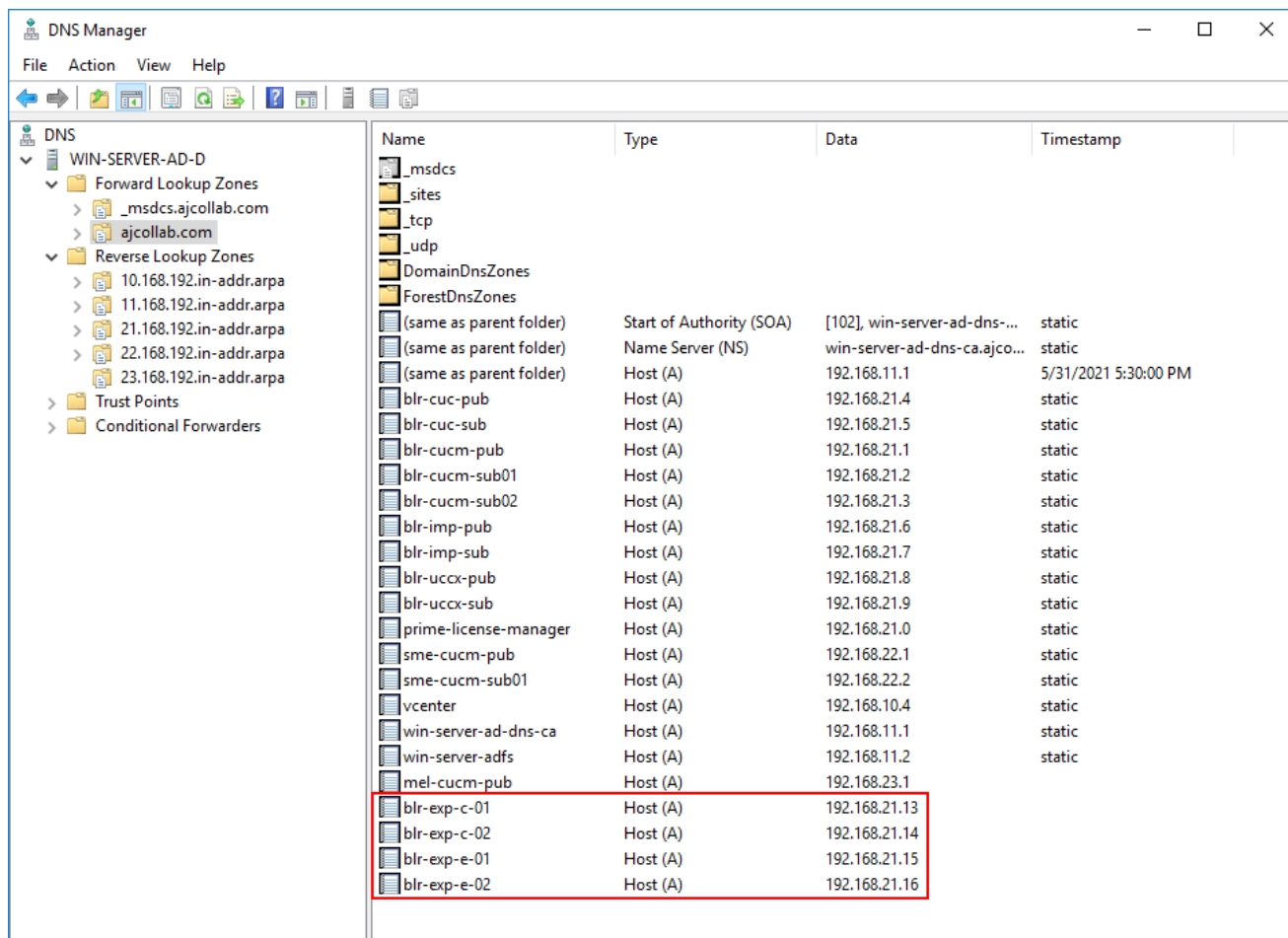
- It enables simple and safe, session-based collaboration outside your firewall - without extra registration, accounts, passwords, or VPN
- Cisco Expressway provides mobile users and guests with unlimited access to all collaboration workloads, including video, voice, instant messaging and content sharing, and thus companies with the opportunity to improve and extend their organizational reach and collaboration with external employees, customers, or partners
- Cisco Expressway supports a wide range of IP phones, endpoints, smartphones, tablets, and provides video interoperability with standards-based H.323, H.264 SVC, or SIP systems
- Older name of was VCS (Video Communication Server), it can do end point registration and firewall traversal
- Cisco removed the endpoint registration capability and released the same product in different name called Expressway. Primary use was just firewall traversal
- Prior to X8.9, we can't register any devices in Expressway, but now (post X8.9) there is no difference in VCS and Expressway in terms of functionality. Expressway can do device registration and firewall traversal. There is a slight difference in the licensing
- VCS is a full-featured call control system that can interface with many kinds of system. The Expressway Series shares many VCS features, but is more appropriate for deployments where Cisco Unified Communications Manager is managing the call control

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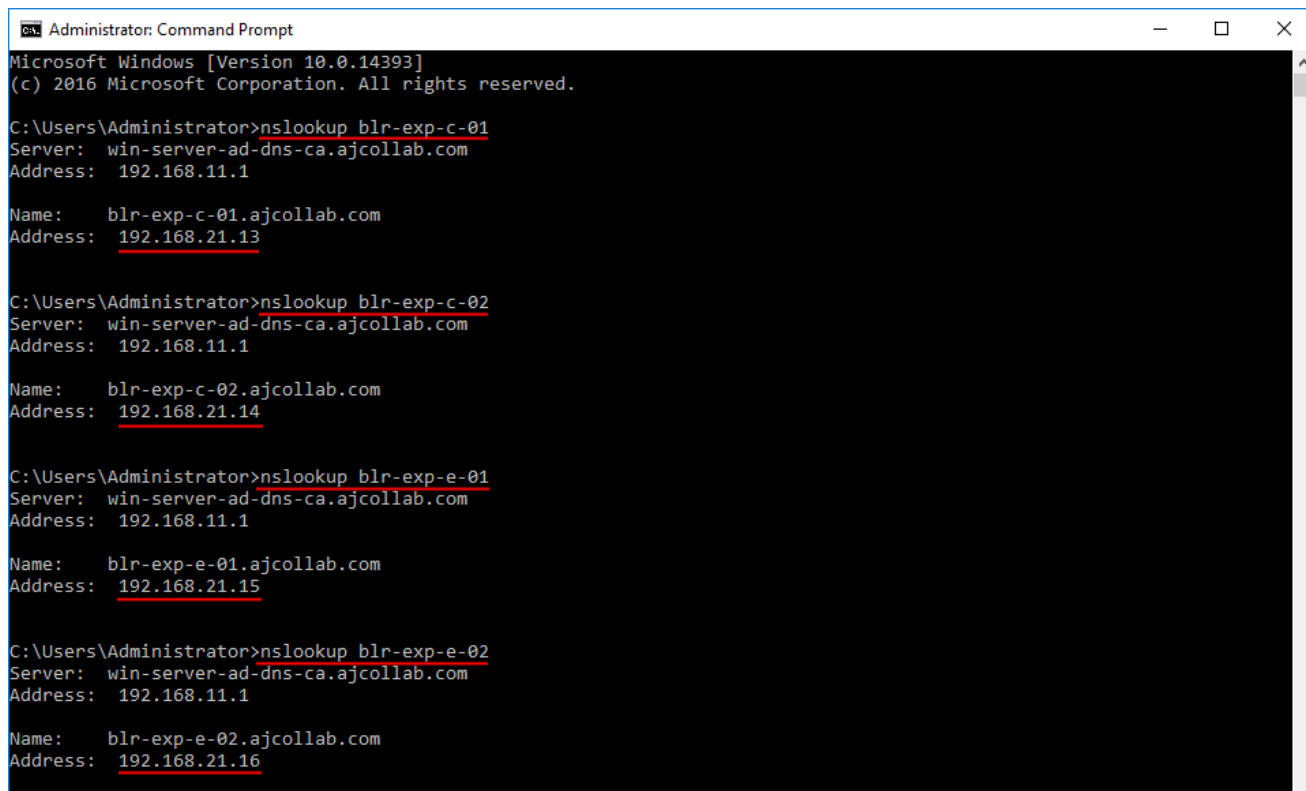
## **Type of calls in Expressway**

- B2B (Business to Business) Calls: One domain to another domain calls
- MRA (Mobile and Remote Access)
- Microsoft Integration (Skype for Business)
- Hybrid Calls (Cisco Meeting Server - CMS)

## [Lab] DNS Entries for Expressway Series Servers



Name	Type	Data	Timestamp
(same as parent folder)	Start of Authority (SOA)	[102], win-server-ad-dns-...	static
(same as parent folder)	Name Server (NS)	win-server-ad-dns-ca.ajco...	static
(same as parent folder)	Host (A)	192.168.11.1	5/31/2021 5:30:00 PM
blr-cuc-pub	Host (A)	192.168.21.4	static
blr-cuc-sub	Host (A)	192.168.21.5	static
blr-cucm-pub	Host (A)	192.168.21.1	static
blr-cucm-sub01	Host (A)	192.168.21.2	static
blr-cucm-sub02	Host (A)	192.168.21.3	static
blr-imp-pub	Host (A)	192.168.21.6	static
blr-imp-sub	Host (A)	192.168.21.7	static
blr-ucxx-pub	Host (A)	192.168.21.8	static
blr-ucxx-sub	Host (A)	192.168.21.9	static
prime-license-manager	Host (A)	192.168.21.0	static
sme-cucm-pub	Host (A)	192.168.22.1	static
sme-cucm-sub01	Host (A)	192.168.22.2	static
vcenter	Host (A)	192.168.10.4	static
win-server-ad-dns-ca	Host (A)	192.168.11.1	static
win-server-adsfs	Host (A)	192.168.11.2	static
mel-cucm-pub	Host (A)	192.168.23.1	
blr-exp-c-01	Host (A)	192.168.21.13	
blr-exp-c-02	Host (A)	192.168.21.14	
blr-exp-e-01	Host (A)	192.168.21.15	
blr-exp-e-02	Host (A)	192.168.21.16	



```
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>nslookup blr-exp-c-01
Server: win-server-ad-dns-ca.ajcollab.com
Address: 192.168.11.1

Name: blr-exp-c-01.ajcollab.com
Address: 192.168.21.13

C:\Users\Administrator>nslookup blr-exp-c-02
Server: win-server-ad-dns-ca.ajcollab.com
Address: 192.168.11.1

Name: blr-exp-c-02.ajcollab.com
Address: 192.168.21.14

C:\Users\Administrator>nslookup blr-exp-e-01
Server: win-server-ad-dns-ca.ajcollab.com
Address: 192.168.11.1

Name: blr-exp-e-01.ajcollab.com
Address: 192.168.21.15

C:\Users\Administrator>nslookup blr-exp-e-02
Server: win-server-ad-dns-ca.ajcollab.com
Address: 192.168.11.1

Name: blr-exp-e-02.ajcollab.com
Address: 192.168.21.16
```

Note: You may find some screenshots without 'blr' in the hostname, those are taken from my old lab.

## [Lab] Deploy Expressways

- Expressway C and E uses same software, initialization and License makes it Edge or Core
- While deploying we use same OVA file for Expressway E and C
- Download the OVA from Cisco downloads

The screenshot shows the Cisco Software Download page for Expressway X12.7.1. The page is titled "Software Download" and includes a navigation bar with links to Products & Services, Support, How to Buy, Training & Events, and Partners. The breadcrumb trail indicates the path: Downloads Home / Unified Communications / Communications Gateways / Expressway Series / Expressway / TelePresence Software- X12.7.1.

On the left sidebar, the "Latest Release" section shows "X12.7.1" as the selected version. Below it, a list of other versions is visible: X8.11.4, All Release, X12, X12.7.1, X12.7.0, X12.6.4, X12.6.3, X12.6.2, X12.6.1, X12.6.0, and X12.5.9.

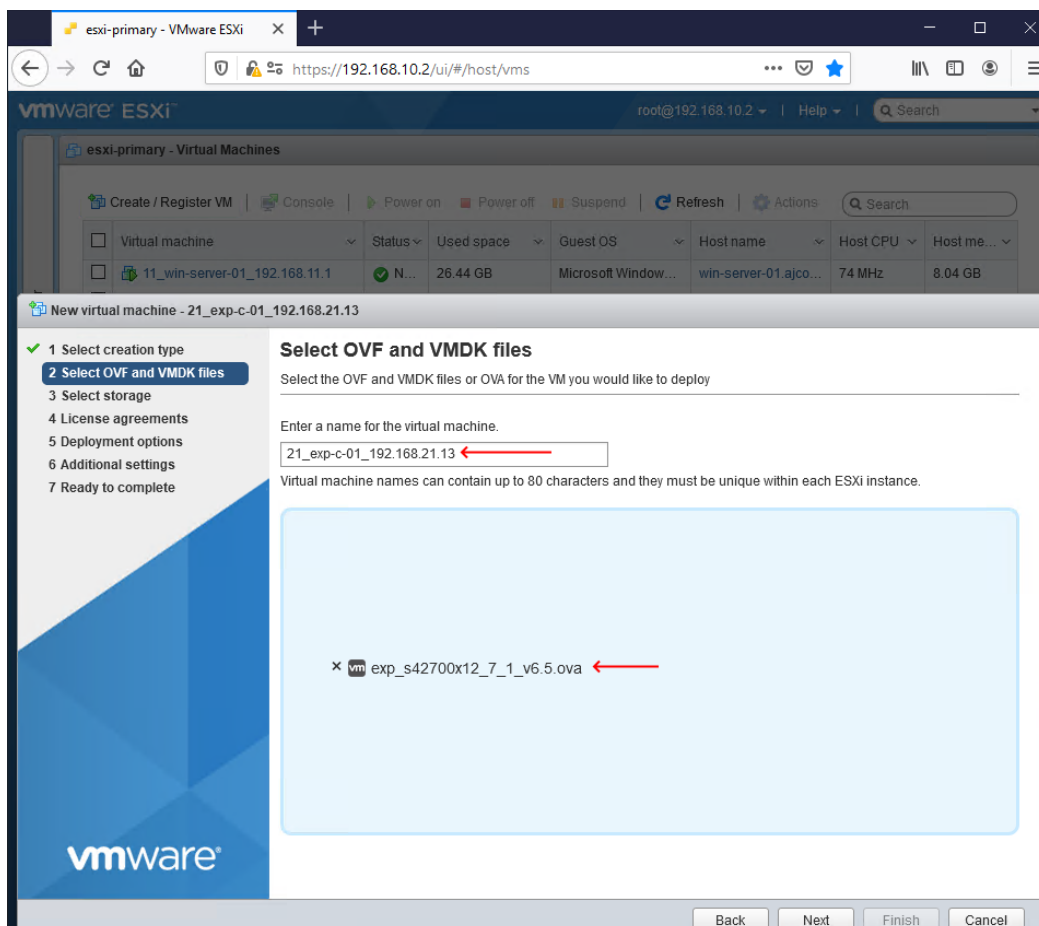
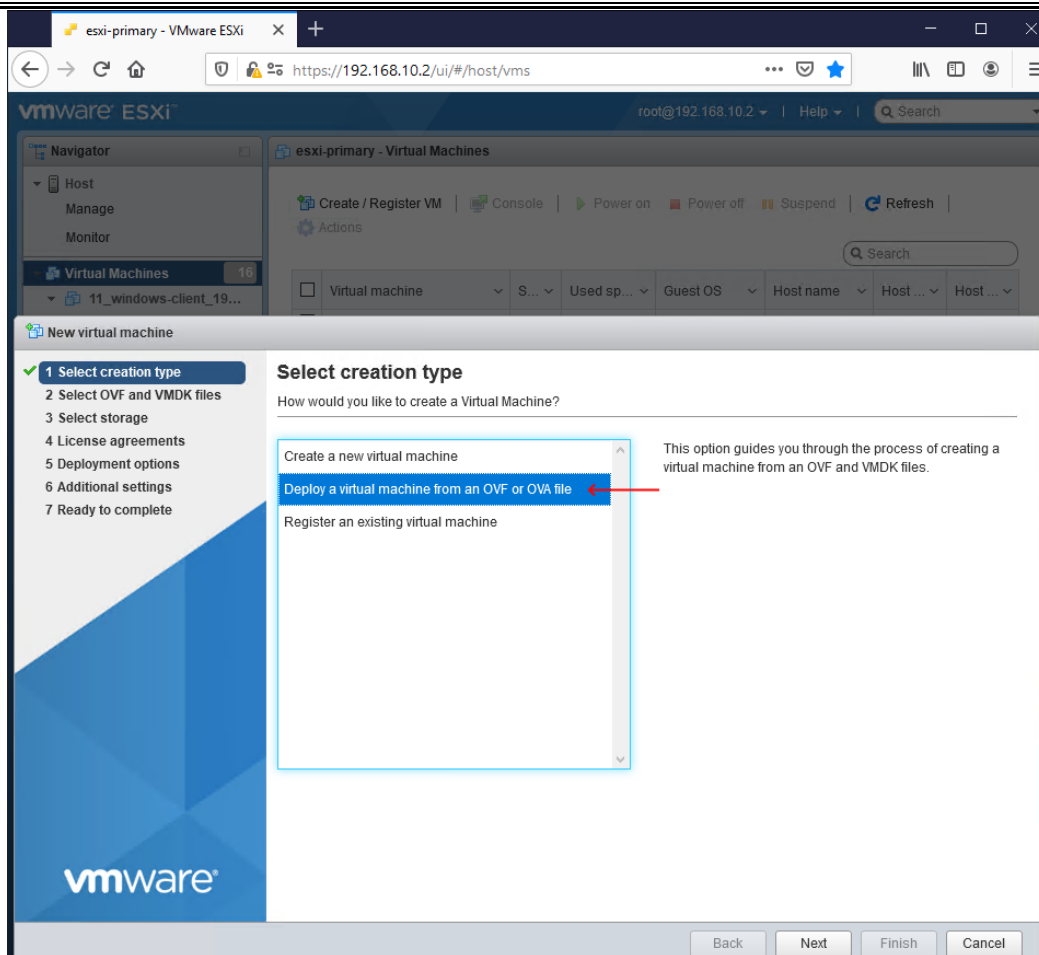
The main content area is titled "Expressway" and shows "Release X12.7.1". It includes a "My Notifications" link and a "Related Links and Documentation" section with a link to "Release Notes for X12.7.1".

A yellow warning box contains the following text: "NOTE: X12.6.1 introduces changes to the TURN service on Expressway. If you are running CMS ver 2.9.2 or earlier and using Expressway as a TURN server, your WebRTC connections will be affected. Please read the Expressway X12.6.1 Release Notes for more information."

Below the warning box is a table with the following columns: File Information, Release Date, Size, and download icons. The table lists three files:

File Information	Release Date	Size	Download Icons
Cisco TelePresence Video Communication Server and Expressway series - X12.7.1 VM version for VSphere Clients 6.0 and earlier - use .ova for initial VM install only. <a href="#">s42700x12_7_1.ova</a>	03-Feb-2021	634.79 MB	<a href="#">Download</a> <a href="#">Add to Cart</a>
Cisco TelePresence Video Communication Server and Expressway series - X12.7.1. <a href="#">s42700x12_7_1.tar.gz</a>	03-Feb-2021	581.52 MB	<a href="#">Download</a> <a href="#">Add to Cart</a>
Cisco TelePresence Video Communication Server and Expressway series - X12.7.1 VM version for VSphere Clients 6.5 - use .ova for initial VM install only. <a href="#">s42700x12_7_1_v6.5.ova</a>	03-Feb-2021	634.79 MB	<a href="#">Download</a> <a href="#">Add to Cart</a>

The third row, which includes the OVA file for VSphere Clients 6.5, is highlighted with a red box.



New virtual machine - 21\_exp-c-01\_192.168.21.13

- ✓ 1 Select creation type
- ✓ 2 Select OVF and VMDK files
- ✓ 3 Select storage
- 4 License agreements
- 5 Deployment options
- 6 Additional settings
- 7 Ready to complete

## Select storage

Select the storage type and datastore

Standard Persistent Memory

Select a datastore for the virtual machine's configuration files and all of its' virtual disks.

Name	Capacity	Free	Type	Thin pro...	Access
datastore1	1.08 TB	748.48 GB	VMFS5	Supported	Single
datastore2	1.09 TB	1.05 TB	VMFS5	Supported	Single

2 items

Back Next Finish Cancel

New virtual machine - 21\_exp-c-01\_192.168.21.13

- ✓ 1 Select creation type
- ✓ 2 Select OVF and VMDK files
- ✓ 3 Select storage
- 4 License agreements
- 5 Deployment options
- 6 Additional settings
- 7 Ready to complete

## License agreements

Read and accept the license agreements

An end-user licens...

End User License Agreement

IMPORTANT: PLEASE READ THIS END USER LICENSE AGREEMENT CAREFULLY. IT IS VERY IMPORTANT THAT YOU CHECK THAT Y  
CISCO SYSTEMS, INC. OR ITS SUBSIDIARY LICENSING THE SOFTWARE INSTEAD OF CISCO SYSTEMS, INC. (« CISCO ») IS W  
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Term and Termination. The Agreement and the license granted herein shall remain effective until terminated.  
Customer Records. Customer grants to Cisco and its independent accountants the right to examine Customer's b

I agree

Back Next Finish Cancel



New virtual machine - 21\_exp-c-01\_192.168.21.13

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 License agreements
- 5 Deployment options**
- 6 Additional settings
- 7 Ready to complete

### Deployment options

Select deployment options

Network mappings	VM Network	VM Network
Deployment type	Small (e.g. BE 6000) <small>Cisco Expressway/VCS Base small configuration (for example BE 6000 platform) Details: CPU: 2 vCPU with 3600 MHz reservation Memory: 4 GB with 4 GB reservation</small>	
Disk provisioning	<input checked="" type="radio"/> Thin <input type="radio"/> Thick <i>In production deployment, use 'Thick'</i>	
Power on automatically	<input checked="" type="checkbox"/>	

Back Next Finish Cancel

New virtual machine - 21\_exp-c-01\_192.168.21.13

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 License agreements
- 5 Deployment options
- 6 Additional settings**
- 7 Ready to complete

IPv4 Enable	<input checked="" type="checkbox"/>
IPv4 Address	192.168.21.13
IPv4 Netmask	255.255.252.0
IPv4 Gateway	192.168.0.1
IPv6 Enable	<input type="checkbox"/>
IPv6 Address	
IPv6 Gateway	
Dedicated Management Interface (DMI) Enable	<input type="checkbox"/>
DMI IPv4 Address	<i>Used for Dedicated Management Interface, LAN3</i>
DMI IPv4 Netmask	
DMI IPv6 Address	
System Hostname	exp-c-01
System Domain Name	ajcollab.com
NTP Servers	192.168.31.1
Default DNS Servers	192.168.11.1

System properties Click to expand

Back Next Finish Cancel

Note: If you miss to configure IP here, you can do in in the vmware console after the VM boot up

New virtual machine - 21\_exp-c-01\_192.168.21.13

1 Select creation type

2 Select OVF and VMDK files

3 Select storage

4 License agreements

5 Deployment options

6 Additional settings

7 Ready to complete

Ready to complete

Review your settings selection before finishing the wizard

Product	Cisco Expressway/VCS Base
VM Name	21_exp-c-01_192.168.21.13
Files	s42700x12_7_1_v6.5_signed-disk1.vmdk s42700x12_7_1_v6.5_signed-disk2.vmdk
Datastore	datastore1
Provisioning type	Thin
Network mappings	VM Network: VM Network
Guest OS Name	Unknown
Profile	Cisco Expressway/VCS Base small configuration (for example BE 6000 platform) Details: CPU: 2 vCPU with 3600 MHz reservation Memory: 4 GB with 4 GB reservation
Properties	Click to expand

Do not refresh your browser while this VM is being deployed.

Back

Next

Finish

Cancel

esi-primary - VMware ESXi

https://192.168.10.2/ui/#/host/vms/19

Virtual Machines

21\_exp-c-01\_192.168.21.13

21\_exp-c-01\_192.168.21.13

Other (32-bit)

ESXi 6.8 virtual machine

2 CPUs

4 GB Memory

0 B VM Tools

2 disks

2.09 KB Storage

General Information

Guest OS

Other (32-bit)

VMware Tools

VMware Tools is not installed

Storage

2 disks

Notes

Cisco Expressway/VCS Base

Hardware Configuration

CPU

2 vCPUs

Memory

4 GB

Hard disk 1

4.13 GB

Hard disk 2

128 GB

Recent tasks

Task	Target	Initiator	Queued	Started	Result	Completed
Upload disk - v42700x1...	21_exp-c-01...	root	03/10/2021	03/10/2021	Completed success...	03/10/2021
Upload disk - v42700x1...	21_exp-c-01...	root	03/10/2021	03/10/2021	Completed success...	03/10/2021
Import VApp	Resources	root	03/10/2021	03/10/2021	Running...	4...

esi-primary - VMware ESXi

https://192.168.10.2/ui/#/host/vms/19

Virtual Machines

21\_exp-c-01\_192.168.21.13

21\_exp-c-01\_192.168.21.13

Other (32-bit)

ESXi 6.8 virtual machine

2 CPUs

4 GB Memory

0 B VM Tools

2 disks

2.09 KB Storage

General Information

Guest OS

Other (32-bit)

VMware Tools

VMware Tools is not installed

Storage

2 disks

Notes

Cisco Expressway/VCS Base

Hardware Configuration

CPU

2 vCPUs

Memory

4 GB

Hard disk 1

4.13 GB

Hard disk 2

128 GB

Recent tasks

Task	Target	Initiator	Queued	Started	Result	Completed
Reconfig VM	21_exp-c-01...	root	03/10/2021	03/10/2021	Completed success...	03/10/2021
Power On VM	21_exp-c-01...	root	03/10/2021	03/10/2021	Completed success...	03/10/2021
Import VApp	Resources	root	03/10/2021	03/10/2021	Completed success...	03/10/2021
Upload disk - v42700x1...	21_exp-c-01...	root	03/10/2021	03/10/2021	Completed success...	03/10/2021
Upload disk - v42700x1...	21_exp-c-01...	root	03/10/2021	03/10/2021	Completed success...	03/10/2021

866

esxi-primary - VMware ESXi

https://192.168.10.2/ui/#/host/vms/19

root@192.168.10.2 | Help | Search

Host

Manage

Monitor

Virtual Machines

17

21\_exp-c-01\_192.168.2...

Monitor

11\_windows-client\_19...

22\_sme-cucm-pub\_19...

31\_cube02\_192.168.31.2

31\_cube01\_192.168.31.1

21\_imp-pub\_192.168.2...

21\_imp-sub\_192.168.2...

21\_cuc-pub\_192.168.2...

21\_cuc-sub\_192.168.2...

21\_cucm-pub\_192.168...

21\_cucm-sub01\_192.1...

21\_cucm-sub02\_192.1...

More VMs...

Storage

2

Networking

1

21\_exp-c-01\_192.168.21.13

21\_exp-c-01\_192.168.21.13

EXT4-fs (loop20): mounted filesystem without journal. Opts: (null)

Starting hwcheck

Starting taacrypto

Bringing up loopback interface

Starting syslog-ng

Starting vmttoolsd

\*\*\*\*\*

Installation Wizard for Cisco Expressway/UCS Base

If you encounter issues or enter incorrect information during the wizard you can press Ctrl+D to restart

Serial number: 00BA8B33

Some questions may also support Tab completion

\*\*\*\*\*

Root password:

Please confirm the password:

Admin password:

Please confirm the password:

\*\*\*\*\*

Installation wizard complete

Press Enter to continue the boot and apply the configuration

Notes

Cisco Expressway/VCS Base

Edit notes

Performance summary last hour

Consumed host CPU

Ready

Consumed host memory...

100

80

60

40

ost CPU / Ready (%)

4

3

2

Consumed host m

Recent tasks

Task	Target	Initiator	Queued	Started	Result	Comple...
Reconfig VM	21_exp-c-01...	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...
Power On VM	21_exp-c-01...	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...
Import VApp	Resources	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...
Upload disk - s42700x1...	21_exp-c-01...	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...
Upload disk - s42700x1...	21_exp-c-01...	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...

https://192.168.10.2/ui/#/host/vms/4

esxi-primary - VMware ESXi

https://192.168.10.2/ui/#/host/vms/19

root@192.168.10.2 | Help | Search

Host

Manage

Monitor

Virtual Machines

17

21\_exp-c-01\_192.168.2...

Monitor

11\_windows-client\_19...

22\_sme-cucm-pub\_19...

31\_cube02\_192.168.31.2

31\_cube01\_192.168.31.1

21\_imp-pub\_192.168.2...

21\_imp-sub\_192.168.2...

21\_cuc-pub\_192.168.2...

21\_cuc-sub\_192.168.2...

21\_cucm-pub\_192.168...

21\_cucm-sub01\_192.1...

21\_cucm-sub02\_192.1...

More VMs...

Storage

2

Networking

1

21\_exp-c-01\_192.168.21.13

21\_exp-c-01\_192.168.21.13

Hint: Num Lock on

```

cisco login: Starting selinux
Starting hostname
Starting sysctl
Mounting haddisks
Bringing up loopback interface
ifup: interface lo already configured
Create default server certificate, CA certificate and key.
log4cxx: No appender could be found for logger (developer.systemresources).
log4cxx: Please initialize the log4cxx system properly.
Starting menuaker
Starting hwcheck
Starting requestd
Service taacrypto already running. Not starting.
Configuring iptablesd
'/tandberg/persistent/iptables.conf' configuration file not found
'/tandberg/persistent/ip6tables.conf' configuration file not found
iptables initialization completed
Configuring packages after upgrade.
EXT4-fs (sda5): re-mounted. Opts: (null)
EXT4-fs (sda5): re-mounted. Opts: (null)

```

Notes

Cisco Expressway/VCS Base

Edit notes

Performance summary last hour

Consumed host CPU

Ready

Consumed host memory...

100

80

60

40

4

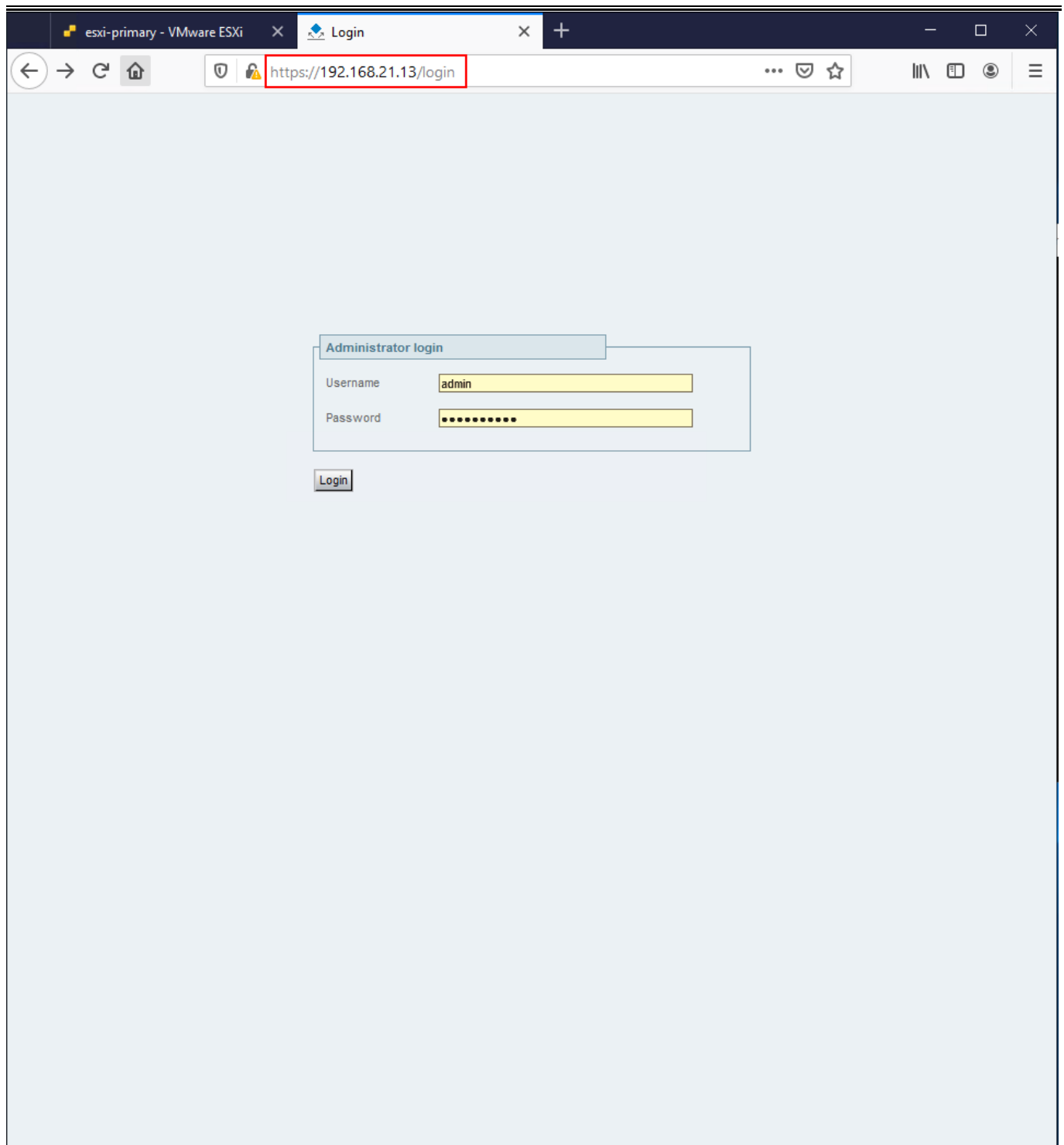
3

2

Consumed host m...

Recent tasks

Task	Target	Initiator	Queued	Started	Result	Comple...
Reconfig VM	21_exp-c-01...	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...
Power On VM	21_exp-c-01...	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...
Import VApp	Resources	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...
Upload disk - s42700x1...	21_exp-c-01...	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...
Upload disk - s42700x1...	21_exp-c-01...	root	03/10/2021 ...	03/10/2021 ...	Completed succes...	03/10/2021 ...



- I have deployed 4 OVAs and will be converting 2 to Expressway C and other 2 to Expressway E

---

## Different Types of License Expressway - C

- After deploying the Expressway OVA, we need to license it. Licenses are in the form of options keys
- Below are some major options keys used in Expressway C

License Name	Purpose
LIC-EXP-RMS	Expressway Rich Media Session – For specific calls like B2B and LYNC integration
LIC-EXP-ROOM	Enable the registration of Room endpoints to the Expressway-C. Remote devices are proxied to Expressway-C by Expressway-E
LIC-EXP-DSK	Enable the registration of Desk endpoints to the Expressway-C. Remote devices are proxied to Expressway-C by Expressway-E
LIC-EXP-GW	Enable GW Feature (H323-SIP) – For H323-SIP interworking
LIC-EXP-MSFT	Microsoft Interoperability Option – For LYNC integration

## Different Types of License Expressway - E

- Below are some major options keys used in Expressway E

License Name	Purpose
LIC-EXP-RMS	Expressway Rich Media Session – For specific calls like B2B and LYNC integration
LIC-EXP-AN	Enable Advanced Networking Option – Enable Dual-NIC and Static NAT address

## [Lab] Initializing and Licensing Expressway - C

exp-primary - VMware ESX | exp-c-01 - Welcome to Cisco C | +

https://192.168.21.13/serviceselect

**Cisco Expressway/VCS Base**

Welcome to Cisco Collaboration services [Help](#) [Logout](#)

Select Series

Expressway series ☒ [←](#)

VCS series ☐

Select Type

Expressway-C ☒ [←](#)

Expressway-E ☐

Select Services

After you select services, you get a simplified menu that is relevant to your selection. ⓘ

Cisco Webex Hybrid Services ☐

Mobile and Remote Access including Meeting Server ☐

Web Proxy ☐

Jabber Guest services ☐

Microsoft gateway service ☐

Registrar ☐

Collaboration Meeting Rooms (CMR) Cloud ☐

Business to business calls ☐

If you proceed without selecting services, you will get the full menu.

Proceed without selecting services ☒ Does not select services or simplify the interface

[Skip Service Setup Wizard](#) [Continue](#) [←](#)

User: admin Access: Read-write System host name: exp-c-01 System time: 15:02 UTC Language: en\_US S/N: **00BA8B33** Version: X12.7.1

exp-primary - VMware ESX | exp-c-01 - Option keys | +

https://192.168.21.13/optionkeysetup

**Cisco Expressway/VCS Base**

Option keys ⓘ

You've licensed this system correctly for the services you selected. Click Continue to go to configuration

Licensing help

Serial number **00BA8B33**

How to get licenses

You need this system's serial number to order keys. Go to the [Product License Registration Portal](#), and load your PAK (Product Authorization Key). Inside your PAK you have one or more Product Identifiers (PDs) that are named like the examples shown in the License status section further down this page. Select the PDs that you need from the ones in the PAK, by looking at the examples shown in the **Required** section of the License status below. When you've selected PDs, click Assign to device and enter the serial number from this page. When you click Finish, you'll get an email with the keys you need. Paste all the email text into this page so the system can read the keys for you. If you generate more than one email from the licensing portal, you can add new paste areas.

License status

Based on the services you have selected:

Description	License PID example	Status
Rich Media Sessions	LIC-EXP-RMS	Not loaded
Microsoft Interoperability	LIC-EXP-MSFT	Not loaded
H323-SIP Interworking Gateway	LIC-EXP-GW	Not loaded
FindMe	LIC-VCS-FNDME	Not loaded

Apply keys

Paste the text from your option keys email here

[Add keys](#) [New paste area](#)

**Installing 10 RMS License**

[Back](#) [Skip Service Setup Wizard](#) [Continue](#)

User: admin Access: Read-write System host name: exp-c-01 System time: 15:08 UTC Language: en\_US S/N: 00BA8B33 Version: X12.7.1

exp-c-01 - Confirm core config

https://192.168.21.13/coreinformation

**Cisco Expressway/VCS Base**

**Confirm core configuration** [Help](#) [Logout](#)

**IP**

IP protocol IPv4 ⓘ

IPv4 address 192.168.21.13 ⓘ

IPv4 subnet mask 255.255.128.0 ⓘ

IPv4 gateway 192.168.0.1 ⓘ

[Configure IP on IP page instead](#)

**Credentials**

Your current password Password has been set

Root password Password has been set

**DNS**

System host name exp-c-01 ⓘ

Domain name ajcollab.com ⓘ

Primary DNS address 192.168.11.1

Secondary DNS address ⓘ

[Configure DNS servers on DNS page instead](#)

**Time**

Primary NTP address 192.168.31.1

[Configure NTP servers on Time page instead](#)

[Back](#) [Skip Service Setup Wizard](#) [Finish](#)

User: admin Access: Read-write System host name: exp-c-01 System time: 15:09 UTC Language: en\_US S/N: 00BA8B33 Version: X12.7.1

3:11 until your session times out exp-c-01 - Restart options

https://192.168.21.13/restartoptions?restart&welcome

**Cisco Expressway-C**

**Restart options** [Help](#) [Logout](#)

**System status**

Cluster status This system is not part of a cluster.

Call status There are 0 calls active

Registration status There are 0 registrations active

[Restart](#)

User: admin Access: Read-write System host name: exp-c-01 System time: 15:11 UTC Language: en\_US S/N: 00BA8B33 Version: X12.7.1



esxi-primary - VMware ESXi

exp-c-01 - Overview

+

←

→

↺

🏠

🔒

https://192.168.21.13/overview

⋮

🔒


☆

☰

📄

👤

☰



Cisco Expressway-C

Status >

System >

Configuration >

Applications >

Users >

Maintenance >

?

 Help

Logout

Overview

You are here: [Status](#) > Overview

System mode

Selected modes

Generic - Do you want to [Run service setup?](#)

System information

System name

Up time1 minute 26 seconds

Software versionX12.7.1

IPv4 addressLAN 1: 192.168.21.13

Options11 Rich Media Sessions, 0 Room Systems, 0 Desktop Systems, Encryption, Interworking, FindMe, Device Provisioning, Expressway Series.

Resource usage (last updated: 15:14:17 UTC)

Registered calls

Current video0

Current audio (SIP)0

Peak video0

Peak audio (SIP)0

Since last restart video0

Since last restart audio (SIP)0

Rich media session calls

Current video0

Current audio (SIP)0

Peak video0

Peak audio (SIP)0

Since last restart video0

Since last restart audio (SIP)0

Rich media sessions

License usage current0%

License usage peak0%

Local Registrations

Current0

Peak0

Since last restart0

Desktop System

License usage currentN/A

License usage peakN/A

Room System

License usage currentN/A

License usage peakN/A

User: admin Access: Read-write System host name: exp-c-01 System time: 15:14 UTC

Language: en\_US S/N: 00BA8B33 Version: X12.7.1

## [Lab] Installing Additional License on Expressway - C

- I wanted to perform Desk Endpoint (DX70, DX80, etc.) registration in Expressway C
- Hence, I should install 'LIC-EXP-DSK' on Expressway C

The screenshot shows the Cisco Expressway-C Maintenance page. The 'Option keys' section is active, displaying a table of existing keys. The 'Add option key' button is highlighted with a red arrow. The 'System information' section shows the serial number 00BA8B33 and active options: 11 Rich Media Sessions, 0 Room Systems, 0 Desktop Systems, Encryption, Interworking, FindMe, Device Provisioning, Expressway Series.

Key	Description
XXXXXXXXXXXXXXXXXXXXC66	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXX125B	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXXCC1	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXXE97	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXX02	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXXB28	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXX149F	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXXB8A	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXXB82	1 Rich Media Session
XXXXXXXXXXXXXXXXXXXX59C	1 Rich Media Session

Buttons: Delete, Select all, Unselect all

System information

Serial number: 00BA8B33

Active options: 11 Rich Media Sessions, 0 Room Systems, 0 Desktop Systems, Encryption, Interworking, FindMe, Device Provisioning, Expressway Series.

Software option

Add option key:

Add option

Current licenses

License	Count
Rich Media Sessions	11
Desktop System License	0
Room System License	0

https://192.168.21.13/optionkeys System host name: exp-c-01 System time: 00:00 UTC Language: en\_US S/N: 00BA8B33 Version: X12.7.1

The screenshot shows the Cisco Expressway-C Maintenance page after adding a new option key. The 'Option key added' message is displayed at the top. The 'Option keys' table now includes the new key, which is highlighted with a red box. The 'System information' section shows the serial number 00BA8B33 and active options: 11 Rich Media Sessions, 0 Room Systems, 10 Desktop Systems, Encryption, Interworking, FindMe, Device Provisioning, Expressway Series.

Key	Description	Status	Validity period
XXXXXXXXXXXXXXXXXXXXA7F3	10 Desktop Systems	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXXC66	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXX125B	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXXCC1	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXXE97	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXX02	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXXB28	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXX49F	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXXB8A	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXXB82	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021
XXXXXXXXXXXXXXXXXXXX9C	1 Rich Media Session	Active (expires in 90 days)	10 Mar 2021 - 8 Jun 2021

Buttons: Delete, Select all, Unselect all

System information

Serial number: 00BA8B33

Active options: 11 Rich Media Sessions, 0 Room Systems, 10 Desktop Systems, Encryption, Interworking, FindMe, Device Provisioning, Expressway Series.

Software option

Add option key:

Add option

Current licenses

License	Count
Rich Media Sessions	11
Desktop System License	10
Room System License	0

User: admin Access: Read-write System host name: exp-c-01 System time: 00:00 UTC Language: en\_US S/N: 00BA8B33 Version: X12.7.1

# [Lab] Initializing and Licensing Expressway - E

exp-e-01 - Welcome to Cisco

https://192.168.21.15/serviceselect

Cisco Expressway/VCS Base

Welcome to Cisco Collaboration services

Select Series

Expressway series

VCS series

Select Type

Expressway-C

Expressway-E

Select Services

Mobile and Remote Access

Jabber Guest services

Registrar

Collaboration Meeting Rooms (CMR) Cloud

Business to business calls

Proceed without selecting services

Does not select services or simplify the interface

Continue

User: admin Access: Read-write System host name: exp-e-01 System time: 20:32 UTC

Language: en\_US S/N: 02DB2696 Version: X12.7.1

exp-e-01 - Option keys

https://192.168.21.15/optionkeysetup

You've licensed this system correctly for the services you selected. Click Continue to go to configuration

Licensing help

Serial number

How to get licenses

02DB2696

You need this system's serial number to order keys. Go to the [Product License Registration Portal](#), and load your PAK (Product Authorization Key). Inside your PAK you have one or more Product Identifiers (PIDs) that are named like the examples shown in the License status section further down this page. Select the PIDs that you need from the ones in the PAK, by looking at the examples shown in the **Required** section of the License status below. When you've selected PIDs, click Assign to device and enter the serial number from this page. When you click Finish, you'll get an email with the keys you need. Paste all the email text into this page so the system can read the keys for you. If you generate more than one email from the licensing portal, you can add new paste areas.

License status

Based on the services you have selected:

Optional	License PID example	Status
Description	LIC-EXP-RMS	Not loaded
Rich Media Sessions	LIC-EXP-MSFT	Not loaded
Microsoft Interoperability	LIC-EXP-GW	Not loaded
H323-SIP Interworking Gateway	LIC-VCS-FINDME	Not loaded
FindMe	LIC-EXP-ROOM	Not loaded
Room Systems	LIC-EXP-DSK	Not loaded
Desktop Systems		
Pre-installed	License PID example	Status
Description	LIC-EXP-TURN	Loaded
TURN Relays	LIC-EXP-AN	Loaded
Advanced Networking		

Apply keys

Paste the text from your option keys email here

C3

9E

14

AE

95

10

51

10

8A

3DF

Add keys

New paste area

Continue

User: admin Access: Read-write System host name: exp-e-01 System time: 20:33 UTC

Language: en\_US S/N: 02DB2696 Version: X12.7.1

exp-e-01 - Confirm core config X

https://192.168.21.15/coreinformation

**Cisco Expressway/VCS Base**

**Confirm core configuration** [Help](#) [Logout](#)

**IP**

IP protocol: IPv4

IPv4 address: 192.168.21.15

IPv4 subnet mask: 255.255.128.0

IPv4 gateway: 192.168.0.1

[Configure IP on IP page instead](#)

**Credentials**

Your current password: Password has been set

Root password: Password has been set

**DNS**

System host name: exp-e-01

Domain name: ajcollab.com

Primary DNS address: 192.168.11.1

Secondary DNS address:

[Configure DNS servers on DNS page instead](#)

**Time**

Primary NTP address: 192.168.31.1

[Configure NTP servers on Time page instead](#)

[Back](#) [Skip Service Setup Wizard](#) [Finish](#)

https://192.168.21.15/Read-write System host name: exp-e-01 System time: 20:34 UTC Language: en\_US S/N: 02DB2696 Version: X12.7.1

exp-e-01 - Overview X

https://192.168.21.15/overview

**Cisco Expressway-E**

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

You are here: [Status](#) > Overview

**Overview**

System mode: Generic - Do you want to [Run service setup?](#)

**System information**

System name: [System name](#)

Up time: 8 minutes 50 seconds

Software version: X12.7.1

IPv4 address: LAN 1: 192.168.21.15

Options: 1 Rich Media Sessions, 0 Room Systems, 0 Desktop Systems, 1600 TURN Relays, Traversal Server, Encryption, Interworking, FindMe, Device Provisioning, Advanced Networking, Expressway Series.

**Resource usage (last updated: 20:35:20 UTC)**

Category	Item	Value
Registered calls	Current video	0
	Current audio (SIP)	0
	Peak video	0
	Peak audio (SIP)	0
	Since last restart video	0
	Since last restart audio (SIP)	0
Rich media session calls	Current video	0
	Current audio (SIP)	0
	Peak video	0
	Peak audio (SIP)	0
	Since last restart video	0
	Since last restart audio (SIP)	0
Rich media sessions	License usage current	0%
	License usage peak	0%
Local Registrations	Current	0
	Peak	0
	Since last restart	0
	Desktop System	License usage current
Room System	License usage peak	N/A
	License usage current	N/A
	License usage peak	N/A
TURN relays	Current	0
	Peak	0
	Since last restart	0

User: admin Access: Read-write System host name: exp-e-01 System time: 20:35 UTC Language: en\_US S/N: 02DB2696 Version: X12.7.1

# [Lab] Basic Configuration of Expressway - C and E

exp-c-01 - IP

https://192.168.21.13/ip

Cisco Expressway-C

This system has 6 alarms

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > Network interfaces > IP

Configuration

IP protocol IPv4 only

Pv4 gateway 192.168.0.1

LAN 1

Pv4 address 192.168.21.13

Pv4 subnet mask 255.255.128.0

Pv4 subnet range 192.168.0.0 - 192.168.127.255

Maximum transmission unit (MTU) 1500

Save

Status

Protocol IPv4

Pv4 gateway 192.168.0.1

LAN 1

Pv4 address 192.168.21.13

Pv4 subnet mask 255.255.128.0

Related tasks

Configure static routes

User: admin Access: Read-write System host name: exp-c-01 System time: 19:00 UTC

Language: en\_US SIP: 0510D7B4 Version: X12.6.1

exp-e-01 - IP

https://192.168.21.15/ip

Cisco Expressway-E

This system has 6 alarms

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > Network interfaces > IP

Configuration

Network interfaces

IP protocol DNS

Time

Static routes

Pv4 gateway 192.168.0.1

LAN 1

Pv4 address 192.168.21.15

Pv4 subnet mask 255.255.128.0

Pv4 subnet range 192.168.0.0 - 192.168.127.255

Pv4 static NAT mode OFF

Maximum transmission unit (MTU) 1500

Save

Status

Protocol IPv4

Pv4 gateway 192.168.0.1

LAN 1

Pv4 address 192.168.21.15

Pv4 subnet mask 255.255.128.0

Related tasks

Configure static routes

User: admin Access: Read-write System host name: exp-e-01 System time: 17:51 UTC

Language: en\_US SIP: 065267F7 Version: X12.6.1

exp-c-01 - DNS

https://192.168.21.13/dns

Cisco Expressway-C

This system has 6 alarms

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > DNS

DNS settings

System host name exp-c-01

Domain name jcollab.com

Search Domains

DNS requests port range Use the ephemeral port range

Default DNS servers

Address 1 192.168.11.1

Address 2

Address 3

Address 4

Address 5

Per-domain DNS servers

Address 1

Domain names

Address 2

Domain names

Address 3

Domain names

Address 4

Domain names

Address 5

Domain names

Save / Flush DNS cache

Related tasks

DNS lookup utility

User: admin Access: Read-write System host name: exp-c-01 System time: 00:00 UTC

Language: en\_US SIP: 0510D7B4 Version: X12.6.1

exp-e-01 - DNS

https://192.168.21.15/dns

Cisco Expressway-E

This system has 6 alarms

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > DNS

DNS settings

System host name

Domain name

Search Domains

DNS requests port range

Default DNS servers

Address 1

Address 2

Address 3

Address 4

Address 5

Per-domain DNS servers

Address 1

Domain names

Address 2

Domain names

Address 3

Domain names

Address 4

Domain names

Address 5

Domain names

Save / Flush DNS cache

Related tasks

DNS lookup utility

User: admin Access: Read-write System host name: exp-e-01 System time: 00:00 UTC

Language: en\_US SIP: 065267F7 Version: X12.6.1

**DNS Manager**

File Action View Help

**DNS**

- WIN-SERVER-01
  - Forward Lookup Zones
    - \_msdcs.ajcollab.com
      - \_msdcs
        - \_sites
        - \_tcp
        - \_udp
      - DomainDnsZones
      - ForestDnsZones
      - (same as parent folder) Host (A) 10.106.79.66 25-Feb-21 2:30:00 PM
      - (same as parent folder) Host (A) 192.168.11.1 24-Feb-21 11:30:00 AM
      - aus-cucm-pub Host (A) 192.168.23.1 static
      - cuc-pub Host (A) 192.168.21.4 static
      - cuc-sub Host (A) 192.168.21.5 static
      - cucm-pub Host (A) 192.168.21.1 static
      - cucm-sub01 Host (A) 192.168.21.2 static
      - cucm-sub02 Host (A) 192.168.21.3 static
      - imp-pub Host (A) 192.168.21.6 static
      - imp-sub Host (A) 192.168.21.7 static
      - sme-cucm-pub Host (A) 192.168.22.1 static
      - sme-cucm-sub01 Host (A) 192.168.22.2 static
      - win-server-01 Host (A) 10.106.79.66 static
      - win-server-01 Host (A) 192.168.11.1 static
      - (same as parent folder) Name Server (NS) win-server-01.ajcollab.com. static
      - (same as parent folder) Start of Authority (SOA) [80], win-server-01.ajcollab.com. static
      - exp-c-01 Host (A) 192.168.21.13
      - exp-c-02 Host (A) 192.168.21.14
      - exp-e-01 Host (A) 192.168.21.15
      - exp-e-02 Host (A) 192.168.21.16
  - Reverse Lookup Zones
    - 11.168.192.in-addr.arpa
    - 21.168.192.in-addr.arpa
    - 22.168.192.in-addr.arpa
    - 23.168.192.in-addr.arpa
  - Trust Points
  - Conditional Forwarders

exp-c-01 - Time

https://192.168.21.13/time

**Cisco Expressway-C**

This system has 6 alarms

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > Time

**Time**

NTP servers

NTP server	Address	Authentication
NTP server 1	192.168.31.1	Disabled
NTP server 2		Disabled
NTP server 3		Disabled
NTP server 4		Disabled
NTP server 5		Disabled

Time zone: Asia/Kolkata

Save

Status (last updated: 00:41:01 IST)

State: Synchronized

NTP server	Condition	Flash	Authentication	Event	Reachability	Offset	Delay	Stratum	Ref id	Ref time	Dispersion	Jitter	Root delay	Root dispersion
192.168.31.1	sys_peer	00 ok	none	sys_peer	XXXXXX	-3.754 ms	0.77 ms	1	LOCL	Sat, Mar 6 2021 0:40:10.749	188.488 ms	0.548 ms	0 ms	0 s

User: admin Access: Read-write System host name: exp-c-01 System time: 00:41 IST Language: en\_US S/N: 05100704 Version: X12.6.1

exp-e-01 - Time

https://192.168.21.15/time

**Cisco Expressway-E**

This system has 6 alarms

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > Time

**Time**

NTP servers

NTP server	Address	Authentication
NTP server 1	192.168.31.1	Disabled
NTP server 2		Disabled
NTP server 3		Disabled
NTP server 4		Disabled
NTP server 5		Disabled

Time zone: Asia/Kolkata

Save

Status (last updated: 00:41:04 IST)

State: Synchronized

NTP server	Condition	Flash	Authentication	Event	Reachability	Offset	Delay	Stratum	Ref id	Ref time	Dispersion	Jitter	Root delay	Root dispersion
192.168.31.1	sys_peer	00 ok	none	sys_peer	XXXXXX	-1.354 ms	0.014 ms	1	LOCL	Sat, Mar 6 2021 0:40:10.749	188.488 ms	0.068 ms	0 ms	0 s

User: admin Access: Read-write System host name: exp-e-01 System time: 00:41 IST Language: en\_US S/N: 06526777 Version: X12.6.1

## Expressway - E Single NIC vs Dual NIC

- Single NIC, assign Private IP Address on the Expressway E and configure a static one to one NAT with a Public IP or directly configure public IP on Expressway E
- Single NIC requires NAT reflection on the firewall, otherwise Expressway E's private IP address will be advertised via C IN of SDP to the far end
- Dual NIC, internal NIC with private IP range and External NIC with Private IP (different subnet than NIC1) NATED to Public IP or direct Public IP
- We need 'Advanced Networking' option keys to enable Dual NIC on Expressway E
- If Expressway E is a VM, add additional vNIC to the VM

exp-e-01 - IP

https://192.168.21.15/ip

**CISCO** Cisco Expressway-E

Status > **System** > Configuration > Applications > Users > Maintenance >

You are here: [System](#) > [Network interfaces](#) > IP

**Configuration**

IP protocol  ⓘ

Use dual network interfaces  ⓘ

IPv4 gateway  ⓘ

*Expressway E with Single NIC*

**LAN 1**

IPv4 address  ⓘ

IPv4 subnet mask  ⓘ

IPv4 subnet range

IPv4 static NAT mode  ⓘ

Maximum transmission unit (MTU)  ⓘ

**Save**

**Status**

Protocol	IPv4
IPv4 gateway	192.168.0.1
LAN 1	<div>IPv4 address 192.168.21.15</div> <div>IPv4 subnet mask 255.255.128.0</div>

**Related tasks**

[Configure static routes](#)

The screenshot displays the Cisco Expressway-E web interface for managing option keys. The breadcrumb trail indicates the user is in the Maintenance section, specifically at Maintenance > Option keys. The main content area is titled 'Option keys' and features a table with the following structure:

Key	Description	Status	Validity period
<div>System information</div> <div>Serial number: 0B5267F7</div> <div>Active options: 1 Rich Media Sessions, 0 Room Systems, 0 Desktop Systems, 1800 TURN Relays, Traversal Server, Encryption, Interworking, Findlife, Device Provisioning, Advanced Networking, Expressway Series.</div>			
<div>Software option</div> <div>Add option key: <input type="text" value="1BA1"/></div> <div>Add option</div>			
Current licenses			
Traversal calls	1		

A red arrow points to the 'Add option' button, which is used to add new option keys to the system.

exp-e-01 - IP

https://192.168.21.15/ip

Cisco Expressway-E

Status >

System >

Configuration >

Applications >

Users >

Maintenance >

IP

You are here: [System](#) > [Network interfaces](#) > IP

Configuration

IPv4 protocol

IPv4 only

Use dual network interfaces

Yes

External LAN interface

LAN 2

Use dedicated management interface (DMI)

No

IPv4 gateway

192.168.0.1

LAN 1 - Internal Internal LAN

IPv4 address

192.168.21.15

IPv4 subnet mask

255.255.224.0

IPv4 subnet range

192.168.0.0 - 192.168.31.255

IPv4 static NAT mode

Off

Maximum transmission unit (MTU)

1500

LAN 2 - External External LAN

IPv4 address

192.168.96.1

IPv4 subnet mask

255.255.224.0

IPv4 subnet range

192.168.96.0 - 192.168.127.255

IPv4 static NAT mode

On

IPv4 static NAT address

150.129.101.39

Maximum transmission unit (MTU)

1500

Save

Status

Protocol

IPv4

IPv4 gateway

192.168.0.1

LAN 1

IPv4 address

192.168.21.15

IPv4 subnet mask

255.255.128.0

User: admin Access: Read-write System host name: exp-e-01 System time: 20:47 UTC

Language: en\_US S/N: 02DB2696 Version: X12.7.1



exp-e-01 - IP

https://192.168.21.15/ip

Cisco Expressway-E

Status >

System >

Configuration >

Applications >

Users >

Maintenance >

IP

You are here: [System](#) > [Network interfaces](#) > IP

Configuration

IPv4 protocol

IPv4 only

Use dual network interfaces

Yes

External LAN interface

LAN 2

Use dedicated management interface (DMI)

No

IPv4 gateway

192.168.0.1

Information

The IPv4 subnet mask of the system's LAN port.

Note: you must restart the system for any changes to take effect.

Default: 255.255.255.0

LAN 1 - Internal Internal LAN

IPv4 address

192.168.21.15

IPv4 subnet mask

255.255.224.0

IPv4 subnet range

192.168.0.0 - 192.168.31.255

IPv4 static NAT mode

Off

Maximum transmission unit (MTU)

1500

Internal Private IP

LAN 2 - External External LAN

IPv4 address

150.129.101.39 Public IP from ISP

IPv4 subnet mask

255.255.224.0

IPv4 subnet range

150.129.96.0 - 150.129.127.255

IPv4 static NAT mode

Off

Maximum transmission unit (MTU)

1500

Save

Status

Protocol

IPv4

IPv4 gateway

192.168.0.1

LAN 1

IPv4 address

192.168.21.15

IPv4 subnet mask

255.255.128.0

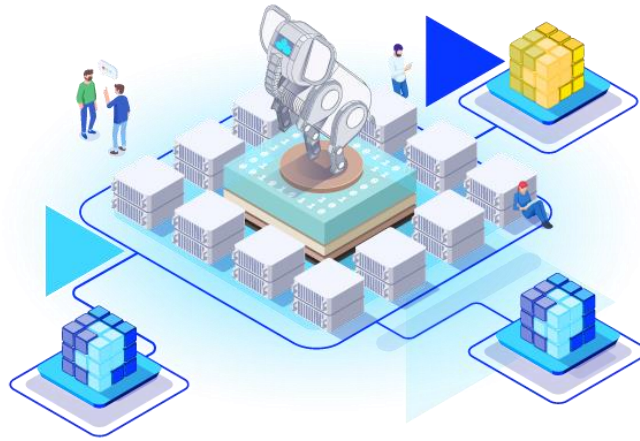
Related tasks

User: admin Access: Read-write System host name: exp-e-01 System time: 20:52 UTC

Language: en\_US S/N: 02DB2696 Version: X12.7.1

---

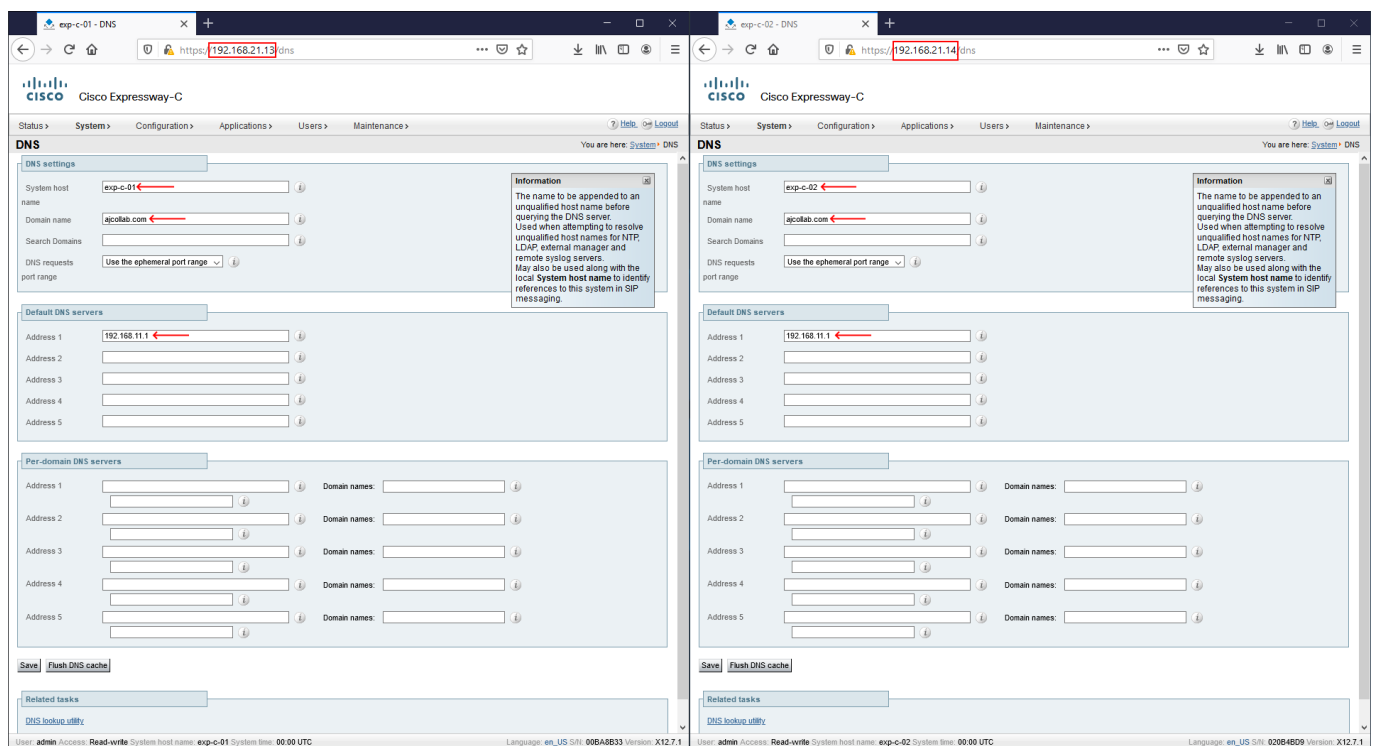
## Clustering of Expressway



- We have 2 Expressway - E and 2 Expressway C servers deployed (total 4 Expressways)
- An Expressway can be part of a cluster of up to six Expressways
- Clustering can provide redundancy while an Expressway is in maintenance mode, or in case it becomes inaccessible due to a network or power outage.
- Endpoints can register to any of the peers in the cluster, so if an endpoint loses connection to its initial peer, it can re-register to another one in the cluster
- Each Expressway in the cluster is a peer of every other one in that cluster
- When you create a cluster, you nominate one peer as the primary, from which its configuration is replicated to the other peers
- We must configure a Cluster FQDN for the Expressway Cluster. This should resolve to IP Address of each peers in the cluster

## Clustering Prerequisites

- All cluster peers are running the same Expressway version
- Each peer is using a hardware platform (appliance or virtual machine) with equivalent capabilities
- Each Expressway in the cluster must be within a 40ms hop round trip delay of all other peers in the cluster
- All peers have the same set of option keys installed, with exception Traversal and non-traversal call licenses, RMS, Room and Desktop System. Rest all the options keys must match
- H.323 mode is enabled on each peer (Configuration > Protocols > H.323). The cluster uses H.323 signaling between peers to determine the best route for calls, even if all endpoints are SIP endpoints



exp-c-01 - Time

https://192.168.21.13/time

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

Time

Time zone

Save

192.168.31.1

192.168.31.2

192.168.31.3

192.168.31.4

192.168.31.5

UTC

Save

Status (last updated: 22:37:52 UTC)

Synchronized

192.168.31.1

sys\_peer

00 ok

none

sys\_peer

0.353 ms

0.45 ms

1

LOCL

Wed, Mar 10 2021 22:36:16:160

5.415 ms

0.302 ms

0 ms

0 s

exp-c-02 - Time

https://192.168.21.14/time

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

Time

Time zone

Save

192.168.31.1

192.168.31.2

192.168.31.3

192.168.31.4

192.168.31.5

UTC

Save

Status (last updated: 22:37:55 UTC)

Synchronized

192.168.31.1

sys\_peer

00 ok

none

sys\_peer

0.133 ms

0.438 ms

1

LOCL

Wed, Mar 10 2021 22:37:22:159

4.576 ms

0.142 ms

0 ms

0 s

exp-c-01 - H.323

https://192.168.21.13/h323

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

H.323

Configuration

H.323 mode

Gatekeeper

Gateway

Save

H.323 status

Registration

Call signaling

Assent

H.460.18

exp-c-02 - H.323

https://192.168.21.14/h323

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

H.323

Configuration

H.323 mode

Gatekeeper

Gateway

Save

H.323 status

Registration

Call signaling

Assent

H.460.18

## [Lab] Expressway - C Clustering

- In my case, I will configure two A Record with name 'exp-c-cluster' and resolves to '192.168.21.13' and '192.168.21.14'

New Host

Name (uses parent domain name if blank):  
exp-c-cluster

Fully qualified domain name (FQDN):  
exp-c-cluster.ajcollab.com.

IP address:  
192.168.21.13 'exp-c-01' IP Address

☒ Create associated pointer (PTR) record  
☐ Allow any authenticated user to update DNS records with the same owner name

Add Host Cancel

New Host

Name (uses parent domain name if blank):  
exp-c-cluster

Fully qualified domain name (FQDN):  
exp-c-cluster.ajcollab.com.

IP address:  
192.168.21.14 'exp-c-02' IP Address

☒ Create associated pointer (PTR) record  
☐ Allow any authenticated user to update DNS records with the same owner name

Add Host Done

DNS Manager				
File Action View Help				
DNS				
WIN-SERVER-01				
Forward Lookup Zones				
_msdcs				
_msdcs.ajcollab.com				
ajcollab.com				
Reverse Lookup Zones				
Trust Points				
Conditional Forwarders				
Name	Type	Data	Timestamp	
_msdcs				
_sites				
_tcp				
_udp				
DomainDnsZones				
ForestDnsZones				
(same as parent folder)	Start of Authority (SOA)	[92], win-server-01.ajcollab.com.	static	
(same as parent folder)	Name Server (NS)	win-server-01.ajcollab.com.	static	
(same as parent folder)	Host (A)	192.168.11.1	3/6/2021 12:00:00 PM	
aus-cucm-pub	Host (A)	192.168.23.1	static	
aus-cucm-sub01	Host (A)	192.168.23.2	static	
cuc-pub	Host (A)	192.168.21.4	static	
cuc-sub	Host (A)	192.168.21.5	static	
cucm-pub	Host (A)	192.168.21.1	static	
cucm-sub01	Host (A)	192.168.21.2	static	
cucm-sub02	Host (A)	192.168.21.3	static	
exp-c-01	Host (A)	192.168.21.13	static	
exp-c-02	Host (A)	192.168.21.14	static	
exp-e-01	Host (A)	192.168.21.15	static	
exp-e-02	Host (A)	192.168.21.16	static	
imp-pub	Host (A)	192.168.21.6	static	
imp-sub	Host (A)	192.168.21.7	static	
sme-cucm-pub	Host (A)	192.168.22.1	static	
sme-cucm-sub01	Host (A)	192.168.22.2	static	
win-server-01	Host (A)	192.168.11.1	static	
exp-c-cluster	Host (A)	192.168.21.13		
exp-c-cluster	Host (A)	192.168.21.14		

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.737]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>nslookup exp-c-cluster
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

Name: exp-c-cluster.ajcollab.com
Addresses: 192.168.21.14
 192.168.21.13

C:\Users\Administrator>
C:\Users\Administrator>
C:\Users\Administrator>nslookup exp-c-cluster
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

Name: exp-c-cluster.ajcollab.com
Addresses: 192.168.21.13
 192.168.21.14

C:\Users\Administrator>
```

exp-c-01 - H.323

https://exp-c-01.ajcollab.com/h323

Cisco Expressway-C

This system has 2 alarms

Status > System > Configuration > Applications > Users > Maintenance >

?

 Help 

Logout

H.323

You are here: Configuration > Protocols > H.323

Configuration

H.323 mode ☒ On

Gatekeeper

Registration UDP port

1719

i

Registration conflict mode

Reject

i

Call signaling TCP port

1720

i

Call signaling port range start

15000

i

Call signaling port range end

19999

i

Time to live

1800

i

Call time to live

120

i

Auto discover

On

i

Gateway

Caller ID

Exclude prefix

i

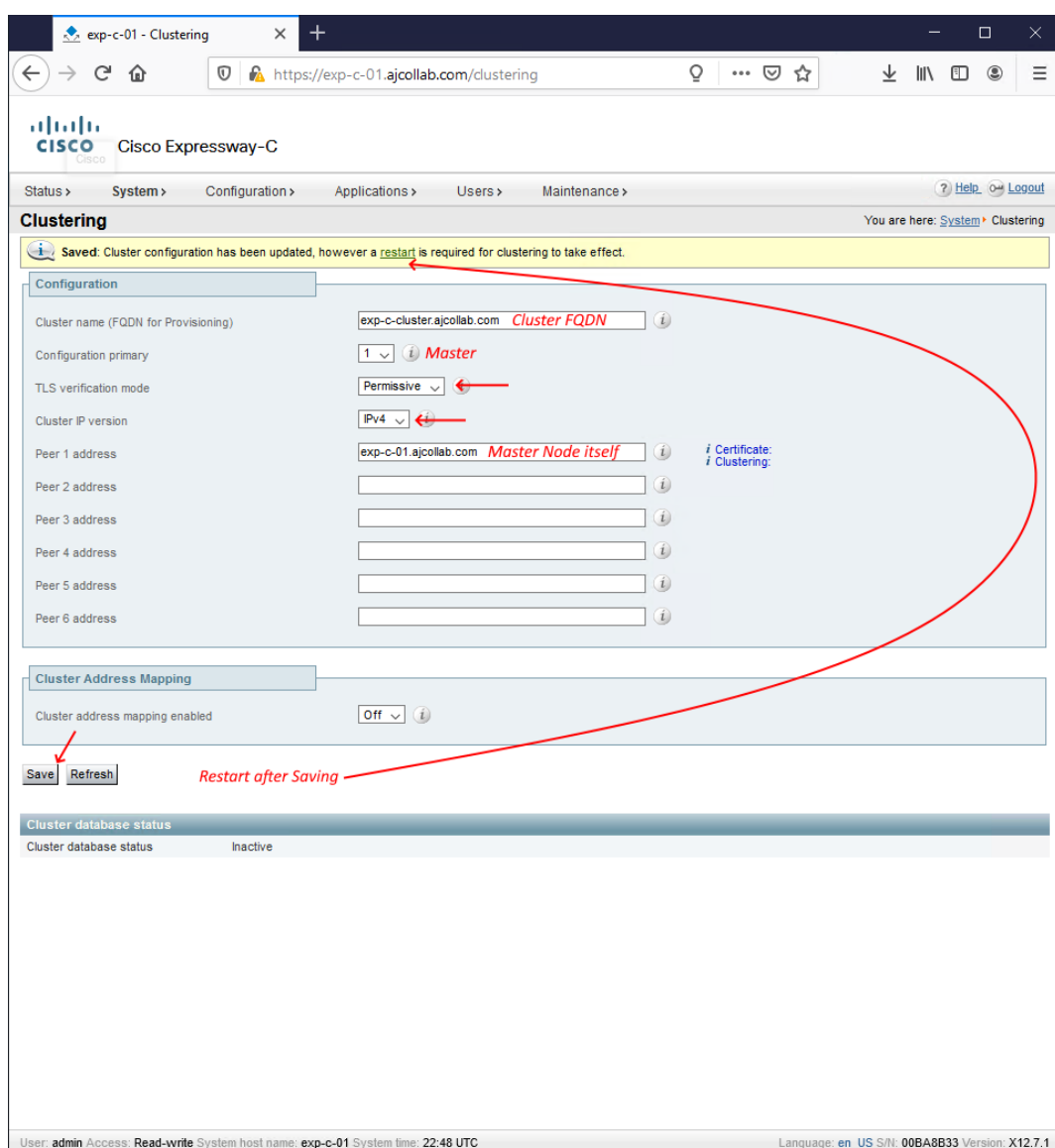
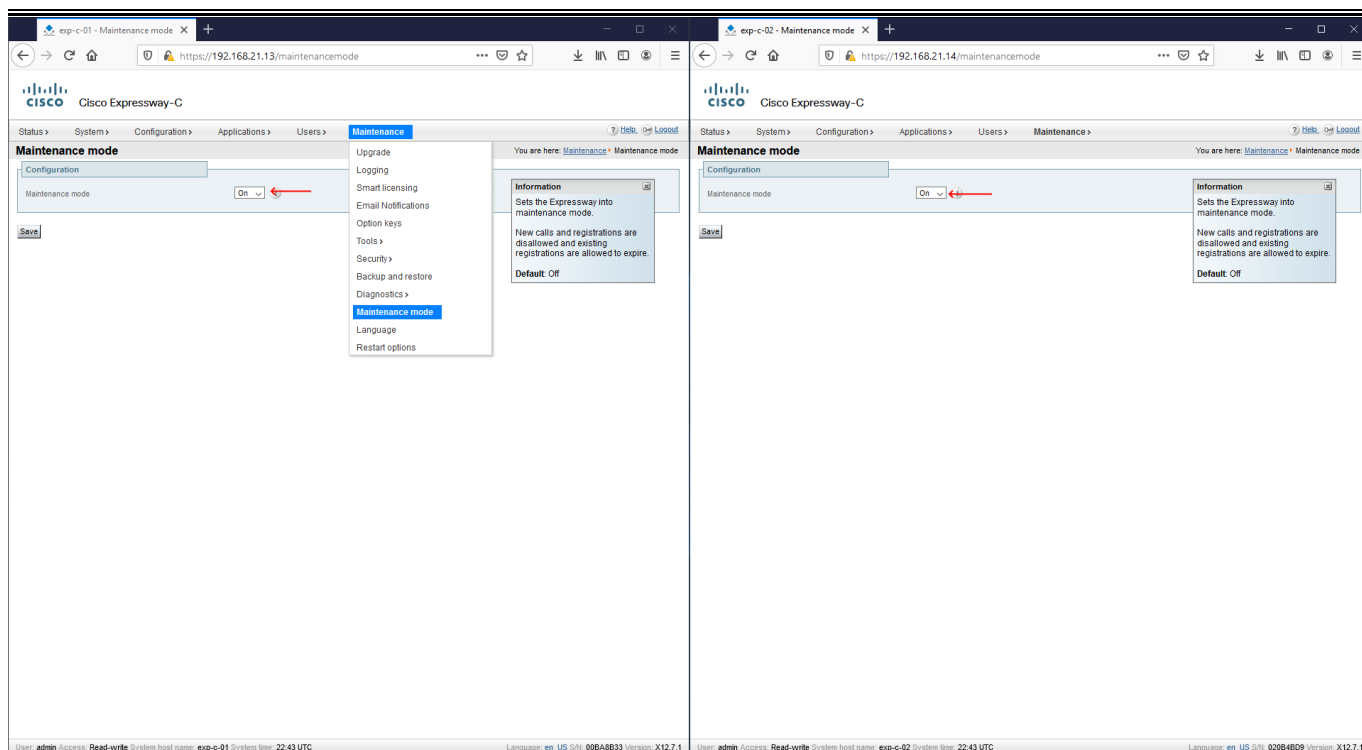
Save

H.323 status

Registration	Status	Active
	IPv4 address	192.168.121.13:1719
Call signaling	Status	Active
	IPv4 address	192.168.121.13:1720
Assent	Call signaling status	Inactive
H.460.18	Call signaling status	Inactive

User: admin Access: Read-write System host name: exp-c-01 System time: 04:50 UTC

Language: en\_US S/N: 07D53472 Version: X12.6.3



exp-c-01 - Clustering

https://exp-c-01.ajcollab.com/clustering

**Cisco Expressway-C**

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

**Clustering** You are here: System > Clustering

**Configuration**

Cluster name (FQDN for Provisioning)  ⓘ

Configuration primary  ⓘ

TLS verification mode  ⓘ

Cluster IP version  ⓘ

Peer 1 address  ⓘ

Peer 2 address  ⓘ

Peer 3 address  ⓘ

Peer 4 address  ⓘ

Peer 5 address  ⓘ

Peer 6 address  ⓘ

*Cluster with 1 Peer*

*! Certificate: Invalid (Common Name in certificate does not match)*  
*✓ Clustering: This system*

*This is OK, we will solve this later in the certificate session*

**Cluster Address Mapping**

Cluster address mapping enabled  ⓘ

**Save** **Refresh**

**Cluster database status**

Cluster database status Active

exp-c-01 - Clustering

https://exp-c-01.ajcollab.com/clustering

**Cisco Expressway-C**

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

**Clustering** You are here: System > Clustering

**Saved:** Cluster configuration has been updated.

**Configuration**

Cluster name (FQDN for Provisioning)  ⓘ

Configuration primary  ⓘ

TLS verification mode  ⓘ

Cluster IP version  ⓘ

Peer 1 address  ⓘ

Peer 2 address  ⓘ

Peer 3 address  ⓘ

Peer 4 address  ⓘ

Peer 5 address  ⓘ

Peer 6 address  ⓘ

*! Certificate: Invalid (Common Name in certificate does not match)*  
*✓ Clustering: This system*

*! Certificate:*  
*! Clustering:*

**Cluster Address Mapping**

Cluster address mapping enabled  ⓘ

**Save** **Refresh**

**Cluster database status**

Cluster database status Active



exp-c-02 - Clustering

https://exp-c-02.ajcollab.com/clustering

Cisco Expressway-C

This system has 1 alarm

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > Clustering

**Clustering**

Saved: Cluster configuration has been updated, however a **restart** is required for clustering to take effect.

Note: This Expressway is part of a cluster but is not the configuration primary. You should only change configuration that is specific to this peer (marked with †). Other configuration changes may be lost. More information can be found on the [Clustering help page](#).

**Configuration**

Cluster name (FQDN for Provisioning) exp-c-cluster.ajcollab.com

Configuration primary 1

TLS verification mode Permissive

Cluster IP version IPv4

Peer 1 address exp-c-01.ajcollab.com

Peer 2 address exp-c-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

**Cluster Address Mapping**

Cluster address mapping enabled Off

Save Refresh

**Cluster database status**

Cluster database status Inactive

Restart after Saving

exp-c-01 - Clustering

https://exp-c-01.ajcollab.com/clustering

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > Clustering

**Clustering**

Note: This Expressway is part of a cluster but is not the configuration primary. You should only change configuration that is specific to this peer (marked with †). Other configuration changes may be lost. More information can be found on the [Clustering help page](#).

**Configuration**

Cluster name (FQDN for Provisioning) exp-c-cluster.ajcollab.com

Configuration primary 1

TLS verification mode Permissive

Cluster IP version IPv4

Peer 1 address exp-c-01.ajcollab.com

Peer 2 address exp-c-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

**Cluster Address Mapping**

Cluster address mapping enabled Off

Save Refresh

**Cluster database status**

Cluster database status Active

exp-c-02 - Clustering

https://exp-c-02.ajcollab.com/clustering

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

You are here: System > Clustering

**Clustering**

Note: This Expressway is part of a cluster but is not the configuration primary. You should only change configuration that is specific to this peer (marked with †). Other configuration changes may be lost. More information can be found on the [Clustering help page](#).

**Configuration**

Cluster name (FQDN for Provisioning) exp-c-cluster.ajcollab.com

Configuration primary 1

TLS verification mode Permissive

Cluster IP version IPv4

Peer 1 address exp-c-01.ajcollab.com

Peer 2 address exp-c-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

**Cluster Address Mapping**

Cluster address mapping enabled Off

Save Refresh

**Cluster database status**

Cluster database status Active

## [Lab] Expressway - E Clustering

- In my case, I will configure two A Record with name 'exp-c-cluster' and resolves to '192.168.21.15' and '192.168.21.16'

New Host

Name (uses parent domain name if blank):  
exp-e-cluster

Fully qualified domain name (FQDN):  
exp-e-cluster.ajcollab.com.

IP address:  
192.168.21.15 'exp-e-01' IP Address

☒ Create associated pointer (PTR) record  
☐ Allow any authenticated user to update DNS records with the same owner name

Add Host Cancel

New Host

Name (uses parent domain name if blank):  
exp-e-cluster

Fully qualified domain name (FQDN):  
exp-e-cluster.ajcollab.com.

IP address:  
192.168.21.16 'exp-e-02' IP Address

☒ Create associated pointer (PTR) record  
☐ Allow any authenticated user to update DNS records with the same owner name

Add Host Cancel

DNS Manager					
File Action View Help					
DNS					
WIN-SERVER-01	Name	Type	Data	Timestamp	
Forward Lookup Zones	_msdcs				
> _msdcs.ajcollab.com	_sites				
> ajcollab.com	_tcp				
> Reverse Lookup Zones	_udp				
> Trust Points	DomainDnsZones				
> Conditional Forwarders	ForestDnsZones				
	(same as parent folder)	Start of Authority (SOA)	[92], win-server-01.ajcollab.com.	static	
	(same as parent folder)	Name Server (NS)	win-server-01.ajcollab.com.	static	
	(same as parent folder)	Host (A)	192.168.11.1	3/6/2021 12:00:00 PM	
	aus-cucm-pub	Host (A)	192.168.23.1	static	
	aus-cucm-sub01	Host (A)	192.168.23.2	static	
	cuc-pub	Host (A)	192.168.21.4	static	
	cuc-sub	Host (A)	192.168.21.5	static	
	cucm-pub	Host (A)	192.168.21.1	static	
	cucm-sub01	Host (A)	192.168.21.2	static	
	cucm-sub02	Host (A)	192.168.21.3	static	
	exp-c-01	Host (A)	192.168.21.13	static	
	exp-c-02	Host (A)	192.168.21.14	static	
	exp-e-01	Host (A)	192.168.21.15	static	
	exp-e-02	Host (A)	192.168.21.16	static	
	imp-pub	Host (A)	192.168.21.6	static	
	imp-sub	Host (A)	192.168.21.7	static	
	sme-cucm-pub	Host (A)	192.168.22.1	static	
	sme-cucm-sub01	Host (A)	192.168.22.2	static	
	win-server-01	Host (A)	192.168.11.1	static	
	exp-c-cluster	Host (A)	192.168.21.13		
	exp-c-cluster	Host (A)	192.168.21.14		
	exp-e-cluster	Host (A)	192.168.21.15		
	exp-e-cluster	Host (A)	192.168.21.16		

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.737]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>nslookup exp-e-cluster ←
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

Name: exp-e-cluster.ajcollab.com
Addresses: 192.168.21.15 ←
 192.168.21.16

C:\Users\Administrator>
C:\Users\Administrator>
C:\Users\Administrator>nslookup exp-e-cluster ←
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

Name: exp-e-cluster.ajcollab.com
Addresses: 192.168.21.16 ←
 192.168.21.15

C:\Users\Administrator>_
```

- Follow the similar procedure that you have done for Expressway C to get the cluster up
- We need to enable 'Cluster address mapping enabled' on Expressway - E so that it forms cluster using internal IPs. Note that Expressway E will have Public IP as well

exp-e-01 - H.323

← → ↻ 🏠

🔒

https://exp-e-01.ajcollab.com/h323

☆

🔔

☰

Cisco Expressway-E

This system has 2 alarms

🔔 ? 🔄

Status > System > Configuration > Applications > Users > Maintenance >

H.323

You are here: [Configuration](#) > [Protocols](#) > H.323

Configuration

H.323 mode

On 

⌵

 ⓘ

Gatekeeper

Registration UDP port

★ 1719 ⓘ

Registration conflict mode

Reject 

⌵

 ⓘ

Call signaling TCP port

★ 1720 ⓘ

Call signaling port range start

★ 15000 ⓘ

Call signaling port range end

★ 19999 ⓘ

Time to live

★ 1800 ⓘ

Call time to live

★ 120 ⓘ

Auto discover

On 

⌵

 ⓘ

Gateway

Caller ID

Exclude prefix 

⌵

 ⓘ

Save

H.323 status

Registration	Status	Active
	IPv4 address	192.168.121.15:1719
Call signaling	Status	Active
	IPv4 address	192.168.121.15:1720
Assent	Call signaling status	Active
	IPv4 address	192.168.121.15:2776
H.460.18	Call signaling status	Active
	IPv4 address	192.168.121.15:2777

User: admin Access: Read-write System host name: exp-e-01 System time: 04:49 UTC

Language: en\_US S/N: 002B3C5C Version: X12.6.3

exp-e-01 - Clustering

https://exp-e-01.ajcollab.com/clustering

Cisco Expressway-E

Status > System > Configuration > Applications > Users > Maintenance >

This system has 7 alarms

You are here: System > Clustering

**Clustering**

Saved: Cluster configuration has been updated.

Configuration

Cluster name (FQDN for Provisioning) exp-e-cluster.ajcollab.com

Configuration primary 1

TLS verification mode Permissive

Cluster IP version IPv4

Peer 1 address exp-e-01.ajcollab.com

Peer 2 address exp-e-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

Cluster Address Mapping

Cluster address mapping enabled On

Cluster address mappings

FQDN: exp-e-01.ajcollab.com IP: 192.168.21.15

FQDN: exp-e-02.ajcollab.com IP: 192.168.21.16

FQDN: IP:

FQDN: IP:

FQDN: IP:

FQDN: IP:

Save Refresh

Cluster database status

Cluster database status Active

exp-e-02 - Clustering

https://exp-e-02.ajcollab.com/clustering

Cisco Expressway-E

Status > System > Configuration > Applications > Users > Maintenance >

This system has 6 alarms

You are here: System > Clustering

**Clustering**

Note: This Expressway is part of a cluster but is not the configuration primary. You should only change configuration that is specific to this peer (marked with †). Other configuration changes may be lost. More information can be found on the Clustering help page.

Configuration

Cluster name (FQDN for Provisioning) exp-e-cluster.ajcollab.com

Configuration primary 1

TLS verification mode Permissive

Cluster IP version IPv4

Peer 1 address exp-e-01.ajcollab.com

Peer 2 address exp-e-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

Cluster Address Mapping

Cluster address mapping enabled On

Cluster address mappings

FQDN: exp-e-01.ajcollab.com IP: 192.168.21.15

FQDN: exp-e-02.ajcollab.com IP: 192.168.21.16

FQDN: IP:

FQDN: IP:

FQDN: IP:

FQDN: IP:

Save Refresh

Cluster database status

Cluster database status Active

- Dual NIC configurations must be separately enabled on the other Peer

The image displays two side-by-side screenshots of the Cisco Expressway-E configuration interface, specifically the 'IP' configuration page for two different peers: exp-e-01 and exp-e-02.

**exp-e-01 - IP Configuration:**

- Configuration:**
  - IP protocol: IPv4 only
  - Use dual network interfaces: Yes
  - External LAN interface: LAN 2
  - Use dedicated management interface (DMI): No
  - IPv4 gateway: 192.168.0.1
- LAN 1 - Internal:**
  - IPv4 address: 192.168.21.15
  - IPv4 subnet mask: 255.255.224.0
  - IPv4 subnet range: 192.168.0.0 - 192.168.31.255
  - IPv4 static NAT mode: Off
  - Maximum transmission unit (MTU): 1500
- LAN 2 - External:**
  - IPv4 address: 192.168.95.1
  - IPv4 subnet mask: 255.255.224.0
  - IPv4 subnet range: 192.168.0.0 - 192.168.127.255
  - IPv4 static NAT mode: On
  - IPv4 static NAT address: 150.129.101.39
  - Maximum transmission unit (MTU): 1500

**exp-e-02 - IP Configuration:**

- Configuration:**
  - IP protocol: IPv4 only
  - Use dual network interfaces: Yes
  - External LAN interface: LAN 2
  - Use dedicated management interface (DMI): No
  - IPv4 gateway: 192.168.0.1
- LAN 1 - Internal:**
  - IPv4 address: 192.168.21.15
  - IPv4 subnet mask: 255.255.224.0
  - IPv4 subnet range: 192.168.0.0 - 192.168.31.255
  - IPv4 static NAT mode: Off
  - Maximum transmission unit (MTU): 1500
- LAN 2 - External:**
  - IPv4 address: 192.168.95.2
  - IPv4 subnet mask: 255.255.224.0
  - IPv4 subnet range: 192.168.0.0 - 192.168.127.255
  - IPv4 static NAT mode: On
  - IPv4 static NAT address: 150.129.101.40
  - Maximum transmission unit (MTU): 1500

Both screenshots show a 'Status' table at the bottom, summarizing the configuration for each peer. The status table for exp-e-01 is as follows:

Protocol	IPv4
IPv4 gateway	192.168.0.1
LAN 1	IPv4 address: 192.168.21.15 IPv4 subnet mask: 255.255.224.0
LAN 2	IPv4 address: 192.168.95.1 IPv4 subnet mask: 255.255.224.0

The status table for exp-e-02 is as follows:

Protocol	IPv4
IPv4 gateway	192.168.0.1
LAN 1	IPv4 address: 192.168.21.15 IPv4 subnet mask: 255.255.224.0
LAN 2	IPv4 address: 192.168.95.2 IPv4 subnet mask: 255.255.224.0

## Phone Security Profile

- For phone registration via MRA, we should have a Phone Security Profile
- The Phone Security Profile name should be present in the Expressway E' SAN field

Phone Security Profile Configuration

Related Links: [Back To Find/List](#) Go

Save Delete Copy Reset Apply Config Add New

**Status**

Update successful

**Phone Security Profile Information**

Product Type: All

Device Protocol: Protocol Not Specified

Name\* MRA-PHONE-SEC-PROFILE.ajcollab.com

Description MRA-PHONE-SEC-PROFILE

Device Security Mode Encrypted

☐ TFTP Encrypted Config

**Phone Security Profile CAPF Information**

Authentication Mode\* By Null String

Key Order\* RSA Only

RSA Key Size (Bits)\* 2048

EC Key Size (Bits) < None >

Note: These fields are related to the CAPF Information settings on the Phone Configuration page.

Save Delete Copy Reset Apply Config Add New

\*- indicates required item.

## [Lab] Expressway - C Certificate Requirement for MRA

The screenshot shows the Cisco Expressway-C web interface. The browser address bar displays <https://exp-c-01.ajcollab.com/servercertificate>. The interface has a top navigation bar with tabs: Status >, System >, Configuration >, Applications >, Users >, and Maintenance. A red notification bubble in the top right corner states "This system has 2 alarms".

The main content area is titled "Server certificate". It contains several sections:

- Server certificate data:** Displays "Server certificate", "Currently loaded certificate expires on Mar 10 2022", and "Certificate Issuer Temporary CA d324e7a4-6ddd-4...". Buttons for "Show (decoded)" and "Show (PE)" are present.
- Reset to default server certificate:** A button to reset the certificate.
- Certificate signing request (CSR):** Displays "Certificate request" and "There is no certificate signing request". A red arrow points to the "Generate CSR" button.
- Upload new certificate:** Includes fields for "Select the server private key file" and "Select the server certificate file", both with "Browse..." buttons. A checkbox for "Re-use current private key" is also present.
- Upload server certificate data:** A button at the bottom.

A "Maintenance" menu is open, showing options: Upgrade, Logging, Smart licensing, Email Notifications, Option keys, Tools >, Security (highlighted), Backup and restore, Diagnostics >, Maintenance mode, Language, and Restart options. The "Security" submenu is also visible, listing: Trusted CA certificate, Server certificate (highlighted), CRL management, Client certificate testing, Certificate-based authentication configuration, Secure traversal test, Ciphers, and SSH configuration.





Phone Security Profile Configur exp-c-01 - Generate CSR

https://exp-c-01.ajcollab.com/generatescr

**Cisco Expressway-C**

This system has 1 alarm

Status > System > Configuration > Applications > Users > Maintenance >

You are here: Maintenance > Security > Generate CSR

### Generate CSR

**Common name**

Common name: FQDN of Expressway cluster

Common name as it will appear: exp-c-cluster.ajcollab.com

**Alternative name**

Subject alternative names: FQDN of Expressway cluster plus FQDN of this peer

Additional alternative names (comma separated): ajcollab.com, MRA-PHONE-SEC-PROFILE.ajcollab.com

Alternative name as it will appear:

DNS:exp-c-cluster.ajcollab.com  
DNS:exp-c-01.ajcollab.com  
DNS:ajcollab.com  
DNS:mra-phone-sec-profile.ajcollab.com

**Additional information**

Key length (in bits): 4096

Digest algorithm: SHA-256

Country: IN

State or province: Karnataka

Locality (town name): Bangalore

Organization (company name): AJ Collab

Organizational unit: Collab

Email address:

**Generate CSR**

Phone Security Profile Configur exp-c-01 - Server certificate

https://exp-c-01.ajcollab.com/servercertificate

**Cisco Expressway-C**

This system has 1 alarm

Status > System > Configuration > Applications > Users > Maintenance >

You are here: Maintenance > Security > Server certificate

### Server certificate

CSR creation successful: Certificate Signing Request saved.

**Server certificate data**

Server certificate: Show (decoded) Show (PEM file)

Currently loaded certificate expires on: Mar 10 2022

Certificate Issuer: Temporary CA d324e7a4-6ddd-4eeb-8b56-e62a56dd1663

**Reset to default server certificate**

**Certificate signing request (CSR)**

Certificate request: Show (decoded) Show (PEM file) Download

Generated on: Mar 11 2021

**Discard CSR**

**Upload new certificate**

Select the server private key file: System will use the private key file generated at the same time as the CSR.

Select the server certificate file: Browse... No file selected.

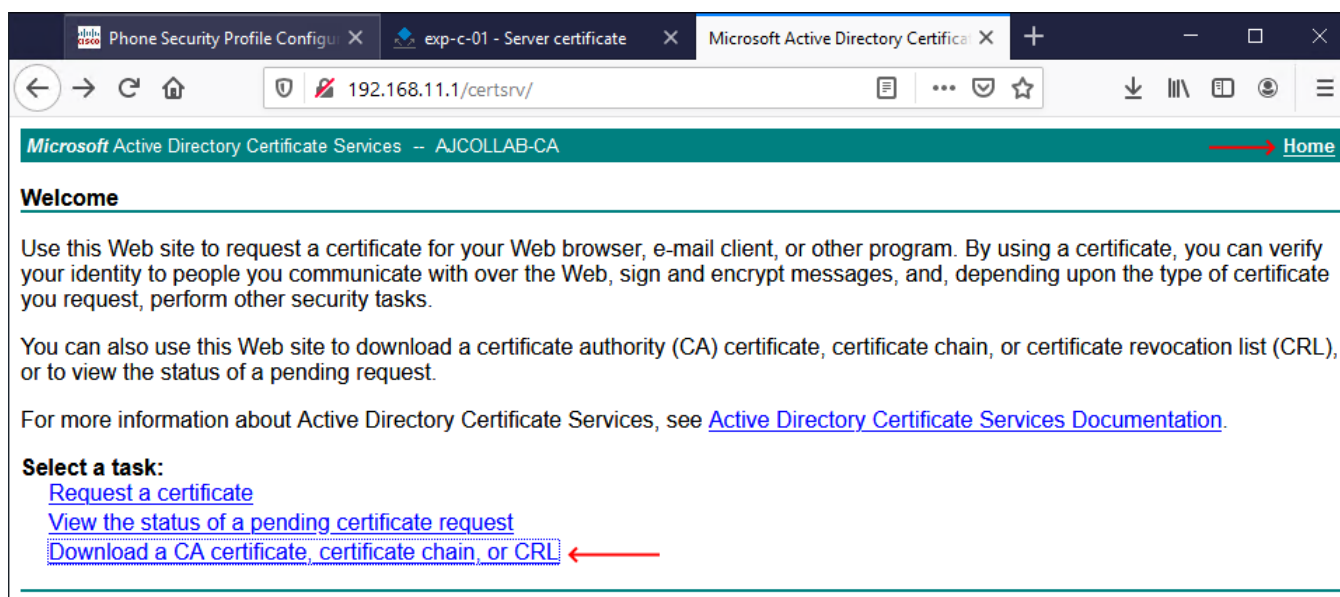
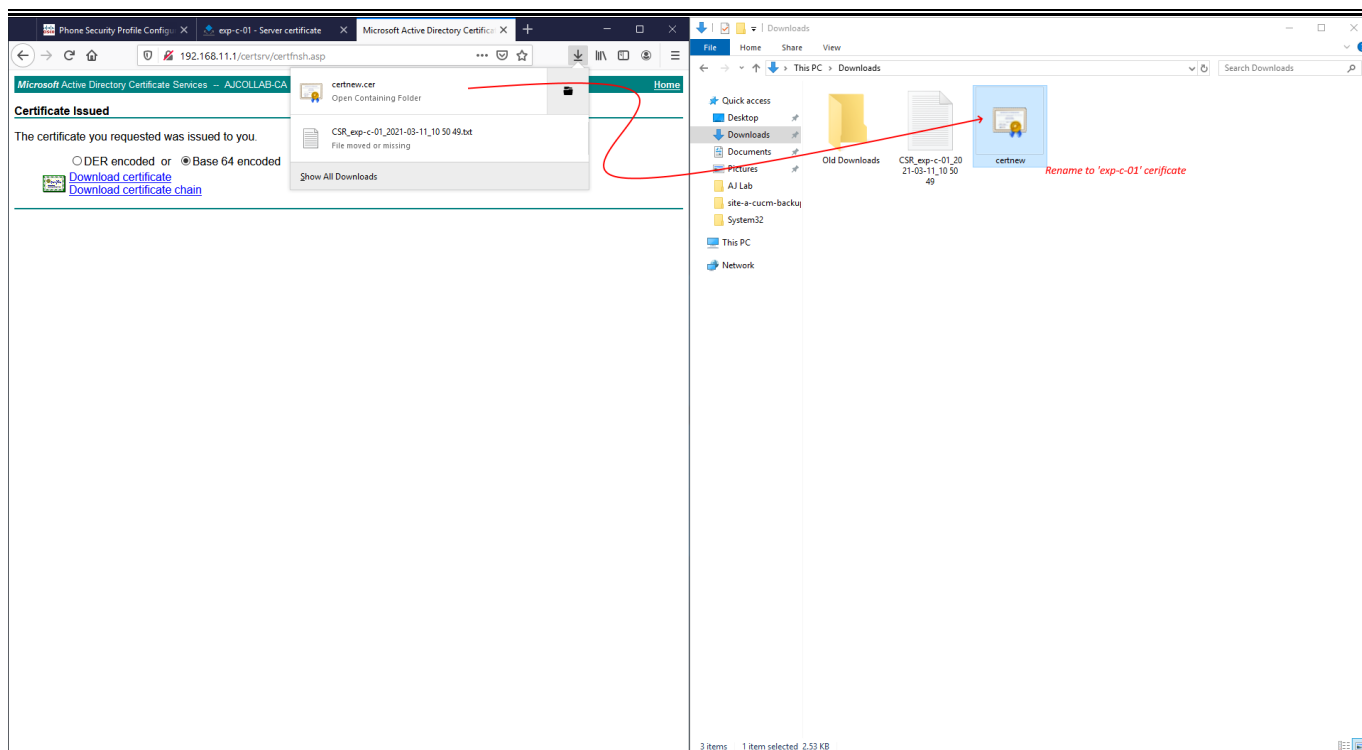
**Upload server certificate data**

The screenshot shows the Cisco Expressway-C 'Server certificate' configuration page. A red arrow points from the 'Download' button for the 'Certificate signing request (CSR)' to a Notepad window. The Notepad window displays the text of the CSR, which begins with '-----BEGIN CERTIFICATE REQUEST-----' and contains a long base64-encoded string.

The screenshot shows the 'Microsoft Active Directory Certificate Services -- AJCOLLAB-CA' website. The 'Welcome' section provides instructions on how to use the site to request a certificate, download a CA certificate, or view the status of a pending request. A red arrow points to the 'Request a certificate' link under the 'Select a task:' section.

The screenshot shows the 'Request a Certificate' page on the Microsoft Active Directory Certificate Services website. It prompts the user to 'Select the certificate type:' and offers the option to 'User Certificate'. A red arrow points to the 'advanced certificate request' link, which is highlighted in the text 'Or, submit an advanced certificate request'.





Phone Security Profile Config | exp-c-01 - Server certificate | Microsoft Active Directory Certificate Services - AJCOLLAB-CA

### Download a CA Certificate, Certificate Chain, or CRL

To trust certificates issued from this certification authority, [install this CA certificate](#).

To download a CA certificate, certificate chain, or CRL, select the certificate and encoding method.

CA certificate:

Current [AJCOLLAB-CA]

Encoding method:

☐ DER

☒ Base 64

[Install CA certificate](#)

[Download CA certificate](#)

[Download CA certificate chain](#)

[Download latest base CRL](#)

[Download latest delta CRL](#)

Downloads

Old Downloads

CSR\_exp-c-01\_2021-03-11\_10:50:49

exp-c-01-certific ate

certnew

Rename to 'AJCOLLAB-CA-ROOT'

4 items 1 item selected 2.53 KB

Phone Security Profile Config | exp-c-01 - Trusted CA certificate | Certificate for cisco

### Trusted CA certificate

Upload

Select a file containing trusted CA certificates

Append CA certificate

Reset to default CA certificate

Related tasks

Activation code onboarding trusted CA certificates

here: Maintenance > Security > Trusted CA certificate

Object	Expiration date	Validity	View
alches user	Mar 09 2026	Valid	View (decoded)
alches user	Nov 24 2031	Valid	View (decoded)

Trusted CA certificate

- Server certificate
- CRL management
- Client certificate testing
- Certificate-based authentication configuration
- Secure traversal test
- Ciphers
- SSH configuration

Downloads

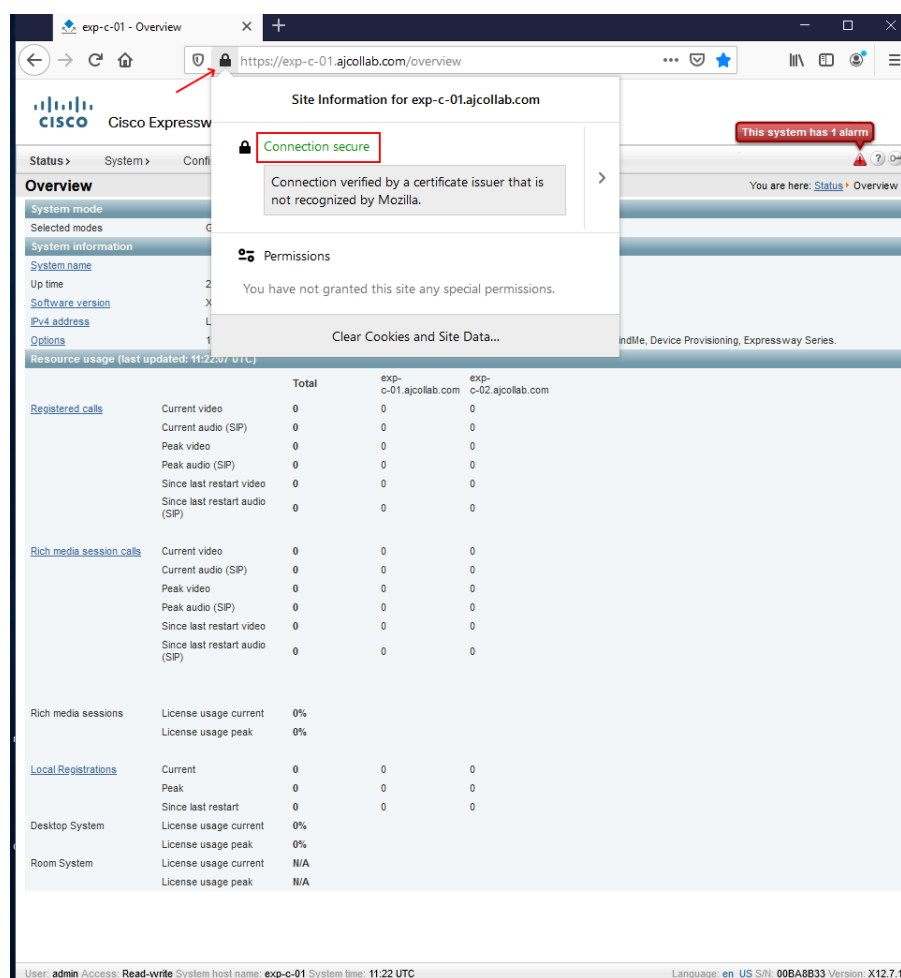
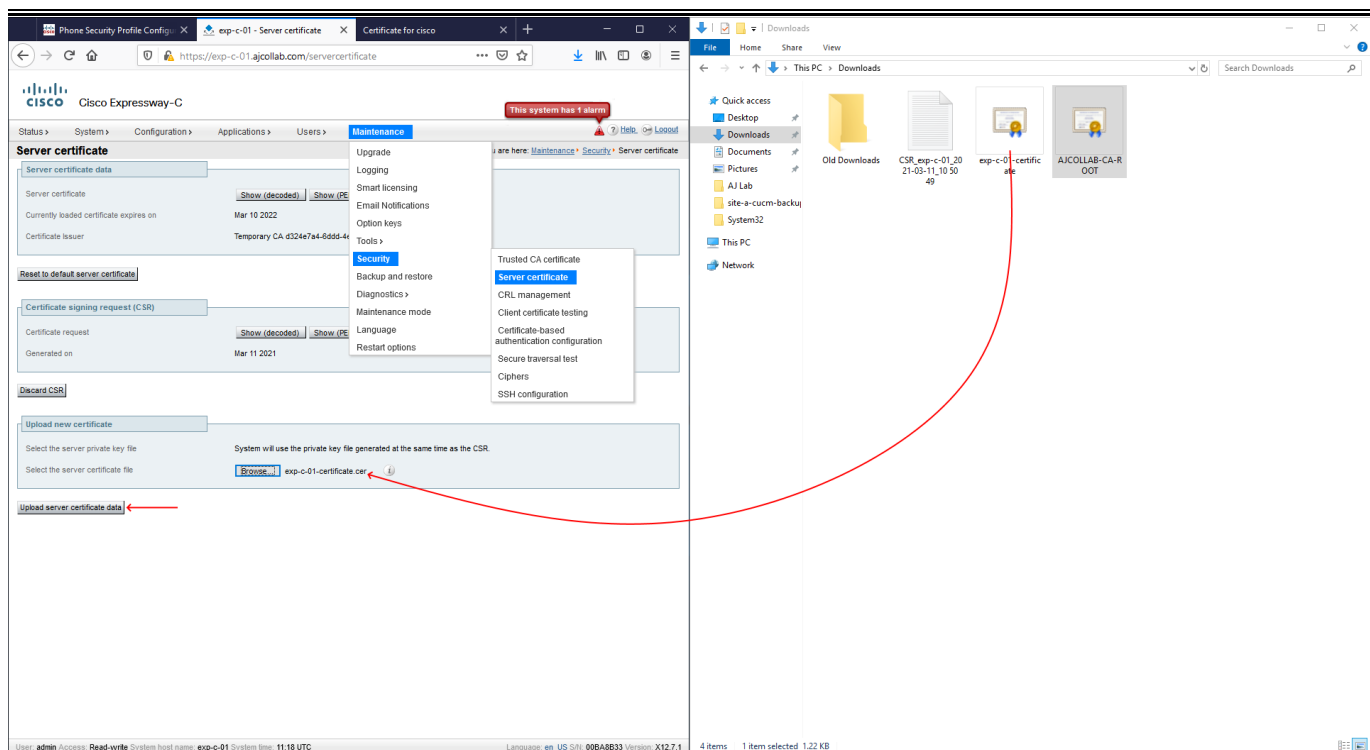
Old Downloads

CSR\_exp-c-01\_2021-03-11\_10:50:49

exp-c-01-certific ate

AJCOLLAB-CA-ROOT

4 items 1 item selected 1.22 KB



- Perform the same steps to upload certificate on another Expressway Peer
- Once the certificates are uploaded in all the peers of the cluster, reboot and then we can set the cluster 'TLS verification mode' to 'Enforce'

# [Lab] Expressway - C Cluster to TLS Enforce

exp-c-01 - Clustering

https://exp-c-01.ajcollab.com/clustering

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

Help Logout

You are here: System > Clustering

Clustering

Note: This Expressway is part of a cluster but is not the configuration primary. You should only change configuration that is specific to this peer (marked with T). Other configuration changes may be lost. More information can be found on the Clustering help page.

Configuration

Cluster name (FQDN for Provisioning)exp-c-cluster.ajcollab.com

Configuration primary1

TLS verification modeEnforce

Cluster IP versionIPv4

Peer 1 addressexp-c-01.ajcollab.com

Peer 2 addressexp-c-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

Cluster Address Mapping

Cluster address mapping enabledOff

Save Refresh

Cluster database status

Cluster database statusActive

User: admin Access: Read-write System host name: exp-c-01 System time: 11:31 UTC Language: en\_US S/N: 008A8B33 Version: X12.7.1

exp-c-02 - Clustering

https://exp-c-02.ajcollab.com/clustering

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

Help Logout

You are here: System > Clustering

Clustering

Note: This Expressway is part of a cluster but is not the configuration primary. You should only change configuration that is specific to this peer (marked with T). Other configuration changes may be lost. More information can be found on the Clustering help page.

Configuration

Cluster name (FQDN for Provisioning)exp-c-cluster.ajcollab.com

Configuration primary1

TLS verification modeEnforce

Cluster IP versionIPv4

Peer 1 addressexp-c-01.ajcollab.com

Peer 2 addressexp-c-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

Cluster Address Mapping

Cluster address mapping enabledOff

Save Refresh

Cluster database status

Cluster database statusActive

User: admin Access: Read-write System host name: exp-c-02 System time: 11:31 UTC Language: en\_US S/N: 02084B09 Version: X12.7.1

904



## [Lab] Expressway - E Certificate Requirement for MRA

The image displays two side-by-side screenshots of the Cisco Expressway-E web interface, specifically the 'Generate CSR' page. Both screenshots are for a system named 'exp-e-01' (left) and 'exp-e-02' (right). The interface shows the 'Generate CSR' section with various input fields for generating a Certificate Signing Request (CSR). Red boxes highlight specific fields: the 'Common name' field (FQDN of Expressway cluster), the 'Additional alternative names' field (ajcolab.com, colab-edge.ajcolab.com), and the 'Alternative name as it will appear' field (DNS:exp-e-cluster.ajcolab.com, DNS:exp-e-01.ajcolab.com, DNS:ajcolab.com, DNS:colab-edge.ajcolab.com). The bottom status bar indicates the user is 'admin' with 'Read-write' access, and the system host name is 'exp-e-01' (left) and 'exp-e-02' (right). The system time is 11:40 UTC for both.

- Expressway E certificate is signed by Public CA like GoDaddy, DigiCert, etc. not internal Enterprise CA
- Since it is bit costly, I have used my internal CA to sign the certificate for the lab. I followed same steps that we did for Expressway C (You will get a certificate warning on Jabber while login)
- In production design, always get the Expressway E certificate signed by public CA

# [Lab] Expressway - E Cluster to TLS Enforce

exp-e-01 - Clustering

https://exp-e-01.ajcollab.com/clustering

Cisco Expressway-E

This system has 5 alarms

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

You are here: [System](#) > [Clustering](#)

Configuration

Cluster name (FQDN for Provisioning)exp-e-cluster.ajcollab.com

Configuration primary1

TLS verification mode

Enforce

Cluster IP versionIPv4

Peer 1 addressexp-e-01.ajcollab.com

Peer 2 addressexp-e-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

Cluster Address Mapping

Cluster address mapping enabledOn

Suggest mappings based on system information

FQDN: exp-e-01.ajcollab.com IP: 192.168.21.15

FQDN: exp-e-02.ajcollab.com IP: 192.168.21.16

FQDN: IP:

FQDN: IP:

FQDN: IP:

FQDN: IP:

FQDN: IP:

Save Refresh

exp-e-01

✓Certificate: Valid

✓Clustering: This system

✓Certificate: Valid

✓Clustering: Active as exp-e-02 (Resolved 'exp-e-02.ajcollab.com' as 192.168.21.16)

exp-e-02 - Clustering

https://exp-e-02.ajcollab.com/clustering

Cisco Expressway-E

This system has 5 alarms

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

You are here: [System](#) > [Clustering](#)

Note: This Expressway is part of a cluster but is not the configuration primary. You should only change configuration that is specific to this peer (marked with T). Other configuration changes may be lost. More information can be found on the [Clustering help page](#).

Configuration

Cluster name (FQDN for Provisioning)exp-e-cluster.ajcollab.com

Configuration primary1

TLS verification mode

Enforce

Cluster IP versionIPv4

Peer 1 addressexp-e-01.ajcollab.com

Peer 2 addressexp-e-02.ajcollab.com

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

Cluster Address Mapping

Cluster address mapping enabledOn

Suggest mappings based on system information

FQDN: exp-e-01.ajcollab.com IP: 192.168.21.15

FQDN: exp-e-02.ajcollab.com IP: 192.168.21.16

FQDN: IP:

FQDN: IP:

FQDN: IP:

FQDN: IP:

FQDN: IP:

Save Refresh

exp-e-02

✓Certificate: Valid

✓Clustering: Active as exp-e-01 (Resolved 'exp-e-01.ajcollab.com' as 192.168.21.15)

✓Certificate: Valid

✓Clustering: This system

User: admin Access: Read-write System host name: exp-e-01 System time: 14:11 UTC

Language: en\_US SRN: 02082696 Version: X12.7.1

User: admin Access: Read-write System host name: exp-e-02 System time: 14:11 UTC

Language: en\_US SRN: 067E060C Version: X12.7.1

906

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## [Lab] Configure MRA (Mobile Remote Access)

- **External DNS SRV** Records must be configured on the public DNS domain provider
- I have purchased 'ajcollab.com' from GoDaddy, let's add below records GoDaddy
- Assume that the Expressway - E FQDN resolves to the public IP but here we use private IP since in the lab I don't have public IP assigned to Expressways



Service	Protocol	Name	Target Host	Priority	Weight	Port
_collab-edge	_tls	@	exp-e-01.ajcollab.com	10	10	8443
_collab-edge	_tls	@	exp-e-02.ajcollab.com	10	10	8443
_sips	_tcp	@	exp-e-01.ajcollab.com	10	10	5061
_sips	_tcp	@	exp-e-02.ajcollab.com	10	10	5061
_sip	_tcp	@	exp-e-01.ajcollab.com	10	10	5060
_sip	_tcp	@	exp-e-02.ajcollab.com	10	10	5060

A Record	IP Address
exp-e-01.ajcollab.com	192.168.21.15
exp-e-02.ajcollab.com	192.168.21.16
exp-c-cluster.ajcollab.com	192.168.21.15
exp-c-cluster.ajcollab.com	192.168.21.16

New Tab Login Products

https://account.godaddy.com/products?go\_redirect=disabled

## Domains





DOMAINS

**ajclassroom.co.in**

Basic Privacy Protection

NOT SETUP





DOMAINS

**ajclassroom.com**

Basic Privacy Protection

NOT SETUP



DOMAINS

**ajcollab.c**

Basic Privacy Protection

Edit Settings

Change Privacy

Manage DNS

All Products and Services

Domains [Manage All →](#)

**ajclassroom.co.in**

Basic Privacy Protection

Set up ▲ DNS Manage

Create a website

Set up an email account

Connect to an existing site

Login

Domain Manager

+

← → ↺ 🏠

🔒 https://dcc.godaddy.com/manage/ajcollab.com/dns

80% 🔍 ⚙

📄 📱 🔔 ☰

ajcollab.com

## Records

Last updated 16-02-2021 23:10 PM

Type	Name	Value	TTL	
A	@	Parked	600 seconds	✎
CNAME	www	@	1 Hour	✎
CNAME	_domainconnect	_domainconnect.gd.domaincontrol....	1 Hour	✎
NS	@	ns41.domaincontrol.com	1 Hour	
NS	@	ns42.domaincontrol.com	1 Hour	
SOA	@	Primary nameserver: ns41.domainc...	1 Hour	

Type \*  
SRV

Service \*  
\_collab-edge

Protocol \*  
\_tls

Name \*  
@

Target \*  
exp-e-01.ajcollab.cor

Priority \*  
10

Weight \*  
10

Port \*  
8443

TTL \*  
1 Hour

Save

Cancel

## Nameservers

Login

Domain Manager

+

← → ↺ 🏠

🔒 https://dcc.godaddy.com/manage/ajcollab.com/dns

80% ⋮ 🛡️ ☆

📄 🗂️ 📷 ⌵

ajcollab.com

## Records

Last updated 11-03-2021 12:40 PM

Type	Name	Value	TTL	
A	@	Parked	600 seconds	✎
CNAME	www	@	1 Hour	✎
CNAME	_domainconnect	_domainconnect.gd.domaincontrol....	1 Hour	✎
NS	@	ns41.domaincontrol.com	1 Hour	
NS	@	ns42.domaincontrol.com	1 Hour	
SOA	@	Primary nameserver: ns41.domainc...	1 Hour	
SRV	_collab-edge._tl...	10 10 8443 exp-e-01.ajcollab.com	1 Hour	✎
SRV	_collab-edge._tl...	10 10 8443 exp-e-02.ajcollab.com	1 Hour	✎
SRV	_sips._tcp.@	10 10 5061 exp-e-01.ajcollab.com	1 Hour	✎
SRV	_sips._tcp.@	10 10 5061 exp-e-02.ajcollab.com	1 Hour	✎
SRV	_sip._tcp.@	10 10 5060 exp-e-01.ajcollab.com	1 Hour	✎
SRV	_sip._tcp.@	10 10 5060 exp-e-02.ajcollab.com	1 Hour	✎

ADD

## Nameservers

Last updated 16-02-2021 23:10 PM

exp-c-01 - Domains

exp-e-01 - DNS lookup

Domain Manager

https://dcc.godaddy.com/manage/ajcollab.com/dns80%

My Domains / Domain Settings

# DNS Management

ajcollab.com

## Records

Last updated 12-03-2021 11:01 AM

Type	Name	Value	TTL
A	exp-e-01	192.168.21.15	1 Hour
A	exp-e-02	192.168.21.16	1 Hour
CNAME	www	@	1 Hour
NS	@	ns41.domaincontrol.com	1 Hour
NS	@	ns42.domaincontrol.com	1 Hour
SOA	@	Primary nameserver: ns41.domainc...	1 Hour
SRV	_collab-edge._tl...	10 10 8443 exp-e-01.ajcollab.com	1 Hour
SRV	_collab-edge._tl...	10 10 8443 exp-e-02.ajcollab.com	1 Hour
SRV	_sip._tcp.@	10 10 5060 exp-e-01.ajcollab.com	1 Hour
SRV	_sip._tcp.@	10 10 5060 exp-e-02.ajcollab.com	1 Hour
SRV	_sips._tcp.@	10 10 5061 exp-e-01.ajcollab.com	1 Hour
SRV	_sips._tcp.@	10 10 5061 exp-e-02.ajcollab.com	1 Hour

```
ca. Command Prompt - nslookup
Microsoft Windows [Version 10.0.19041.508]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\User>nslookup ←
Default Server: UnKnown
Address: 192.168.0.1

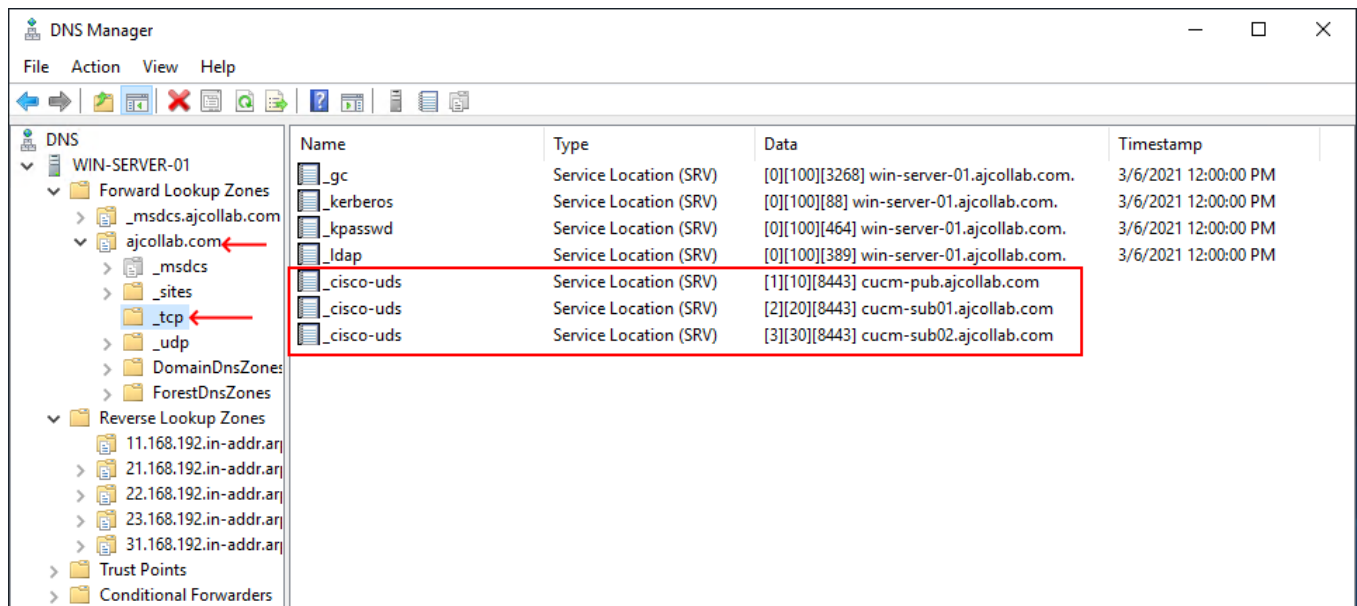
> set type=srv ←
> _collab-edge._tls.ajcollab.com ←
Server: UnKnown
Address: 192.168.0.1

Non-authoritative answer:
_collab-edge._tls.ajcollab.com SRV service location:
 priority = 10
 weight = 10
 port = 8443 ←
 svr hostname = blr-exp-e-02.ajcollab.com ←
_collab-edge._tls.ajcollab.com SRV service location:
 priority = 10
 weight = 10
 port = 8443 ←
 svr hostname = blr-exp-e-01.ajcollab.com ←
ajcollab.com nameserver = ns41.domaincontrol.com
ajcollab.com nameserver = ns42.domaincontrol.com
blr-exp-e-01.ajcollab.com internet address = 192.168.21.15 ←
blr-exp-e-02.ajcollab.com internet address = 192.168.21.16 ←
>
> _
```



- Internal DNS Records are already configured for Jabber On-Premise Registration lab

Service	Protocol	Priority	Weight	Port	Target Host
_cisco-uds	_tcp	1	10	8443	cucm-pub.ajcollab.com
_cisco-uds	_tcp	2	20	8443	cucm-sub01.ajcollab.com
_cisco-uds	_tcp	3	30	8443	cucm-sub02.ajcollab.com



DNS Manager

File Action View Help

DNS

WIN-SERVER-01

Forward Lookup Zones

ajcollab.com

\_msdcs

\_sites

\_tcp

\_udp

DomainDnsZones

ForestDnsZones

Reverse Lookup Zones

11.168.192.in-addr.arpa

21.168.192.in-addr.arpa

22.168.192.in-addr.arpa

23.168.192.in-addr.arpa

31.168.192.in-addr.arpa

Trust Points

Conditional Forwarders

Name	Type	Data	Timestamp
_gc	Service Location (SRV)	[0][100][3268] win-server-01.ajcollab.com.	3/6/2021 12:00:00 PM
_kerberos	Service Location (SRV)	[0][100][88] win-server-01.ajcollab.com.	3/6/2021 12:00:00 PM
_kpasswd	Service Location (SRV)	[0][100][464] win-server-01.ajcollab.com.	3/6/2021 12:00:00 PM
_ldap	Service Location (SRV)	[0][100][389] win-server-01.ajcollab.com.	3/6/2021 12:00:00 PM
_cisco-uds	Service Location (SRV)	[1][10][8443] cucm-pub.ajcollab.com	
_cisco-uds	Service Location (SRV)	[2][20][8443] cucm-sub01.ajcollab.com	
_cisco-uds	Service Location (SRV)	[3][30][8443] cucm-sub02.ajcollab.com	

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.737]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>nslookup
Default Server: win-server-01.ajcollab.com
Address: 192.168.11.1

> set type=srv
> _cisco-uds._tcp.ajcollab.com
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

_cisco-uds._tcp.ajcollab.com SRV service location:
 priority = 1
 weight = 10
 port = 8443
 svr hostname = cucm-pub.ajcollab.com
_cisco-uds._tcp.ajcollab.com SRV service location:
 priority = 2
 weight = 20
 port = 8443
 svr hostname = cucm-sub01.ajcollab.com
_cisco-uds._tcp.ajcollab.com SRV service location:
 priority = 3
 weight = 30
 port = 8443
 svr hostname = cucm-sub02.ajcollab.com
cucm-pub.ajcollab.com internet address = 192.168.21.1
cucm-sub01.ajcollab.com internet address = 192.168.21.2
cucm-sub02.ajcollab.com internet address = 192.168.21.3
>
> exit

C:\Users\Administrator>
C:\Users\Administrator>nslookup cucm-pub.ajcollab.com
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

Name: cucm-pub.ajcollab.com
Address: 192.168.21.1

C:\Users\Administrator>
C:\Users\Administrator>nslookup cucm-sub01.ajcollab.com
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

Name: cucm-sub01.ajcollab.com
Address: 192.168.21.2

C:\Users\Administrator>
C:\Users\Administrator>nslookup cucm-sub02.ajcollab.com
Server: win-server-01.ajcollab.com
Address: 192.168.11.1

Name: cucm-sub02.ajcollab.com
Address: 192.168.21.3

C:\Users\Administrator>
```

- Make sure internal Jabber Login works fine
- CUCM Cluster nodes, CUC Nodes and Expressway - C should be signed with internal Enterprise CA (Certificate cross import is required otherwise)
- CUCM, CUC and Expressway - C must have Enterprise CA as Trust Certificate
- Refer CUCM Certificate Section to know more about multi SAN CUCM Certificates
- Expressway - E must be signed with Public CA
- Expressway - E and C must have Public Root CA as Trust Certificate



Configuration >> Protocol >> SIP >>

Cisco

Cisco Expressway-C

This system has 4 alarms

Status >

System >

Configuration >

Applications >

Users >

Maintenance >

You are here: Configuration > Protocol > SIP

SIP

Configuration

SIP mode

On

UDP mode

On

UDP port

5060

TCP mode

On

TCP port

5060

TLS mode

On

TLS port

5061

Mutual TLS mode

Off

Mutual TLS port

5062

TCP outbound port start

25000

TCP outbound port end

29999

Session refresh interval (seconds)

1800

Minimum session refresh interval (seconds)

500

TLS handshake timeout (seconds)

5

Certificate revocation checking

Certificate revocation checking mode

Off

Registration controls

Standard registration refresh strategy

Maximum

Standard registration refresh minimum (seconds)

45

Standard registration refresh maximum (seconds)

60

Outbound registration refresh strategy

Variable

Outbound registration refresh minimum (seconds)

300

Outbound registration refresh maximum (seconds)

3600

SIP registration proxy mode

Off

User: admin Access: Read-write System host name: bit-exp-c-01 System time: 07:57 UTC

Language: en\_US S/N: 09061A46 Version: X12.6.3

Cisco

Cisco Expressway-E

Status >

System >

Configuration >

Applications >

Users >

Maintenance >

You are here: Configuration > Protocol > SIP

SIP

Configuration

SIP mode

On

UDP mode

Off

UDP port

5060

TCP mode

Off

TCP port

5060

TLS mode

On

TLS port

5061

Mutual TLS mode

Off

Mutual TLS port

5062

TCP outbound port start

25000

TCP outbound port end

29999

Session refresh interval (seconds)

1800

Minimum session refresh interval (seconds)

500

TLS handshake timeout (seconds)

5

Certificate revocation checking

Certificate revocation checking mode

Off

Registration controls

Standard registration refresh strategy

Maximum

Standard registration refresh minimum (seconds)

45

Standard registration refresh maximum (seconds)

60

Outbound registration refresh strategy

Variable

Outbound registration refresh minimum (seconds)

300

Outbound registration refresh maximum (seconds)

3600


SIP registration proxy mode

Off

User: admin Access: Read-write System host name: bit-exp-e-01 System time: 07:57 UTC

Language: en\_US S/N: 06207777 Version: X12.6.3

## Configuration >> Unified Communications >> Configuration



Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >

Unified Communications

You are here: Configuration > Unified Communications > Configuration

Configuration

Unified Communications mode

Mobile and remote access

MRA Access Control

Authentication path

UCM/LDAP basic authentication

Authorize by OAuth token with refresh

Off

Authorize by user credential

On

IM and Presence Service nodes, Unified CM servers and Unity Connection servers

IM and Presence Service nodes

2

[Configure IM and Presence Service nodes](#)

Unified CM servers

2

[Configure Unified CM servers](#)

Unity Connection servers

1

[Configure Unity Connection servers](#)

Meeting Server configuration

Guest account client URI

[No Guest account client URI](#)

Advanced

HTTP server allow list

[Configure HTTP server allow list](#)

[See automatic inbound rules](#)

SIP Path headers

Off

*This should be on if you have Jabber CSF with multiple Lines*

Credentials refresh interval (minutes)

480

Credentials cleanup interval (minutes)

720

Maximum authorizations per period

8

Rate control period (seconds)

300

Save


Unified Communications service configuration status

User: admin Access: Read-write System host name: exp-c-01 System time: 08:54 UTC Language: en\_US S/N: 07D53472 Version: X12.6.3

## Configuration >> Domain >> New (Helps to route the registration to CUCM)

exp-c-01 - Domains

https://exp-c-01.ajcollab.com/domains?uuid=e8b30cc1-ac8c-4dc8-...

 Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

**Domains** You are here: [Configuration](#) > [Domains](#) > Edit

Configuration

Domain name

Supported services for this domain

SIP registrations and provisioning on Expressway

On

SIP registrations and provisioning on Unified CM

On

IM and Presence Service

On

XMPP federation

Off

Information

Instant messaging and presence services for this SIP domain are provided by Cisco Unified Communications Manager IM and Presence Service.

Save

Delete

Cancel

User: admin Access: Read-write System host name: exp-c-01 System time: 21:37 UTC Language: en\_US S/N: 00BA8B33 Version: X12.7.1

## Configuration >> Unified Communications >> Unified CM Servers

exp-c-01 - Unified CM servers

https://exp-c-01.ajcollab.com/cucmlookup?uuid=new

**Cisco Expressway-C**

Status > System > **Configuration** > Applications > Users > Maintenance > [Help](#) [Logout](#)

**Unified CM servers** You are here: [Configuration](#) > [Unified Communications](#) > [Unified CM servers](#) > New

**Unified CM server lookup**

Unified CM publisher address \*  ⓘ

Username \*  *CUCM user with 'AXL API' Access* ⓘ

Password \*  ⓘ

TLS verify mode  ⓘ

AES GCM support  ⓘ

SIP UPDATE for session refresh  ⓘ

ICE Passthrough support  ⓘ

**Related tasks**

[Configure IM and Presence Service nodes](#)

[Configure Unity Connection Servers](#)

exp-c-01 - Unified CM servers

https://exp-c-01.ajcollab.com/cucmlookup

**Cisco Expressway-C**

Status > System > **Configuration** > Applications > Users > Maintenance > [Help](#) [Logout](#)

**Unified CM servers** You are here: [Configuration](#) > [Unified Communications](#) > [Unified CM servers](#)

**Success:** Connection success: The server cucm-pub.ajcollab.com was successfully discovered and queried. Connections established with known cluster nodes. Inserted: cucm-sub01, cucm-sub02

	Publisher address	Username	TLS verify mode	Nodes discovered by this lookup	AES GCM support	SIP UPDATE for session refresh	ICE Passthrough support	Actions
<input type="checkbox"/>	<a href="#">cucm-pub.ajcollab.com</a>	admin	On	cucm-sub02, cucm-sub01	Off	On	Off	<a href="#">View/Edit</a>

Click **Refresh servers** to refresh the details of the nodes associated with the selected addresses

**Currently found Unified CM nodes**

Publisher address	Name	UCM Version	Zone Protocol	Zone Status
cucm-pub.ajcollab.com	cucm-sub01	11.5.1.13901(3)	TCP	TCP: Unknown
cucm-pub.ajcollab.com	cucm-sub02	11.5.1.13901(3)	TCP	TCP: Unknown

**Related tasks**

[Configure IM and Presence Service nodes](#)

[Configure Unity Connection Servers](#)

## Configuration >> Unified Communications >> IM and Presence Service nodes

**IM and Presence Service node discovery**

IM and Presence Service database publisher node:

Username:

Password:

TLS verify mode:

**Information**

The FQDN or IP address of the IM and Presence Service database publisher node.

You must enter the publisher address of each IM and Presence Service cluster in turn.

Range: 1 to 1024 characters

**Add address** **Cancel**

**Currently found IM and Presence Service nodes**

There are no servers currently discovered

**Related tasks**

- [Configure Unified CM servers](#)
- [Configure Unity Connection Servers](#)

**Success:** Connection success: The server imp-pub.ajcollab.com was successfully discovered and queried. Connections established with known cluster nodes. Inserted: imp-pub, imp-sub

Publisher address	Username	TLS verify mode	Nodes discovered by this lookup	Actions
<input type="checkbox"/> imp-pub.ajcollab.com	admin	On	imp-sub, imp-pub	<a href="#">View/Edit</a>

**Add** **Delete** **Select all** **Unselect all** **Refresh servers**

Click **Refresh servers** to refresh the details of the nodes associated with the selected addresses

**Currently found IM and Presence Service nodes**

Publisher address	Name	Version	Status
imp-pub.ajcollab.com	imp-pub	11.5.1.10000(4)	XMPP router: Inactive ( <a href="#">see Unified Communications status</a> )
imp-sub.ajcollab.com	imp-sub	11.5.1.10000(4)	XMPP router: Inactive ( <a href="#">see Unified Communications status</a> )

**Related tasks**

- [Configure Unified CM servers](#)
- [Configure Unity Connection Servers](#)



Configuration >> Unified Communications >> Unity Connection servers

exp-c-01 - Unity Connection se X

https://exp-c-01.ajcollab.com/ucxnlookup?uuid=new

Cisco Expressway-C

Status >System >Configuration >Applications >Users >Maintenance >

HelpLogout

Unity Connection servers

You are here: Configuration >Unified Communications >Unity Connection servers >New

Unity Connection lookup

Unity Connection address

\*cuc-pub.ajcollab.com

Username

\*admin

Password

\*.....

TLS verify mode

On

Add address

Cancel

Related tasks

Configure Unified CM servers

Configure IM and Presence Service nodes

exp-c-01 - Unity Connection se X

https://exp-c-01.ajcollab.com/ucxnlookup

Cisco Expressway-C

Status >System >Configuration >Applications >Users >Maintenance >

HelpLogout

Unity Connection servers

You are here: Configuration >Unified Communications >Unity Connection servers

Success: Connection success: The server cuc-pub.ajcollab.com was successfully discovered and queried. Connections established with known cluster nodes. Inserted: cuc-pub, cuc-sub

	Publisher address	Username	TLS verify mode	Nodes discovered by this lookup	Actions
<input type="checkbox"/>	cuc-pub.ajcollab.com	admin	On	cuc-pub, cuc-sub	<a href="#">View/Edit</a>

Add

Delete

Select all

Unselect all

Refresh servers

Click **Refresh servers** to refresh the details of the nodes associated with the selected addresses

Currently found Unity Connection Servers

Publisher address	Host	Version
cuc-pub.ajcollab.com	cuc-pub	11.5.1.1680
cuc-pub.ajcollab.com	cuc-sub	11.5.1.1680

Related tasks

Configure Unified CM servers

Configure IM and Presence Service nodes

## Expressway - E

### Configuration >> Unified Communications >> Configuration

exp-c-01 - Unified Communi... exp-e-01 - Unified Communi... +

https://exp-e-01.ajcollab.com/edge

**Cisco Expressway-E**

Status > System > **Configuration >** Applications > Users > Maintenance > [Help](#) [Logout](#)

**Unified Communications** You are here: [Configuration](#) > [Unified Communications](#) > [Configuration](#)

**Configuration**

Unified Communications mode **Mobile and remote access**

**XMPP federation**

XMPP federation support **Off**

**Advanced**

STUN keepalive **On**

**Save**

### Configuration >> Traversal >> TURN

exp-c-01 - Unified Communi... exp-e-01 - TURN +

https://exp-e-01.ajcollab.com/turn

**Cisco Expressway-E**

Status > System > **Configuration >** Applications > Users > Maintenance > [Help](#) [Logout](#)

**TURN** You are here: [Configuration](#) > [Traversal](#) > [TURN](#)

**Server**

**TURN services** **Off**

Check TURN nonce **On**

TURN nonce expiry duration \* **600**

TCP 443 TURN service **Off**

TURN requests port \* **3478**

Delegated credential checking **Off**

Authentication realm \* **TANDBERG** [Configure TURN client credentials on local database](#)

Media port range start \* **24000**

Media port range end \* **29999**

**Save**

**TURN server status**

Status **Inactive**

## Configuration >> Authentication >> Devices >> Local database >> New

exp-c-01 - Unified Communicat... exp-e-01 - Local authentication X +

https://exp-e-01.ajcollab.com/credentials?uuid=new

**Cisco Expressway-E**

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

**Local authentication database** You are here: [Configuration](#) > [Authentication](#) > [Local database](#) > New

**Configuration**

Name \* traversal.admin ⓘ

Password \* ..... ⓘ

[Create credential](#) [Cancel](#)

**Related tasks**

[Generate passphrase](#)

## Configuration >> Zones >> Zones >> New

exp-c-01 - Unified Communicat...

exp-e-01 - Create zone


+

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□

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← → ↻ 🏠 🔒 https://exp-e-01.ajcollab.com/createzone ... 🛡️ ☆ ⬇️ 📄 📄 📄 ☰

 Cisco Expressway-E

Status > System > Configuration > Applications > Users > Maintenance > Help Logout

Create zone You are here: Configuration > Zones > Zones > Create zone

Configuration

Name \* EXP-C-MRA-TRAVERSAL-ZONE

Type \* Unified Communications traversal

Hop count \* 15

Connection credentials

Username \* traversal.admin

Password [Add/Edit local authentication database](#)

SIP

Port \* 7001

TLS verify subject name \* exp-c-cluster.ajcollab.com

Accept proxied registrations Allow

ICE support Off

ICE Passthrough support Off

Multistream mode On

SIP poison mode Off

Preloaded SIP routes support Off

SIP parameter preservation Off

AES GCM support Off

SIP UPDATE for session refresh Off

Authentication

Authentication policy Do not check credentials

UDP / TCP probes

UDP retry interval \* 2

User: admin Access: Read-write System host name: exp-e-01 System time: 00:00 UTC Language: en\_US S/N: 02DB2696 Version: X12.7.1

## Expressway - C

Configurations >> Zones >> Zones >> New

**exp-c-01 - Create zone** **exp-e-01 - Zones**

https://exp-c-01.ajcollab.com/createzone

**Cisco Expressway-C**

Status > System > **Configuration >** Applications > Users > Maintenance > [Help](#) [Logout](#)

**Create zone** You are here: [Configuration](#) > [Zones](#) > [Zones](#) > [Create zone](#)

**Configuration**

Name \* EXP-E-MRA-TRAVERSAL-ZONE

Type \* Unified Communications traversal

Hop count \* 15

**Connection credentials**

Username \* traversal.admin

Password \* .....

*This must be locally configured on 'Exp-E'*

**SIP**

Port \* 7001

Accept proxied registrations Allow

ICE support Off

ICE Passthrough support Off

Multistream mode On

SIP poison mode Off

Preloaded SIP routes support Off

SIP parameter preservation Off

AES GCM support Off

SIP UPDATE for session refresh Off

**Authentication**

Authentication policy Do not check credentials

Accept delegated credential checks Off

**Client settings**

Retry interval \* 120

User: admin Access: Read-write System host name: exp-c-01 System time: 00:00 UTC Language: en\_US S/N: 00BA8B33 Version: X12.7.1

exp-c-01 - Create zone

exp-e-01 - Zones

+

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↺

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https://exp-c-01.ajcollab.com/createzone

...

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📖

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🔍

☰

CISCO

Cisco Expressway-C

Status >

System >

Configuration >

Applications >

Users >

Maintenance >

?

Help

🔑

Logout

Create zone

You are here: [Configuration](#) > [Zones](#) > [Zones](#) > Create zone

Port

★

7001

⬅

Accept proxied registrations

Allow

i

ICE support

Off

i

ICE Passthrough support

Off

i

Multistream mode

On

i

SIP poison mode

Off

i

Preloaded SIP routes support

Off

i

SIP parameter preservation

Off

i

AES GCM support

Off

i

SIP UPDATE for session refresh

Off

i

Authentication

Authentication policy

Do not check credentials

i

Accept delegated credential checks

Off

i

Client settings

Retry interval

★

120

i

Location

Peer 1 address

exp-e-01.ajcollab.com

i

Peer 2 address

exp-e-02.ajcollab.com

i

Peer 3 address

i

Peer 4 address

i

Peer 5 address

i

Peer 6 address

i

Create zone

Cancel

User: admin Access: Read-write System host name: exp-c-01 System time: 00:00 UTC

Language: en\_US S/N: 00BA8B33 Version: X12.7.1

exp-c-01 - Zones

https://exp-c-01.ajcollab.com/zones

Cisco Expressway-C

Status>System>Configuration>Applications>Users>Maintenance>

You are here: Configuration>Zones>Zones

Name	Type	Calls	Bandwidth used	H323 status	SIP status	Search rule status	Actions
DefaultZone	Default zone	0	0 kbps	On	On		<a href="#">View/Edit</a>
CEVp-cvcm-sub01	Neighbor	0	0 kbps	Off	Active	Enabled search rules 1	<a href="#">View</a>
CEVp-cvcm-sub02	Neighbor	0	0 kbps	Off	Active	Enabled search rules 1	<a href="#">View</a>
EXP-C-TRAVERSAL-ZONE	Unified Communications traversal	0	0 kbps	Off	Active	No search rules configured	<a href="#">View/Edit</a>

[New](#) [Delete](#) [Select all](#) [Unselect all](#)

☐ Hide generated items

User: admin Access: Read-write System host name: exp-c-01 System time: 22:36 UTC Language: en\_US SIP: 008A8B33 Version: X12.7.1

exp-e-01 - Zones

https://exp-e-01.ajcollab.com/zones

Cisco Expressway-E

Status>System>Configuration>Applications>Users>Maintenance>

You are here: Configuration>Zones>Zones

Name	Type	Calls	Bandwidth used	H323 status	SIP status	Search rule status	Actions
DefaultZone	Default zone	0	0 kbps	On	On		<a href="#">View/Edit</a>
EXP-E-TRAVERSAL-ZONE	Unified Communications traversal	0	0 kbps	Off	Active	No search rules configured	<a href="#">View/Edit</a>

[New](#) [Delete](#) [Select all](#) [Unselect all](#)

User: admin Access: Read-write System host name: exp-e-01 System time: 22:36 UTC Language: en\_US SIP: 02082696 Version: X12.7.1

exp-c-01 - Edit zone

https://exp-c-01.ajcollab.com/editzone?id=3

Cisco Expressway-C

Status>System>Configuration>Applications>Users>Maintenance>

You are here: Configuration>Zones>Zones>Edit zone

SIP parameter preservation

AES GCM support

SIP UPDATE for session refresh

Authentication

Client settings

Location

Authentication policy

Accept delegated credential checks

Retry interval

Peer 1 address

Peer 2 address

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

exp-e-01.ajcollab.com

exp-e-02.ajcollab.com

SIP Reachable: 192.168.21.15:7001

SIP Reachable: 192.168.21.16:7001

Save

Cancel

Delete

Status

State

Number of calls to this zone

Number of provided registrations from this zone

Bandwidth used on this Expressway

Total bandwidth used across this cluster

Search rules targeting this zone

Related tasks

Active

0

0

0 kbps

0 kbps

0

[Configure search rules](#)

User: admin Access: Read-write System host name: exp-c-01 System time: 00:00 UTC Language: en\_US SIP: 008A8B33 Version: X12.7.1

exp-c-02 - Edit zone

https://exp-c-02.ajcollab.com/editzone?id=3

Cisco Expressway-C

Status>System>Configuration>Applications>Users>Maintenance>

You are here: Configuration>Zones>Zones>Edit zone

SIP UPDATE for session refresh

Authentication

Client settings

Location

Authentication policy

Accept delegated credential checks

Retry interval

Peer 1 address

Peer 2 address

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

exp-e-01.ajcollab.com

exp-e-02.ajcollab.com

SIP Reachable: 192.168.21.15:7001

SIP Reachable: 192.168.21.16:7001

Save

Cancel

Delete

Status

State

Number of calls to this zone

Number of provided registrations from this zone

Bandwidth used on this Expressway

Total bandwidth used across this cluster

Search rules targeting this zone

Related tasks

Active

0

0

0 kbps

0 kbps

0

[Configure search rules](#)

User: admin Access: Read-write System host name: exp-c-02 System time: 22:47 UTC Language: en\_US SIP: 02084B09 Version: X12.7.1

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exp-c-01 - Edit zone

exp-e-01 - Edit zone

https://exp-e-01.ajcollab.com/editzone?id=1

Cisco Expressway-E

Status> System> Configuration> Applications> Users> Maintenance>

You are here: Configuration> Zones> Zones> Edit zone

AES GCM support

OFF

SIP UPDATE for session refresh

OFF

Authentication

Authentication policy

Do not check credentials

UDP / TCP probes

UDP retry interval

2

UDP retry count

5

UDP keep alive interval

20

TCP retry interval

2

TCP retry count

5

TCP keep alive interval

20

Save

Cancel

Delete

Status

State

Active

SIP port

Active

Number of calls to this zone

0

Number of provisioned registrations from this zone

0

Bandwidth used on this Expressway

0 kbps

Total bandwidth used across this cluster

0 kbps

Connection 1

SIP: Reachable: 192.168.21.13:25002

Connection 2

SIP: Reachable: 192.168.21.14:25046

Search rules targeting this zone

0

Related tasks

Configure search rules

User: admin Access: Read-write System host name: exp-e-01 System time: 22:49 UTC Language: en\_US SIP: 02062696 Version: X12.7.1

exp-c-02 - Edit zone

exp-e-02 - Edit zone

https://exp-e-02.ajcollab.com/editzone?id=1

Cisco Expressway-E

Status> System> Configuration> Applications> Users> Maintenance>

You are here: Configuration> Zones> Zones> Edit zone

AES GCM support

OFF

SIP UPDATE for session refresh

OFF

Authentication

Authentication policy

Do not check credentials

UDP / TCP probes

UDP retry interval

2

UDP retry count

5

UDP keep alive interval

20

TCP retry interval

2

TCP retry count

5

TCP keep alive interval

20

Save

Cancel

Delete

Status

State

Active

SIP port

Active

Number of calls to this zone

0

Number of provisioned registrations from this zone

0

Bandwidth used on this Expressway

0 kbps

Total bandwidth used across this cluster

0 kbps

Connection 1

SIP: Reachable: 192.168.21.13:25003

Connection 2

SIP: Reachable: 192.168.21.14:25053

Search rules targeting this zone

0

Related tasks

Configure search rules

User: admin Access: Read-write System host name: exp-e-02 System time: 22:49 UTC Language: en\_US SIP: 067E060C Version: X12.7.1

exp-c-01 - Unified Communic...

exp-e-01 - Unified Communic...

https://exp-c-01.ajcollab.com/edgesatus

Cisco Expressway-C

Status> System> Configuration> Applications> Users> Maintenance>

You are here: Status> Unified Communications status

Unified Communications status

Unified Communications status

Enabled

Unified CM registrations

Configured

M and Presence Service

Configured

XMP Federation

Not configured (Configure a domain on Expressway-C)

Single Sign-On support

Not configured (Enable on the Unified Communications page)

OAuth token with refresh

Configured

Activity

Unified CM calls: Current video

0

Unified CM calls: Current audio (SIP)

0

Current UCMLDAP basic authenticated sessions

0

Total UCMLDAP basic authenticated sessions

0

Total provisioning requests since last restart

0

View detailed MRA authentication statistics

View and manage OAuth token holders

Domains

Name

Services

Associated zones

ajcollab.com

Unified CM registrations, M and Presence Service

EXP-E-MRA-TRAVERSAL-ZONE

Zones

Name

SIP status

EXP-E-MRA-TRAVERSAL-ZONE

Active

Advanced status information

View sessions authorized by user credential

View ssh tunnel status

User: admin Access: Read-write System host name: exp-c-01 System time: 22:53 UTC Language: en\_US SIP: 006A8B33 Version: X12.7.1

exp-c-01 - Unified Communic...

exp-e-01 - Unified Communic...

https://exp-e-01.ajcollab.com/edgesatus

Cisco Expressway-E

Status> System> Configuration> Applications> Users> Maintenance>

You are here: Status> Unified Communications status

Unified Communications status

Unified Communications status

Enabled

Unified CM registrations

Configured

M and Presence Service

Configured

XMP Federation

Not configured (Enable federation on Unified Communications page)

Single Sign-On support

Not configured (Enable on the Unified Communications page)

OAuth token with refresh

Configured

Activity

Unified CM calls: Current video

0

Unified CM calls: Current audio (SIP)

0

Domains

Name

Services

Associated zones

ajcollab.com

Unified CM registrations, M and Presence Service

EXP-C-MRA-TRAVERSAL-ZONE

Zones

Name

SIP status

EXP-C-MRA-TRAVERSAL-ZONE

Active

Advanced status information

View ssh tunnel status

User: admin Access: Read-write System host name: exp-e-01 System time: 22:53 UTC Language: en\_US SIP: 02062696 Version: X12.7.1



Find and List Phones

Cisco Unified CM Administration

For Cisco Unified Communications Solutions

admin

Search Documentation

About

Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

Find and List Phones

Related Links: [Actively Logged In Device Report](#)

Status

8 records found

Phone (1 - 8 of 8)

Find Phone where | Device Name | begins with | Find | Clear Filter

	Device Name(Line)	Description	Device Pool	Device Protocol	Status	IPv4 Address	Copy	Super Copy
<input type="checkbox"/>	CIPC-JASCEM	11002 - Abdul Jaseem	BANGALORE-PHONES-DEVICE-POOL	SCCP	None	None		
<input type="checkbox"/>	CIPC-JASEEM2	11002 - Abdul Jaseem	BANGALORE-PHONES-DEVICE-POOL	SCCP	None	None		
<input type="checkbox"/>	CSEH81THIK	11003 - Hritvik Roshan	BANGALORE-PHONES-DEVICE-POOL	SIP	None	None		
<input checked="" type="checkbox"/>	CSPJASEEM	11002 - Abdul Jaseem	BANGALORE-PHONES-DEVICE-POOL	SIP	Registered with cucm-sub01.ajcollab.com	192.168.21.14		
<input type="checkbox"/>	SEP08CC6831D463	Auto 11001	Default	SIP	None	None		
<input type="checkbox"/>	SEP84B517AF4C43	21001 - Jennifer Garner	TEXAS-PHONES-DEVICE-POOL	SIP	None	None		
<input type="checkbox"/>	SEPAAAAAAAAAAAA1	11001 - Deepika Padukone	BANGALORE-PHONES-DEVICE-POOL	SCCP	None	None		
<input type="checkbox"/>	SEPAAAAAAAAAAAA2	11003 - Hritvik Roshan	BANGALORE-PHONES-DEVICE-POOL	SIP	None	None		

Add New | Select All | Clear All | Delete Selected | Reset Selected | Apply Config to Selected

File View Tools Help

Connect: windows-external-client\_192.168.11.3

Windows Desktop

Cisco Jabber

Abdul Jaseem Available

Search or call

Contacts

Add your first contact.

Add Contact

New Custom Contact

Connect to a device

Connection Status

Cisco Jabber Version 12.6.1 (284405)

Softphone Status: Connected

Protocol: SIP

Address: cucm-pub.ajcollab.com (CCMCP - Expressway) (IPv4)

Device: CSPJASEEM

Line: 11002

Desktop Status: Not connected

Protocol: CTI

Address: (CTI) (Unknown)

Voicemail Status: Connected

Address: 192.168.21.4 (IPv4)


Copy Options Close


This is Expressway-C IP

929

## [Lab] Register DX70 in Expressway-C

- Make sure you have Desktop System and RMS licenses installed
- I have DX70, hence used Desktop license, if you have Room device, install required license

 Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance > ? 

**Option keys** You are here: [Maintenance](#) > Option keys



Key ▾	Description	Status	Validity period
<input type="checkbox"/> 11E34115.21080906.5.758610C1	10 Desktop Systems	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.5.75718148	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.10.48100523	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.2.4814202E	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.3.24950272	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.4.0887473D	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.5.8423744C	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.6.02EAC785	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.7.8008807A	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.8.902480F9	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021
<input type="checkbox"/> 11E34115.21080906.9.038021A8	1 Rich Media Session	Active (expires in 90 days)	9 Jun 2021 - 7 Sep 2021

System information

Serial number07D53472

Active options11 Rich Media Sessions, 0 Room Systems, 10 Desktop Systems, Encryption, Interworking, FindMe, Device Provisioning, Expressway Series.

Software option

Add option key   

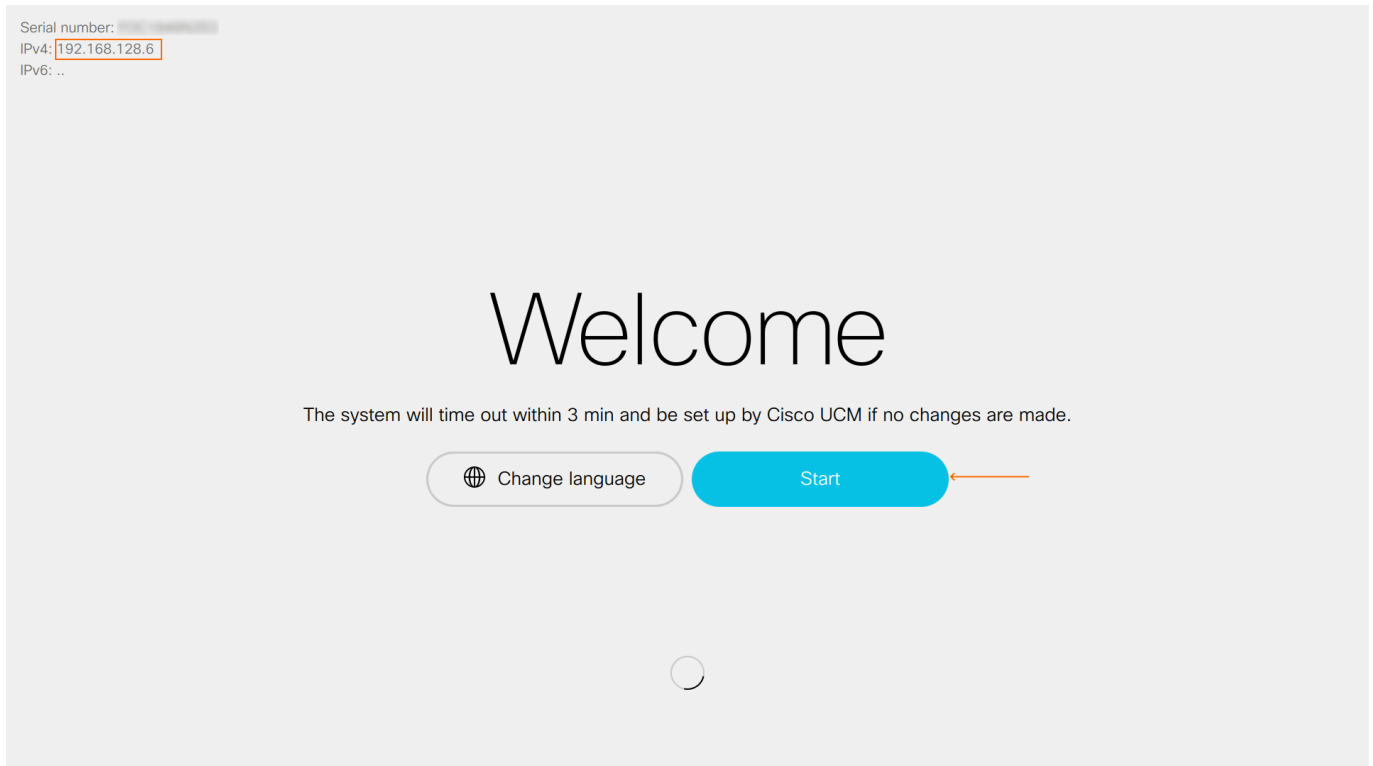
Add option

Current licenses

	Total	exp-c-01.ajcollab.com	exp-c-02.ajcollab.com
Rich Media Sessions	22	11	11
Desktop System License	20	10	10
Room System License	0	0	0

User: admin Access: Read-write System host name: exp-c-01 System time: 00:00 UTC Language: en\_US S/N: 07D53472 Version: X12.6.3

- 
- Obtain the DX70 IP Address from the device and access the web interface



exp-c-01 - Option keysX

exp-e-01 - Unified ConX

Find and List Route PaX

192.168.128.6 - Edit UsX

← → ↺ 🏠

🔒 https://192.168.128.6/web/users/edit/admin

80% ☆ 📄 ⌵

Cisco Webex

Local Device Controls

🔍 Find page ⓘ

👤

192.168.128.6  
DX70

🏠 Home

📞 Call

SETUP

⚙️ Settings

**👤 Users** ←

🔒 Security

CUSTOMIZATION

📄 Personalization

✍️ UI Extensions Editor

☰ Macro Editor

🔗 Developer API

SYSTEM MAINTENANCE

🔄 Software

🔍 Issues and Diagnostics

🕒 Backup and Recovery

Edit User: admin

⏪ Back

General

Roles

☒ Admin ⓘ

☒ Audit ⓘ

☐ RoomControl ⓘ

☐ Integrator ⓘ

☒ User ⓘ

Status

☒ Active

☐ Inactive

Client Certificate DN

If using client certificates for authentication, enter the client certificate's full Distinguished Name. Both the `/CN=alice/DC=example/DC=com` and the `CN=alice, DC=example, DC=com` formats are supported.

☐ Require passphrase change on next user sign in

Passphrase

☒ Valid

Login attempts

0 failed login attempts since last login 2021-04-09

Your passphrase

When creating or modifying admin users, you must enter your own passphrase for verification.

Save

Passphrase

Passphrase

ⓘ

[Generate new passphrase... ⓘ](#)

Repeat passphrase

Your passphrase

When creating or modifying admin users, you must enter your own passphrase for verification.

Change Passphrase

exp-c-01 - Event Log x Login x Cisco Unified CM Con x 192.168.128.6 - Config x

https://192.168.128.6/web/configurations/config/Provisioning 90%

Cisco Webex  
Local Device Controls

192.168.128.6  
DX70

Home  
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SETUP

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CUSTOMIZATION

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Macro Editor  
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SYSTEM MAINTENANCE

Software  
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Backup and Recovery

Settings

Configurations Statuses Send Whiteboard to Email Audio and Video

Search...

Configuration / Provisioning Collapse All Expand All

Audio  
Bluetooth  
CallHistory  
Cameras  
Conference  
FacilityService  
H323  
HttpClient  
HttpFeedback  
Logging  
Macros  
Network  
NetworkPort  
NetworkServices  
Peripherals  
Phonebook  
Provisioning  
Proximity  
RoomCleanup

Connectivity (i) Auto v  
CUCM CallManagementRecords Enablec v  
CallDiagnostics  
LoginName (i) (0 to 80 characters)  
Mode (i) Off ← v  
Password (i) (0 to 64 characters)  
TlsVerify (i) Off v  
WebexEdge (i) Off v

ExternalManager

Address (i) (0 to 64 characters)  
AlternateAddress (i) (0 to 64 characters)  
Domain (i) (0 to 64 characters)  
Path (i) (0 to 255 characters)  
Protocol (i) HTTP v

exp-c-01 - Event Log X Login X Cisco Unified CM Con X 192.168.128.6 - Config X

https://192.168.128.6/web/configurations/config/SIP 80%

Cisco Webex Local Device Controls

192.168.128.6 DX70

Home Call

SETUP

Settings ←

Users Security

CUSTOMIZATION

Personalization UI Extensions Editor Macro Editor Developer API

SYSTEM MAINTENANCE

Software Issues and Diagnostics Backup and Recovery

Bluetooth CallHistory Cameras Conference FacilityService H323 HttpClient HttpFeedback Logging Macros Network NetworkPort NetworkServices Peripherals Phonebook Provisioning Proximity RoomCleanup RoomReset RoomScheduler RTP Security SerialPort SIP ← Standby System Init

ANAT On (0 to 255 characters)

DefaultTransport TCP (0 to 255 characters)

DisplayName 11003 - Hrithik Roshan (0 to 550 characters)

Line Private (0 to 255 characters)

ListenPort Off (0 to 255 characters)

Mailbox 10001 (0 to 255 characters)

MinimumTLSVersion TLSv1.0 (0 to 255 characters)

PreferredIPSignaling IPv4 (0 to 255 characters)

Proxy 1 Address 192.168.21.13 (0 to 255 characters)

Proxy 2 Address 192.168.21.14 (0 to 255 characters)

Proxy 3 Address (0 to 255 characters)

Proxy 4 Address (0 to 255 characters)

TlsVerify Off (0 to 255 characters)

Type Standard (0 to 255 characters)

URI 41001@ajcollab.com (0 to 255 characters)

Exp-C

Authentication

Password (0 to 128 characters)

UserName (0 to 128 characters)

Ice

DefaultCandidate Host (0 to 128 characters)

Mode Auto (0 to 128 characters)

Turn

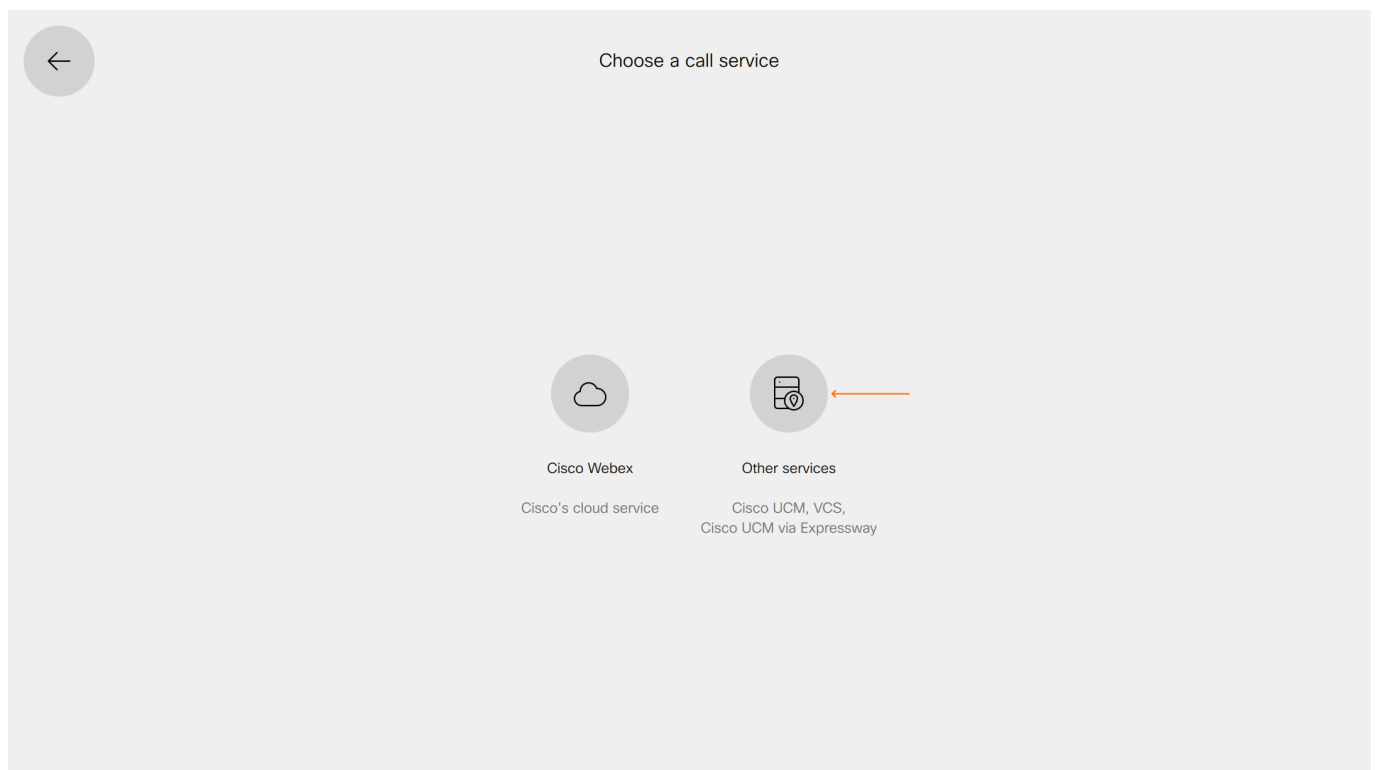
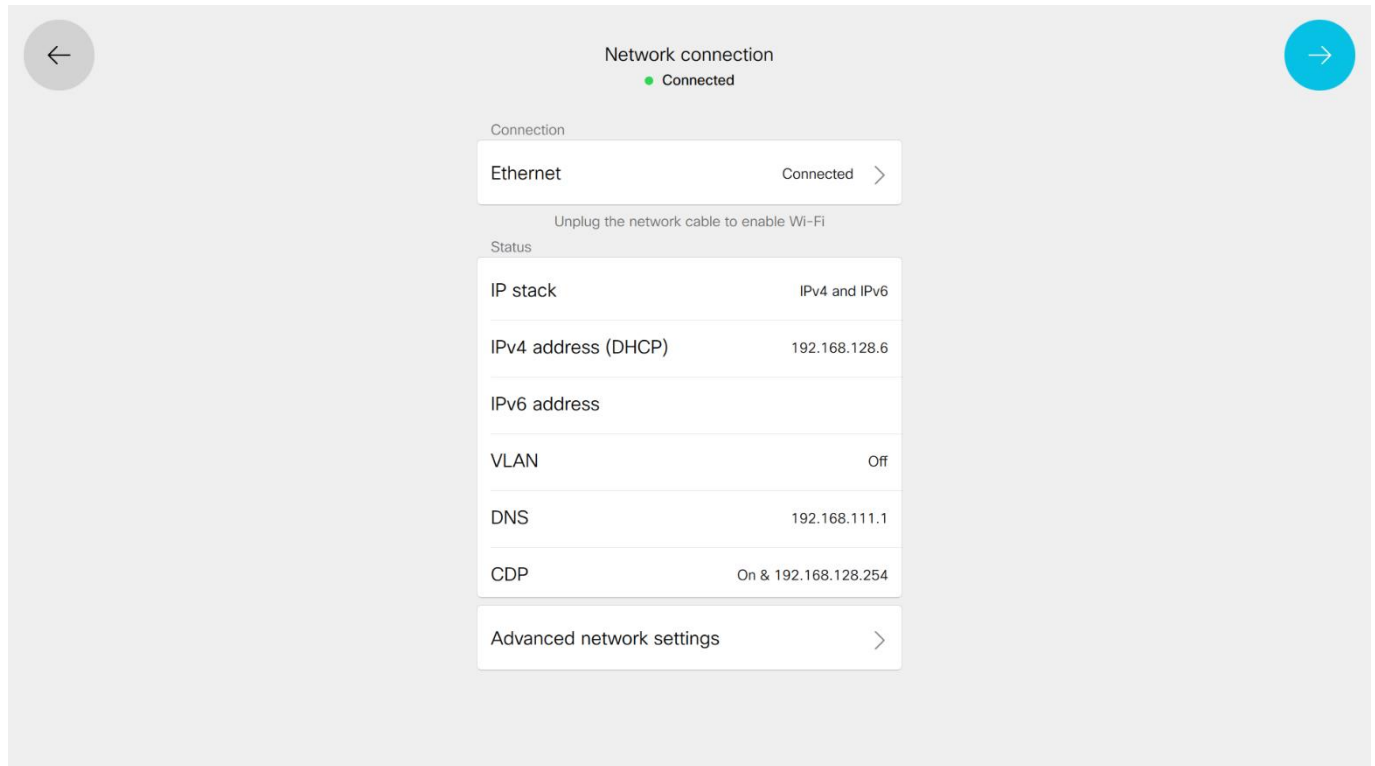
DiscoverMode On (0 to 128 characters)

DropRflx Off (0 to 128 characters)

Password (0 to 128 characters)

Server (0 to 255 characters)

- You can do the registration via the device initial configuration wizard as well





*This option comes only if the TP device has TFTP Server details from DHCP*

A Cisco UCM service at 192.168.121.1 is available in your network. Continuing will activate this device to that service. Alternatively, choose another service.

[Change service](#) ←



#### Other services



Cisco UCM



Cisco UCM  
via Expressway



VCS



Advanced setup



←
VCS
→

Host server address

192.168.21.13 Expressway-C

Username

admin

Passphrase

\*\*\*\*\*

Show passphrase ☐

Domain

41001@ajcollab.com URI

q	w	e	r	t	y	u	i	o	p	⌫	1	2 ABC	3 DEF
a	s	d	f	g	h	j	k	l	-	_	4 GHI	5 JKL	6 MNO
^	z	x	c	v	b	n	m	.	@	^	7 PQRS	8 TUV	9 WXYZ
🗨	.?123							/	.com	Enter	*	0 +	#

exp-c-01 - Registration X
Login X
Cisco Unified CM Con X
AJ Lab DX70 - System X

[←](#) [→](#) [🏠](#) [🔒](#) [https://192.168.128.6/web](#) 90% [☆](#) [📧](#) [📄](#) [☰](#)

**Cisco Webex**  
Local Device Controls

**AJ Lab DX70**  
DX70

[🏠 Home](#)

[📞 Call](#)

**SETUP**

[⚙️ Settings](#)

[👤 Users](#)

[🔒 Security](#)

**CUSTOMIZATION**

[📁 Personalization](#)

[✍️ UI Extensions Editor](#)

[☰ Macro Editor](#)

[🔧 Developer API](#)

**SYSTEM MAINTENANCE**

[🔄 Software](#)

[🔍 Issues and Diagnostics](#)

[🔄 Backup and Recovery](#)

## System Information

**General**

192.168.128.6  
IPv4

74:26:AC:F3:5A:8E  
MAC Address

-  
IPv6

FOC1846N3S3  
Serial Number

Ethernet  
Active Interface

50° C / 122° F

Temperature

**Issues**

⚠️

Time Server Not Reachable

[View All](#)

**H323**

Inactive  
Status

-  
Gatekeeper

-  
Number

-  
ID

**Software**

ce 9.15.3.13 e8923dc6f18 2021-04-09

Software Version

**Calendar**

📅

No calendar integration found.

**SIP**

Registered  
Status


192.168.21.13  
Proxy

41001@ajcollab.com

URI

Find and List Ph...blr-exp-c-01 - Re...blr-exp-c-02 - O...192.168.128.4 - C...vSphere - colpo...+--□×

←→↺🏠🔒https://blr-exp-c-01.ajcollab.com/registrations...☆🔍📄👤☰

Cisco Expressway-C

This system has 2 alarms

Status >System >Configuration >Applications >Users >Maintenance >

🚨? Help Logout

Registrations by device

You are here: Status >Registrations >By device

Records: 1

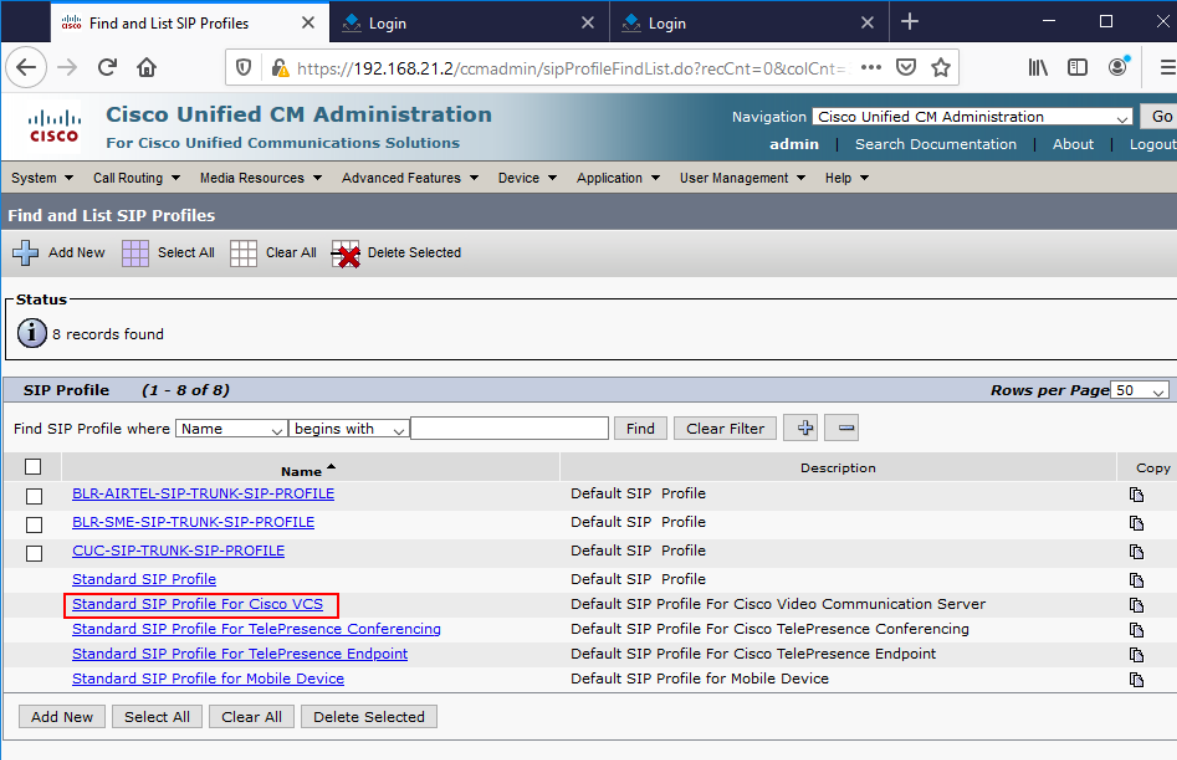
Page 1 of 1

Name ▾	Number	Type	Protocol	Creation time	Address	Device type	Peer	Actions
<input type="checkbox"/> 41001@ajcollab.com		SIP UA	SIP	2021-06-02 19:48:50	sip:41001@192.168.128.4:5061;transport=tls	Desktop Systems	This system	<a href="#">View</a>

UnregisterSelect allUnselect all

## [Lab] CUCM and Expressway C Integration


- Create a SIP Trunk from CUCM to Expressway C



The screenshot shows the Cisco Unified CM Administration interface. The page title is "Find and List SIP Profiles". The navigation bar includes "System", "Call Routing", "Media Resources", "Advanced Features", "Device", "Application", "User Management", and "Help". The "Find and List SIP Profiles" section has buttons for "Add New", "Select All", "Clear All", and "Delete Selected". A status box indicates "8 records found". The table below lists the SIP profiles:

<input type="checkbox"/>	Name	Description	Copy
<input type="checkbox"/>	<a href="#">BLR-AIRTEL-SIP-TRUNK-SIP-PROFILE</a>	Default SIP Profile	
<input type="checkbox"/>	<a href="#">BLR-SME-SIP-TRUNK-SIP-PROFILE</a>	Default SIP Profile	
<input type="checkbox"/>	<a href="#">CUC-SIP-TRUNK-SIP-PROFILE</a>	Default SIP Profile	
<input type="checkbox"/>	<a href="#">Standard SIP Profile</a>	Default SIP Profile	
<input type="checkbox"/>	<a href="#">Standard SIP Profile For Cisco VCS</a>	Default SIP Profile For Cisco Video Communication Server	
<input type="checkbox"/>	<a href="#">Standard SIP Profile For TelePresence Conferencing</a>	Default SIP Profile For Cisco TelePresence Conferencing	
<input type="checkbox"/>	<a href="#">Standard SIP Profile For TelePresence Endpoint</a>	Default SIP Profile For Cisco TelePresence Endpoint	
<input type="checkbox"/>	<a href="#">Standard SIP Profile for Mobile Device</a>	Default SIP Profile for Mobile Device	

At the bottom of the table, there are buttons for "Add New", "Select All", "Clear All", and "Delete Selected".



**Cisco Unified CM Administration**  
 For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go  
 admin | [Search Documentation](#) | [About](#) | [Logout](#)

System ▾ | Call Routing ▾ | Media Resources ▾ | Advanced Features ▾ | Device ▾ | Application ▾ | User Management ▾ | Bulk Administration ▾ | Help ▾

**SIP Trunk Security Profile Configuration**
Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**  
 Status: Ready

**SIP Trunk Security Profile Information**

Name\*   
 Description   
 Device Security Mode Non Secure ▾  
 Incoming Transport Type\* TCP+UDP ▾  
 Outgoing Transport Type TCP ▾  
☐ Enable Digest Authentication  
 Nonce Validity Time (mins)\*   
 X.509 Subject Name   
 Incoming Port\* 

← Since MRA traffic comes from the same source IP with port 5060/5061,  
 you need to use a different listening port for this trunk in CUCM

☐ Enable Application level authorization  
☐ Accept presence subscription  
☐ Accept out-of-dialog refer\*\*  
☒ Accept unsolicited notification ←  
☒ Accept replaces header ←  
☐ Transmit security status  
☐ Allow charging header  
 SIP V.150 Outbound SDP Offer Filtering\* Use Default Filter ▾

Save Delete Copy Reset Apply Config Add New

Region Configuration

Login

Login

https://192.168.21.2/ccmadmin/regionEdit.do?key=277612bd80%

Cisco Unified CM Administration

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Region Configuration

Related Links: Back To Find/ListGo

SaveDeleteResetApply ConfigAdd New

Status

Add successful

Click on the Reset button to have the changes take effect.

Region Information

Name\*EXPRESSWAY-C-REGION

Region Relationships

Region	Audio Codec Preference List	Maximum Audio Bit Rate	Maximum Session Bit Rate for Video Calls	Maximum Session Bit Rate for Immersive Video Calls
NOTE: Regions not displayed	Use System Default	Use System Default	Use System Default	Use System Default

Modify Relationship to other Regions

Regions	Audio Codec Preference List	Maximum Audio Bit Rate	Maximum Session Bit Rate for Video Calls	Maximum Session Bit Rate for Immersive Video Calls
<div>BANGALORE-PHONES-REGIONBLR-AIRTEL-SIP-TRUNK-REGIONBLR-SME-SIP-TRUNK-REGIONCUC-SIP-TRUNK-REGIONDefault</div>	Keep Current Setting	<div><div>64 kbps (G.722, G.711)</div><div>kbps</div></div>	<div><div>Keep Current Setting</div><div>Use System Default</div><div>None</div><div>6000 kbps</div></div>	<div><div>Keep Current Setting</div><div>Use System Default</div><div>None</div><div>6000 kbps</div></div>

SaveDeleteResetApply ConfigAdd New

\*- Indicates required item.

Device Pool Configuration
Login
Login

https://192.168.21.2/ccmadmin/devicePoolEdit.do?key=093b935c-9c01-

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**Device Pool Configuration**
Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Device Pool Information**  
Device Pool: EXPRESSWAY-C-DP (0 members\*\*)

**Device Pool Settings**  
Device Pool Name\* EXPRESSWAY-C-DP  
Cisco Unified Communications Manager Group\* SUB01-SUB02-CCM-GROUP  
Calling Search Space for Auto-registration < None >  
Adjunct CSS < None >  
Reverted Call Focus Priority Default  
Intercompany Media Services Enrolled Group < None >

**Roaming Sensitive Settings**  
Date/Time Group\* IST-DATE-TIME-GROUP  
Region\* EXPRESSWAY-C-REGION  
Media Resource Group List < None >  
Location < None >  
Network Locale < None >  
SRST Reference\* Disable  
Connection Monitor Duration\*\*\*  
Single Button Barge\* Default  
Join Across Lines\* Default  
Physical Location < None >  
Device Mobility Group < None >  
Wireless LAN Profile Group < None > [View Details](#)

**Local Route Group Settings**  
Standard Local Route Group < None >



Trunk Configuration
Login
Login

https://192.168.21.2/ccmadmin/trunkEdit.do?key=63b402f4-144d-904b

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Trunk Configuration
Related Links: Back To Find/List Go

Save Delete Reset Add New

**Device Information**

Product:	SIP Trunk
Device Protocol:	SIP
Trunk Service Type	None(Default)
Device Name*	EXPRESSWAY-C-SIP-TRUNK
Description	EXPRESSWAY-C-SIP-TRUNK
Device Pool*	EXPRESSWAY-C-DP
Common Device Configuration	< None >
Call Classification*	OnNet
Media Resource Group List	< None >
Location*	Hub_None
AAR Group	< None >
Tunneled Protocol*	None
QSIG Variant*	No Changes
ASN.1 ROSE OID Encoding*	No Changes
Packet Capture Mode*	None
Packet Capture Duration	0

☐ Media Termination Point Required  
☒ Retry Video Call as Audio  
☐ Path Replacement Support  
☐ Transmit UTF-8 for Calling Party Name  
☐ Transmit UTF-8 Names in QSIG APDU  
☐ Unattended Port  
☐ SRTP Allowed - When this flag is checked, Encrypted TLS needs to be configured in the network to provide end to end security. Failure to do so will expose keys and other information.  
Consider Traffic on This Trunk Secure\* When using both sRTP and TLS  
Route Class Signaling Enabled\* Default  
Use Trusted Relay Point\* Default  
☐ PSTN Access  
☒ Run On All Active Unified CM Nodes

**Intercompany Media Engine (IME)**

E.164 Transformation Profile < None >

**MLPP and Confidential Access Level Information**

MLPP Domain	< None >
Confidential Access Mode	< None >
Confidential Access Level	< None >



Trunk Configuration
Login
Login
https://192.168.21.2/ccmadmin/trunkEdit.do?key=63b402f4-144d-904b...

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Trunk Configuration
Related Links: Back To Find/List Go

Save Delete Reset Add New

**Call Routing Information**

- ☒ Remote-Party-Id
- ☒ Asserted-Identity
- Asserted-Type\* Default
- SIP Privacy\* Default

**Inbound Calls**

- Significant Digits\* All
- Connected Line ID Presentation\* Default
- Connected Name Presentation\* Default
- Calling Search Space EXPRESSWAY-C-INBOUND-CSS
- AAR Calling Search Space < None >
- Prefix DN
- ☒ Redirecting Diversion Header Delivery - Inbound

**Incoming Calling Party Settings**

If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

Clear Prefix Settings Default Prefix Settings

Number Type	Prefix	Strip Digits	Calling Search Space	Use Device Pool CSS
Incoming Number	Default	0	< None >	<input checked="" type="checkbox"/>

**Incoming Called Party Settings**

If the administrator sets the prefix to Default this indicates call processing will use prefix at the next level setting (DevicePool/Service Parameter). Otherwise, the value configured is used as the prefix unless the field is empty in which case there is no prefix assigned.

Clear Prefix Settings Default Prefix Settings


Number Type	Prefix	Strip Digits	Calling Search Space	Use Device Pool CSS
Incoming Number	Default	0	< None >	<input checked="" type="checkbox"/>

**Connected Party Settings**

- Connected Party Transformation CSS < None >
- ☒ Use Device Pool Connected Party Transformation CSS

**Outbound Calls**

- Called Party Transformation CSS < None >
- ☒ Use Device Pool Called Party Transformation CSS


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**Trunk Configuration**
Related Links:
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Save
Delete
Reset
Add New

**SIP Information**

**Destination**

☐ Destination Address is an SRV

	Destination Address	Destination Address IPv6	Destination Port
1 *	blr-exp-c-cluster.ajcollab.com		5060

MTP Preferred Originating Codec\*
711ulaw

BLF Presence Group\*
Standard Presence group

SIP Trunk Security Profile\*
EXP-C-SIP-TRUNK-SIP-SEC-PROFILE

Rerouting Calling Search Space
< None >

Out-Of-Dialog Refer Calling Search Space
< None >

SUBSCRIBE Calling Search Space
< None >

SIP Profile\*
Standard SIP Profile For Cisco VCS
[View Details](#)

DTMF Signaling Method\*
No Preference

**Normalization Script**

Normalization Script
vcs-interop

☐ Enable Trace

	Parameter Name	Parameter Value
1		

**Recording Information**

☒ None
☐ This trunk connects to a recording-enabled gateway
☐ This trunk connects to other clusters with recording-enabled gateways

**Geolocation Configuration**

Geolocation
< None >


Geolocation Filter
< None >

☐ Send Geolocation Information

Save
Delete
Reset
Add New

*i* \*- indicates required item.

*i* \*\*- Device reset is not required for changes to Packet Capture Mode and Packet Capture Duration.



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**Route Group Configuration**
Related Links: Back To Find/List Go

Save Delete Add New

**Status**  
 Add successful

**Route Group Information**  
 Route Group Name\*  ←  
 Distribution Algorithm\* Circular ▾

**Route Group Member Information**  
**Find Devices to Add to Route Group**  
 Device Name contains  Find  
 Available Devices\*\*  

AIRTEL-CUBE-SIP-TRUNK  
 BLR-SME-SIP-TRUNK  
 CUC-PUB-SIP-TRUNK  
 CUC-SUB-SIP-TRUNK  
 EXP-C-SIP-TRUNK

 Port(s) All ▾  
Add to Route Group

**Current Route Group Members**  
 Selected Devices (ordered by priority)\* 

EXP-C-SIP-TRUNK (All Ports) ←  

▼

▲


▼

▲



Reverse Order of Selected Devices  
 Removed Devices\*\*\* 


▲

▼

**Route Group Members**  
 [EXP-C-SIP-TRUNK](#)

Save Delete Add New

 \*- indicates required item.  
 \*\*Select device, select port, and click Add to Route Group

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Route List Configuration

Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

Status

Update successful

Route List Information

Registration: Registered with Cisco Unified Communications Manager blr-cucm-sub01.ajcollab.com  
IPv4 Address: 192.168.121.2  
☒ Device is trusted  
Name\* EXPRESSWAY-C-SIP-TRUNK-RL  
Description EXPRESSWAY-C-SIP-TRUNK-RL  
Cisco Unified Communications Manager Group\* SUB01-SUB02-CCM-GROUP  
☒ Enable this Route List (change effective on Save; no reset required)  
☒ Run On All Active Unified CM Nodes

Route List Member Information

Selected Groups\*\*

EXPRESSWAY-C-SIP-TRUNK-RG

▼

▲

▼

▲


Add Route Group

Removed Groups\*\*\*

▼

▲

Route List Details

 EXPRESSWAY-C-SIP-TRUNK-RG

Save Delete Copy Reset Apply Config Add New

**Cisco Unified CM Administration**  
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**Partition Configuration**
Related Links: [Back To Find/List](#) Go

Save

**Status**  
 Status: Ready

**Partition Information**  

To enter multiple partitions, use one line for each partition entry. You can enter up to 75 partitions; the names and descriptions can have up to a total of 1475 characters. The partition name cannot exceed 50 characters. Use a comma (,) to separate the partition name and description on each line. If a description is not entered, Cisco Unified Communications Manager uses the partition name as the description. For example:  
<< partitionName >> , << description >>  
CiscoPartition, Cisco employee partition  
DallasPartition

Name\*

**Cisco Unified CM Administration**  
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**Calling Search Space Configuration**
Related Links: [Back To Find/List](#) Go

Save Delete Copy Add New

**Status**  
 Status: Ready

**Calling Search Space Information**  

Name\*


Description

**Route Partitions for this Calling Search Space**  

Available Partitions\*\*

Selected Partitions


- Global Learned Enterprise Patterns
- Global Learned E164 Numbers
- Global Learned E164 Patterns
- Global Learned Enterprise Numbers
- EXPRESSWAY-DEVICES-PT**



**Cisco Unified CM Administration**  
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**Route Pattern Configuration**
Related Links: [Back To Find/List](#) Go

 Save

**Status**  
 Status: Ready

**Pattern Definition**

Route Pattern\*

Route Partition EXPRESSWAY-DEVICES-PT

Description

Numbering Plan -- Not Selected --

Route Filter < None >

MLPP Precedence\* Default

☐ Apply Call Blocking Percentage

Resource Priority Namespace Network Domain < None >

Route Class\* Default

Gateway/Route List\* EXPRESSWAY-C-SIP-TRUNK-RL [\(Edit\)](#)

Route Option  
☒ Route this pattern  
☐ Block this pattern No Error

Call Classification\* OnNet

External Call Control Profile < None >

☐ Allow Device Override
 ☐ Provide Outside Dial Tone
 ☐ Allow Overlap Sending
 ☐ Urgent Priority

☐ Require Forced Authorization Code

Authorization Level\*

☐ Require Client Matter Code

**Calling Party Transformations**

☐ Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation\* Default

Calling Name Presentation\* Default

Calling Party Number Type\* Cisco CallManager

Calling Party Numbering Plan\* Cisco CallManager

**Connected Party Transformations**

Connected Line ID Presentation\* Default

- When you configure B2B Calls, create a SIP Route Pattern that route everything to Expressway C

**SIP Route Pattern Configuration**

Related Links: [Back To Find/List](#) [Go](#)

**Status**

Status: Ready

**Pattern Definition**

Pattern Usage\* Domain Routing

IPv4 Pattern\* .\*

IPv6 Pattern

Description B2B-CALL

Route Partition < None >

SIP Trunk/Route List\* EXPRESSWAY-C-SIP-TRUNK-RL [\(Edit\)](#)

☐ Block Pattern

**Calling Party Transformations**

☐ Use Calling Party's External Phone Mask

Calling Party Transformation Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation\* Default

Calling Line Name Presentation\* Default

**Connected Party Transformations**

Connected Line ID Presentation\* Default

Connected Line Name Presentation\* Default

[Save](#)

**i** \*- indicates required item.

**Cisco Unified CM Administration**  
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### Enterprise Parameters Configuration

Save Set to Default Reset Apply Config

<a href="#">Effective Access Privileges For Overlapping User Groups and roles *</a>	Maximum	Maximum
<a href="#">Allow non-super user to grant access to administrative web pages *</a>	True	True
<a href="#">User Assignment Mode for Presence Server *</a>	Balanced	Balanced
<a href="#">Directory Group Operations on Cisco IM and Presence *</a>	Disabled	Disabled
<a href="#">Maximum Enterprise Group Size to allow Presence Information *</a>	100	100
<a href="#">Syncing Mode for Enterprise Groups *</a>	Differential Sync	Differential Sync

#### Service Manager TCP ports parameters

<a href="#">Service Manager TCP Server communication port number *</a>	8888	8888
<a href="#">Service Manager TCP Client communication port number *</a>	8889	8889

#### CRS Application Parameters

<a href="#">Auto Attendant Installed *</a>	false
<a href="#">IPCC Express Installed *</a>	false

#### Clusterwide Domain Configuration

<a href="#">Organization Top Level Domain</a>	
<a href="#">Cluster Fully Qualified Domain Name</a>	ajcollab.com

#### Denial-of-Service Protection

<a href="#">Denial-of-Service Protection *</a>	True	True
------------------------------------------------	------	------

#### TLS Handshake Timer

<a href="#">TLS Handshake Timer *</a>	60	60
---------------------------------------	----	----

#### TLS Resumption Timer

<a href="#">TLS Resumption Timer *</a>	3600	3600
----------------------------------------	------	------

#### Cisco Support Use

<a href="#">Cisco Support Use 1</a>	
<a href="#">Cisco Support Use 2</a>	

#### IPv6

<a href="#">Enable IPv6 *</a>	False	False
<a href="#">IP Addressing Mode Preference for Media *</a>	IPv4	IPv4
<a href="#">IP Addressing Mode Preference for Signaling *</a>	IPv4	IPv4

#### IPv6 for Phones

<a href="#">Allow Auto-Configuration for Phones *</a>	On	On
-------------------------------------------------------	----	----



- Create a SIP Profile for IP Phones, this is optional, you may skip this

SIP Profile Configuration

Save

**SIP Profile Information**

Name\* IP-PHONES-SIP-PROFILE

Description Default SIP Profile

Default MTP Telephony Event Payload Type\* 101

Early Offer for G.Clear Calls\* Disabled

User-Agent and Server header information\* Send Unified CM Version Information as User-Agent

Version in User Agent and Server Header\* Major And Minor

Dial String Interpretation\* Phone number consists of characters 0-9, \*, #, and

Confidential Access Level Headers\* Disabled

☐ Redirect by Application

☐ Disable Early Media on 180

☐ Outgoing T.38 INVITE include audio mline

☐ Offer valid IP and Send/Receive mode only for T.38 Fax Relay

☒ Use Fully Qualified Domain Name in SIP Requests

☐ Assured Services SIP conformance

☐ Enable External QoS\*\*

**SDP Information**

SDP Session-level Bandwidth Modifier for Early Offer and Re-invites\* TIAS and AS

SDP Transparency Profile < None >

Accept Audio Codec Preferences in Received Offer\* Default

☐ Require SDP Inactive Exchange for Mid-Call Media Change

☐ Allow RR/RS bandwidth modifier (RFC 3556)

SIP Profile Configuration
Login
Login
https://192.168.21.2/ccadmin/sipProfileEdit.do?done=1&key=fcbc7581

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SIP Profile Configuration
Related Links: Back To Find/List Go

Save

Caller ID DN
Caller Name

**Trunk Specific Configuration**

Reroute Incoming Request to new Trunk based on\* Never
Resource Priority Namespace List < None >
SIP Rel1XX Options\* Disabled
Video Call Traffic Class\* Mixed
Calling Line Identification Presentation\* Default
Session Refresh Method\* Invite
Early Offer support for voice and video calls\* Disabled (Default value)
☐ Enable ANAT
☐ Deliver Conference Bridge Identifier
☐ Allow Passthrough of Configured Line Device Caller Information
☐ Reject Anonymous Incoming Calls
☐ Reject Anonymous Outgoing Calls
☐ Send ILS Learned Destination Route String
☐ Connect Inbound Call before Playing Queuing Announcement

**SIP OPTIONS Ping**


☐ Enable OPTIONS Ping to monitor destination status for Trunks with Service Type "None (Default)"
Ping Interval for In-service and Partially In-service Trunks (seconds)\* 60
Ping Interval for Out-of-service Trunks (seconds)\* 120
Ping Retry Timer (milliseconds)\* 500
Ping Retry Count\* 6

**SDP Information**

☐ Send send-receive SDP in mid-call INVITE
☒ Allow Presentation Sharing using BFCP
☐ Allow iX Application Media
☐ Allow multiple codecs in answer SDP

Save















## Configuration >> Protocols >> SIP

 Cisco Expressway-C


Status > System > **Configuration >** Applications > Users > Maintenance > [Help](#) [Logout](#)


**SIP** You are here: [Configuration](#) > [Protocols](#) > SIP

**Configuration**

SIP mode	On 
UDP mode	Off 
UDP port	* 5060 
TCP mode	On 
TCP port	* 5060 
TLS mode	On 
TLS port	* 5061 
Mutual TLS mode	Off 
Mutual TLS port	* 5062 
TCP outbound port start	* 25000 
TCP outbound port end	* 29999 
Session refresh interval (seconds)	* 1800 
Minimum session refresh interval (seconds)	* 500 
TLS handshake timeout (seconds)	* 5 

**Certificate revocation checking**


Certificate revocation checking mode	Off 
--------------------------------------	-----------------------------------------------------------------------------------------

 Cisco Expressway-C





Status > System > **Configuration >** Applications > Users > Maintenance > [Help](#) [Logout](#)

**Domains** You are here: [Configuration](#) > [Domains](#) > Edit

**Configuration**


Domain name	* ajcollab.com 
-------------	----------------------------------------------------------------------------------------------------


**Supported services for this domain**

SIP registrations and provisioning on Expressway	On 
SIP registrations and provisioning on Unified CM	On 
IM and Presence Service	On 
XMPP federation	Off 

[Save](#) [Delete](#) [Cancel](#)

## Configurations >> Zones >> Zones >> New


 Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance > ? 

**Edit zone** You are here: [Configuration](#) > [Zones](#) > [Zones](#) > Edit zone

Configuration


Name

\* CUCM-NEIGHBOUR-ZONE 

Type


Neighbor

Hop count

\* 15 


H.323

Mode


Off 

SIP


Mode

On 


Port

\* 6060 


Transport

TCP 


Accept proxied registrations

Allow 


Media encryption mode

Auto 


ICE support

Off 


ICE Passthrough support

Off 


Multistream mode

On 


Preloaded SIP routes support

Off 

AES GCM support


Off 

SIP UPDATE for session refresh


Off 

Authentication

Authentication policy


Do not check credentials 

SIP authentication trust mode

Off 

Location

Look up peers by

Address 

User: admin Access: Read-write System host name: exp-c-01 System time: 00:00 UTC Language: en\_US S/N: 07D53472 Version: X12.6.3



## Edit zone

You are here: [Configuration](#) > [Zones](#) > [Zones](#) > Edit zone

## Authentication

Authentication policy

Do not check credentials ▾ ⓘ

SIP authentication trust mode

Off ▾ ⓘ

## Location

Look up peers by

Address ▾ ⓘ

Peer 1 address

blr-cucm-sub01.ajcollab.com ⓘ

SIP: Reachable: 192.168.121.2:6060

Peer 2 address

blr-cucm-sub02.ajcollab.com ⓘ

SIP: Reachable: 192.168.121.3:6060

Peer 3 address

 ⓘ

Peer 4 address

 ⓘ

Peer 5 address

 ⓘ

Peer 6 address

 ⓘ

## Advanced

Zone profile

Cisco Unified Communications Manager (9.x or later) ⓘ

[Save](#) [Cancel](#) [Delete](#)

## Status

State Active ⓘ

Number of calls to this zone 0

Number of proxied registrations from this zone 0

Bandwidth used on this Expressway 0 kbps

Total bandwidth used across this cluster 0 kbps

Search rules targeting this zone 0

## Related tasks

[Configure search rules](#)



## Edit search rule

You are here: [Configuration](#) > [Dial plan](#) > [Search rules](#) > Edit search rule

## Configuration

Rule name	* ROUTE-FROM-CUCM
Description	ROUTE-FROM-CUCM
Priority	* 100
Protocol	SIP
SIP variant	All SIP Variants
Source	Named
Source name	* CUCM-NEIGHBOUR-ZONE
Request must be authenticated	No
Mode	Alias pattern match
Pattern type	Regex
Pattern string	* (4....)@exp-c-cluster\ajcollab\com:5060
Pattern behavior	Replace
Replace string	\1@ajcollab.com
On successful match	Stop
Target	* Local Zone
State	Enabled

  
[Save](#) [Delete](#) [Cancel](#)

## Related tasks

[Test whether a pattern match or transform has the expected result](#)  
[Perform a test search for an alias](#)



## Edit search rule

You are here: [Configuration](#) > [Dial plan](#) > [Search rules](#) > Edit search rule

## Configuration

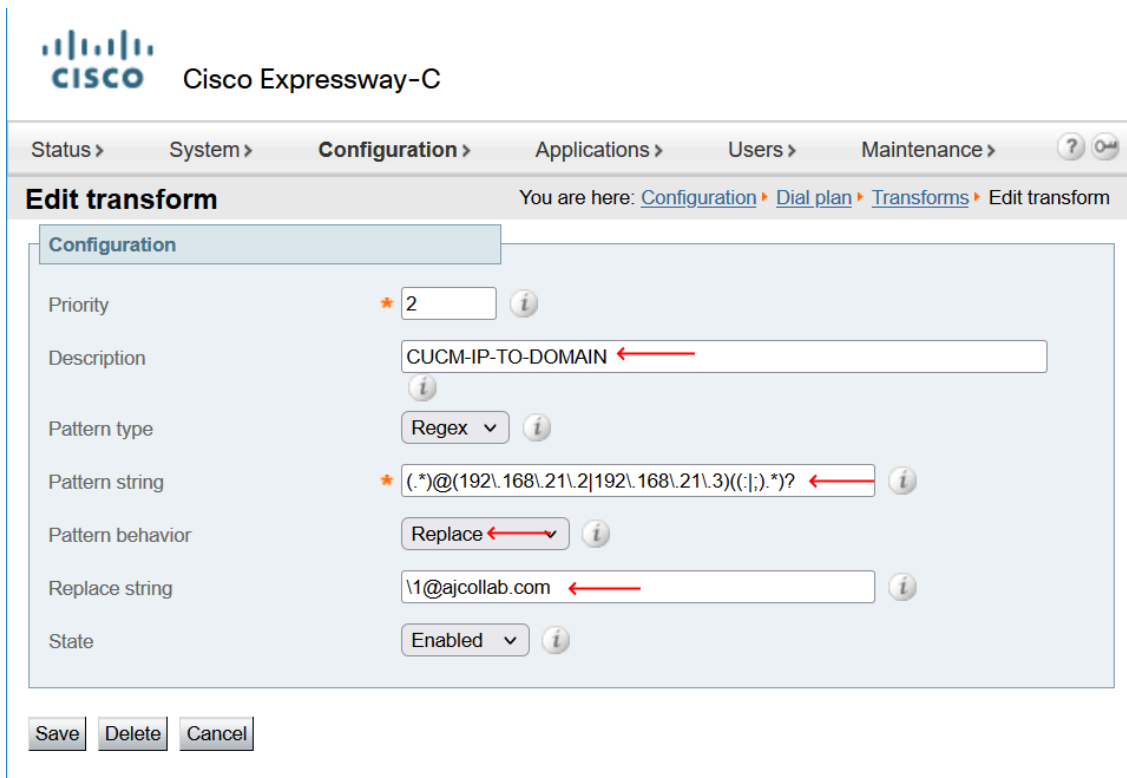
Rule name	* ROUTE-TO-CUCM
Description	ROUTE-TO-CUCM
Priority	* 100
Protocol	SIP
SIP variant	All SIP Variants
Source	All zones
Request must be authenticated	No
Mode	Alias pattern match
Pattern type	Regex
Pattern string	* [^4]...@ajcollab1.com
Pattern behavior	Leave
On successful match	Stop
Target	* CUCM-NEIGHBOUR-ZONE
State	Enabled

[Save](#) [Delete](#) [Cancel](#)

## Related tasks

[Test whether a pattern match or transform has the expected result](#)[Perform a test search for an alias](#)

- Change CUCM IPs to @DOMAIN format
- Match = `(.*)@(192\168\21\2|192\168\21\3)(([:;].*)?)`
- Change = `\1@ajcollab.com`



**Cisco Expressway-C**

Status > System > **Configuration** > Applications > Users > Maintenance > ?

**Edit transform** You are here: [Configuration](#) > [Dial plan](#) > [Transforms](#) > Edit transform

**Configuration**

Priority: 2

Description: CUCM-IP-TO-DOMAIN

Pattern type: Regex

Pattern string: `(.*)@(192\168\21\2|192\168\21\3)(([:;].*)?)`

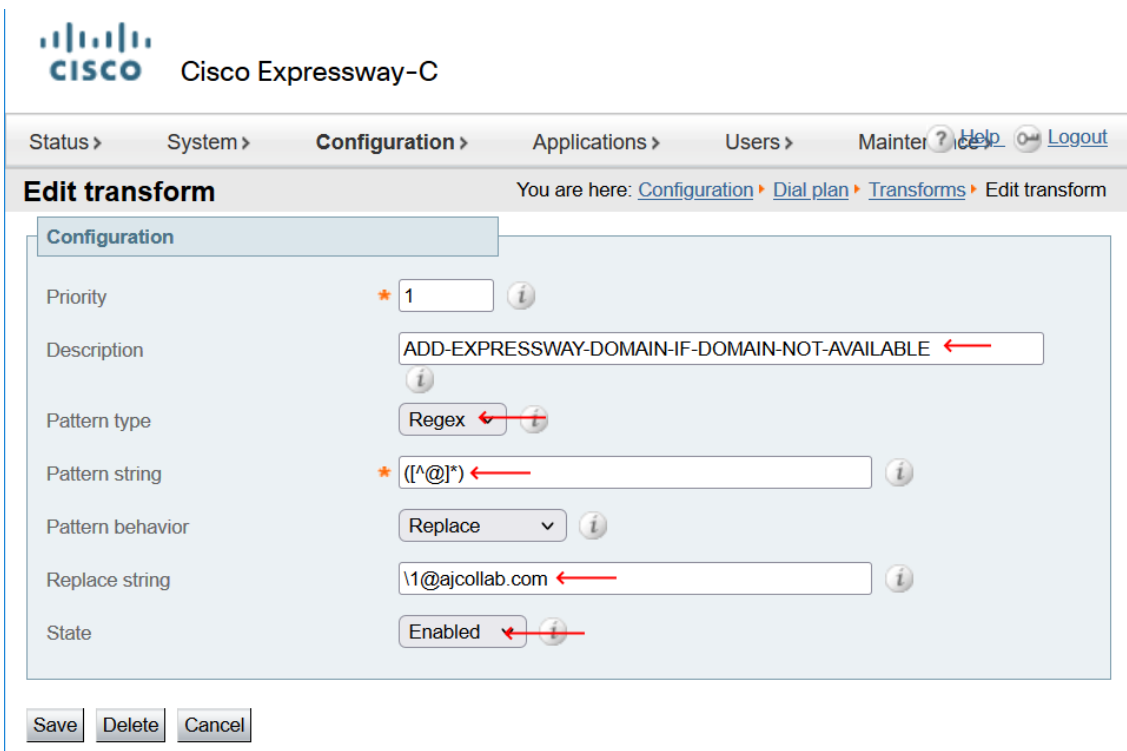
Pattern behavior: Replace

Replace string: `\1@ajcollab.com`

State: Enabled

Save Delete Cancel

- Add @DOMAIN in every call which doesn't have '@' part
- Match = `([^@]*)`
- Change = `\1@ajcollab.com`



**Cisco Expressway-C**

Status > System > **Configuration** > Applications > Users > Maintenance > ? Help Logout

**Edit transform** You are here: [Configuration](#) > [Dial plan](#) > [Transforms](#) > Edit transform

**Configuration**

Priority: 1

Description: ADD-EXPRESSWAY-DOMAIN-IF-DOMAIN-NOT-AVAILABLE

Pattern type: Regex

Pattern string: `([^@]*)`

Pattern behavior: Replace

Replace string: `\1@ajcollab.com`

State: Enabled

Save Delete Cancel



 **Security risk**  
System passphrase not set



Incoming call  
**11002 - Abdul Jaseem**  
11002@192.168.21.3

Answer

Decline

---

## [Lab] B2B (Business to Business) Call Using Expressways



- On CUCM Create SIP Trunk from CUCM to Expressway C (Already created)
- On Expressway-C Create Neighbor Zone from Expressway-C to CUCM and Traversal Client zone from Expressway-C to Expressway E
- Expressway-E Create Traversal Server zone from Expressway-E to Expressway-C and DNS Zone to internet

## Expressway C Configuration

- Creating Traversal Client Zone in Expressway E

The screenshot displays the Cisco Expressway-C configuration interface in a web browser. The browser tabs show 'vSphere - colpod1\_windows-ext', 'blr-exp-c-01 - Edit zone', and 'blr-exp-e-01 - Edit zone'. The address bar shows the URL 'https://blr-exp-c-01.ajcollab.com/editzone?id=4'. The Cisco logo is in the top left, and the page title is 'Cisco Expressway-C'. The navigation bar includes links for Status, System, Configuration, Applications, Users, and Maintenance. The 'Edit zone' page is active, showing the configuration for a zone named 'EXPRESSWAY-E-B2B-TRAVERSAL-ZONE'. The configuration is divided into sections: Configuration, Connection credentials, H.323, and SIP. Red arrows point to specific fields: the zone name, type, hop count, username, password, H.323 mode, SIP mode, port, transport, TLS verify mode, and several SIP-related options.

**Configuration**

Name: EXPRESSWAY-E-B2B-TRAVERSAL-ZONE

Type: Traversal client

Hop count: 15

**Connection credentials**

Username: traversal.admin

Password: \*\*\*\*\*

**H.323**

Mode: Off

**SIP**

Mode: On

Port: 7002

Transport: TLS

TLS verify mode: On

Accept proxied registrations: Allow

Media encryption mode: Auto

ICE support: Off

ICE Passthrough support: Off

Multistream mode: On

SIP poison mode: Off

Preloaded SIP routes support: Off

SIP parameter preservation: Off

AES GCM support: Off

SIP UPDATE for session refresh: Off

User: admin Access: Read-write System host name: blr-exp-c-01 System time: 00:00 UTC Language: en\_US S/N: 09861AA6 Version: X12.6.3

vSphere - colpod1\_windows-ext X
blr-exp-c-01 - Edit zone X
+

https://blr-exp-c-01.ajcollab.com/editzone?id=4

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance >
[Help](#)
[Logout](#)

**Edit zone**
You are here: [Configuration](#) > [Zones](#) > [Zones](#) > Edit zone

Authentication

Authentication policy
Do not check credentials
i

Accept delegated credential checks
Off
i

Client settings

Retry interval
★ 120
i

Disconnect on fail interval
★ 0
i

Location

Peer 1 address
blr-exp-e-01.ajcollab.com
i
SIP: Reachable: 192.168.21.15:7002

Peer 2 address
blr-exp-e-02.ajcollab.com
i
SIP: Reachable: 192.168.21.16:7002

Peer 3 address
i

Peer 4 address
i

Peer 5 address
i

Peer 6 address
i

Save Cancel Delete

Status

State
Active

Number of calls to this zone
0

Number of proxied registrations from this zone
0

Bandwidth used on this Expressway
0 kbps

Total bandwidth used across this cluster
0 kbps

Search rules targeting this zone
0

Related tasks

[Configure search rules](#)

User: admin Access: Read-write System host name: blr-exp-c-01 System time: 00:00 UTC
Language: en\_US S/N: 09861AA6 Version: X12.6.3

## Expressway E Configuration

- Creating Traversal Server Zone in Expressway E

The screenshot displays the Cisco Expressway-E configuration interface in a web browser. The browser tabs show 'vSphere - colpod1\_windows-ext', 'blr-exp-c-01 - Zones', and 'blr-exp-e-01 - Edit zone'. The address bar shows the URL 'https://blr-exp-e-01.ajcollab.com/editzone?id=2'. The Cisco logo is visible in the top left, and the page title is 'Cisco Expressway-E'. The navigation bar includes links for Status, System, Configuration, Applications, Users, and Maintenance. The 'Edit zone' page is active, showing the configuration for a zone named 'EXPRESSWAY-C-B2B-TRAVERSAL-ZON'. The configuration is divided into several sections: Configuration, Connection credentials, H.323, and SIP. Red arrows point to specific fields in each section.

**Configuration**

- Name: \* EXPRESSWAY-C-B2B-TRAVERSAL-ZON
- Type: Traversal server
- Hop count: \* 15

**Connection credentials**

- Username: \* traversal.admin
- Password: [Add/Edit local authentication database](#)

**H.323**

- Mode: Off

**SIP**

- Mode: On
- Port: \* 7002
- Transport: TLS
- TLS verify mode: On
- TLS verify subject name: \* blr-exp-c-cluster.ajcollab.com
- Accept proxied registrations: Allow
- Media encryption mode: Auto
- ICE support: Off
- ICE Passthrough support: Off
- Multistream mode: On
- SIP poison mode: Off
- Preloaded SIP routes support: Off
- SIP parameter preservation: Off
- AES GCM support: Off

User: admin Access: Read-write System host name: blr-exp-e-01 System time: 00:00 UTC Language: en\_US S/N: 06207F77 Version: X12.6.3

vsphere - colpod\_l\_windows-vi x

bl-exp-c-01 - Edit zone x

+

https://bl-exp-c-01.ajcollab.com/editzone?id=4

Cisco Expressway-C

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

Edit zone

You are here: Configuration > Zones > Zones > Edit zone

Authentication

Authentication policy 

Do not check credentials

Accept delegated credential checks 

Off

Client settings

Retry interval 

120

Disconnect on fail interval 

0

Location

Peer 1 address 

bl-exp-e-01.ajcollab.com

SP: Reachable: 192.168.21.15.7002

Peer 2 address 

bl-exp-e-02.ajcollab.com

SP: Reachable: 192.168.21.16.7002

Peer 3 address

Peer 4 address

Peer 5 address

Peer 6 address

Save Cancel Delete

Status

State 

Active

Number of calls to this zone 0

Number of provided registrations from this zone 0

Bandwidth used on this Expressway 0 kbps

Total bandwidth used across this cluster 0 kbps

Search rules targeting this zone 0

Related tasks

[Configure search rules](#)

bl-exp-e-01 - Edit zone x

+

https://bl-exp-e-01.ajcollab.com/editzone?id=2

Cisco Expressway-E

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

Edit zone

You are here: Configuration > Zones > Zones > Edit zone

AES GCM support 

Off

SP UPDATE for session refresh 

Off

Authentication

Authentication policy 

Do not check credentials

UDP / TCP probes

UDP retry interval 

2

UDP retry count 

5

UDP keep alive interval 

20

TCP retry interval 

2

TCP retry count 

5

TCP keep alive interval 

20

Save Cancel Delete

Status

State 

Active

SP port 

Active

W323 port 

Inactive

Number of calls to this zone 0

Number of provided registrations from this zone 0

Bandwidth used on this Expressway 0 kbps

Total bandwidth used across this cluster 0 kbps

Connection 1 

SP: Reachable: 192.168.21.13.25052

Connection 2 

SP: Reachable: 192.168.21.14.25049

Search rules targeting this zone 0

Related tasks

[Configure search rules](#)

Activate Windows  
Go to Settings to activate Windows.

User: admin Access: Read-write System host name: bl-exp-c-01 System time: 00:00 UTC Language: en\_US S/N: 09861A46 Version: X12.6.3

User: admin Access: Read-write System host name: bl-exp-e-01 System time: 00:00 UTC Language: en\_US S/N: 06207777 Version: X12.6.3

966

- Create DNS Zone in Expressway E

blr-exp-e-01 - Create zone

+

←

→

↺

🏠

🔒

https://blr-exp-e-01.ajcollab.com/createzone

☆

📧

☰

Cisco Expressway-E

Status >

System >

Configuration >

Applications >

Users >

Maintenance >

?

Out

Create zone

You are here: [Configuration](#) > [Zones](#) > [Zones](#) > Create zone

Name

\* B2B-DNS-ZONE 

←

i

Type

\* DNS 

←

i

Hop count

\* 15 

i

H.323

Mode

On 

▼

i

SIP

Mode

On 

▼

i

TLS verify mode

Off 

▼

i

Fallback transport protocol

UDP 

▼

i

Media encryption mode

Auto 

▼

i

ICE support

Off 

▼

i

ICE Passthrough support

Off 

▼

i

Preloaded SIP routes support

Off 

▼

i

Modify DNS request

Off 

▼

i

AES GCM support

Off 

▼

i

SIP UPDATE for session refresh

Off 

▼

i

Authentication

SIP authentication trust mode

Off 

▼

i

Advanced

Include address record

Off 

▼

i

Zone profile

Default 

▼

i

Create zone

Cancel

Activate Windows

Go to Settings to activate Windows.

User: admin Access: Read-write System host name: blr-exp-e-01 System time: 00:00 UTC

Language: en\_US S/N: 06207F77 Version: X12.6.3

- Make sure you have created B2B SIP Route Pattern in CUCM and pointed to Expressway C SIP Trunk

vSphere - colpod1\_windows-ext X blr-exp-c-01 - Edit search rule X SIP Route Pattern Configuration X

https://blr-cucm-pub.ajcollab.com/ccmadmin/sipRoutePatternEdit.do

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

**SIP Route Pattern Configuration** Related Links: Back To Find/List Go

Save

**Status**  
Status: Ready

**Pattern Definition**

Pattern Usage\* Domain Routing  
IPv4 Pattern\* .\*  
IPv6 Pattern  
Description B2B-CALL  
Route Partition < None >  
SIP Trunk/Route List\* EXPRESSWAY-C-SIP-TRUNK-RL (Edit)  
☐ Block Pattern

**Calling Party Transformations**

☐ Use Calling Party's External Phone Mask  
Calling Party Transformation Mask  
Prefix Digits (Outgoing Calls)  
Calling Line ID Presentation\* Default  
Calling Line Name Presentation\* Default

**Connected Party Transformations**

Connected Line ID Presentation\* Default  
Connected Line Name Presentation\* Default

Save

\*- indicates required item.



## Outgoing B2B Call Search Rule on Expressway C and E

- On Expressway-C **(?!.\*@ajcollab\.com.\*\$).\*** Do not match my domain and send the call Expressway-E Traversal Zone
- On Expressway-E **(?!.\*@ajcollab\.com.\*\$).\*** Do not match my domain and send the call to DNS Zone

The image displays two side-by-side screenshots of the Cisco Expressway configuration interface, specifically the 'Edit search rule' page. Both screenshots show the configuration for a search rule on a specific Expressway (C and E).

**Left Screenshot (Cisco Expressway-C):**

- Rule name:** ROUTE-B2B-TO-EXPRESSWAY-E
- Description:** ROUTE-B2B-TO-EXPRESSWAY-E
- Priority:** 150
- Protocol:** Any
- Source:** All zones
- Request must be authenticated:** No
- Mode:** Alias pattern match
- Pattern type:** Regex
- Pattern string:** (?!.\*@ajcollab\.com.\*\$).\*
- Pattern behavior:** Leave
- On successful match:** Continue
- Target:** EXPRESSWAY-E-B2B-TRAVERSAL-ZONE
- State:** Enabled

**Right Screenshot (Cisco Expressway-E):**

- Rule name:** ROUTE-B2B-TO-DNS-ZONE
- Description:** ROUTE-B2B-TO-DNS-ZONE
- Priority:** 150
- Protocol:** Any
- Source:** All zones
- Request must be authenticated:** No
- Mode:** Alias pattern match
- Pattern type:** Regex
- Pattern string:** (?!.\*@ajcollab\.com.\*\$).\*
- Pattern behavior:** Leave
- On successful match:** Continue
- Target:** B2B-DNS-ZONE
- State:** Enabled

## Incoming B2B Call Search Rule on Expressway C and E

- On Expressway-E **(.\*@ajcollab\.com.\*\$).\*** match my domain and send the call to Expressway-C Traversal Zone
- On Expressway-C **(.\*@ajcollab\.com.\*\$).\*** match my domain and send the call CUCM Neighbor Zone

The image displays two side-by-side screenshots of the Cisco Expressway configuration interface, specifically the 'Edit search rule' page. Both screenshots show the configuration for a search rule on a specific Expressway (C and E).

**Left Screenshot (Cisco Expressway-C):**

- Rule name:** ROUTE-B2B-TOCUCM-NEIGHBOUR-ZONE-INCOMING
- Description:** ROUTE-B2B-TOCUCM-NEIGHBOUR-ZONE-INCOMING
- Priority:** 150
- Protocol:** Any
- Source:** All zones
- Request must be authenticated:** No
- Mode:** Alias pattern match
- Pattern type:** Regex
- Pattern string:** (.\*@ajcollab\.com.\*\$).\*
- Pattern behavior:** Leave
- On successful match:** Continue
- Target:** CUCM-NEIGHBOUR-ZONE
- State:** Enabled

**Right Screenshot (Cisco Expressway-E):**

- Rule name:** ROUTE-B2B-TO-EXPRESSWAY-C-TRAVERSAL-ZONE-INCOMING
- Description:** ROUTE-B2B-TO-EXPRESSWAY-C-TRAVERSAL-ZONE-INCOMING
- Priority:** 150
- Protocol:** Any
- Source:** All zones
- Request must be authenticated:** No
- Mode:** Alias pattern match
- Pattern type:** Regex
- Pattern string:** (.\*@ajcollab\.com.\*\$).\*
- Pattern behavior:** Leave
- On successful match:** Continue
- Target:** EXPRESSWAY-C-B2B-TRAVERSAL-ZONE
- State:** Enabled

- Create Call Policy in Expressway E to reject unknown callers

blr-exp-e-01 - Call Policy config

https://blr-exp-e-01.ajcollab.com/adminpolicy

**Cisco Expressway-E**

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

**Call Policy configuration** You are here: [Configuration](#) > [Call Policy](#) > Configuration

**Configuration**

Call Policy mode: Local CPL

**Save**

**Policy files**

Call policy file: CPL File [Show Call Policy file](#)

CPL XSD file: XSD File [Show CPL XSD file](#)

CPL extensions xsd file: XSD File [Show CPL extensions XSD file](#)

Select the new Call Policy file: [Browse...](#) No file selected.

**Upload file**

**Related tasks**

[Edit Call Policy rules](#)

blr-exp-e-01 - Edit Call Policy rule

https://blr-exp-e-01.ajcollab.com/editcallpolicyrule?id=1

**Cisco Expressway-E**

Status > System > Configuration > Applications > Users > Maintenance > [Help](#) [Logout](#)

**Edit Call Policy rule** You are here: [Configuration](#) > [Call Policy](#) > Edit Call Policy rule

**Edit Call Policy rule**

Source type: From address

Rule applies to: Authenticated callers

Source pattern: (.\*)@spam!.com.\*\$

Destination pattern: \*

Action: Reject

**Save** **Delete** **Cancel**

---

## **Chapter 3 - Cloud Collaboration**

### **Cisco Cloud Collaboration Solution**

### **Webex Control Hub**



---

## Cisco Cloud Collaboration Solution



### UCM Cloud

- It is a cloud based CUCM hosted by Cisco, interface is exactly similar to on-premise CUCM
- It is bit costly as compared to Webex, hence Cisco recommends UCM Cloud if you have 1000+ users
- The Administration interface is completely managed by customer, we can do User Management, Device Management, BAT, etc.
- OS Administration and Serviceability access is limited since this is a managed environment
- Selfcare portal is available to all end users

### Hosted Collaboration Solution (HCS)

- Service Provider Hosted Collaboration Solution. CUCM is hosted by HSC Partners (Verizon, AT&T, etc.)
- Partners can offer smaller price hence it is cheaper than UCM Cloud

### Cisco Webex

- Cloud based collaboration solution hosted and managed by Cisco
- Offers 3 main services Messaging, Meeting and Calling

---

## Overview of Webex Solutions

- **Webex Meetings:** Host video conferences with HD video, audio, and screen sharing. Designed for small to medium sized business. 1000 participants.
- **Webex Personal Room:** Same platform as Webex meetings, it has a static meeting ID and URL. Used for quick collaboration and meetings
- **WebEx Events:** Similar to Webex meetings but with more participants (3000 participants)
- **Webex Training:** Other flavor of Webex Meetings that provides impactful training experience
- **Webex Support:** Other flavor of Webex Meetings that provides real-time support and customer service. Kind of remote desktop management solution
- All the Webex Meeting solutions are Web Based
- **Webex Teams Messaging:** Connect instantly with team messaging, secure file-sharing and whiteboarding
- **Webex Cloud Calling:** Get a phone number and business calling system so you can make and receive calls on any device.
- **Webex Contact Center:** Cloud Based contact center solution

The screenshot shows the Webex Enterprise Site dashboard for Abdul Jaseem V.P.'s Personal Room. The interface includes a sidebar with navigation options: Home, Meetings, Recordings, Preferences, Insights, Support, Downloads, and Feedback. The main content area displays the user's profile, a search bar, and buttons for 'Start a Meeting' and 'Schedule'. Below this, there is a section for 'Upcoming Meetings' with a list of scheduled sessions and a 'Join' button. On the right, there is a 'Webex Meetings app' download prompt, a 'Recent Personal Rooms' section with room codes (SL, AS, IR, RK, MK), and two charts under 'Insights': 'Meetings I hosted or attended' and 'Participants in meetings I hosted or attended'.

WebEx Enterprise Site - Home

Join a meeting or search for a meeting, recording, or transcript

English Abdul

Abdul Jaseem V.P.'s Personal Room

<https://www.webex.com/join/abvp> Personal Room

More ways to join

Start a Meeting Schedule

Upcoming Meetings

2:00 PM - 3:30 PM Mon, Mar 15

2:30 PM - 3:30 PM Tue, Mar 16

8:30 PM - 10:00 PM Tue, Mar 16

View all meetings

Webex Training

Webex Events

Webex Support

Webex Meetings app

Install the Webex Meetings app to get ready for upcoming meetings.

Download

Recent Personal Rooms

SL AS IR RK MK

Insights

Meetings I hosted or attended

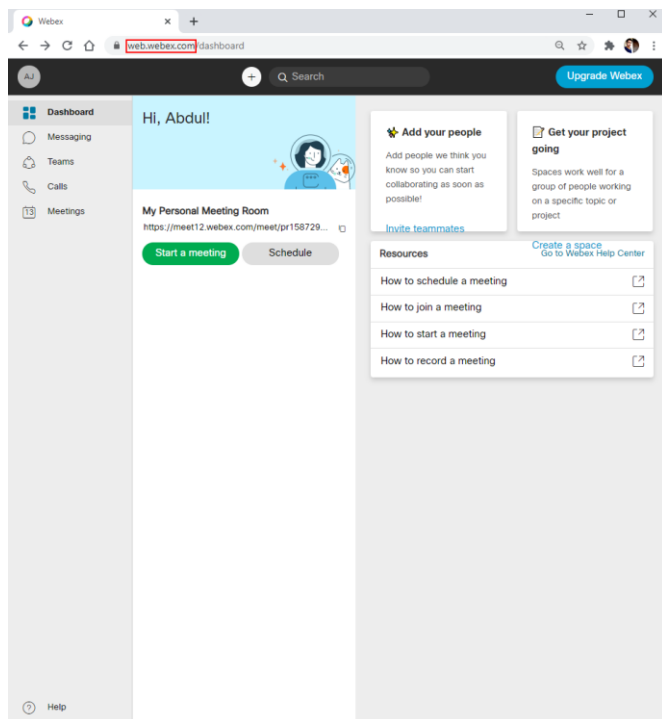
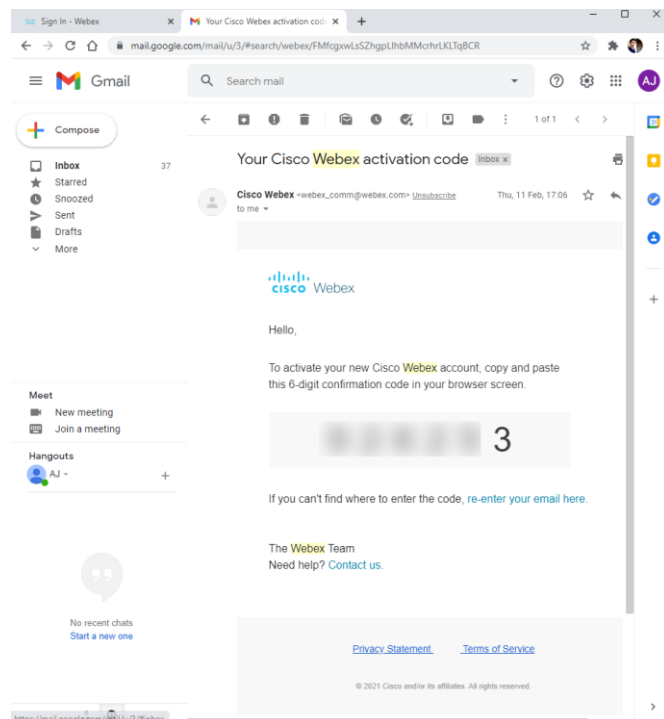
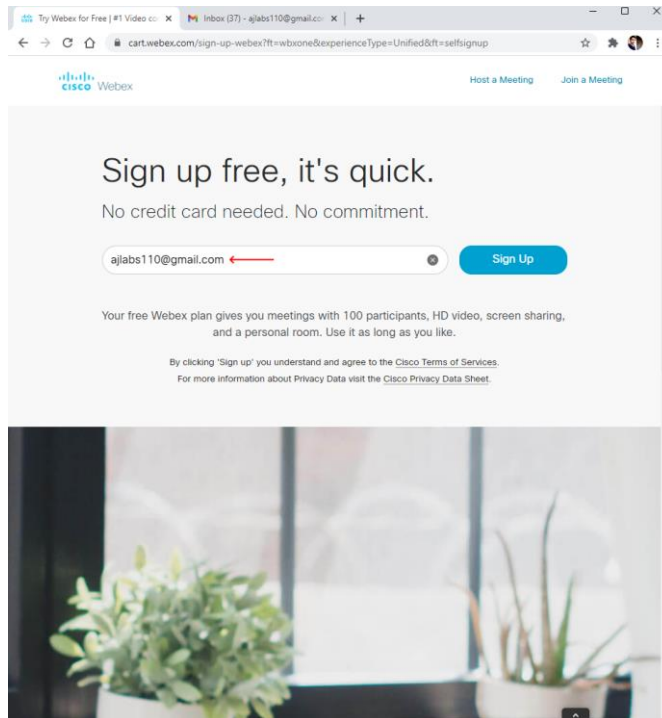
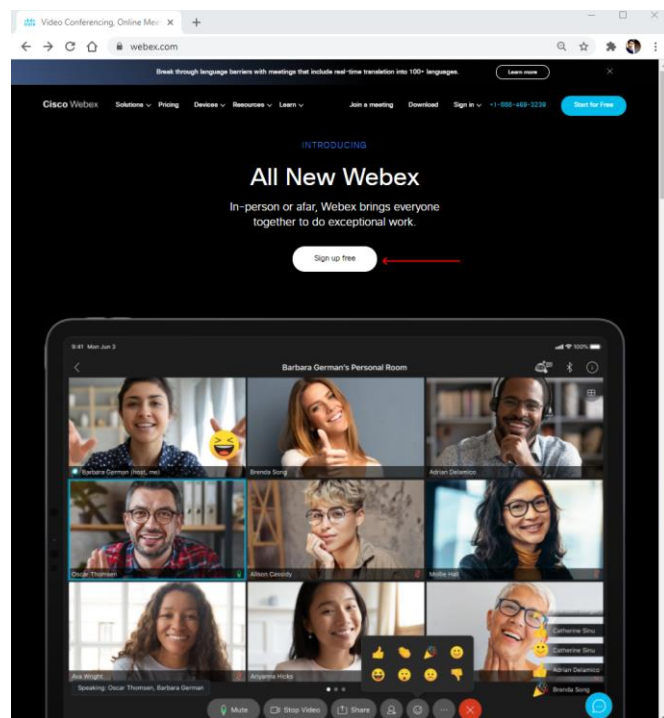
Participants in meetings I hosted or attended

---

## Webex Calling

- BroadCloud Calling: Powered Cisco hosted BroadSoft Cloud IP-PBX Data Center
- BroadWorks: Service Provider (Partner) hosted BroadSoft Cloud IP-PBX Date Center. This is cheaper as compared to BroadCloud
- Webex Calling powered by BroadSoft requires IP Phones registered to Control Hub to be running Multi Party Phone (MPP) software
- Webex Calling offers 3 PSTN options
  1. Cloud Connected PSTN: Direct connect to the PSTN through the cloud. Customers can choose which provide to be used. We can decide who we want to be the cloud PSTN service provider
  2. Local CUBE Gateway: Uses on-premise gateway to breakout to PSTN
  3. Bundled PSTN: We can use both of the above options to connect to PSTN
- UCM Calling: Uses on-premise CUCM to facilitate calling functionality. We can make calls from Teams just like we make call from an IP Phone registered on-premise CUCM. The client has to be in corporate network
- Hybrid Call Service: Same as UCM Calling but Teams client can be anywhere on the internet. It uses Expressway Core Connector Host

# Sign Up for Free WebEx Account





# Sign Up for Paid WebEx Account

Cisco WebEx Plans and Pricing

Choose a plan that empowers your life and business

Billed annually ☐ Billed monthly ☒

Save 10% with an annual billing cycle

Free	Starter	Business	Enterprise Plan
₹0	₹1,049.00*	₹2,099.00*	
per host, per month	per host, per month	per host, per month	Plans for businesses that need a custom WebEx experience
<a href="#">Get started</a>	<a href="#">Buy Now</a>	<a href="#">Buy Now</a>	<a href="#">Contact Sales</a>

\*Taxes included at checkout

	Free	Starter	Business	Enterprise
Number of hosts	1 user	1 to 50	1 to 100	Customizable
- Meetings & Video conferencing				
Meeting length (how long can my meetings be?)	Up to 50 min	24 hours	24 hours	24 hours
How many people can join a meeting (participants vs. hosts)	Up to 100	Up to 150	Up to 200	Customizable

Buy Cisco WebEx Online

Welcome back

Customize your cart

☐ Business ☒ Starter

1 host license

Small to mid-size teams

**SAVE 10%**

Annually: ₹944.92 per host per month (₹11,339.00 per year)

Monthly: ₹1,049.00 per host per month (billed monthly)

**You will get**

- Up to 150 participants in a meeting
- 5GB Cloud Storage
- Includes Cisco WebEx Teams
- Purchase up to 50 licenses

[Plan details](#)

**Order Summary**

Starter plan	₹1,049.00
1 host license	Monthly
	₹1,049.00 /host/month
GST	Added later
Today's charge	₹1,049.00
Auto-renews monthly	Before GST

Buy Cisco WebEx Online

purchase.webex.com/checkout

1 Account details \* Required fields

Email address  Edit Create password\*

First name\*  Last name\*

2 Address \* Required fields

Billing address

Legal company name or Individual name \*

Address\*

Town/City\*  PIN code\*

State\*  Country/Region

GSTIN

Need to add a service-to address? ☐

[Continue](#)

**Order Summary**

Starter plan	₹1,049.00
1 host license	Monthly
	₹1,049.00 /host/month
GST	Added later
Today's charge	₹1,049.00
Auto-renews monthly	Before GST

Buy Cisco WebEx Online

purchase.webex.com/checkout

2 Address Edit

Abdul Jaseem VP  
Vattapparambil House  
Karuvarakundu, 676523  
India

3 Payment details \* Required fields

All transactions are secure and encrypted.

☒ I agree to the Terms of Use, Privacy Policy and Payment and Auto-renewal  
I also agree that I am of age to enter into a binding legal agreement in my country of residence.

[Place Order](#)

**Order Summary**


Starter plan	₹1,049.00
1 host license	Monthly
	₹1,049.00 /host/month
GST	₹188.82
Today's charge	₹1,237.82
Auto-renews monthly	

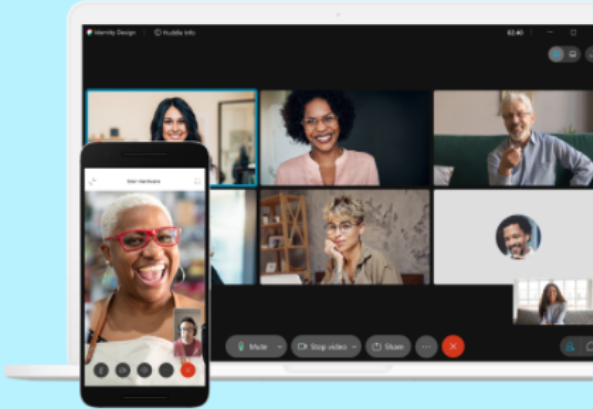
- You will receive a 6-digit confirmation code and validate it. I was unable to take the screenshot for that step



Buy Cisco Webex Online

purchase.webex.com/order-status





## Get ready to experience the new Webex.

Just a moment while we set everything up.

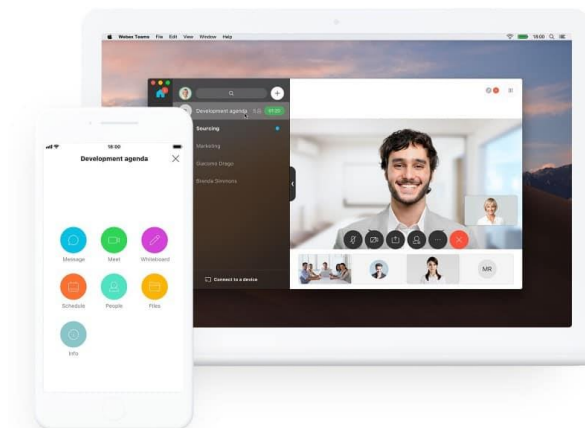
- ☒ Building your Webex account.
- ☐ Personalizing your account.
- ☐ Launching

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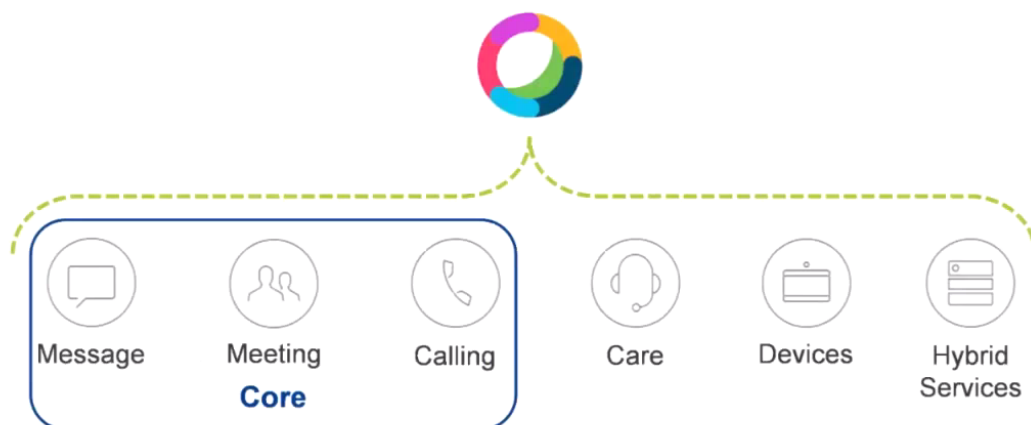
It will take quite some time to complete the setup.

---

## Webex Teams Overview



- It is not a product, it's a Brand. Initial name was Cisco Spark and re-branded to Webex Teams
- Core Products: Messaging, Meeting and Calling
- Other Products: Care, Devices and Hybrid Services
- Messaging is the primary product that comes in every plan, meetings can be integrated to Webex Teams or customers can have standalone meeting site



- All these products are hosted on the Cloud and managed from a single management portal called **Webex Control Hub**
- Free account will support the core features such as Messages, Meetings and Calling, rest of the products are available only for the paid accounts

---

## Webex Teams Infrastructure



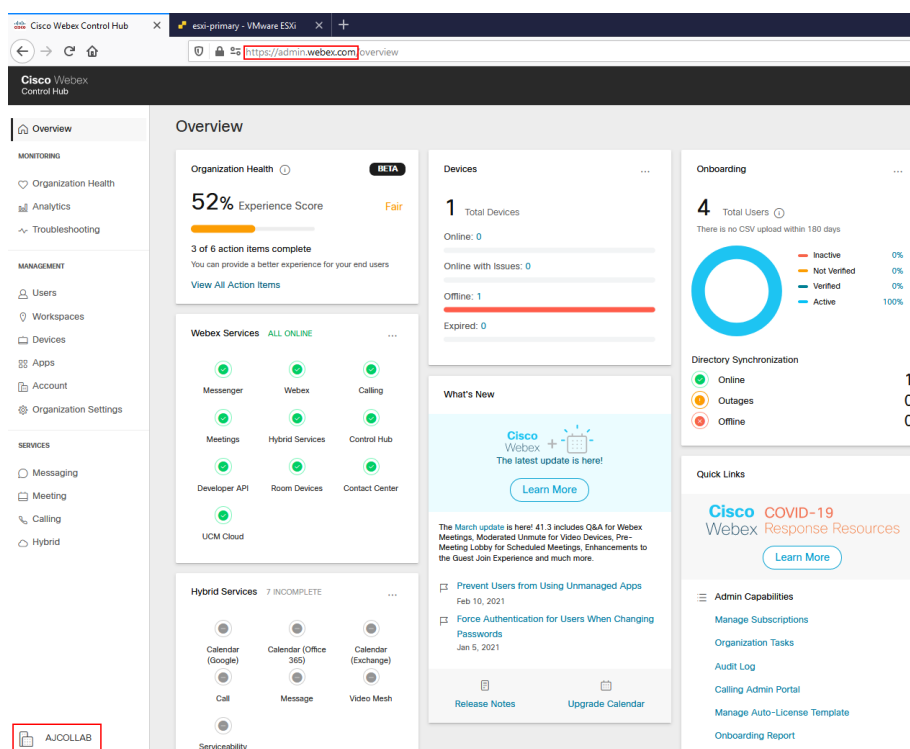
- Webex Teams built as Microservice architecture on an Open Stack framework by Cisco but many features under Teams are acquired by Cisco re-architected
- The complete Webex Teams suit (except WebEx meetings) hosted in Amazon Web Services (AWS) as of today (14/May/2021)
- WebEx Meetings are hosted in Webex Data Centers
- Webex Teams portfolio effectively uses the Auto Scaling functionality of AWS to meet the demand and load requirement
- Microservices helps to add new feature, maintain, and scale the services
- All the microservices internally communicates REST APIs via HTTP
- SIP messages are converted to HTTP APIs with the help of a server called L2SIP
- Media uses SRTP and it is end to end encrypted
- We can capture HTTP Client logs and Packets to troubleshoot issues
- Webex Teams uses Agile (continuous development and deployment) methodology
- We can build our own chat bots

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## WebEx Control Hub Overview

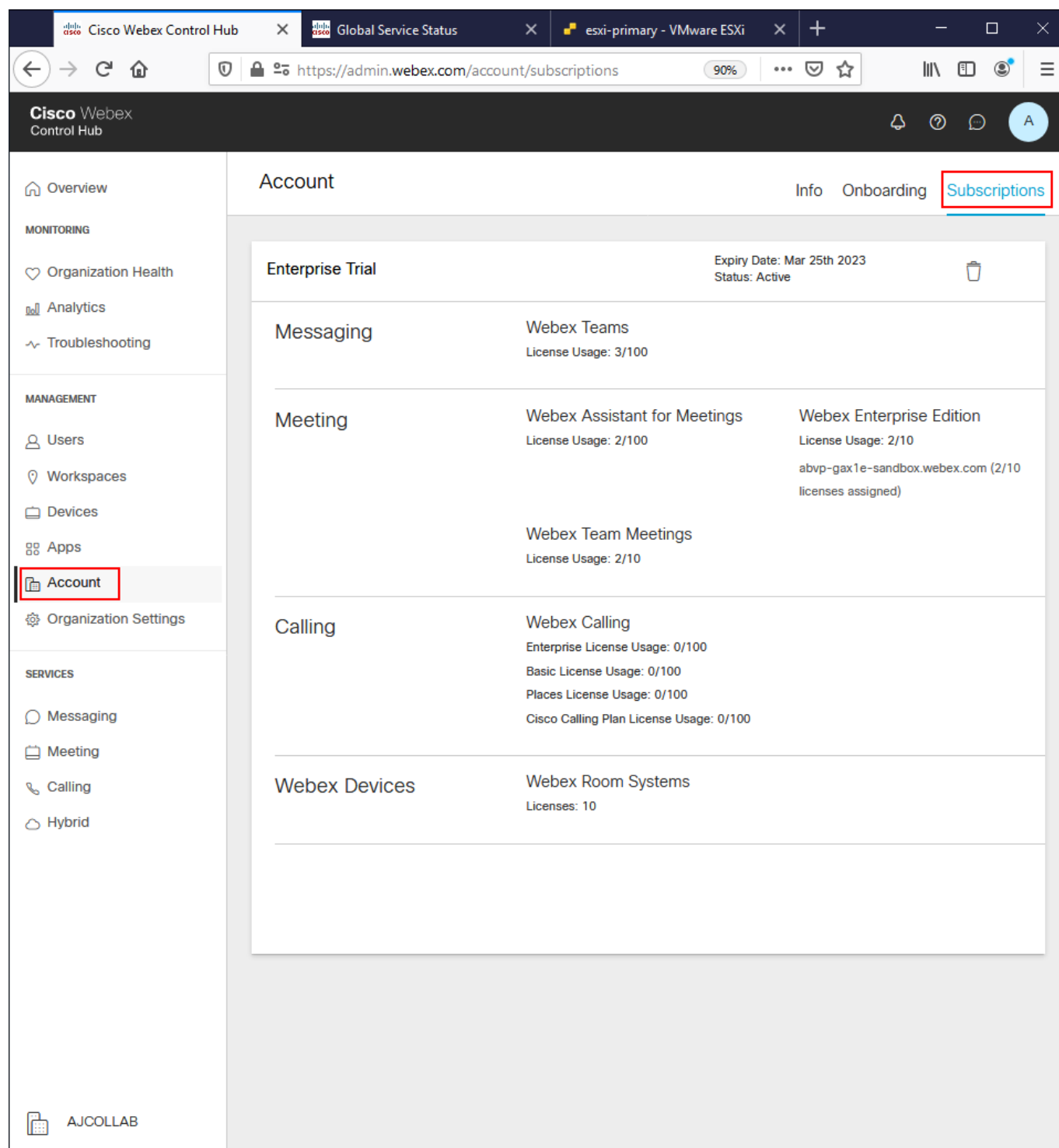


- The administrative portal that manages Webex Teams product suits
- It has several views and roles depending on who logged in (Partners used to manage customers, Customers used to manage users, Cisco TAC used to support everyone)
- After customer purchases the service (either from web portal or via partners), Control Hub creates an Organization
- Each organization fall under a specific geographical region, but you can have users from across the globe inside an organization
- Use Control Hub to manage your users, services, and devices. After your organization is created, you receive an email to get started on using the administrative functions on Control Hub



## Subscription Status

Go to Accounts >> Subscriptions



The screenshot shows the Cisco Webex Control Hub interface. The browser address bar indicates the URL <https://admin.webex.com/account/subscriptions>. The page title is "Cisco Webex Control Hub". The sidebar on the left contains the following navigation items:

- Overview
- MONITORING
  - Organization Health
  - Analytics
  - Troubleshooting
- MANAGEMENT
  - Users
  - Workspaces
  - Devices
  - Apps
  - Account**
  - Organization Settings
- SERVICES
  - Messaging
  - Meeting
  - Calling
  - Hybrid

The main content area is titled "Account" and has tabs for "Info", "Onboarding", and "Subscriptions" (which is highlighted). The "Subscriptions" tab displays the following information:

**Enterprise Trial** (Expiry Date: Mar 25th 2023, Status: Active)

Category	Subscription Name	License Usage
Messaging	Webex Teams	License Usage: 3/100
Meeting	Webex Assistant for Meetings	License Usage: 2/100
	Webex Enterprise Edition	License Usage: 2/10 abvp-gax1e-sandbox.webex.com (2/10 licenses assigned)
	Webex Team Meetings	License Usage: 2/10
Calling	Webex Calling	Enterprise License Usage: 0/100 Basic License Usage: 0/100 Places License Usage: 0/100 Cisco Calling Plan License Usage: 0/100
Webex Devices	Webex Room Systems	Licenses: 10

At the bottom left of the sidebar, there is a logo for "AJCOLLAB".

- Overall Webex Teams Suit Status is available at [status.webex.com](https://status.webex.com)

The screenshot shows a web browser window with the URL [https://status.webex.com/service/status?lang=en\\_US](https://status.webex.com/service/status?lang=en_US). The page header includes the Cisco Webex logo and navigation links: Service Status, Incident History, Maintenance, and Help. The main heading is "Latest Webex Status Information". Below this, a message states: "As you can imagine, we are seeing unprecedented volumes during this extraordinary time. From time to time, this may cause some degradation of service. Please see below for latest status on services." The page displays several service status cards, each with a green checkmark icon indicating they are operational.

Service	Status
<b>Webex Meetings</b>	Operational
Access Webex...	Operational
Start/join meeti...	Operational
Video Platform	Operational
Join audio via ...	Operational
Join audio via T...	Operational
Schedule meet...	Operational
Share content	Operational
<b>Webex Teams</b>	Operational
Room creation ...	Operational
Send and read ...	Operational
File sharing an...	Operational
Client calling a...	Operational
Sign in and sig...	Operational
Web and desk...	Operational
Mobile apps	Operational
Search	Operational
Integrations	Operational
<b>Webex Control Hub</b>	Operational
Sign in	Operational
Reports	Operational
User managem...	Operational
Device manage...	Operational
Hybrid service ...	Operational
<b>Webex Cloud Registered Device</b>	Operational
Webex Room S...	Operational
<b>Webex Calling (Spark Call)</b>	Operational
Desktop phone...	Operational
<b>Webex Messenger</b>	Operational
Sign in	Operational
Send/receive a...	Operational

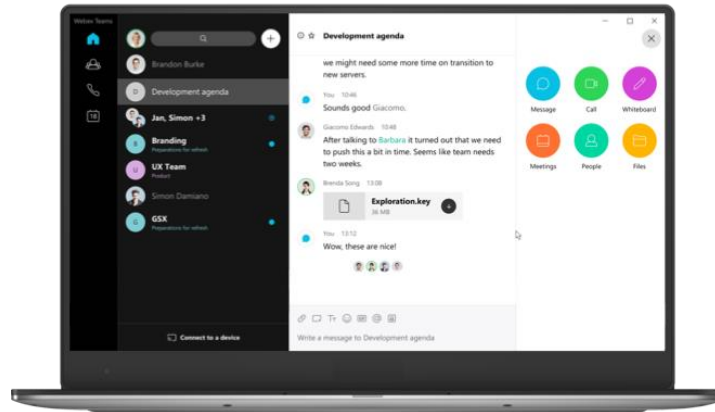
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## **Control Hub Deployment Life Cycle**

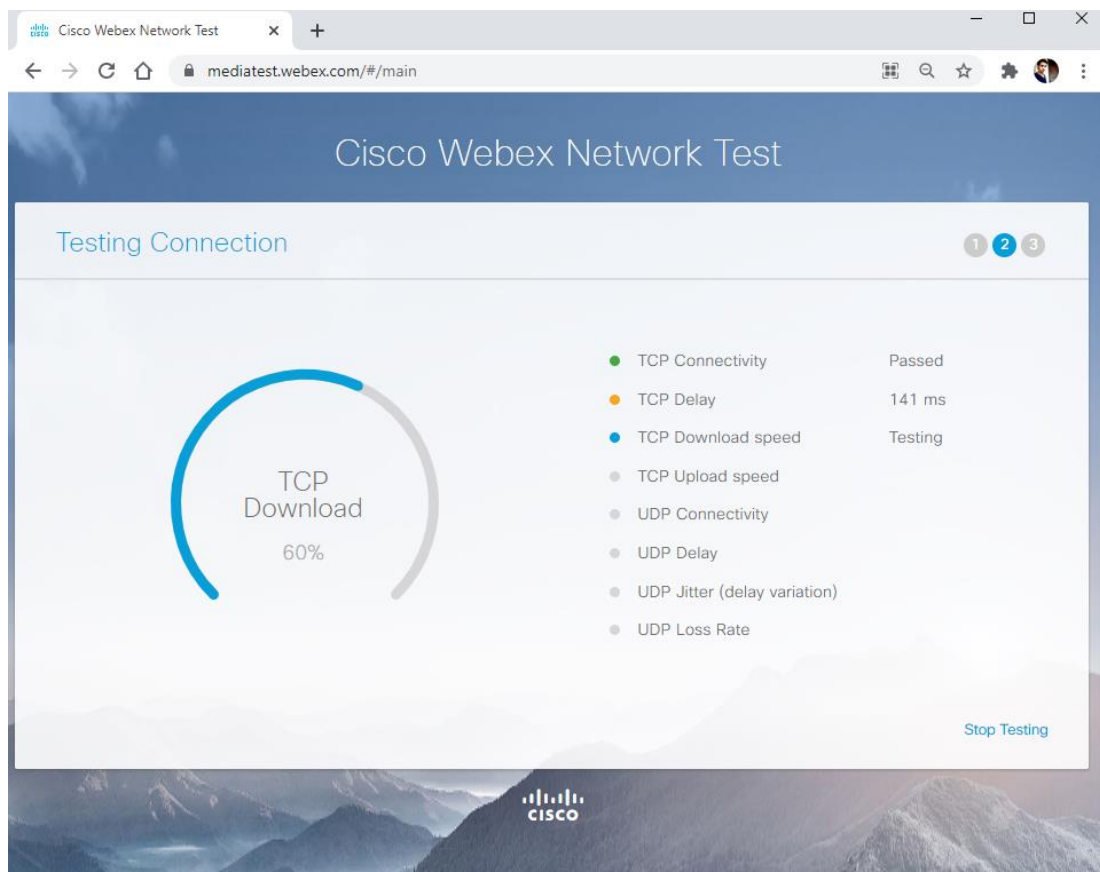
1. Org Creation (Partners Creates or Direct order)
2. Customer Admin Can Login to admin.webex.com
3. Customer Admin Configure Services (Directory Connect, SSO, Hybrid Services, etc.)
4. Customer Admin Sync / Create Users
5. Customer Admin Add Devices
6. Customer Admin creates Policies
7. Reporting and Diagnostics

---

## Webex Teams Client



- Desktop Client (Windows and MAC)
- Browser Based Client (limited functionality)
- Mobile Client (Android and IOS based)
- VDI Client (Use local resources for the Audio and Video calls)
- mediatest.webex.com used to test the connectivity





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## **Spaces**

- Group chat functionality in Teams
- We can add multiple people in one Space

## **Teams**

- Similar to Space but initially create a Team, add members to it and then create Spaces
- Team members can automatically join the Space that comes under the Teams

## **Meetings**

- When we have Webex Meetings, then we have option for Webex meetings otherwise it is just Teams meeting
- The video call option is pretty much the Teams Meeting feature
- Teams Meeting and Webex Meetings are different

## **Calendar**

- Synced with Webex Meeting Account and Outlook

[Lab] Local User Management in Webex Control Hub

Cisco Webex Control Hub

admin.webex.com/users

Cisco Webex Control Hub

10

V

Overview

MONITORING

Analytics

Troubleshooting

Organization Health

MANAGEMENT

Users

Workspaces

Devices

Apps

Account

Organization Settings

SERVICES

Messaging

Meeting

Calling

Hybrid

AJCOLLAB

Users

All

First Name

Last Name

ajlabs110@gmail.com

Cancel

Save

First Name

Anas

Last Name

Hira

Display Name

Anas Hira

Email Address

ajlabs110@gmail.com

Cisco Webex Control Hub

admin.webex.com/users

Cisco Webex Control Hub

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Overview

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Analytics

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Hybrid

AJCOLLAB

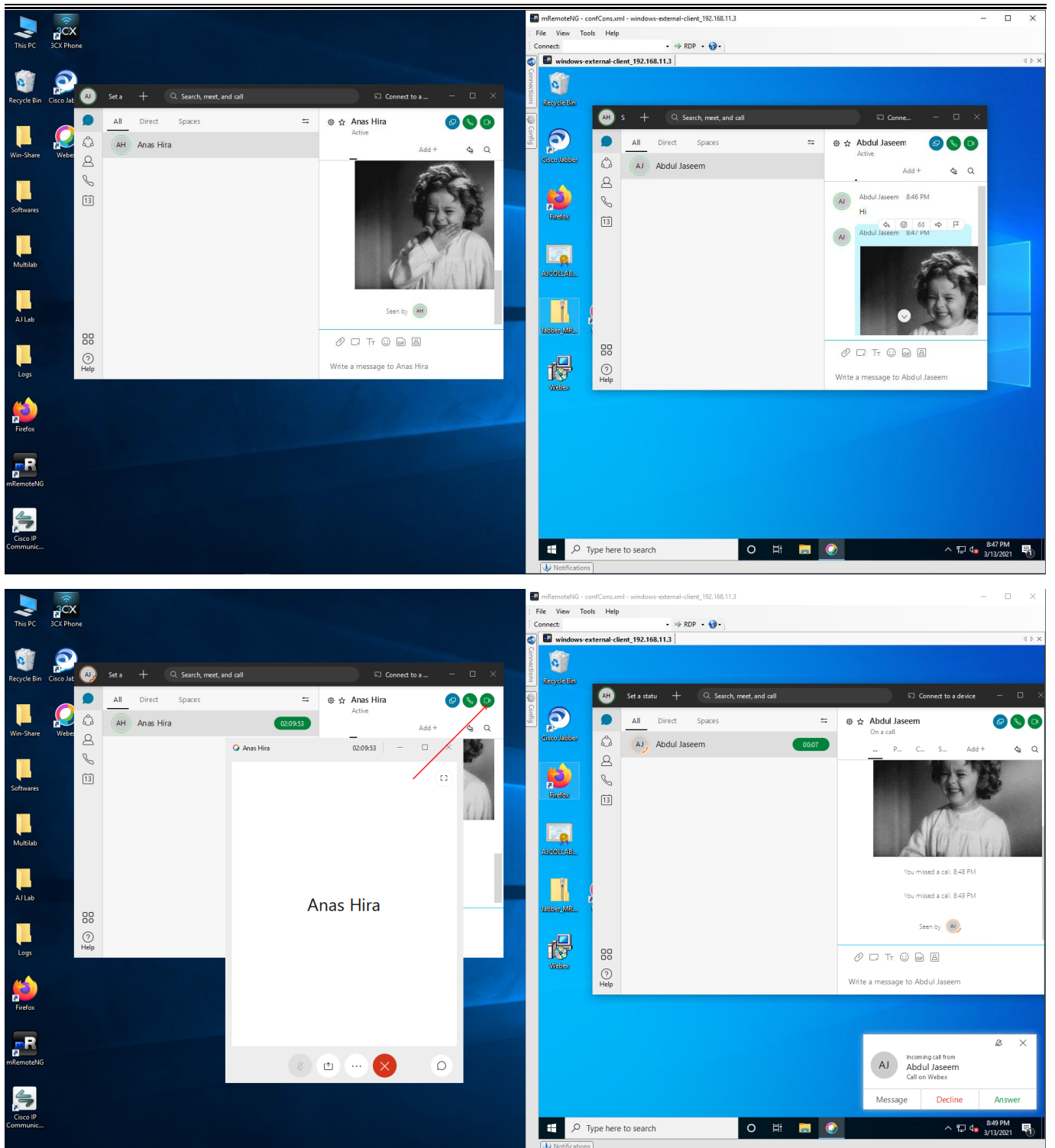
Users

UsersGroupsLicenses

All

Manage Users

	First Name	Last Name	Display Na...	Email	Status	Actions
	Abdul	Jaseem	Abdul Jase...	vpjaseem@...	Active	
	Anas	Hira	Anas Hira	ajlabs110@...	Active	...



Cisco Webex Control Hub

admin.webex.com/users

Cisco Webex Control Hub

10

V

Overview

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Organization Health

MANAGEMENT

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SERVICES

Messaging

Meeting

Calling

Hybrid

AJCOLLAB

Users

All

First Name

Last Name

Abdul

Jaseem

Anas

Hira

Abdul Jaseem

vpjaseem@gmail.com

User

Services

Edit

Messaging

Cisco Webex Teams Free Messaging

Meeting

Cisco Webex Meetings

Calling

Cisco Webex Free Calling

Hybrid Services

Calendar Service

Off

Call Service

Off

Message Service

Off

Roles and Security

Administrator Roles

Security

Devices

Device Settings

Software Upgrade Channel

Default (Stable)

Lock Settings on Touch Devices

User Details

Name Labels

Not Enrolled

The screenshot displays the Cisco Webex Control Hub interface. The top navigation bar includes the Cisco Webex Control Hub logo and a search bar. The main content area is divided into three sections. The left sidebar contains navigation links for Overview, Monitoring (Analytics, Troubleshooting, Organization Health), Management (Users, Workspaces, Devices, Apps, Account, Organization Settings), and Services (Messaging, Meeting, Calling, Hybrid). The central section shows the 'Users' page with a table of users. The table has columns for First Name and Last Name. Two users are listed: Abdul Jaseem and Anas Hira. Anas Hira is highlighted in blue. The right section shows the profile of Anas Hira, including his email address (ajlabs110@gmail.com) and a list of roles. Under 'Organization Administrator Roles', the 'Organization Administrator' role is selected, indicated by a red arrow. Other roles listed include Full Administrator, Read-only Administrator, Support Administrator, User and Device Administrator, Device Administrator, Compliance Officer, and Advanced Troubleshooting Access. The bottom left corner shows the AJCOLLAB logo.

First Name	Last Name
Abdul	Jaseem
Anas	Hira

**Organization Administrator Roles**

- ☒ Organization Administrator
- ☐ Full Administrator
- ☐ Read-only Administrator

**Functional Administrator Roles**

- ☐ Support Administrator
- ☐ User and Device Administrator
- ☐ Device Administrator
- ☐ Compliance Officer
- ☐ Advanced Troubleshooting Access

**Service Administrator Roles**

The screenshot displays the Cisco Webex Control Hub interface. The left sidebar contains navigation links categorized into Overview, MONITORING, MANAGEMENT, and SERVICES. The 'Users' link under MANAGEMENT is highlighted with a red arrow. The main content area shows the 'Users' page with a list of users. A red arrow points to the user 'Anas Hira' in the list. The right sidebar shows the configuration options for the selected user, including Hybrid Services, Roles and Security, Devices, Device Settings, User Details, and Settings.

First Name	Last Name
Abdul	Jaseem
Anas	Hira

**Users**

Search:  All

**ANAS HIRA** (ajlabs110@gmail.com)

**Hybrid Services**

- Calendar Service: Off
- Call Service: Off
- Message Service: Off

**Roles and Security**

- Administrator Roles
- Security

**Devices**

**Device Settings**

- Software Upgrade Channel: Stable
- Lock Settings on Touch Devices: Off

**User Details**

- Name Labels: Not Enrolled
- Last Email Status: Delivered

**Settings**

- Calling Behavior

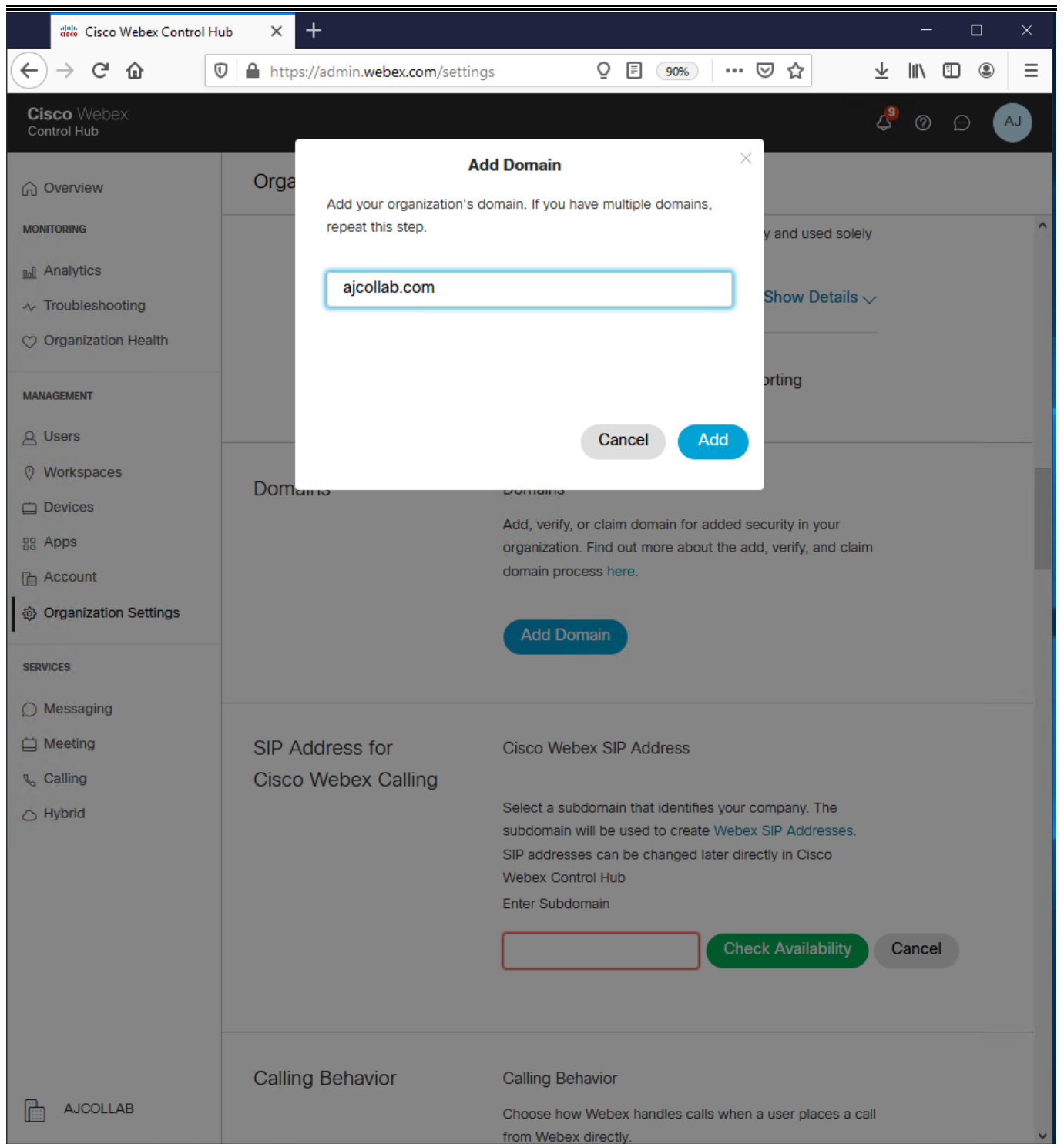
## [Lab] Domain Verification

- All the users with your domain will be verified automatically, you don't need manual email verification by the user
- It allows to claim users from Consumer Organization (Free account with your domain email ID)

The screenshot displays the Cisco Webex Control Hub Administration Console. The left sidebar shows the navigation menu with categories: Overview, MONITORING (Analytics, Troubleshooting, Organization Health), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The 'Organization Settings' link is highlighted with a red arrow. The main content area is titled 'Organization Settings' and contains several sections:

- Organization Settings**: A section with a disclaimer: 'All information will be treated confidentially and used solely for product quality enhancement.' It includes a 'Device Log Report Details' link and a 'Show Details' dropdown.
- Domains**: A section titled 'Domains' with a description: 'Add, verify, or claim domain for added security in your organization. Find out more about the add, verify, and claim domain process [here](#).' It features an 'Add Domain' button, which is also highlighted with a red arrow.
- SIP Address for Cisco Webex Calling**: A section titled 'SIP Address for Cisco Webex Calling' with a description: 'Cisco Webex SIP Address. Select a subdomain that identifies your company. The subdomain will be used to create [Webex SIP Addresses](#). SIP addresses can be changed later directly in Cisco Webex Control Hub.' It includes a text input field labeled 'Enter Subdomain' and a 'Check Availability' button.
- Calling Behavior**: A section titled 'Calling Behavior' with a description: 'Choose how Webex handles calls when a user places a call from Webex directly.'





Cisco Webex Control Hub

https://admin.webex.com/settings

Cisco Webex Control Hub

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Overview

MONITORING

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SERVICES

Messaging

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Calling

Hybrid

AJCOLLAB

Organization Settings

All information will be treated confidentially and used solely for product quality enhancement.

Device Log Report Details Show Details

Enable Automatic Crash reporting

Domains

Domains

Add, verify, or claim domain for added security in your organization. Find out more about the add, verify, and claim domain process here.

ajcollab.com

● pending

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Add Domain

Retrieve verification token

Verify Domain

SIP Address for Cisco Webex Calling

Cisco Webex SIP Add

Claim verified domain

Release domain

Remove domain

Select a subdomain that i subdomain will be used to create Webex SIP addresses. SIP addresses can be changed later directly in Cisco Webex Control Hub

Enter Subdomain

Check Availability

Cancel

Calling Behavior

Calling Behavior

994

Cisco Webex Control Hub

https://admin.webex.com/settings

Cisco Webex Control Hub

Overview

MONITORING

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Account

Organization Settings

SERVICES

Messaging

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Calling

Hybrid

AJCOLLAB

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Verify Domain

Before you verify

ajcollab.com

you must copy and paste this DNS verification token to the TXT record section to prove that you own the domain:

d01a3fa5093058cadbe7

bb3

[Learn more](#) about how to enter the DNS verification token.

Close

Verify

Domains

Add, verify, or claim domain for added security in your organization. Find out more about the add, verify, and claim domain process [here](#).

ajcollab.com

pending

Add Domain

SIP Address for Cisco Webex Calling

Cisco Webex SIP Address

Select a subdomain that identifies your company. The subdomain will be used to create [Webex SIP Addresses](#). SIP addresses can be changed later directly in Cisco Webex Control Hub

Enter Subdomain

Check Availability

Cancel

Calling Behavior

Calling Behavior

Cisco Webex Control Hub

Domain Manager

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https://dcc.godaddy.com/manage/ajcollab.com/dns80%

## Records

Last updated 12-03-2021 11:01 AM

Type	Name	Value	TTL	
A	exp-e-01	192.168.21.15	1 Hour	
A	exp-e-02	192.168.21.16	1 Hour	
CNAME	www	@	1 Hour	
NS	@	ns41.domaincontrol.com	1 Hour	
NS	@	ns42.domaincontrol.com	1 Hour	
SOA	@	Primary nameserver: ns41.domainc...	1 Hour	
SRV	_collab-edge._tl...	10 10 8443 exp-e-01.ajcollab.com	1 Hour	
SRV	_collab-edge._tl...	10 10 8443 exp-e-02.ajcollab.com	1 Hour	
SRV	_sip._tcp.@	10 10 5060 exp-e-01.ajcollab.com	1 Hour	
SRV	_sip._tcp.@	10 10 5060 exp-e-02.ajcollab.com	1 Hour	
SRV	_sips._tcp.@	10 10 5061 exp-e-01.ajcollab.com	1 Hour	
SRV	_sips._tcp.@	10 10 5061 exp-e-02.ajcollab.com	1 Hour	

Type \*

TXT

▼

Host \*

@

TXT Value \*

cisco-ci-domain-ver

TTL \*










1 Hour

▼

Save

Cancel

Last updated 12-03-2021 11:01 AM

Type	Name	Value	TTL	
A	exp-e-01	192.168.21.15	1 Hour	
A	exp-e-02	192.168.21.16	1 Hour	
CNAME	www	@	1 Hour	
NS	@	ns41.domaincontrol.com	1 Hour	
NS	@	ns42.domaincontrol.com	1 Hour	
SOA	@	Primary nameserver: ns41.domainc...	1 Hour	
SRV	_collab-edge._tl...	10 10 8443 exp-e-01.ajcollab.com	1 Hour	
SRV	_collab-edge._tl...	10 10 8443 exp-e-02.ajcollab.com	1 Hour	
SRV	_sip._tcp.@	10 10 5060 exp-e-01.ajcollab.com	1 Hour	
SRV	_sip._tcp.@	10 10 5060 exp-e-02.ajcollab.com	1 Hour	
SRV	_sips._tcp.@	10 10 5061 exp-e-01.ajcollab.com	1 Hour	
SRV	_sips._tcp.@	10 10 5061 exp-e-02.ajcollab.com	1 Hour	

Type ▼

Host ▼

TXT Value ▼

TXT ▼

@

cisco-ci-domain-ver

TTL ▼

1 Hour

Save

Cancel

Cisco Webex Control Hub

https://admin.webex.com/settings

### Verify Domain

Before you verify  
**ajcollab.com**

you must copy and paste this DNS verification token to the TXT record section to prove that you own the domain:

**d01a3fa5093058cadbe7b3**

[Learn more](#) about how to enter the DNS verification token.

Close Verify

Domains

Add, verify, or claim domain for added security in your organization. Find out more about the add, verify, and claim domain process [here](#).

ajcollab.com ● pending ...

Add Domain

SIP Address for Cisco Webex Calling

Cisco Webex SIP Address

Select a subdomain that identifies your company. The subdomain will be used to create [Webex SIP Addresses](#). SIP addresses can be changed later directly in Cisco Webex Control Hub

Enter Subdomain

Check Availability Cancel

AJCOLLAB

Cisco Webex Control Hub

Domain Manager

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https://admin.webex.com/settings

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Cisco Webex Control Hub

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🏠 Overview

MONITORING

📊 Analytics

🔧 Troubleshooting

📶 Organization Health

MANAGEMENT

👤 Users

📍 Workspaces

📱 Devices

📁 Apps

📁 Account

⚙️ Organization Settings

SERVICES

💬 Messaging

📅 Meeting

📞 Calling

🔄 Hybrid

📅 AJCOLLAB

Organization Settings

All information will be treated confidentially and used solely for product quality enhancement.

Device Log Report Details [Show Details](#) ▾

🔵 ✓

Enable Automatic Crash reporting

Domains

Domains

Add, verify, or claim domain for added security in your organization. Find out more about the add, verify, and claim domain process [here](#).

ajcollab.com

● verified

⋮

Add Domain

SIP Address for Cisco Webex Calling

Cisco Webex SIP Address

Select a subdomain that identifies your company. The subdomain will be used to create [Webex SIP Addresses](#). SIP addresses can be changed later directly in Cisco Webex Control Hub

Enter Subdomain

Check Availability

Cancel

Calling Behavior

998

Cisco Webex Control Hub

Domain Manager

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🔒 https://admin.webex.com/users 80% ⋮ 🛡️ ☆

⬇️ 📖 📄 📷 📱 ☰

Cisco Webex Control Hub

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🏠 Overview

MONITORING

📊 Analytics

🔧 Troubleshooting

📈 Organization Health

MANAGEMENT

👤 Users

📍 Workspaces

📱 Devices

📁 Apps

📁 Account

⚙️ Organization Settings

SERVICES

🗨️ Messaging

📅 Meeting

📞 Calling

🔗 Hybrid

Users

Users Groups Licenses

🔍

👤 All

Manage Users

	First Name	Last Name	Displ...	Email	Status	Actions
👤	Abdul	Jaseem	Abdul ...	vpjaseem@gmail.com	● Active	
👤	Anas	Hira	Anas ...	ajlabs110@gmail.com	● Active	
👤	Hrithik	Roshan	Hrithik...	<u>hrithik.roshan@ajcollab.com</u>	● Verified	...
👤	Jennifer	Garner	Jennif...	<u>jennifer.garner@ajcollab.com</u>	● Verified	...

When you verify a Domain, all the users from that domain will be verified automatically!

📁 AJCOLLAB

## Claim the Domain

- Once you claim the domain, those users can be a part of only your organization
- They can't have any free account or can't be a part of different organization
- You must convert all existing users to your org before claiming a domain

The screenshot displays the Cisco Webex Control Hub Administration Console. The left sidebar contains navigation links for Overview, MONITORING (Organization Health, Analytics, Troubleshooting), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The main content area is titled "Organization Settings" and includes sections for "Automatic Crash Reporting" and "Domains".

The "Domains" section is active, showing a table of domains. The first entry is "ajcollab.com" with a status of "verified". A red arrow points to the three-dot menu icon next to this entry. The dropdown menu is open, showing options: "Add Domain", "Retrieve verification token", "Verify Domain", "Claim verified domain" (highlighted with a red arrow), "Release domain", and "Remove domain".

Below the domains table, there is a section for "SIP Address for Cisco Webex Calling". It includes a "Cisco Webex SIP Address" field and a "Subdomain" field. A red arrow points to the "Claim verified domain" option in the dropdown menu.



---

## [Lab] Cisco Directory Connector



- On-Premise application for user synchronization to Cloud (like LDAP sync in CUCM but not exactly the same). It is a software that can be installed on your Windows AD
- Microsoft Active Directory becomes the primary source for user accounts in Control Hub
- We can sync entire AD with Webex Control Hub
- It is a software that can be downloaded from Control Hub and it can be installed on a Windows Server
- LDAP filters can be applied to specifically sync required users
- Directory Connector is per domain based, if we have multiple domains, we need multiple Directory Connectors as well
- Directory Connector is compatible with Microsoft Azure AD as well

## Control Hub >> Users >> Manage Users >> Turn on Directory Synchronization

The screenshot shows the Cisco Webex Control Hub interface. The browser address bar indicates the URL is <https://admin.webex.com/users>. The main content area is titled "Manage Users".

**Active Directory**

- Directory Synchronization
  - Disabled
  - [Turn on Directory Synchronization](#)

**Modify Users**

- Manually Add Users**  
Add up to 25 users.
- CSV Add or Modify Users**  
Add or modify users with a CSV file.
  - [Export user list](#)
  - [View import history \(tasks\)](#)
- Claim Users**  
There are no users to claim.

**Resend Invitations**

Resend invitations to all verified and unverified users.  
[Resend invitations](#)

OR

Cisco Webex Control Hub

https://admin.webex.com/settings

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Overview

MONITORING

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Troubleshooting

Organization Health

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Calling

Hybrid

AJCOLLAB

Organization Settings

Your UC Manager Profile will default to your organization's domain. You can add UC manager Profiles for "Jabber in Team Messaging" or "Calling in Webex Teams (UCM)" deployment.

Add Profile

Directory Synchronization

Directory Synchronization

Disabled

User Security ⓘ

When enabled, users who change their passwords will have to sign in to Webex again after the new passwords are detected by Directory Connector.

Force authentication when users change passwords

Directory Synchronization

New users will be automatically added from your directory when it synchronizes. Updates can be made directly in Cisco Directory Connector.

[Download Directory Synchronization](#)

[How to Turn On Directory Synchronization](#)

[Troubleshoot Cisco Directory Connector](#)

People Insights

When enabled users see comprehensive, real-time business and professional profiles.

Note: Allow 48 hours for changes to People Insights to show in their Webex profiles

[People Insights adoption toolkit](#)

[What is People Insights?](#)

[Enable for your site](#)

Cisco Webex Control Hub

https://admin.webex.com/users

90%

Cisco Webex Control Hub

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Manage Users

License Summary

You've enabled Auto-Assign. All synchronized users will be assigned the following licenses automatically.

Messaging

Webex Teams

Meeting

Webex Team Meetings

Webex Enterprise Edition

abvp.webex.com

Back

Next

AJCOLLAB

Cisco Webex Control Hub

https://admin.webex.com/users

## Manage Users

### Install Directory Connector

Follow these steps in order to install the Directory Connector:

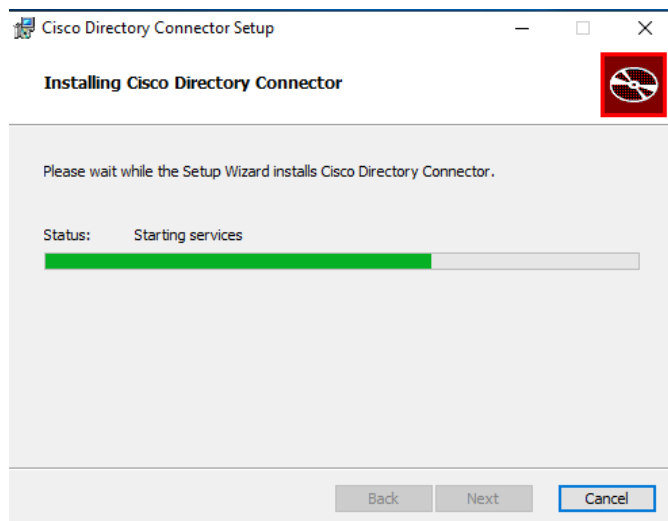
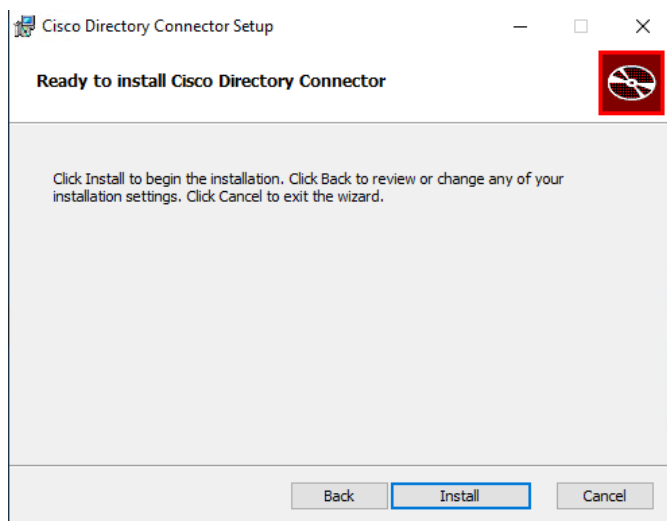
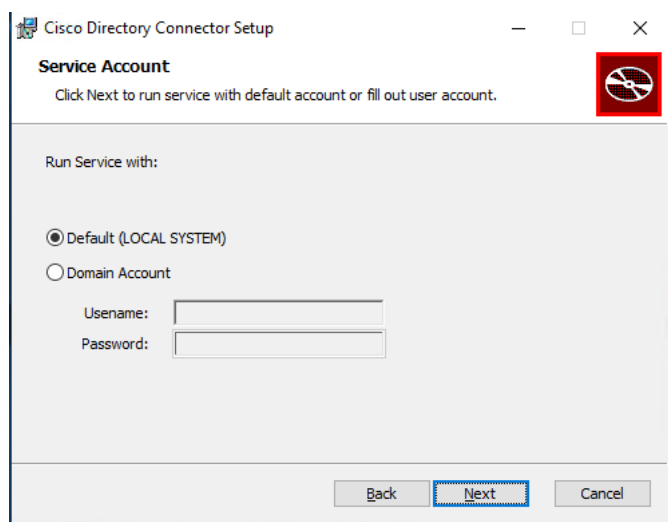
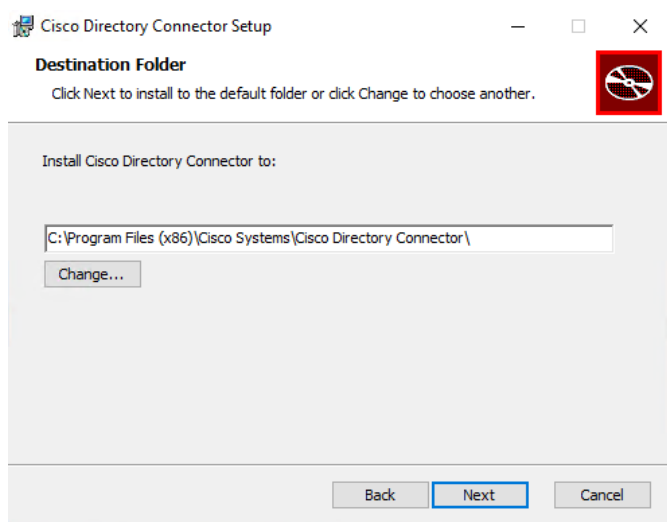
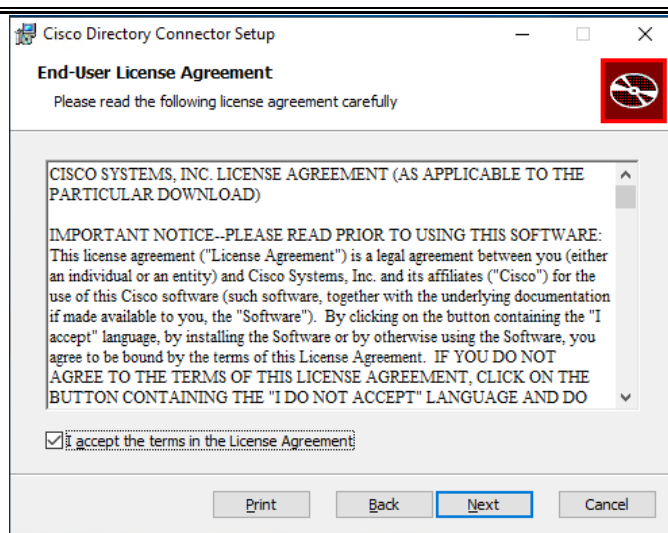
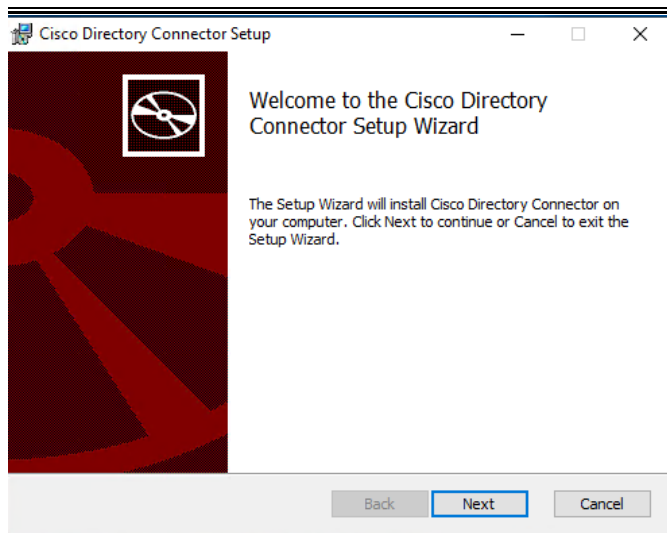
1. **Download and Install** the Cisco Directory Connector in your enterprise.
2. Configure the Active Directory synchronization agreement.
3. Test the synchronization agreement.

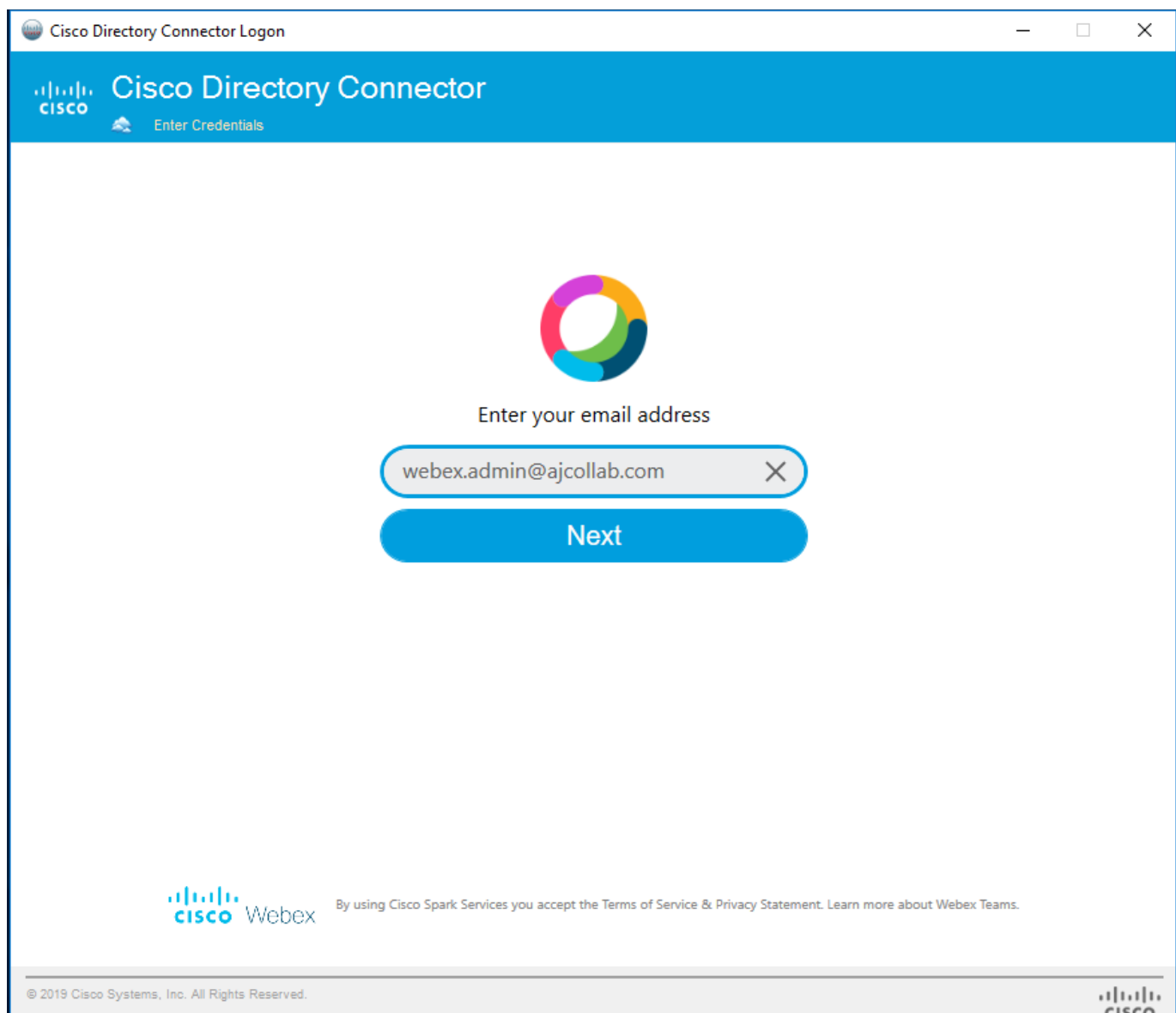
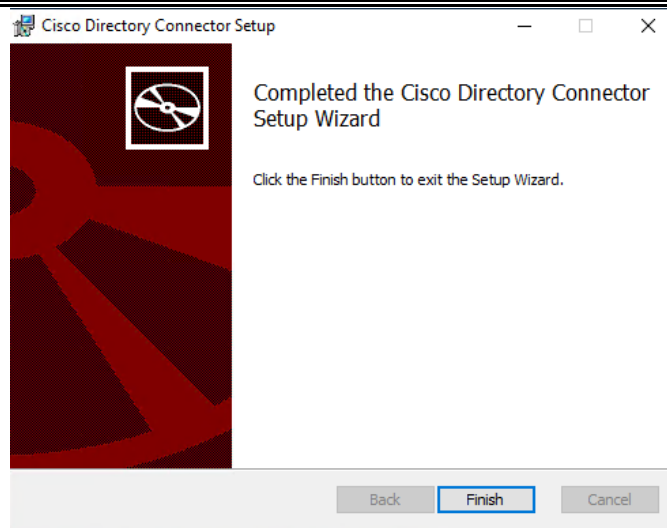
**Warning:** If you have already added users manually, performing an Active Directory synchronization may cause previously added users to be removed. Please check the Cisco Directory Connector Dry Run Reports to verify that all expected users are present.

Press Next when you're ready to verify that identity information is being synchronized.

Back Next

AJCOLLAB







## Cisco Directory Connector

Confirming configuration...

Cisco Directory Connector : Bind to New Domain

Please select a new domain to bind

Organization : **AJCOLLAB**

☒ AD DS ☐ LDAP over SSL

☐ AD LDS  :



Cisco Directory Connector

Welcome, Abdul Jaseem | Sign Out

Dashboard Configuration

Actions Help

Start Incremental Sync Sync Dry Run Launch Event Viewer Refresh [F5]

Cloud Organization: **AJCOLLAB** Active Directory Domain **ajcollab.com**

**Current Synchronization**

Status: ● Stopped  
 Mode: Manual [Enable Auto Sync](#)  
 Connector:   
 Type:   
 Started:   
 Phase:

**Last Synchronization**

Status: ●   
 Connector: None  
 Type: Incremental

**Connectors**

Connector	Last Connection
WIN-SERVER-01	3/15/2021 12:05 PM

**Enable Manual Synchronization**

⚠ You can enable manual synchronization now. If you want to enable automatic synchronization, go to the dry run report and delete mismatched objects.

Do you want to enable manual synchronization?

**Next Synchronization**

Full: Not Scheduled  
 Incremental: Not Scheduled

**Current Synchronization Status**

Status:

**Configuration Summary**

All objects will be synchronized.  
 Delete threshold has been set to 20 objects.  
 Log level is Info.

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- Go ahead and skip the Dry Run if you get any pop-ups

Cisco Directory Connector

Cisco Directory Connector

Welcome, Webex Admin | Sign Out

DashboardConfiguration\*

ActionsHelp

Launch Event Viewer

Cloud Organization: **AJ Collab**Active Directory Domain **ajcollab.com**

GeneralObject SelectionPolicyScheduleUser Attribute MappingNotificationAvatar

Connector Name :WIN-SERVER-AD-DLog Level :Info

Preferred Domain Controllers

win-server-ad-dns-ca.ajcollab.com

Add

Up

Down

Remove

☐ Automatically upgrade to the latest Cisco Directory Connector version when it's available (Recommended)

☐ LDAP over SSL

Apply

Cancel

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CISCO

Cisco Directory Connector

Cisco

Cisco Directory Connector

Welcome, Webex Admin | Sign Out

DashboardConfiguration\*

ActionsHelp

Launch Event Viewer

Cloud Organization: **AJ Collab**Active Directory Domain **ajcollab.com**

GeneralObject SelectionPolicyScheduleUser Attribute MappingNotificationAvatar

Connector Name :WIN-SERVER-AD-DLog Level :Info

Preferred Domain Controllers

win-server-ad-dns-ca.ajcollab.com

Add

Up

Down

Remove

☐ Automatically upgrade to the latest Cisco Directory Connector version when it's available (Recommended)

☐ LDAP over SSL

Apply

Cancel

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CISCO

Cisco Directory Connector

Welcome, Webex Admin | Sign Out

Dashboard Configuration\*

Actions Help

Launch Event Viewer

Cloud Organization: **AJ Collab** Active Directory Domain **ajcollab.com**

General **Object Selection** Policy Schedule User Attribute Mapping Notification Avatar

Object Type : LDAP Filters :

☒ Users ☐ Groups

☐ Identify Rooms

On Premises Base DNs to Synchronize

Entire domain will be synchronized

Select

Apply Cancel

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- Use below custom filter, that will make sure only users with valid email ID will be synchronized  
(`&(objectCategory=user)(objectClass=user)(mail=*)`)

Cisco Directory Connector

Dashboard

Configuration\*

Actions

Help

Launch Event Viewer

Cloud Organization: **AJ**

General

Object Selection

Policy

Object Type : LDAP

☒ Users

☐ Groups

On Premises Base DN's to Synchronize

Entire domain will be synch

Apply

Cancel

Select Synchronization Container

☒ DC=ajcollab,DC=com

☒ BuiltIn

☒ Computers

☒ Domain Controllers

☒ ForeignSecurityPrincipals

☒ Keys

☒ LostAndFound

☒ Managed Service Accounts

☒ Program Data

☒ Service Accounts

☒ System


☒ UC BLR Cluster Users

☒ Users

Select

Cancel

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 CISCO

Cisco Directory Connector

Cisco Directory Connector
Welcome, Webex Admin | Sign Out

Dashboard Configuration\*

Actions Help

Launch Event Viewer

Cloud Organization: **AJ Collab**
Active Directory Domain **ajcollab.com**

General Object Selection Policy Schedule **User Attribute Mapping** Notification Avatar

\* = Required attribute

Active Directory Attribute Name		Cisco Cloud Attribute Name
ou	>	ou
	>	phoneNumbers;type-work_extension
physicalDeliveryOfficeName	>	physicalDeliveryOfficeName
postalCode	>	postalCode
preferredLanguage	>	preferredLanguage
mail ←	>	sipAddresses;type-enterprise
sn	>	sn
st	>	st
streetAddress	>	street
ipPhone ←	>	telephoneNumber
	>	timezone
title	>	title
mail	>	* uid ← <i>Do not change this</i>

Apply
Cancel

Cisco Directory Connector

Cisco Directory Connector

Welcome, Webex Admin | Sign Out

Dashboard

Configuration\*

Actions

Help

Launch Event Viewer

Cloud Organization: **AJ Collab**Active Directory Domain **ajcollab.com**

General

Object Selection

Policy

Schedule

User Attribute Mapping

Notification

Avatar

Active Directory Attribute Name

ou

physicalDeliveryOfficeName

postalCode

preferredLanguage

mail

sn

st

streetAddress

ipPhone

title

mail

Confirm Configuration Changes

You are changing the synchronization configuration. We suggest you perform a dry run to see the impact on synchronized objects.

Apply Config Changes

Dry Run

Cancel

st

street

telephoneNumber

timezone

title

\* uid

Apply

Cancel

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CISCO

Cisco Directory Connector
Welcome, Webex Admin | Sign Out

Dashboard
Configuration\*

Actions
Help

Sync Now
Synchronization Mode
Enable Auto Sync
Reset Connector Secret
Dry Run ...
Cancel Sync Job
Switch Domain
Set Domain Priority
TroubleShooting
Refresh F5
Exit Alt+F4

Dry Run
Launch Event Viewer
Refresh [F5]

lab
Active Directory Domain ajcollab.com

Last Synchronization

Status
Connector
Type
Started
Finished

None
Incremental

Status
Connector
Type
Started
Finished

Error
WIN-SERVER-AD-D
Requested full
6/12/2021 1:52 PM
6/12/2021 1:53 PM

Connectors

Connector	Last Connection
WIN-SERVER-AD-D	6/12/2021 2:03 PM

Cloud Statistics

Users	35
Groups	
Rooms	

Next Synchronization

Full	Not Scheduled
Incremental	Not Scheduled

Current Synchronization Status

Status
Hit threshold limit. Attempted to delete 33 objects.

Override Threshold

Configuration Summary

Some Users will be synchronized .  
No Groups will be synchronized .  
Delete threshold has been set to 20 objects.  
Log level is Info.

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## Cisco Directory Connector

Summary 0 Admins Deleted 0 Users Deleted 0 Groups Deleted 1 Objects Added 33 Objects Matched 0 Rooms Deleted 2 Mismatched Objects



## Summary of Dry Run

- 0 Admin objects will be deleted
- 0 Non Admin user objects will be deleted
- 0 Group objects will be deleted
- 1 Objects will be added
- 33 Objects Matched
- 0 Room objects will be deleted
- 2 Mismatched Objects

Delete threshold (20 objects) is not exceeded. No objects would be deleted

Save Results to File...

Done



## Cisco Directory Connector

Summary 0 Admins Deleted 0 Users Deleted 0 Groups Deleted 1 Objects Added 33 Objects Matched 0 Rooms Deleted 2 Mismatched Objects

These objects must match entries in Active Directory or be deleted from the cloud if you want to enable automatic synchronization. Deleting these objects removes the user accounts in Control Hub and all space lists and conversation history are erased. You can also do a manual synchronization so mismatches appear but accounts aren't deleted. [Delete all objects](#)

Object Type	Distinguished Name	Display Name (UID)
user		Webex ReadOnly ( webex.readonly@ajcollab.com )
user		admin@ ( )


*These 2 accounts are available in Cloud but not in AD.  
Create some users in AD and make sure to fill the same Email IDs in the AD Email Attribute*

Save Results to File...

Done

Webex ReadOnly Properties?×

Member Of	Dial-in	Environment	Sessions
Remote control	Remote Desktop Services Profile		COM+
General	Address	Account	Profile
	Telephones	Organization	

 Webex ReadOnly

First name: Webex

Initials:

Last name: ReadOnly

Display name: Webex ReadOnly

Description:

Office:

Telephone number:

Other...

E-mail: webex.readonly@ajcollab.com ←

Web page:

Other...

OK

Cancel

Apply

Help

Cisco Directory Connector

Welcome, Webex Admin | Sign Out

Dashboard
Configuration\*

Actions
Help

Sync Now

Synchronization Mode

Enable Auto Sync

Reset Connector Secret

Dry Run ...

Cancel Sync Job

Switch Domain

Set Domain Priority

TroubleShooting

Refresh
F5

Exit
Alt+F4

Dry Run

Launch Event Viewer

Refresh [F5]

Enable Synchronization

Resume Directory Synchronization

Disable Synchronization

Status
Connector
Type
Started
Finished

None
Incremental

Status
Connector
Type
Started
Finished

Error
WIN-SERVER-AD-D
Requested full
6/12/2021 1:52 PM
6/12/2021 1:53 PM

Directory Domain
ajcollab.com

Connectors

Connector	Last Connection
WIN-SERVER-AD-D	6/12/2021 2:13 PM

Cloud Statistics

Users	35
Groups	
Rooms	

Next Synchronization

Full	Not Scheduled
Incremental	Not Scheduled

Current Synchronization Status

Status

Hit threshold limit. Attempted to delete 33 objects.

Override Threshold

Configuration Summary

Some Users will be synchronized .  
No Groups will be synchronized .  
Delete threshold has been set to 20 objects.  
Log level is Info.



Cisco Directory Connector
Welcome, Abdul Jaseem | Sign Out

Dashboard Configuration

Sync Now

Synchronization Mode

Enable Auto Sync

Reset Connector Secret

Dry Run ...

Cancel Sync Job

Switch Domain

Set Domain Priority

TroubleShooting

Refresh F5

Exit Alt+F4

Dry Run

Launch Event Viewer

Refresh [F5]

Enable Synchronization

Resume Directory Synchronization

Disable Synchronization

Status
Connector
Type
Started
Finished

None
Incremental

Status
Connector
Type
Started
Finished

None
Full

Directory Domain **ajcollab.com**

Connectors

Connector	Last Connection
WIN-SERVER-01	3/15/2021 12:20 PM

Cloud Statistics

Users
Groups
Rooms

Next Synchronization

Full	Not Scheduled
Incremental	Not Scheduled

Current Synchronization Status

Status

Configuration Summary

Some Users will be synchronized .  
No Groups will be synchronized .  
Delete threshold has been set to 20 objects.  
Log level is Info.

Cisco Directory Connector
Welcome, Abdul Jaseem | Sign Out

Dashboard
Configuration

Actions
Help

Start Incremental Sync
Sync Dry Run
Launch Event Viewer
Refresh [F5]

Cloud Organization: **AJCOLLAB**
Active Directory Domain **ajcollab.com**

### Current Synchronization

Status Stopped  
Mode **Manual** [Enable Auto Sync](#)  
Connector  
Type  
Started  
Phase

### Last Synchronization

Status None  
Connector  
Type **Incremental**

### Connectors

Connector	Last Connection
WIN-SERVER-01	3/15/2021 12:20 PM

### Enable Manual Synchronization

You can enable manual synchronization now. If you want to enable automatic synchronization, go to the dry run report and delete mismatched objects.

Do you want to enable manual synchronization?

Enable Now
Not Now

### Next Synchronization

Full	Not Scheduled
Incremental	Not Scheduled

### Current Synchronization Status

Status

### Configuration Summary

Some Users will be synchronized .  
No Groups will be synchronized .  
Delete threshold has been set to 20 objects.  
Log level is Info.

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Cisco Directory Connector

Cisco Directory Connector
Welcome, Abdul Jaseem | Sign Out

Dashboard
Configuration

Actions
Help

Start Incremental Sync
Sync Dry Run
Launch Event Viewer
Refresh [F5]

Cloud Organization: **AJCOLLAB**
Active Directory Domain **ajcollab.com**

### Current Synchronization

Status

Mode

Connector

Type

Started

Phase

Status

Mode

Connector

Type

Started

Finished

Phase

### Last Synchronization

Status

Connector

Type

Started

Finished

Status

Connector

Type

Started

Finished

### Connectors

Connector	Last Connection
WIN-SERVER-01	3/15/2021 12:20 PM

### Cloud Statistics

Users

Groups

Rooms

### Next Synchronization

Full

Incremental

Next Connector connection

Not Scheduled

### Current Synchronization Status

Status

### Configuration Summary

Some Users will be synchronized .  
No Groups will be synchronized .  
Delete threshold has been set to 20 objects.  
Log level is Info.

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Cisco Directory Connector
Welcome, Abdul Jaseem | Sign Out

Dashboard
Configuration

Sync Now

Synchronization Mode

Enable Auto Sync

Reset Connector Secret

Dry Run ...

Cancel Sync Job

Switch Domain

Set Domain Priority

TroubleShooting

Refresh
F5

Exit
Alt+F4

Incremental

Full

Active Directory Domain **ajcollab.com**

Status
Connector
Type
Started
Finished

None
Incremental

Status
Connector
Type
Started
Finished

None
Full

Connector
Last Connection

WIN-SERVER-01
3/15/2021 12:25 PM

Users
Groups
Rooms

Full
Incremental

Next Connector connection
Not Scheduled

Status

Some Users will be synchronized .  
No Groups will be synchronized .  
Delete threshold has been set to 20 objects.  
Log level is Info.

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1024



Cisco Directory Connector

Welcome, Abdul Jaseem | Sign Out

Dashboard
Configuration

Actions
Help

Start Incremental Sync
Sync Dry Run
Launch Event Viewer
Refresh [F5]

Cloud Organization: **AJCOLLAB**
Active Directory Domain **ajcollab.com**

### Current Synchronization

Status
● In Progress

Mode
Manual
[Enable Auto Sync](#)

Connector
WIN-SERVER-01

Type
Requested full

Started
3/15/2021 12:26 PM

Phase

The cloud is publishing data to the connector.

	Upload	Process
User	100%	100%
Avatar	N/A	N/A

### Last Synchronization

Status
●

Connector
None

Type
Incremental

Started

Finished

Status
●

Connector
None

Type
Full

Started

Finished

### Connectors

Connector	Last Connection
<span>●</span> WIN-SERVER-01	3/15/2021 12:26 PM

### Cloud Statistics

Users

3

Groups

Rooms

### Next Synchronization

Full	Synchronization in progress
Incremental	Not Scheduled

### Current Synchronization Status

Status

### Configuration Summary

Some Users will be synchronized .  
No Groups will be synchronized .  
Delete threshold has been set to 20 objects.  
Log level is Info.

The screenshot displays the Cisco Webex Control Hub interface. On the left is a navigation sidebar with sections: Overview, MONITORING (Analytics, Troubleshooting, Organization Health), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The main content area is titled 'Users' and includes tabs for Users, Groups, and Licenses. A search bar and a 'Manage Users' button are at the top right of the table. The table lists five users. The last two, Hrithik and Jennifer, are enclosed in a red rectangular box. Below this box, a red text annotation reads: 'If the domain is not verified, then user has to manually verify the account!'.

	First Name	Last Name	Display Na...	Email	Status	Actions
	Abdul	Jaseem	Abdul Jase...	vpjaseem@...	Active	
	Anas	Hira	Anas Hira	ajlabs110@...	Active	
	Hrithik	Roshan	Hrithik Rosh...	hrithik.ros...	Not Verif...	...
	Jennifer	Garner	Jennifer Gar...	jennifer.garn...	Not Verif...	...

*If the domain is not verified, then user has to manually verify the account!*

*If the domain is not verified, then user has to manually verify the account!*

Cisco Webex Control Hub

Domain Manager

←

→

↺

🏠

🔒

https://admin.webex.com/users

80%

⋮

🔒

☆

Cisco Webex Control Hub

🔔

?

💬

AJ

🏠 Overview

MONITORING

📊 Analytics

🔧 Troubleshooting

📈 Organization Health

MANAGEMENT

👤 Users

📍 Workspaces

📱 Devices

📄 Apps

📁 Account

⚙️ Organization Settings

SERVICES

💬 Messaging

📅 Meeting

📞 Calling

🔄 Hybrid

📅 AJCOLLAB

Users

🔍

👤 All

Manage Users

	First Name	Last Name	Displ...	Email	Status	Actions
👤	Abdul	Jaseem	Abdul ...	vpjaseem@gmail.com	● Active	
👤	Anas	Hira	Anas ...	ajlabs110@gmail.com	● Active	
👤	Hrithik	Roshan	Hrithik...	<u>hrithik.roshan@ajcollab.com</u>	● Verified	...
👤	Jennifer	Garner	Jennif...	<u>jennifer.garner@ajcollab.com</u>	● Verified	...

When you verify a Domain, all the users from that domain will be verified automatically!

Cisco Webex Control Hub

Domain Manager

+

←

→

↺

🏠

🔒

https://admin.webex.com/settings

💡

📄

80%

⋮

🛡️

☆

📄

🔍

👤

☰

Cisco Webex Control Hub

🏠 Overview

MONITORING

📊 Analytics

🔧 Troubleshooting

📶 Organization Health

MANAGEMENT

👤 Users

📍 Workspaces

📱 Devices

🔧 Apps

📁 Account

⚙️ Organization Settings

SERVICES

🗨️ Messaging

📅 Meeting

📞 Calling

🔄 Hybrid

Organization Settings

UC Manager Profiles

UC Manager Profiles

Your UC Manager Profile will default to your organization's domain. You can add UC manager Profiles for "Jabber in Team Messaging" or "Calling in Webex Teams (UCM)" deployment.

Add Profile

Directory Synchronization

New users will be automatically added from your directory when it synchronizes. Updates can be made directly in Cisco Directory Connector.

ajcollab.com

WIN-SERVER-01

Operational

Turn Off ajcollab.com

User Security

Deactivate WIN-SERVER-01

When enabled, users who change their passwords will have to sign in to Webex again after the new passwords are detected by Directory Connector.

Force authentication when users change passwords

People Insights

When enabled users see comprehensive, real-time business and professional profiles.

Note: Allow 48 hours for changes to People Insights to show in their Webex profiles

People Insights adoption toolkit

What is People Insights?

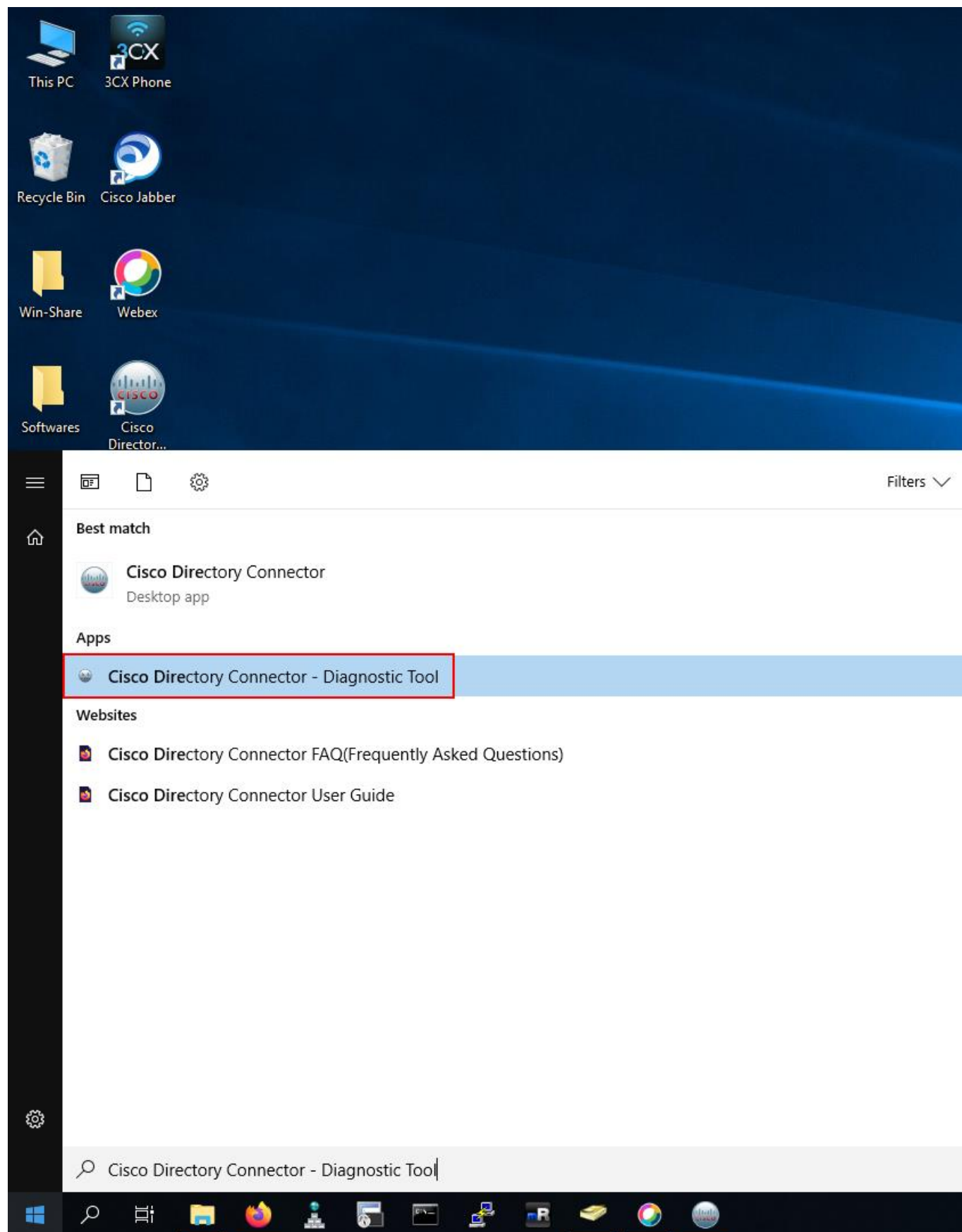
Enable for your site

Show People Insights

📁

AJCOLLAB

## [Lab] Troubleshooting Directory Connector



Cisco Directory Connector - Diagnostic Tool

AD-DSAD-LDSLAP RAW

Active Directory Domain Services Connection Test

Domainajcollab.comLoad Domain Controllers

Domain Controllerwin-server-01.ajcollab.com

Get Specified Attribute Value

AttributeADSchemaTest

Active Directory Queries

Objects☒ User☒ Group

Search Filter

Cookie☒ Auto Fill CookieClear

StatusTotalRun Query

Console Results

Test getting AD schema  
Succeed in getting AD schema.  
Schema Path:LDAP://ajcollab.com/CN=Schema,CN=Configuration,DC=ajcollab,DC=com

Clear AllSave...

---

## Webex Teams SSO

- One set of credentials to access multiple different services
- Authentication handled by IdP (Identity Provider) server, there are 2 types of SSO
- Intra-Organizational SSO: Access resources within the organization
- Inter-Organizational SSO: Also known as federated SSO, establish trust between multiple orgs to authenticate users
- Webex Teams utilizes web federated SSO with SAML 2.0, it uses web browser to exchange identity information across HTTPS
- Identity information formatted using Security Assertion Markup Language (SAML) 2.0, XML based open standard
- **Service Provider (SP):** Provides the service that being utilized (application or system that user logs in to. e.g. CUCM, Webex Control Hub, etc.)
- **Identity Provider (IdP):** System that challenges a user for their credentials and tells the SP if the login was successful or not. Microsoft Azure and okta are cloud based IdPs Microsoft Windows ADFS, PingID etc. are other IdPs
- **Claim:** An IdP configuration that determines what information is to send to SP. Its basically taking some attributes (uid as SAM-AccountName)
- In the Webex Control Hub, the SP is Webex that is managed by Cisco and the IdP can be a Windows Server with ADFS installed, that is managed by customer



---

## Process of SSO Login

- User logs in to Service Provider (SP) web interface
- It gets redirected to IdP and submit the credentials (SAML Request)
- IdP sends information back to SP based on Claim rule and browser redirects back to the SP (SAML Response)

## Metadata File

- SP and IdP will have its own meta data files
- **Entity ID:** URL of SP, this identifies which SP initiates the request
- **Endpoint URL:** URL of IdP
- **Name ID:** User attributes
- **Certificates:** Signing and Encryption Certificates
- **Claim Rule:** Defines the attributes and values that are returned in the SAML response
- Both Metadata files must be cross imported (SP to IdP and verse versa)

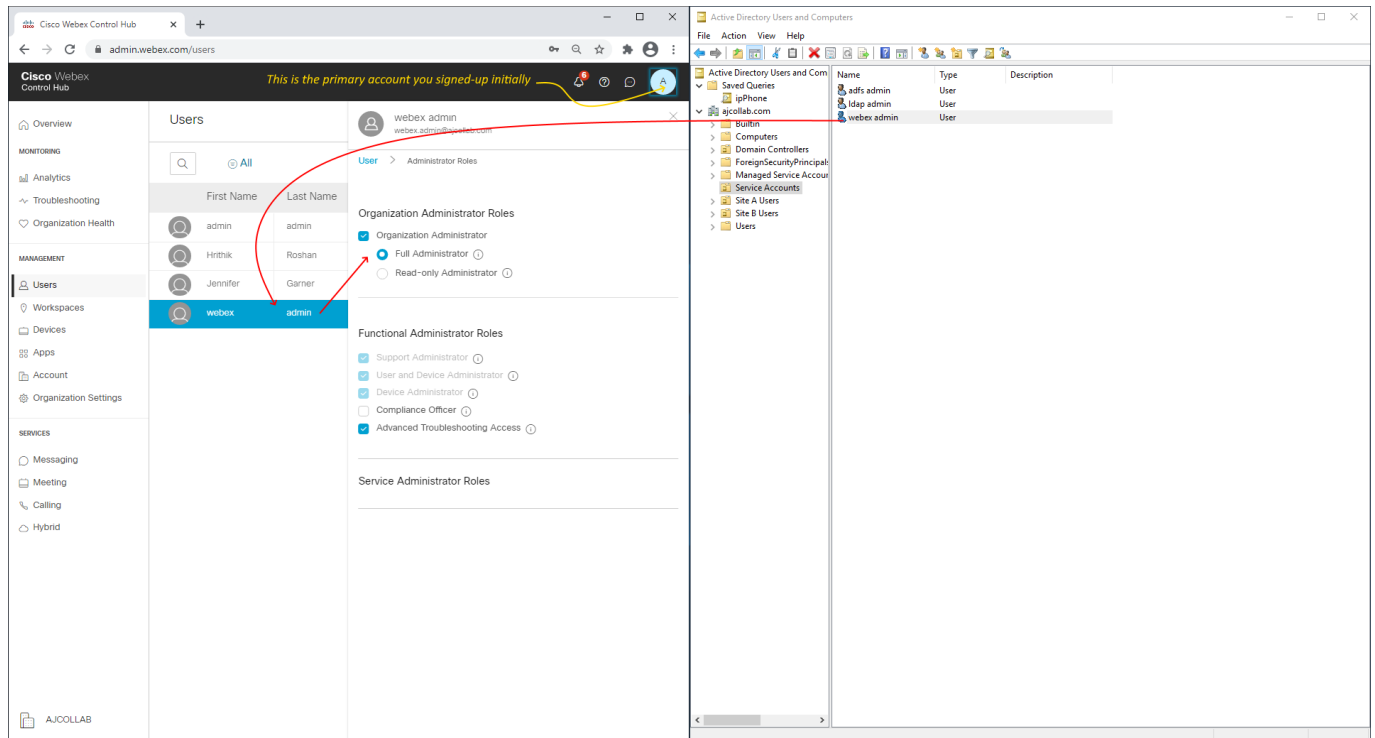


---

## [Lab] Webex Control Hub SSO Configuration

Before enabling SSO, you must configure Cisco Directory Sync and make one AD synced user as 'Full Admin'

I have added a user 'webex.admin' in AD and made that user as a 'Full Admin' in Control Hub



If we miss this step, after we enable SSO, we won't be able to sign in as Administrator

Download the ADFDS Federation Metadata from the Windows ADFDS Server

<https://win-server-02-adfs.ajcollab.com/FederationMetadata/2007-06/FederationMetadata.xml>



Cisco Webex Control Hub

https://admin.webex.com/settings

Cisco Webex Control Hub

6

?

A

Overview

MONITORING

Analytics

Troubleshooting

Organization Health

MANAGEMENT

Users

Workspaces

Devices

Apps

Account

Organization Settings

SERVICES

Messaging

Meeting

Calling

Hybrid

AJCOLLAB

Organization Settings

Show People Insights

Authentication

Single Sign-On

Disabled

Modify

Remember Me Controls

When enabled, user could skip entering the email address and the "Discovery Page" during the login. The login id will stay valid in the browser until reached selected time.

30 Days (Def...

Multi-Factor Authentication

When enabled, all users will have to use a mobile phone with a TOTP compliant authenticator. We recommend Duo Authenticator.

When disabled, all users need to use only password to authenticate.

Email

Suppress Admin Invite Emails

When enabled, users will not receive the automated Cisco invitation emails when licenses are assigned. Only use this feature if you wish to send your own email invite campaign. This setting only works if you turn on Single-Sign-On

Cisco Webex Control Hub

https://admin.webex.com/settings

## Enterprise Settings

### Single Sign-On

☐ Use the built-in identity service for user authentication. (Simple)

☒ Integrate a 3rd-party identity provider. (Advanced)

● Single sign-on is not enabled

Back Next

When disabled, all users need to use only password to authenticate.

Email Suppress Admin Invite Emails


When enabled, users will not receive the automated Cisco invitation emails when licenses are assigned. Only use this feature if you wish to send your own email invite campaign. This setting only works if you turn on Single-Sign-On

AJCOLLAB

Cisco Webex Control Hub

https://admin.webex.com/settings

## Enterprise Settings



### Export Directory Metadata


Download the following trust metadata file from the Cisco Webex Control Hub, and upload it into your identity provider (IdP) management interface. When you have finished uploading the file into your IdP, return to this screen and press Next.

[Download Metadata File](#)

Back Next

Opening idb-meta-8b4f7f04-f573-46b3-aa73-6e1cce547c5c-SP.xml

You have chosen to open:

 **idb-meta-8b4f7f04-f573-46b3-aa73-6e1cce547c5c-SP.xml**  
which is: Extensible Markup Language (XML) (11.4 KB)  
from: blob:

**What should Firefox do with this file?**

- ☐ Open with Firefox
- ☐ Open with Internet Explorer (default)
- ☒ Save File
- ☐ Do this automatically for files like this from now on.

OK Cancel




Cisco Webex Control Hub

https://admin.webex.com/settings

90%

Cisco Webex Control Hub

Enterprise Settings



Test SSO Setup

Press the button below to test your SSO configuration. The test will open in a new browser window. Enter valid SSO credentials and verify the login was successful.

Test SSO Connection

Back Save

When disabled, all users need to use only password to authenticate.

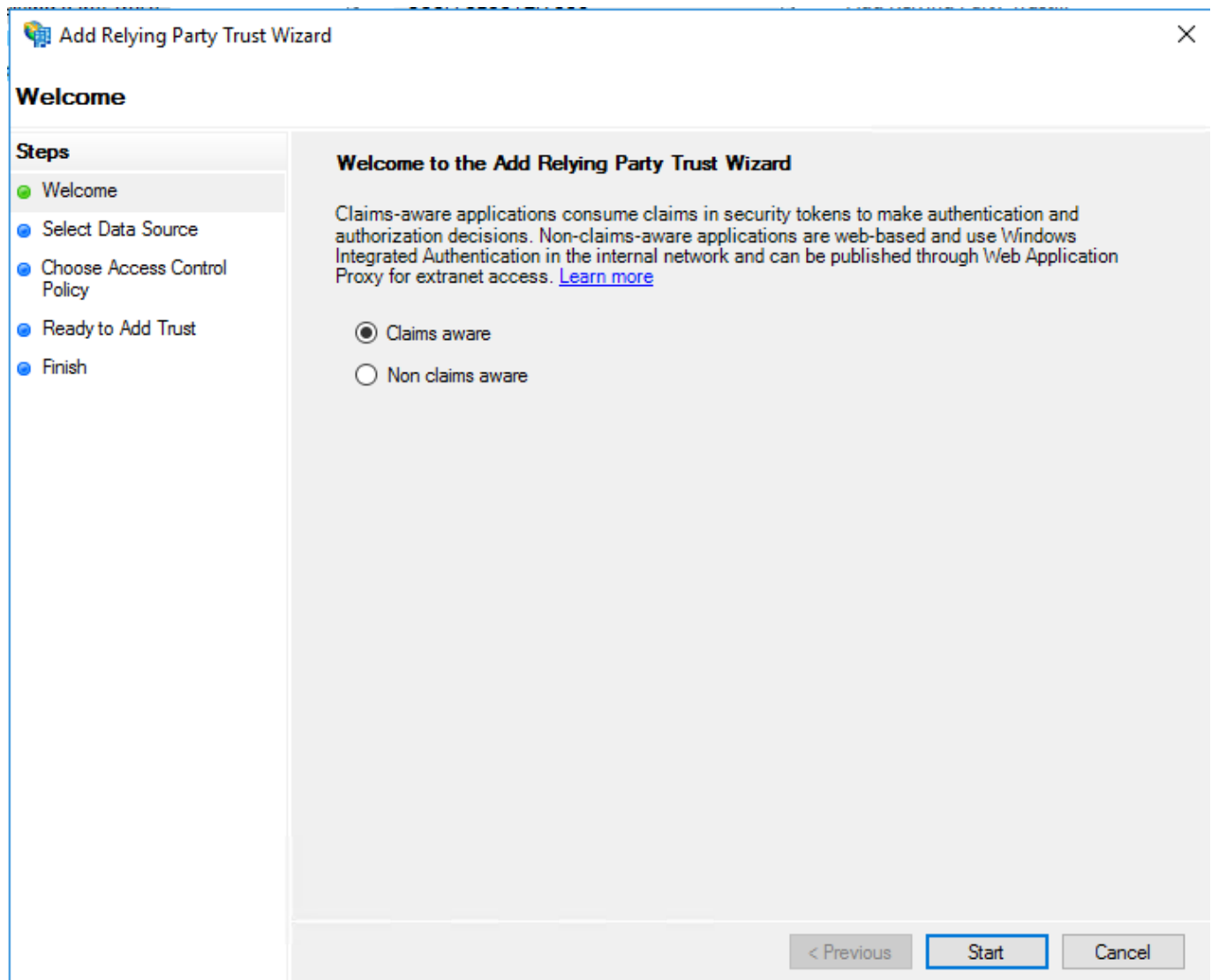
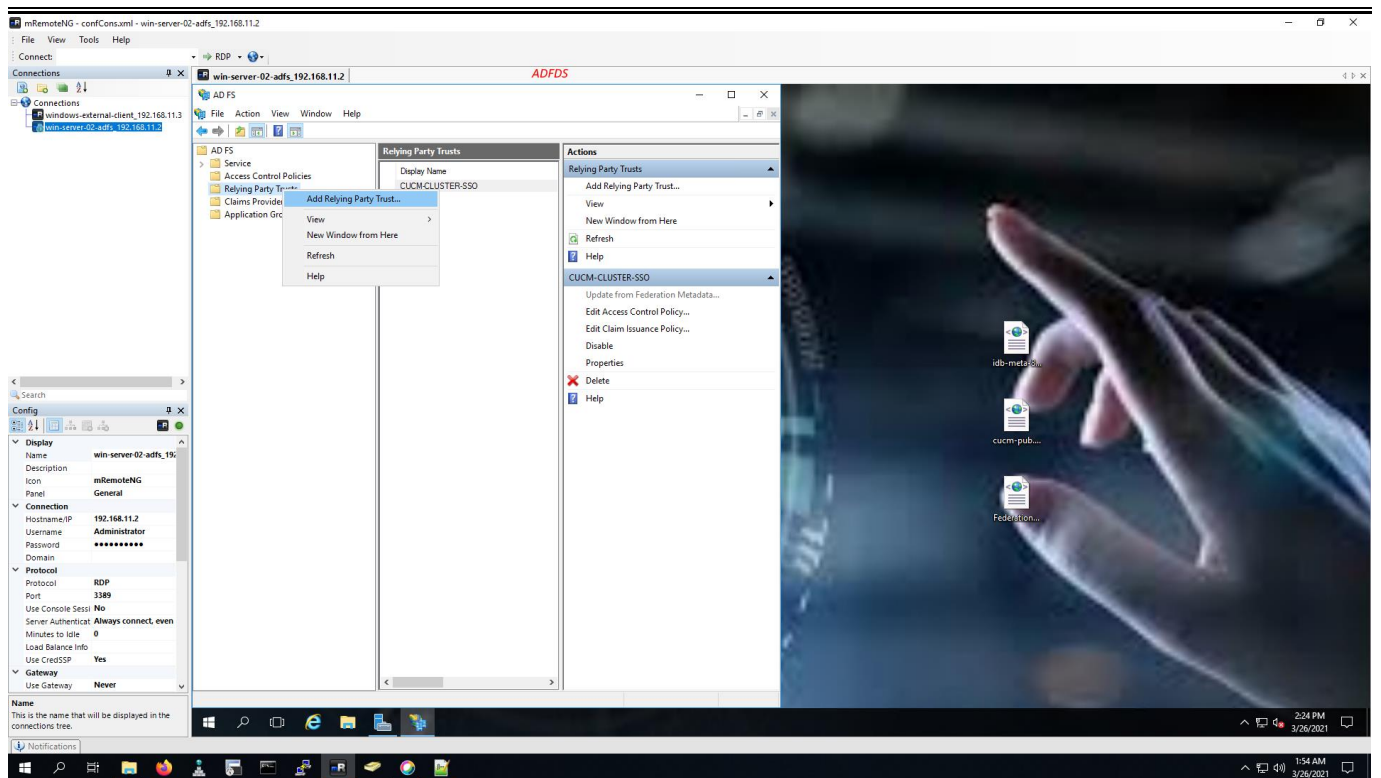
☐

Email

Suppress Admin Invite Emails

When enabled, users will not receive the automated Cisco invitation emails when licenses are assigned. Only use this feature if you wish to send your own email invite campaign. This setting only works if you turn on Single-Sign-On

AJCOLLAB







**Choose Access Control Policy****Steps**

- Welcome
- Select Data Source
- Specify Display Name
- **Choose Access Control Policy**
- Ready to Add Trust
- Finish

Choose an access control policy:

Name	Description
Permit everyone	Grant access to everyone.
Permit everyone and require MFA	Grant access to everyone and require MFA.
Permit everyone and require MFA for specific group	Grant access to everyone and require MFA for a specific group.
Permit everyone and require MFA from extranet access	Grant access to the intranet users and require MFA from extranet access.
Permit everyone and require MFA from unauthenticated devices	Grant access to everyone and require MFA from unauthenticated devices.
Permit everyone and require MFA, allow automatic device registr...	Grant access to everyone and require MFA, allow automatic device registration.
Permit everyone for intranet access	Grant access to the intranet users.
Permit specific group	Grant access to users of one or more groups.

Policy

Permit everyone ←

☐ I do not want to configure access control policies at this time. No user will be permitted access for this application.

&lt; Previous

Next &gt;

Cancel

Add Relying Party Trust Wizard

×

### Ready to Add Trust

Steps

Welcome

Select Data Source

Specify Display Name

Choose Access Control Policy

Ready to Add Trust

Finish

The relying party trust has been configured. Review the following settings, and then click Next to add the relying party trust to the AD FS configuration database.

MonitoringIdentifiersEncryptionSignatureAccepted ClaimsOrganizationEndpointsNotes

Specify the monitoring settings for this relying party trust.

Relying party's federation metadata URL:

☐ Monitor relying party

☐ Automatically update relying party

This relying party's federation metadata data was last checked on:  
< never >

This relying party was last updated from federation metadata on:  
< never >

< Previous

Next >

Cancel

**Finish****Steps**

- Welcome
- Select Data Source
- Specify Display Name
- Choose Access Control Policy
- Ready to Add Trust
- **Finish**

The relying party trust was successfully added.

- ☒ Configure claims issuance policy for this application

[Close](#)

mRemoteNG - confCons.xml - win-server-02-adfs\_192.168.11.2

File View Tools Help

Connect: RDP

Connections

- connections
- windows-external-client\_192.168.11.3
- win-server-02-adfs\_192.168.11.2

AD FS

File Action View Window Help

AD FS

- Service
- Access Control Policies
- Relying Party Trusts
- Claims Provider Trusts
- Application Groups

Relying Party Trusts

Display Name
CUCM-CLUSTER-SSO
WEBEX-CONTROL-HUB-SSO

Actions

Relying Party Trusts

- Add Relying Party Trust...
- View
- New Window from Here
- Refresh
- Help

WEBEX-CONTROL-HUB-SSO

- Update from Federation Metadata...
- Edit Access Control Policy...
- Edit Claim Issuance Policy...
- Disable
- Properties
- Delete
- Help

Config

Display

Name	win-server-02-adfs_192.168.11.2
Description	
Icon	mRemoteNG
Panel	General

Connection

Hostname/IP	192.168.11.2
Username	Administrator
Password	*****
Domain	

Protocol

Protocol	RDP
Port	3389
Use Console Session	No
Server Authentication	Always connect, even if the server does not support it
Minutes to Idle	0
Load Balance Info	
Use CredSSP	Yes

Gateway

Use Gateway	Never
-------------	-------

Name

This is the name that will be displayed in the connections tree.

Edit claim issuance policy for the selected relying party trust

Windows taskbar icons: Start, Search, Task View, File Explorer, Firefox, mRemoteNG, Edge, Task Manager, File Explorer, Settings, File Explorer, File Explorer.

Edit Claim Issuance Policy for WEBEX-CONTROL-HUB-SSO

Issuance Transform Rules

The following transform rules specify the claims that will be sent to the relying party.

Order	Rule Name	Issued Claims
-------	-----------	---------------

Add Rule...

Edit Rule...

Remove Rule...

OK

Cancel

Apply

**Select Rule Template****Steps**

- Choose Rule Type
- **Configure Claim Rule**

Select the template for the claim rule that you want to create from the following list. The description provides details about each claim rule template.

Claim rule template:

Send LDAP Attributes as Claims ←

Claim rule template description:

Using the Send LDAP Attribute as Claims rule template you can select attributes from an LDAP attribute store such as Active Directory to send as claims to the relying party. Multiple attributes may be sent as multiple claims from a single rule using this rule type. For example, you can use this rule template to create a rule that will extract attribute values for authenticated users from the displayName and telephoneNumber Active Directory attributes and then send those values as two different outgoing claims. This rule may also be used to send all of the user's group memberships. If you want to only send individual group memberships, use the Send Group Membership as a Claim rule template.

< Previous

Next >

Cancel

Add Transform Claim Rule Wizard

### Configure Rule

**Steps**

- Choose Rule Type
- Configure Claim Rule

You can configure this rule to send the values of LDAP attributes as claims. Select an attribute store from which to extract LDAP attributes. Specify how the attributes will map to the outgoing claim types that will be issued from the rule.

Claim rule name:

Rule template: Send LDAP Attributes as Claims

Attribute store:

Mapping of LDAP attributes to outgoing claim types:

	LDAP Attribute (Select or type to add more)	Outgoing Claim Type (Select or type to add more)
	E-Mail-Addresses	uid <i>Type this</i>
»		

< Previous

Finish

Cancel

Edit Claim Issuance Policy for WEBEX-CONTROL-HUB-SSO

Issuance Transform Rules

The following transform rules specify the claims that will be sent to the relying party.

Order	Rule Name	Issued Claims
1	NameID	uid

↑

↓

Add Rule...

Edit Rule...

Remove Rule...

OK

Cancel

Apply

1048




**Select Rule Template****Steps**

- Choose Rule Type
- **Configure Claim Rule**

Select the template for the claim rule that you want to create from the following list. The description provides details about each claim rule template.

Claim rule template:

Send Claims Using a Custom Rule 

Claim rule template description:

Using a custom rule, you can create rules that can't be created with a rule template. Custom rules are written in the AD FS claim rule language. Capabilities that require custom rules include:

- Sending claims from a SQL attribute store
- Sending claims from an LDAP attribute store using a custom LDAP filter
- Sending claims from a custom attribute store
- Sending claims only when 2 or more incoming claims are present
- Sending claims only when an incoming claim value matches a complex pattern
- Sending claims with complex changes to an incoming claim value
- Creating claims for use only in later rules

< Previous

**Next >** 

Cancel

Add Transform Claim Rule Wizard
✕

### Configure Rule

**Steps**

- Choose Rule Type
- Configure Claim Rule

You can configure a custom claim rule, such as a rule that requires multiple incoming claims or that extracts claims from a SQL attribute store. To configure a custom rule, type one or more optional conditions and an issuance statement using the AD FS claim rule language.

Claim rule name:

Rule template: Send Claims Using a Custom Rule

Custom rule:

```

name"]
=> issue(Type =
"http://schemas.xmlsoap.org/ws/2005/05/identity/claims/nameidentifier",
Issuer = c.Issuer, OriginalIssuer = c.OriginalIssuer, Value = c.Value,
ValueType = c.ValueType, Properties
["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/format"] = "urn:oasis:names:tc:SAML:2.0:nameid-format:transient", Properties
["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/namequalifier"] = "win-server-02-
adfs.ajcollab.com/adfs/com/adfs/service/trust", Properties
["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/spnamequalifier"] = "https://idbroker-b-us.webex.com/8b4f7f04-f573-46b3-aa73-6e1cce547c5c");|

```

< Previous
Finish
Cancel

```

c:[Type ==
"http://schemas.microsoft.com/ws/2008/06/identity/claims/windowsaccountname"]
=> issue(Type =
"http://schemas.xmlsoap.org/ws/2005/05/identity/claims/nameidentifier", Issuer =
c.Issuer, OriginalIssuer = c.OriginalIssuer, Value = c.Value, ValueType =
c.ValueType,
Properties["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/forma
t"] = "urn:oasis:names:tc:SAML:2.0:nameid-format:transient",
Properties["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/nameq
ualifier"] = "win-server-02-adfs.ajcollab.com/adfs/com/adfs/service/trust",
Properties["http://schemas.xmlsoap.org/ws/2005/05/identity/claimproperties/spnam
equalifier"] = "https://idbroker-b-us.webex.com/8b4f7f04-f573-46b3-aa73-
6e1cce547c5c");

```

Note: The idbroker URL is available on the Webex metadata

---

## Enterprise Settings



### Test SSO Setup

Press the button below to test your SSO configuration. The test will open in a new browser window. Enter valid SSO credentials and verify the login was successful.

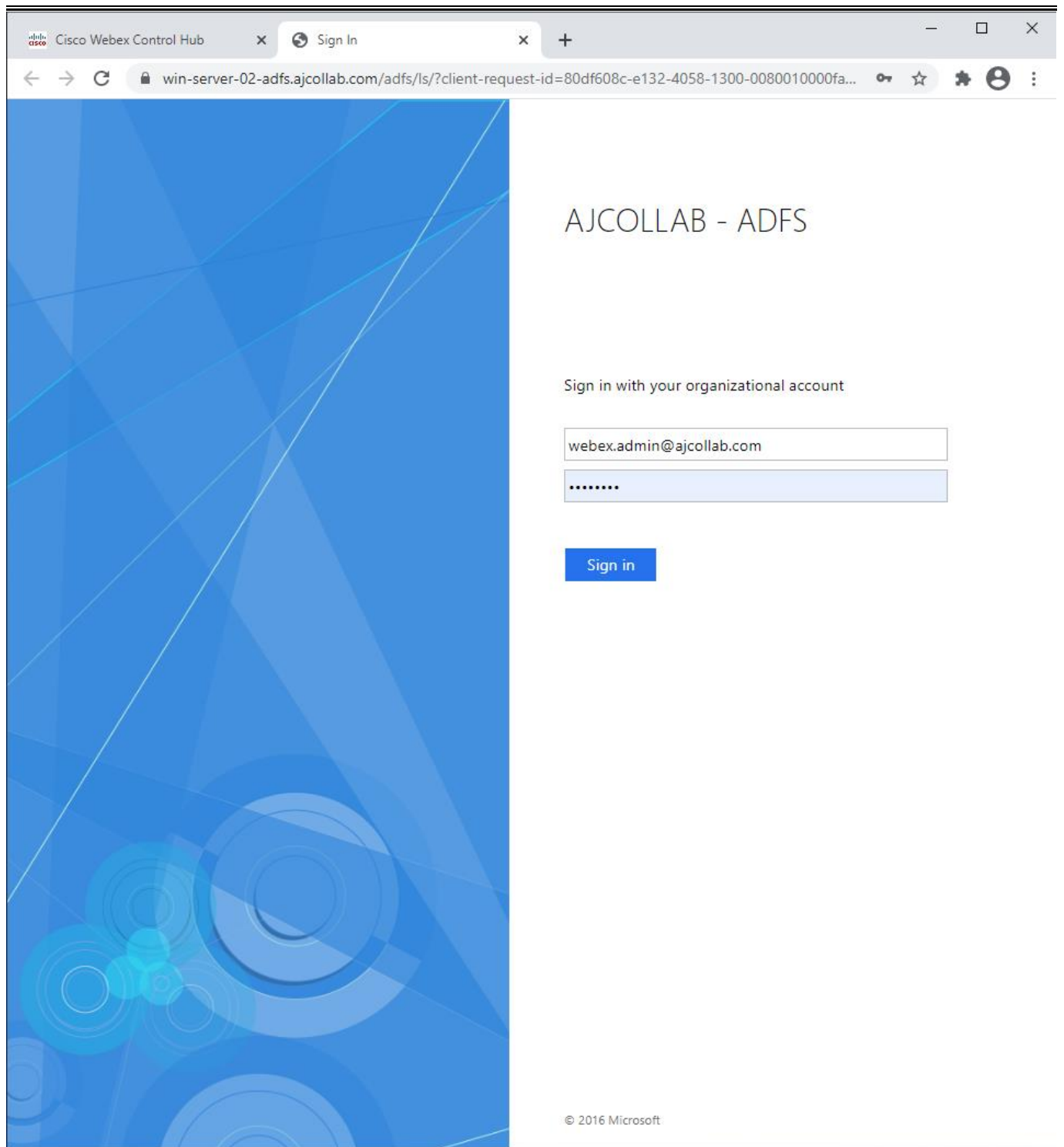
Test SSO Connection

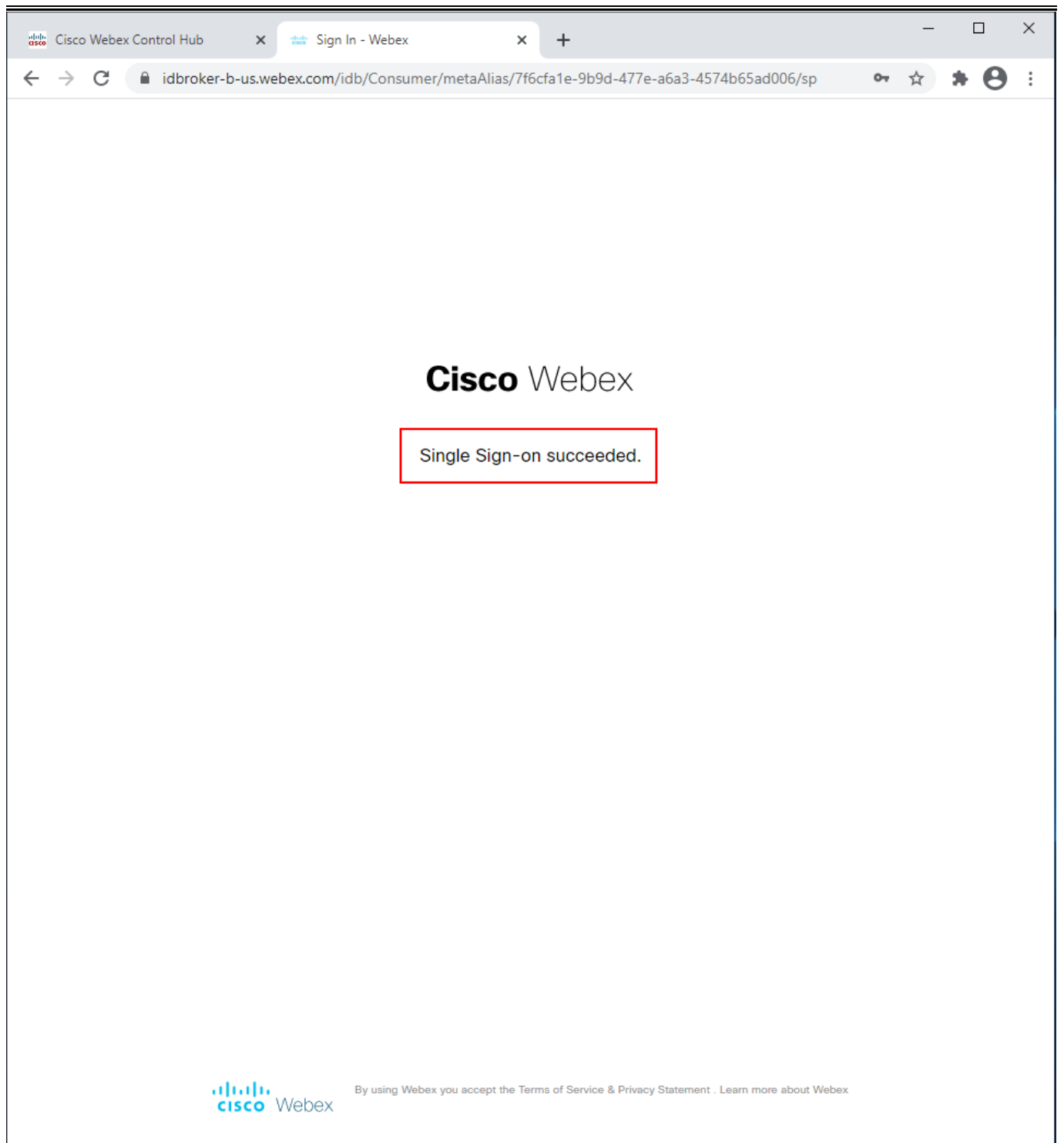


Back

Save







Cisco Webex Control Hub

Sign In - Webex

admin.webex.com/settings

Cisco Webex Control Hub

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AJCOLLAB

Enterprise Settings

Test SSO Setup

Press the button below to test your SSO configuration. The test will open in a new browser window. Enter valid SSO credentials and verify the login was successful.

Test SSO Connection

If your test was successful, enable Single Sign On below. Otherwise, disable Single Sign On or return to the previous steps. If you turn on SSO then Cisco recommends that you temporarily give an external user admin privileges, so that they can log in if there is a problem with SSO.

☒ The test was successful. Enable Single Sign On.

☐ The test was unsuccessful. Disable Single Sign On.

Back

Save

Operational

passwords will have to

sswords are detected

users change

People Insights

When enabled users see comprehensive, real-time

[Lab] Manually Assign License to the Users

Cisco Webex Control Hub

Global Service Status

esxi-primary - VMware ESXi

https://admin.webex.com/users80%

Cisco Webex Control Hub

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Users

All

	First Name	Last Name	Display
	admin	admin	admin@
	Hrithik	Roshan	Hrithik R
	Jennifer	Garner	Jennifer
	webex	admin	webex ad

Hrithik Roshan

hrithik.roshan@ajcollab.com

User

Services

Messaging

Meeting

Calling

Hybrid Services

Calendar Service

Message Service

Roles and Security

Administrator Roles

Security

Devices

Services enabled for Hrithik Roshan

Messaging

Meeting

Calling

Cisco Webex Teams Free Messaging

Webex Teams

Cisco Webex Teams Free Meetings

Webex Team Meetings

Cisco Webex Free Calling

Webex Assistant for Meetings

Webex Enterprise Edition

abvp-gas1e-sandbox.webex.com

Close

Edit licenses

Services enabled for Hrithik Roshan

Messaging

Meeting

Calling

Cisco Webex Teams Free Messaging

Cisco Webex Teams Free Meetings

Cisco Webex Free Calling

Messaging

Meetings

Calling

Webex Teams

Cisco Webex Team Meetings

Webex Assistant for Meetings

Webex Enterprise Edition

abvp-gas1e-sandbox.webex.com

Webex Calling

Enterprise

Basic

Back

Save

## Auto License Assignment

- License Template is created and assigned to AD group
- When users Sync from a specific AD Group, those get assigned a pre-defined License Template
- We can edit / modify / disable the license template anytime

## Organization Based License Assignment

- Assign license to the users automatically from at the Organization Level
- You can modify individual users once the assigned licenses from the Org

The screenshot shows the Cisco Webex Control Hub interface. The left sidebar contains navigation options: Overview, MONITORING (Organization Health, Analytics, Troubleshooting), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The main content area is titled 'Licenses' and has tabs for Users, Groups, and Licensess. The 'Licensess' tab is active. A red arrow points to the 'Users' tab in the sidebar. Another red arrow points to the 'Licensess' tab in the main header. The main content area displays 'Licenses assignment' information, stating that licenses are only assigned to new users and providing a 'Learn More' link. Below this, there are two management options: 'Organization-based management' (selected) and 'Group-based management'. The 'Organization-based management' section shows a table of licenses assigned to new users. The table has columns for Service, License Name, and License Details. The services listed are Messaging, Meeting, and Calling. The license names are Cisco Webex Teams Free Messaging, Cisco Webex Teams Free Meetings, and Cisco Webex Teams Free Calling. The license details show the license is assigned to the 'Webex Teams' group. A 'Modify' button is visible below the table. The 'Group-based management' section is currently unselected.

Service	License Name	License Details
Messaging	Cisco Webex Teams Free Messaging	Webex Teams
Meeting	Cisco Webex Teams Free Meetings	Webex Team Meetings
Calling	Cisco Webex Teams Free Calling	Webex Assistant for Meetings



## Policies and Features

- Block external communication, File Share control, Mobile PIN Lockout, Webex Assistant, Face recognition, etc.
- We can apply at User level or Org level

The screenshot displays the Cisco Webex Control Hub Administration Console. The browser address bar shows `https://admin.webex.com/settings`. The left sidebar contains a navigation menu with sections: Overview, MONITORING (Organization Health, Analytics, Troubleshooting), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The 'Organization Settings' menu item is highlighted with a red arrow. The main content area is titled 'Organization Settings' and contains three sections: 'External Communication', 'Face Recognition', and 'Privacy'. The 'External Communication' section is highlighted with a red arrow and includes a toggle for 'Block external messaging' (which is turned off), a description about blocking external contacts, and a section for 'Allowed domains for external messaging' with a text input field and 'Check domain' and 'Add' buttons. The 'Face Recognition' section is also highlighted with a red arrow and includes a description and a 'Review Setting' button. The 'Privacy' section is partially visible at the bottom.

**Organization Settings**

**External Communication**

Block external messaging

Block your users from inviting external contacts to Cisco Webex Teams spaces and prevent your users from joining external Cisco Webex Teams spaces.

☐

Allowed domains for external messaging

Type to check and add specific domains. To learn more about domain claim and verify, click [here](#).

Enter Domain Name

Check domain Add

**Face Recognition**

Using camera data to provide a smarter meeting experience.

Review Setting

**Privacy**

Support Access

This setting gives Cisco or Partner Support read-only

# Enabling External Domain Messaging

Cisco Webex Control Hub

admin.webex.com/settings

webex Control Hub

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AJ Collab

Organization Settings

webex Control Hub sessions. You determine the amount of time Webex Control Hub remains idle until users are signed out.

Control Hub timeout

20 minutes (Def... ▾)

External Communication

Block external messaging

Block your users from inviting external contacts to Webex spaces and prevent them from joining external Webex spaces

×

Allow domains for external messaging

To allow external communication with specific domains, add the domains, set the permissions, and then switch on the toggle.

→ [Manage domains and permissions](#)

Group Spaces

Limit access to only join group spaces owned by your organization. This doesn't apply to spaces with just one other person.

×

Face Recognition

Using camera data to provide a smarter meeting experience.

Name Labels

Review Setting

Cisco Webex Control Hub

admin.webex.com/settings/manage-domains

webex Control Hub

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< Organization Settings

Allowed Domains

Search

1 Domain

Actions

Domain

Status

cisco.com

● Claimed in Webex

You can add other domain here so that you can message other org

---

## [Lab] Workspaces

- Workspaces are the physical locations of collaboration within your organization. Workspace details give you an at-a-glance overview of the usage, settings, and environmental status for the physical location
- This helps you understand the workspace conditions to make decisions that enhance the end-user experience

The screenshot shows the Cisco Webex Control Hub interface. The browser address bar displays `admin.webex.com/workspaces?query=&filters=&locations=`. The left sidebar contains a navigation menu with sections: Overview, MONITORING (Analytics, Troubleshooting, Organization Health), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The 'Workspaces' item in the MANAGEMENT section is highlighted with a red arrow. The main content area is titled 'Workspaces' and features a large light blue box with the heading 'Add your first Workspace'. Below the heading, text explains that workspaces represent physical spaces and provides details on usage and settings. A blue button labeled '+ Add Workspace' is centered in the box, also highlighted with a red arrow. A link 'What is a Workspace?' is visible in the top right of the main area. The bottom left of the sidebar shows the user profile 'AJCOLLAB'.



Cisco Webex Control Hub

admin.webex.com/workspaces?query=&filters=&locations=

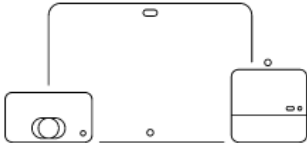
Cisco Webex Control Hub

10

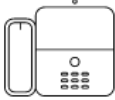
V

Add Workspace

What kind of device do you want to set up in this workspace?



Cisco Webex Rooms device  
e.g. Cisco Webex Board, Room, and Desk series,  
and Webex Share.

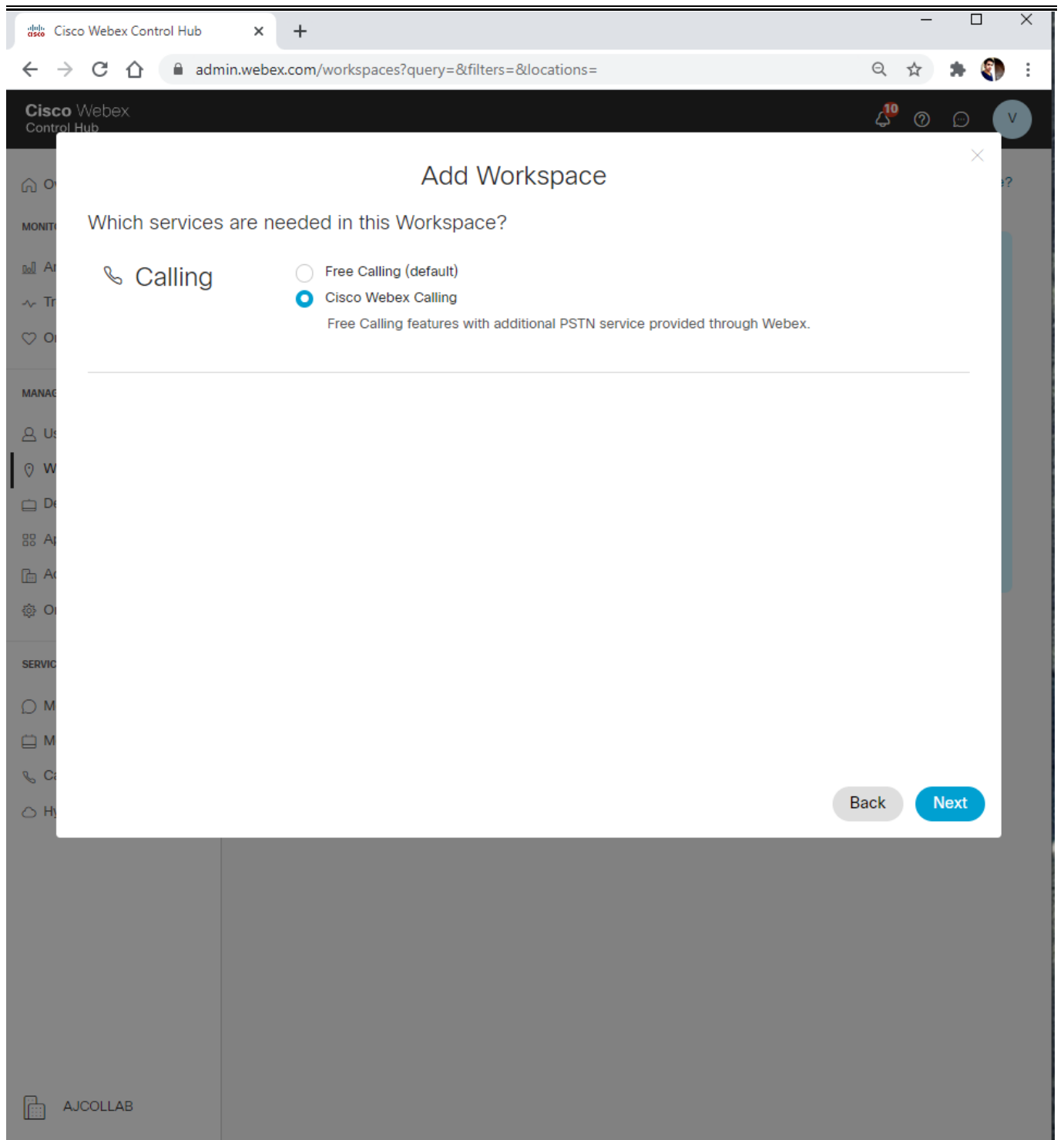


Cisco IP Phone  
e.g. Cisco 8845, 8865, 8800 and Analog Telephone  
Adapter ports

Back

Next

AJCOLLAB



## [Lab] Register Cisco DX70 in Cloud

The screenshot shows the Cisco Webex Control Hub admin interface. The browser address bar displays `admin.webex.com/devices`. The left sidebar contains a navigation menu with sections: Overview, MONITORING (Analytics, Troubleshooting, Organization Health), MANAGEMENT (Users, Workspaces, **Devices**, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The 'Devices' page is active, showing a large grey area with a laptop icon and the text 'No devices yet'. Below this, it says 'After you activate Webex devices, you'll see them listed here.' and a green 'Add Device' button is visible, pointed to by a red arrow. The top right of the interface shows a user profile icon with the letter 'A'.



## Add Device

### Assign to a user or a workspace?

Devices for personal usage should be assigned to a specific user. A workspace represents a physical location containing a device not owned by a specific user, such as a meeting room with a Webex Board 55 or a reception with a shared phone.



Existing User  
Personal Usage



Workspace  
Shared Usage



**Multiple Cisco IP Phones:** To bulk activate devices, [Import/Upload CSV file](#).

Cancel

Next

---

## Add Device



Which user will this device belong to?

Hrithik Roshan (hrithik.roshan@ajcollab.com)




Back

Next

Add Device

Activation Code

An Activation Code is a **one time password**. Share this code with the person setting up the device belonging to **Hrithik Roshan**, or enter or scan it yourself when prompted by the device. Once the device has been successfully activated, you will be able to find and configure it in Users or Devices.



0897-0704-2661-6729

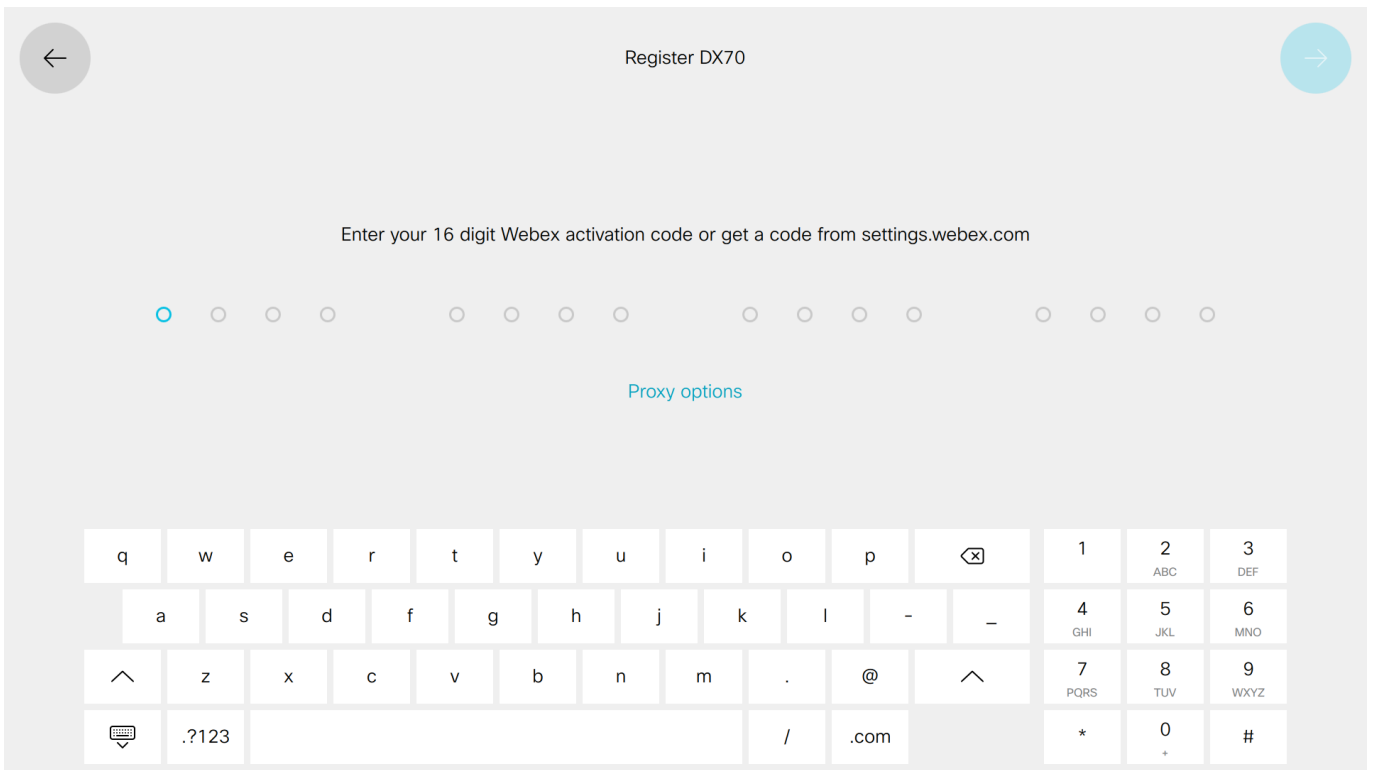
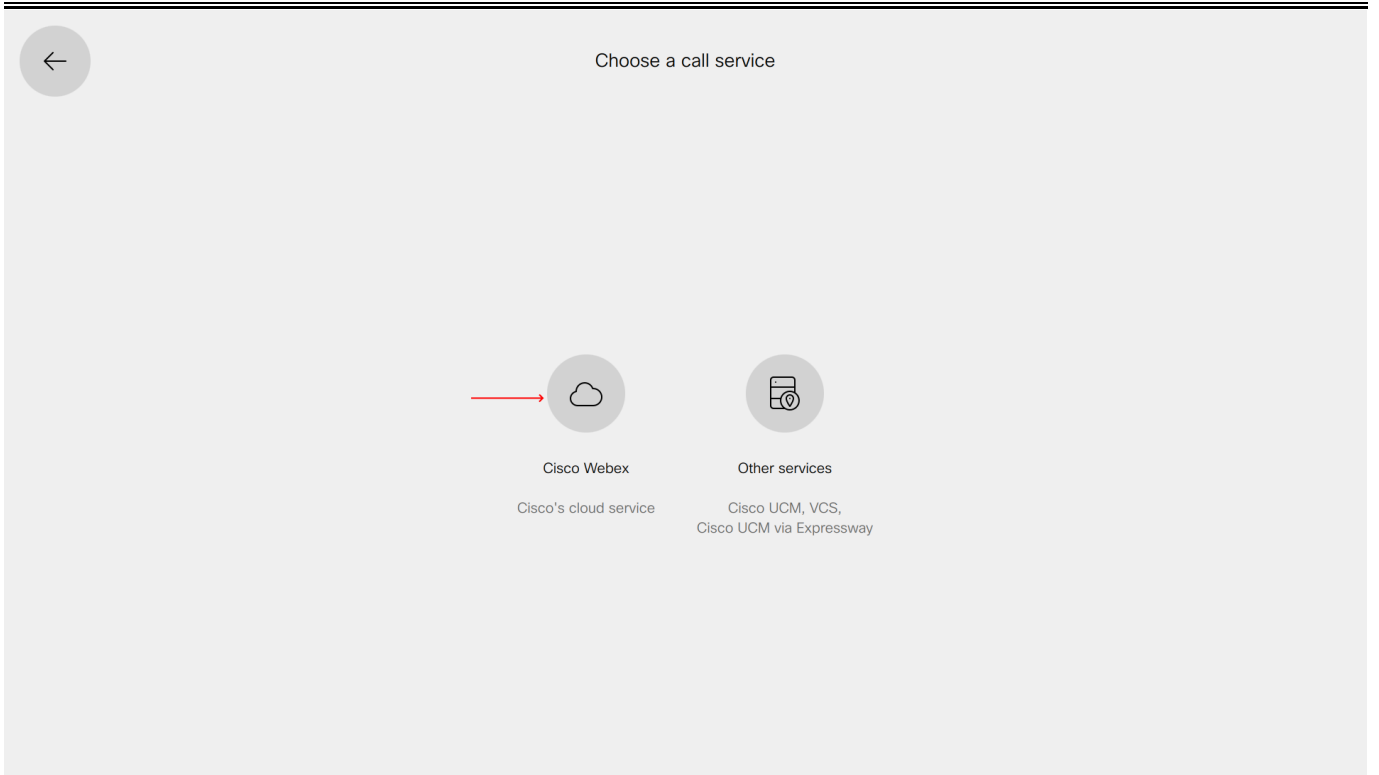
Expires April 3, 2021 12:52 AM (PDT)

Copy

Email

Print

- Now restore factory the DX70
- You can enter the 16-digit code when the DX70 comes online by selecting Webex option from the device



- Alternatively, use the register option from the DX70 web interface

The screenshot displays the Cisco Webex DX70 System Information web interface. The browser address bar shows the URL `https://[redacted]/web`. The interface is divided into a left sidebar and a main content area.

**Left Sidebar:**

- Home**
- Call**
- SETUP**
  - Settings
  - Users
  - Security
- CUSTOMIZATION**
  - Personalization
  - UI Extensions Editor
  - Macro Editor
  - Developer API
- SYSTEM MAINTENANCE**
  - Software
  - Issues and Diagnostics
  - Backup and Recovery

**Main Content Area:**

**System Information**

**General**

IPV4	MAC Address
-	-
IPV6	-

FOC1846N3S3  
Serial Number

Wireless  
Active Interface

44° C / 111.2° F  
Temperature

**Software**

ce 9.15.3.13 e8923dc6f18 2021-04-09  
Software Version

**Calendar**

No calendar integration found.

**Issues**

- Passphrase Vulnerability
- First Time Wizard not Completed
- Missing System Name

[View All](#)

**H323**

Inactive Status	- Gatekeeper
- Number	- ID

**SIP**

Inactive Status	- Proxy
--------------------	------------

**Register System**

In order to place calls with this video system, it needs to be registered to a call service.

[Register to Webex](#)

System Information

DX70

Home

Call

SETUP

Settings

Users

Security

CUSTOMIZATION

Personalization

UI Extensions Editor

Macro Editor

Developer API

SYSTEM MAINTENANCE

Software

Issues and Diagnostics

Backup and Recovery

System Information

General

IPv4

MAC Address

IPv6

FOC1846N3S3

Serial Number

Wireless

Active Interface

44°C / 111.2°F

Issues

Passphrase Vulnerability

First Time Wizard not Completed

Missing System Name

View All

Calendar

No calendar integration found.

SIP

Inactive

Status

Proxy

Register System

In order to place calls with this video system, it needs to be registered to a call service.

Register to Webex

Register to Webex

Enter your 16 digits Webex activation code or get a code from [settings.webex.com](#).

XXXX-XXXX-XXXX-XXXX

Register

Note: After a successful registration, any existing user accounts on the video system will be disabled and logged out. They can be enabled again via the [Cisco Webex Control Hub](#).

Cisco Webex Control Hub

Sign In - Webex

admin.webex.com/devices

Cisco Webex Control Hub

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Devices

ManageSettingsMy AlertsSoftwareResources

Find devices by status, type, and more

Online1

Expired0

Offline0

Issues0

Add Device

1 Device in total

0 devices selected

EditExport as CSVDelete

	Type	Product	Status	Belongs to
<input type="checkbox"/>	Rooms & Desks	Cisco Webex DX70	Online	Hrithik Roshan



Note: Registering Cisco 8865 Phones will follow the same steps, phone must be in MPP firmware



---

## Webex Devices



- Webex devices are broadly categorized into three such as Board devices, Room Devices and Desk devices
- Board devices used is an all-in-one touchscreen enabled and white boarding capable device
- Room devices are of 2 types: with integrated display devices called Room Series and without integrated display called Room Kit series
- Desk devices can be used as an extended screen for your Laptop and provide unified communication features

---

## Webex Board Series (55, 70, 85)



**NEW**  
Webex Board 85



Webex Board 70



Webex Board 55



- Watch video demonstration: Cisco Webex Board

## Webex Room Series



Room 55



**NEW**  
Room 55D



**NEW**  
Room 70S G2



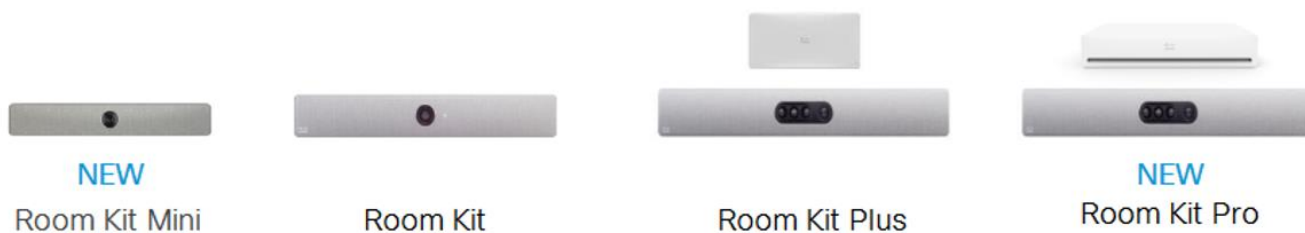
**NEW**  
Room 70D G2

- Watch video demonstration: Cisco Webex Room Series

---

## Webex Room Kit Series

- The display is not integrated, we can use any third party 4K display



- Watch video demonstration: Webex Room Kit Mini

## Cisco DX Series (DX70, DX80, Desk Pro)



- Watch video demonstration: Cisco Webex Desk Pro and Cisco DX80

---

## Cisco Telepresence SX Series (SX10, SX20, SX80)

- SX Series is now End of Sale, hence you won't see that in future



SX10



SX20



Speaker Track 60



SX80

### Video Demonstration: SX10

### Webex Share

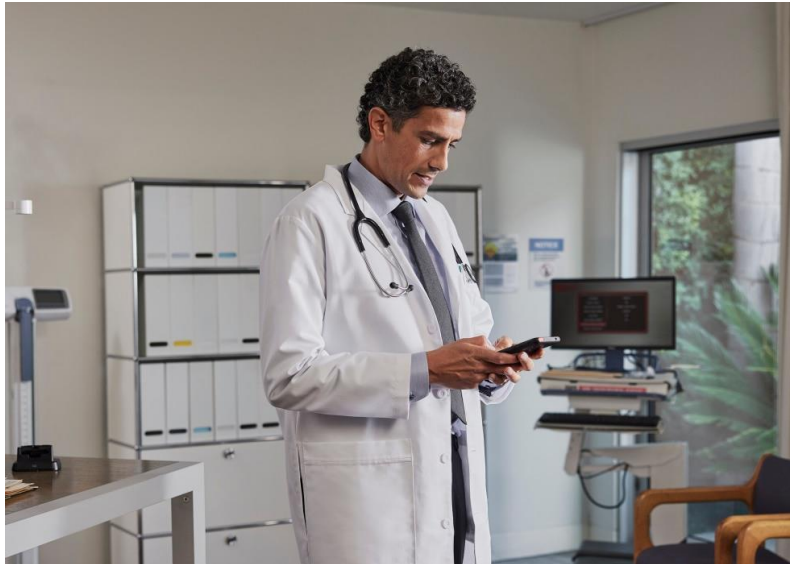
- Used to share content, screen wirelessly to any display having HDMI connectivity
- This device must be provisioned in the control hub



- Watch video demonstration: Webex Share

---

## Webex Calling



- There are basically three types of calling in Webex
- One to One (1:1) non PSTN URI calling (Default)
- Make calls directly from Webex, backed by Webex Calling (broadcloudpbx) with extension and PSTN DID support
- Unified CM Calling or UCM Calling - Webex Cloud integrated with on-premises CUCM

## 1:1 Call Non PSTN

- This is the default calling option available in Webex
- Users can call using their email ID
- No additional configuration required

The screenshot displays the Cisco Webex Control Hub administrative interface. The browser address bar shows `admin.webex.com/users`. The interface is divided into three main sections: a left sidebar, a central 'Users' table, and a right-hand configuration panel.

**Left Sidebar:**

- Overview**
- MONITORING**
  - Organization Health
  - Analytics
  - Troubleshooting
  - Reports
- MANAGEMENT**
  - Users** (highlighted with a red arrow)
  - Workspaces
  - Devices
  - Apps
  - Account
  - Organization Settings
- SERVICES**
  - Updates
  - Messaging
  - Meeting
  - Calling
  - Connected UC
  - Hybrid
- AJ Collab

**Central 'Users' Table:**

First Name	Last Name
admin	a

The first row is highlighted in blue, and a red arrow points to its user icon.

**Right-hand Configuration Panel (User: Abdul Jaseem, ajlabs110@gmail.com):**

- Services:**
  - Messaging: Basic Messaging
  - Meeting: Basic Space Meetings
  - Calling: Call on Webex (1:1 call, non-PSTN)** (highlighted with a red box and a red arrow pointing to 'Edit Licenses')
- Hybrid Services:**
  - Calendar Service: Off
  - Message Service: Off
- Roles and Security:**
  - Administrator Roles
  - Security
- Devices:**
  - Add Device** (button)
- Device Settings:**
  - Software Upgrade Channel: Default (Stable)
  - Lock Settings on Touch Devices: ☐

Cisco Webex Control Hub

admin.webex.com/users

webex Control Hub

Overview

MONITORING

Organization Health

Analytics

Troubleshooting

Reports

MANAGEMENT

Users

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Account

Organization Settings

SERVICES

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Messaging

Meeting

Calling

Connected UC

Hybrid

AJ Collab

Groups

Licenses

Manage Users

Actions

Services enabled for Abdul Jaseem

Messaging

Meeting

Calling

Free Public Collaboration Services

☒ Basic Messaging

☒ Basic Space Meetings

Call on Webex (1:1 call, non-PSTN)

Licensed Collaboration Services

Messaging

☐ Advanced Messaging

Meetings

☐ Advanced Space Meetings

☐ Webex Assistant for Meetings

☐ Webex Meetings Suite

pramodhk-gaxb8-sandbox.webex.com

Calling

☐ Webex Calling

☐ Enterprise

☐ Basic

Back

Save

Enable location for Webex Calling powered by broadcloudpbx

- We need to enable locations to enable Webex Calling broadcloudpbx

Cisco Webex Control Hub

admin.webex.com/calling/locations

webex Control Hub

8

?

A

Overview

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Updates

Messaging

Meeting

Calling

Connected UC

Hybrid

AJ Collab

Calling

NumbersLocationsCall RoutingFeaturesPSTN OrdersOrdersService Settings

Client Settings

Search

Add Location

Location	Routing Prefix	Acti...
★ Site1		...



Cisco Webex Control Hub

admin.webex.com/calling/locations

webex Control Hub

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Connected UC

Hybrid

AJ Collab

Service Settings

Add Location

Acti...

...

Add Location

Location Name

Texas

Location Address

999 Metromedia Place Dallas

Country/Region

United States of America

Street address line 2 (optional)

Language

English (United States)

City/Town

Dallas

State/Province/Region

Texas

Zip/Postal code

75247

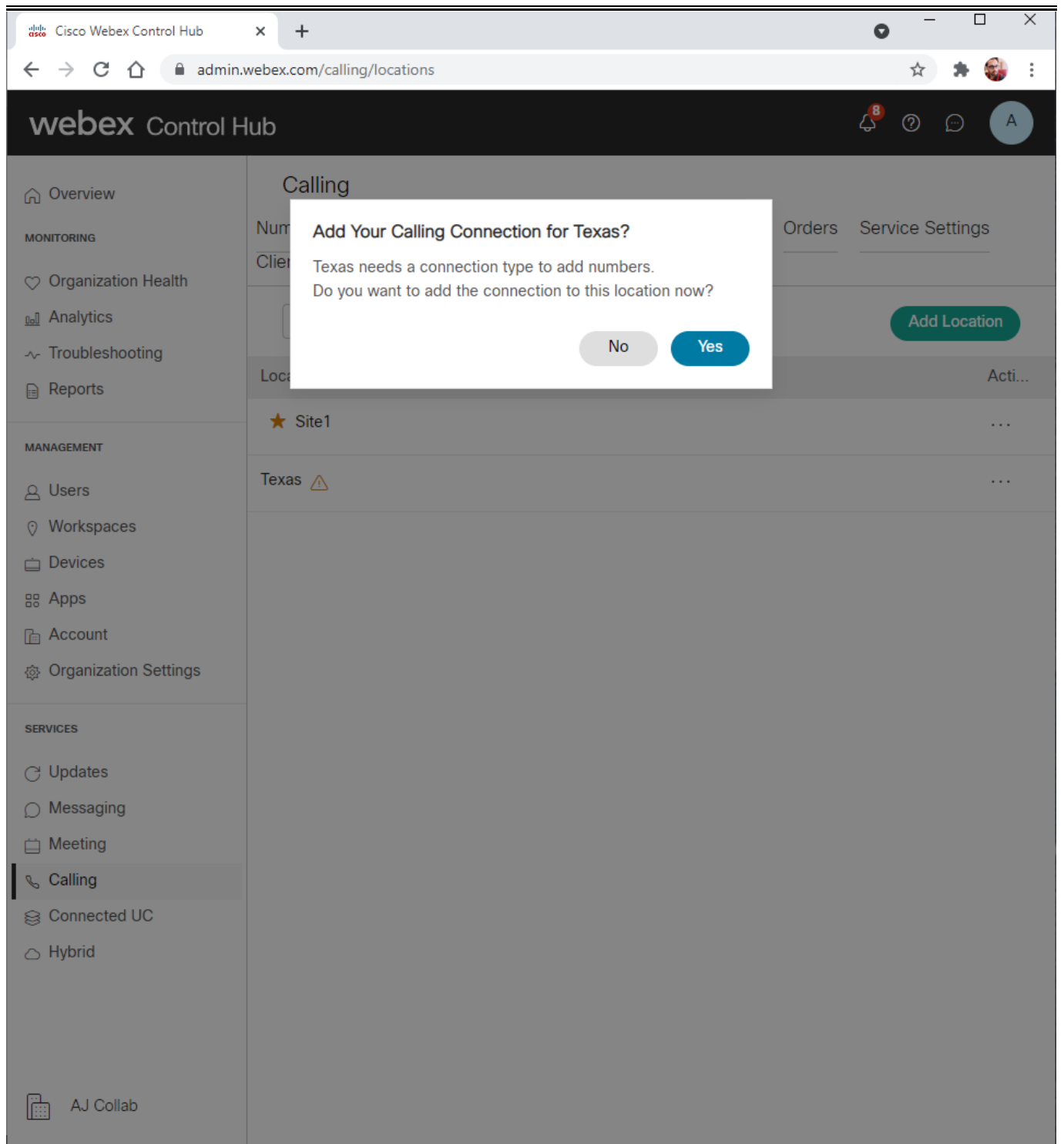
Time zone

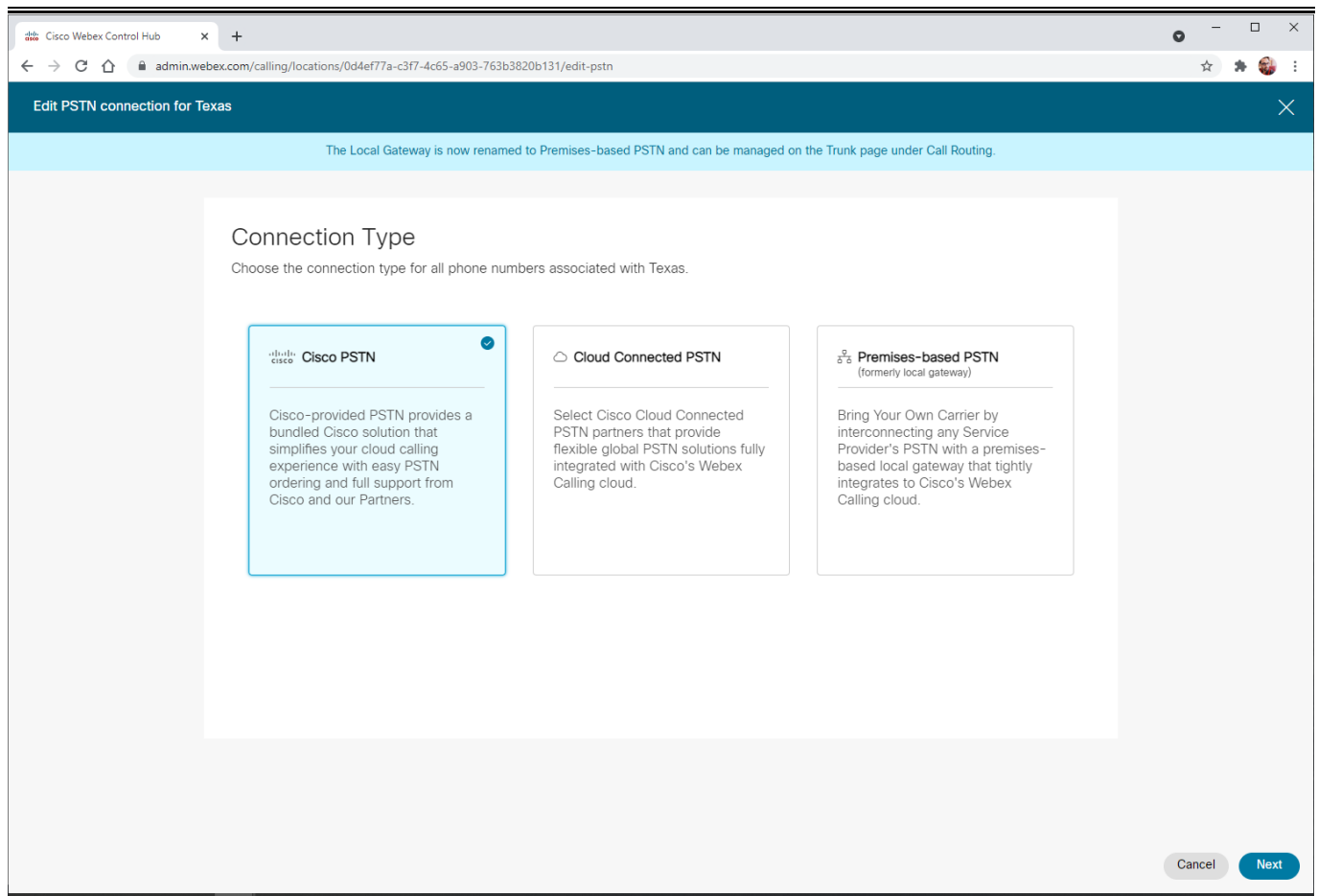
America/Los\_Angeles

Skype for Business

Cancel

Save





- You can select a PSTN option and proceed

Connecting PSTN to a Site

Cisco Webex Control Hub

admin.webex.com/calling/locations

webex Control Hub

8

A

Overview

MONITORING

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Calling

NumbersLocationsCall Routing

Search

Location

Routing

★ Site1

Site1

Location ID: fa84f9d9-0b40-4bf2-8eb5-ef10f86d68e9

Overview

PSTN Connection

Numbers

Main Number

Not Selected

You will not be able to make or receive calls until this number is added

Dialing

Internal Dialing

External Dialing

Emergency Calling

Emergency Callback Number

Location main number

Call Settings

Scheduling

Voice Portal

Unassigned

Advanced Call Settings

Phone Configurations

Configure Phone Settings

Phone Settings

Organization's Default

Cisco Webex Control Hub


admin.webex.com/calling/locations/fa84f9d9-0b40-4bf2-8eb5-ef10f86d68e9/edit-pstn

Edit PSTN connection for Site1


The Local Gateway is now renamed to Premises-based PSTN and can be managed on the Trunk page under Call Routing.

### Connection Type


Choose the connection type for all phone numbers associated with Site1.

 **Cisco PSTN**

Cisco-provided PSTN provides a bundled Cisco solution that simplifies your cloud calling experience with easy PSTN ordering and full support from Cisco and our Partners.

 **Cloud Connected PSTN**

Select Cisco Cloud Connected PSTN partners that provide flexible global PSTN solutions fully integrated with Cisco's Webex Calling cloud.

 **Premises-based PSTN**  
(formerly local gateway)

Bring Your Own Carrier by interconnecting any Service Provider's PSTN with a premises-based local gateway that tightly integrates to Cisco's Webex Calling cloud.

Cancel

Next

1085

Cisco Webex Control Hub

admin.webex.com/calling/locations/fa84f9d9-0b40-4bf2-8eb5-ef10f86d68e9/edit-pstn

Edit PSTN connection for Site1

Contract Information

Emergency disclaimer

Emergency Services Address

Done

## Contract Information

Provide information of the person who will sign the legal contract with Cisco.

Company Name

AJ Collab

First Name

Admin

Last Name

User

Email Address

admin@company.com

Confirm Email Address

admin@company.com

Back

Next

Cisco Webex Control Hub

admin.webex.com/calling/locations/fa84f9d9-0b40-4bf2-8eb5-ef10f86d68e9/edit-pstn

Edit PSTN connection for Site1

Contract Information

Emergency disclaimer

Emergency Services Address

Done

## Emergency disclaimer

Prior to initiating your services, we ask that you read and agree to the emergency calling policy below by typing your name and job title in the fields provided.

- If Your Cisco VoIP service has been terminated or suspended

If You or Your Users are not comfortable with the limitations of emergency calls made using a VoIP service, Cisco recommends that You or Your Users consider an alternate means for accessing traditional emergency calling services.

#### 4. Liability

We invite You to carefully review the limitations of liability included in Your applicable Offer Description with respect to Cisco's liability for emergency calling services.

**By filling in the below, You acknowledge that You have read and understand the above policy.**

Authorized contact ⓘ

Job title

Date

Consulting Engineer

06/14/21

ⓘ You will be able to enter your name and job title after going through the full emergency calling policy.

Back

Agree and Continue

Cisco Webex Control Hub

admin.webex.com/calling/locations/fa84f9d9-0b40-4bf2-8eb5-ef10f86d68e9/edit-pstn

Edit PSTN connection for Site1

Contract Information

Emergency disclaimer

Emergency Services Address

Done

### Emergency Services Address

In case of an emergency, the local emergency response crew will use this address to locate the caller.

Country/Region

United States of Ameri

Service address

170 W Tasman

Street address line

City/Town

San Jose

State/Province/Region

California

Zip/Postal code

95134

Back

Save



## Ordering DID Number from PSTN

Cisco Webex Control Hub

admin.webex.com/calling/locations/fa84f9d9-0b40-4bf2-8eb5-ef10f86d68e9/edit-pstn

Edit PSTN connection for Site1

Contract Information

Emergency disclaimer

Emergency Services Address

Done

✓ PSTN connection saved


Your Information

Contract Information

AJ Collab  
Admin User  
admin@pramodhk.webexsandbox.co

Emergency Services Address

170 W TASMAN DR  
SAN JOSE, CA 95134  
United States of America



Recommended

Next, search and  
select the numbers to  
add.

Add numbers

Done (add numbers later)

1089

Cisco Webex Control Hub

admin.webex.com/overview

Add Numbers

Select a Location

Select Numbers

Done

Choose a Location to Add Numbers

Location

Site1

PSTN Connection

Cisco PSTN

Order New Numbers

Add an order for new numbers directly from Cisco.

Port Numbers Over

Available with paid subscription

Transfer numbers from your current carrier to Cisco.

Cancel

Next

Cisco Webex Control Hub

admin.webex.com/overview

Add Numbers (Site1)

Select a Location

Select Numbers

Done

### Specify the numbers you want to order

What area should these numbers be from?  
We'll find you numbers in the area code or city of your choice.

**Country**  
United States of America

**State/Province/Region**  
California

**Search by**  
City

**City**  
Agoura


How many numbers do you want auto-selected for you?  
We can choose up to 10 non-consecutive numbers for you. You will be able to see and change the numbers before submitting the order.

2

Search

Selected Numbers

Clear All



**You haven't added any numbers.**  
Search and click the displayed numbers to add them here.

Total: 0/10

[I need some help](#)

Back

Order

Cisco Webex Control Hub

admin.webex.com/overview

Add Numbers (Site1)

Select a Location

Select Numbers

Done

Specify the numbers you want to order

100 numbers found in **California** with city **Agoura**.

Search again? Selected numbers will be saved in your cart.

(747) 303-0002

(747) 303-0003

(747) 303-0005

(747) 303-0007

(747) 303-0008

(747) 303-0009

(747) 303-0011

(747) 303-0012

(747) 303-0013

(747) 303-0015

(747) 303-0016

(747) 303-0018

(747) 303-0024

(747) 303-0025

(747) 303-0026

(747) 303-0030

(747) 303-0031

(747) 303-0032

(747) 303-0035

(747) 303-0036

(747) 303-0037

(747) 303-0039

(747) 303-0040

(747) 303-0041

Selected Numbers

Clear All

(747) 303-0002

x

(747) 303-0003

x

Total: 2/10

I need some help

Back


Order

Cisco Webex Control Hub

admin.webex.com/overview

### Add Numbers

Select a Location      Select Numbers      Done



✓ **Order Submitted**  
You can check your order status in [PSTN Orders](#)

Phone Numbers (2)

(747) 303-0002

(747) 303-0003

Close    View orders

- It will take some to get activated

Enabling Webex Calling powered by broadcloudpbx for Workspace

Cisco Webex Control Hub

admin.webex.com/workspaces/58ece243-8448-4a6e-8f57-af343017b5a3

webex Control Hub

8

?

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Meeting

Calling

Connected UC

Hybrid

AJ Collab

Workspaces

AJ Collab Training Room

Meeting Room

Capacity: 10 people

No occupancy data available

Edit

Delete

Devices

Cisco Webex DX70

Online Yesterday at 10:51 PM

Software Upgrade Channel

Stable (Default)

Lock Settings on Touch Devices

Off

Edit API Access

Calling

Call on Webex (1:1 call, non-PSTN)

Cisco Webex SIP Address  
aj\_collab\_training\_room@ajcollab.rooms.webex.com

Calendar

Not configured

+ Add Calendar

Notes

No notes

Add Notes

Real-Time Utilization Metrics

Real-time utilization metrics are disabled for your organization. Go to the Workspace Metrics section of the Device Settings to enable.

Real-Time Environmental Metrics

Beta

Real-time environmental metrics are disabled for your organization. Go to the Workspace Metrics section of the Device Settings to enable.

Location

There is no location specified for this workspace.

Assign Location

Cisco Webex Control Hub

admin.webex.com/workspaces/58ece243-8448-4a6e-8f57-af343017b5a3

## webex Control Hub

### Edit Calling Service

Calling

☐ Call on Webex (1:1 call, non-PSTN) (default)

☒ Cisco Webex Calling

Free Calling features with additional PSTN service provided through Webex.

Cancel Next

+ Add Calendar

Notes

No notes

+ Add Notes

AJ Collab

Cisco Webex Control Hub

admin.webex.com/workspaces/58ece243-8448-4a6e-8f57-af343017b5a3

webex Control Hub

MONITOR

MANAGE

SERVICES

Hybrid

NOT CONFIGURED

+ Add Calendar

Notes

No notes

Add Notes

AJ Collab

Edit Calling Service

Assign numbers

Choose from the available phone numbers and extensions in the drop-down lists. These will become the primary line which you can use to reach this place.

Reset

User	Location	Phone Number	Extension	Calling Plan
AJ Collab Training Room	Site1	+17473030002		<input checked="" type="checkbox"/>

Assigning only PSTN DID Number

BackSave



Cisco Webex Control Hub

admin.webex.com/workspaces/58ece243-8448-4a6e-8f57-af343017b5a3

webex Control Hub

MONITOR

MANAGE

SERVICES

Hybrid

Not configured

+ Add Calendar

Notes

No notes

Add Notes

AJ Collab

Edit Calling Service

Assign numbers

Choose from the available phone numbers and extensions in the drop-down lists. These will become the primary line which you can use to reach this place.

Reset

User	Location	Phone Number	Extension	Calling Plan
AJ Collab Training Room	Site1	None	51001	<input checked="" type="checkbox"/>

Assigning internal only Extension

BackSave

Cisco Webex Control Hub

admin.webex.com/workspaces/58ece243-8448-4a6e-8f57-af343017b5a3

webex Control Hub

MONITOR

MANAGE

SERVICES

Hybrid

Not configured

+ Add Calendar

Notes

No notes

Add Notes

Assign numbers

Choose from the available phone numbers and extensions in the drop-down lists. These will become the primary line which you can use to reach this place.

Reset

User	Location	Phone Number	Extension	Calling Plan
AJ Collab Training Room	Site1	+17473030002	51001	<input checked="" type="checkbox"/>

Assigning PSTN DID Number and Internal Extension

BackSave

## Enabling Webex Calling powered by broadcloudpbx for User

The screenshot displays the Cisco Webex Control Hub administration interface. The left sidebar contains navigation menus for Overview, Monitoring (Organization Health, Analytics, Troubleshooting, Reports), Management (Users, Workspaces, Devices, Apps, Account, Organization Settings), and Services (Updates, Messaging, Meeting, Calling, Connected UC, Hybrid). The 'Users' menu item is highlighted with a red arrow. The main content area is divided into three sections. The top section, titled 'Users', contains a search bar and a table of users. The first user, 'admin', is highlighted with a blue row, and a red arrow points to their profile icon. The middle section shows the user's details for 'Abdul Jaseem' (ajlabs110@gmail.com). The bottom section displays the user's configuration, including services (Messaging, Meeting, Calling), hybrid services (Calendar Service, Message Service), roles and security (Administrator Roles, Security), and devices (Add Device button, Device Settings, Software Upgrade Channel, Lock Settings on Touch Devices). A red arrow points to the 'Edit Licenses' link in the 'Services' section.

**Users**

First Name	Last Name
admin	a

**User**

Abdul Jaseem  
ajlabs110@gmail.com

**Services** [Edit Licenses](#)

- Messaging: Basic Messaging
- Meeting: Basic Space Meetings
- Calling: Call on Webex (1:1 call, non-PSTN) >

**Hybrid Services**

- Calendar Service: Off >
- Message Service: Off >

**Roles and Security**

- Administrator Roles >
- Security >

**Devices**

[Add Device](#)

**Device Settings**

Software Upgrade Channel: Default (Stable) v

Lock Settings on Touch Devices: ☐

Cisco Webex Control Hub

admin.webex.com/users

webex Control Hub

Overview

MONITORING

Organization Health

Analytics

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MANAGEMENT

Users

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Organization Settings

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Messaging

Meeting

Calling

Connected UC

Hybrid

AJ Collab

Groups

Licenses

Manage Users

Actions

Services enabled for Abdul Jaseem

Messaging

Meeting

Calling

Free Public Collaboration Services

☒ Basic Messaging

☒ Basic Space Meetings

Call on Webex (1:1 call, non-PSTN)

Licensed Collaboration Services

Messaging

☐ Advanced Messaging

Meetings

☐ Advanced Space Meetings

☐ Webex Assistant for Meetings

☐ Webex Meetings Suite

[pramodhk-gaxb8-sandbox.webex.com](#)

Calling

☒ Webex Calling

☒ Enterprise

☐ Basic

Back

Next

1100

Cisco Webex Control Hub

admin.webex.com/users

webex Control Hub

MONITOR

MANAGE

SERVICES

Hybrid

AJ Collab

Assign Numbers

User	Location	Phone Number	Extension	Calling Plan
Abdul Jaseem ajlabs110@gmail.com	Site1	+17473030003	51002	<input checked="" type="checkbox"/>

Back

Finish

---

## **Webex Edge Solution**

- Webex Edge Audio: Integrate on-premise CUCM and local PSTN via voice gateways in CUCM
- Webex Edge Connect: Dedicated managed QoS Enabled IP Link from on-premise to Cisco Webex Cloud through direct peering partner
- Webex Edge Video Mesh: Local instance media processing using on-premise resources

## Webex UCM Calling (From Corporate Local Network)

- Make Webex Team to a kind of hybrid endpoint. Some services will be served by cloud (Chat, File Sharing, etc.) and some Calling Services offered by on-premises CUCM
- The requirement of CUCM ins not going to fade away as it is a powerful call control server
- It is just like how Jabber Client gets the Phone Services via CSF
- DNS SRV for **\_cisco-uds** must be configured just like we did for Jabber on premise SRV

The screenshot shows the DNS Manager application window. The left pane displays the DNS hierarchy for WIN-SERVER-01, with the Forward Lookup Zones expanded to show the \_cisco-uds record under the \_tcp subzone of the ajcollab.com domain. The main pane displays a table of SRV records for the \_cisco-uds service.

Name	Type	Data	Timestamp
_cisco-uds	Service Location (SRV)	[3][30][8443] cucm-sub02.ajcollab.com.	static
_cisco-uds	Service Location (SRV)	[1][10][8443] cucm-pub.ajcollab.com.	static
_cisco-uds	Service Location (SRV)	[2][20][8443] cucm-sub01.ajcollab.com.	static
_gc	Service Location (SRV)	[0][100][3268] win-server-01.ajcollab.com.	4/11/2021 12:00:00 PM
_kerberos	Service Location (SRV)	[0][100][88] win-server-01.ajcollab.com.	4/11/2021 12:00:00 PM
_kpasswd	Service Location (SRV)	[0][100][464] win-server-01.ajcollab.com.	4/11/2021 12:00:00 PM
_ldap	Service Location (SRV)	[0][100][389] win-server-01.ajcollab.com.	4/11/2021 12:00:00 PM

The \_cisco-uds Properties dialog box is open, showing the Service Location (SRV) tab. The Domain is set to ajcollab.com. The Service is set to \_cisco-uds, the Protocol is set to \_tcp, the Priority is 1, the Weight is 10, and the Port number is 8443. The Host offering this service is set to cucm-pub.ajcollab.com.

- Enabling UCM Call for individual User

The screenshot displays the Cisco Webex Control Hub interface. The left sidebar contains navigation menus for Overview, Monitoring, Management, and Services. The 'Users' section is selected under Management. The main content area shows a list of users with columns for First Name and Last Name. The user 'Hrithik Roshan' is highlighted. A red arrow points to the 'Calling' service in the 'Services' section of the user's profile. Another red arrow points to the 'Calling' service in the 'Services' list. The 'Calling' service is currently disabled, indicated by a red arrow pointing to the 'Off' status.

First Name	Last Name
admin	admin
Hrithik	Roshan
Jennifer	Garner
webex	admin

**Services**

- Messaging
- Meeting
- Calling

**Hybrid Services**

- Calendar Service: Off
- Message Service: Off

**Roles and Security**

- Administrator Roles
- Security

**Devices**

**Device Settings**

- Software Upgrade Channel: Default (Stable)
- Lock Settings on Touch Devices: Off

**User Details**

- Name Labels: Not Enrolled



Cisco Webex Control Hub

https://admin.webex.com/users90%

Cisco Webex Control Hub

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Organization Health

Analytics

Troubleshooting

MANAGEMENT

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Devices

Apps

Account

Organization Settings

SERVICES

Messaging

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Calling

Hybrid

AJCOLLAB

Users

All

	First Name	Last Name
	admin	admin
	Hrithik	Roshan
	Jennifer	Garner
	webex	admin

Hrithik Roshan  
hrithik.roshan@ajcollab.com

User > Call

Cisco Webex SIP Address

License & Calling Behavior

Cisco Webex Free Calling

Primary Work Number

11003

1105

Cisco Webex Control Hub

←

→

↺

🏠

🔒

🌐

🔗

https://admin.webex.com/users

90%

⋮

🔒

☆

📄

📅

👤

☰

Cisco Webex Control Hub

🔔

?

💬

A

🏠 Overview

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📊 Organization Health

📈 Analytics

🔧 Troubleshooting

MANAGEMENT

👤 Users

📍 Workspaces

📱 Devices

📦 Apps

📄 Account

⚙️ Organization Settings

SERVICES

💬 Messaging

📅 Meeting

📞 Calling

🌐 Hybrid

📄

AJCOLLAB

https://admin.webex.com

Users

🔍

All

	First Name	Last Name
👤	admin	admin
👤	Hrithik	Roshan
👤	Jennifer	Garner
👤	webex	admin

👤 Hrithik Roshan

hrithik.roshan@ajcollab.com

✕

📞 Calling

Hybrid Services

📅 Calendar Service

Off

➤

💬 Message Service

Off

➤

Roles and Security

👤 Administrator Roles

➤

🔒 Security

➤

Devices

Device Settings

Software Upgrade Channel

Default (Stable)

▼

Lock Settings on Touch Devices

🔔

🔘

User Details

Name Labels

Not Enrolled

➤

Last Email Status

None

Settings

Calling Behavior

➤

Cisco Webex Control Hub

https://admin.webex.com/users

90%

...

🔒

🌟

🔍

📄

👤

☰

Cisco Webex Control Hub

🔔

?

💬

A

🏠 Overview

MONITORING

📊 Organization Health

📈 Analytics

🔧 Troubleshooting

MANAGEMENT

**👤 Users**

📍 Workspaces

📱 Devices

📦 Apps

📁 Account

⚙️ Organization Settings

SERVICES

💬 Messaging

📅 Meeting

📞 Calling

🔄 Hybrid

📄 AJCOLLAB

https://admin.webex.com

Users

🔍 All

	First Name	Last Name
👤	admin	admin
👤	Hrithik	Roshan
👤	Jennifer	Garner
👤	webex	admin

👤 Hrithik Roshan

hrithik.roshan@ajcollab.com

Cancel Save

Calling Behavior

Choose how this user makes calls in Webex.

☐ Organization Setting: Calling in Webex

Use the setting you've specified at the organization level.

☐ Calling in Webex

Make calls directly in Webex, backed by Webex Calling or Hybrid Calling.

☒ Calling in Webex (Unified CM)

Make calls in Webex registered to Unified CM for midcall features.

You are defaulted to your organization's domain.

☐ Webex Calling app

Make calls in the Webex Calling app or through a cross-launch from Webex app.

☐ Cisco Jabber app

Make calls in Cisco Jabber or through a cross-launch from Webex app.

☐ Third-Party app

Make calls in a third-party calling app or through a cross-launch from Webex app.

- Alternatively, you can enable UCM Calling at the Org level

The screenshot shows the Cisco Webex Control Hub Administration interface. The left sidebar contains a navigation menu with sections: Overview, MONITORING (Organization Health, Analytics, Troubleshooting), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The 'Organization Settings' item is highlighted with a red arrow. The main content area is titled 'Organization Settings' and contains two sections: 'Cisco Webex Calling' and 'Calling Behavior'. The 'Cisco Webex Calling' section has a text box for 'Enter Subdomain' with a red border, a green 'Check Availability' button, and a grey 'Cancel' button. The 'Calling Behavior' section has a title and a description: 'Choose how Webex handles calls when a user places a call from Webex directly.' Below this are five radio button options: 'Calling in Webex', 'Calling in Webex (Unified CM)', 'Webex Calling app', 'Cisco Jabber app', and 'Third-Party app'. The 'Calling in Webex (Unified CM)' option is selected and highlighted with a red box. The bottom of the page shows 'UC Manager Profiles'.

Cisco Webex Control Hub

Organization Settings

Cisco Webex Calling

Select a subdomain that identifies your company. The subdomain will be used to create [Webex SIP Addresses](#). SIP addresses can be changed later directly in Cisco Webex Control Hub

Enter Subdomain

Check Availability Cancel

Calling Behavior

Calling Behavior

Choose how Webex handles calls when a user places a call from Webex directly.

☐ Calling in Webex

Make calls directly in Webex, backed by Webex Calling or Hybrid Calling.

☒ Calling in Webex (Unified CM)

Make calls in Webex registered to Unified CM for midcall features.

You are defaulted to your organization's domain.

☐ Webex Calling app

Make calls in the Webex Calling app or through a cross-launch from Webex app.

☐ Cisco Jabber app

Make calls in Cisco Jabber or through a cross-launch from Webex app.

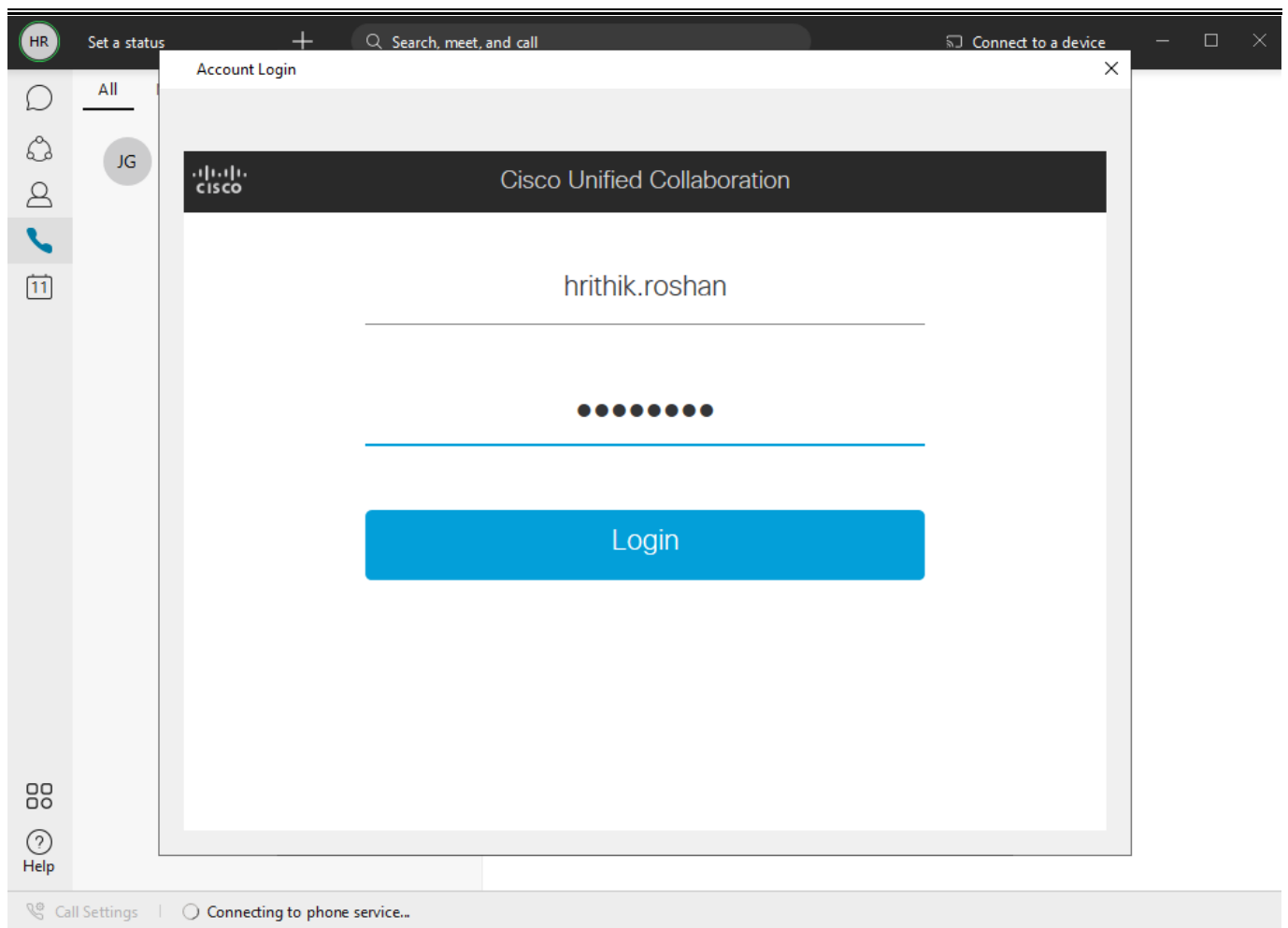
☐ Third-Party app

Make calls in a third-party calling app or through a cross-launch from Webex app.

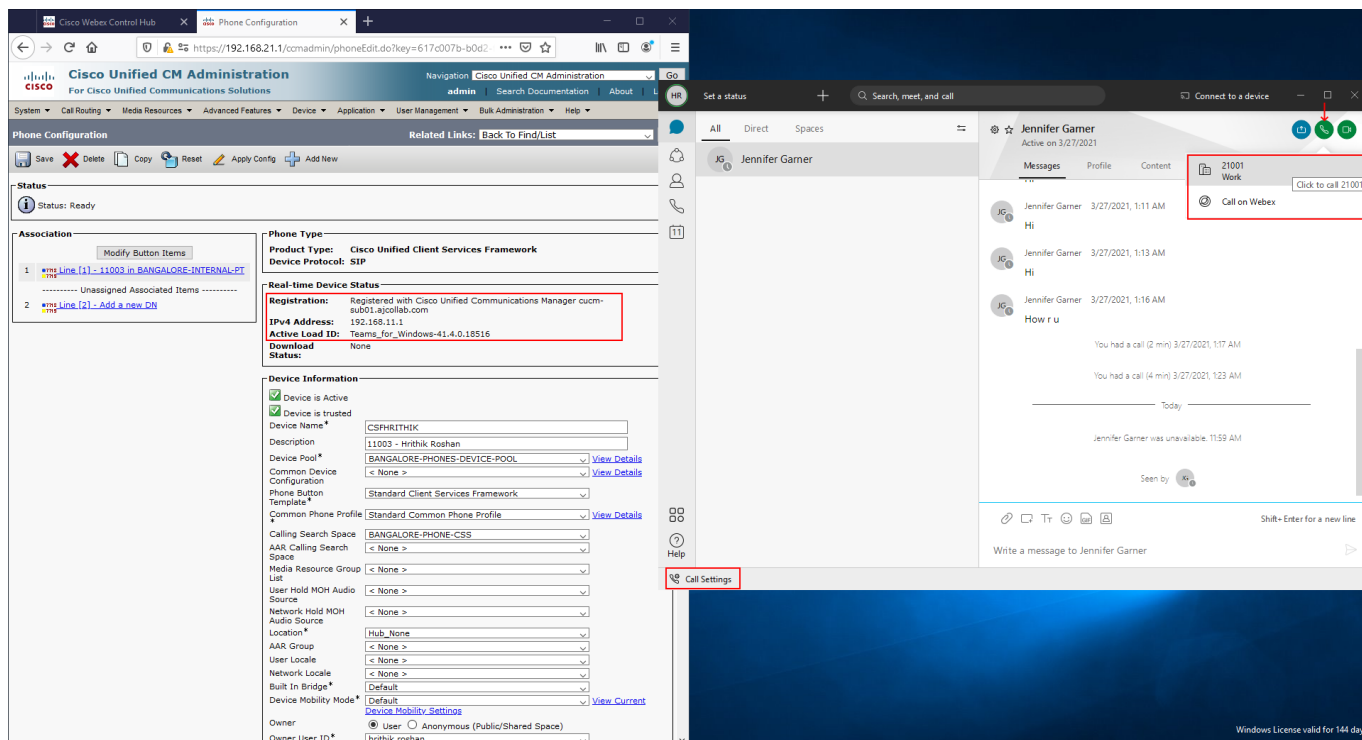
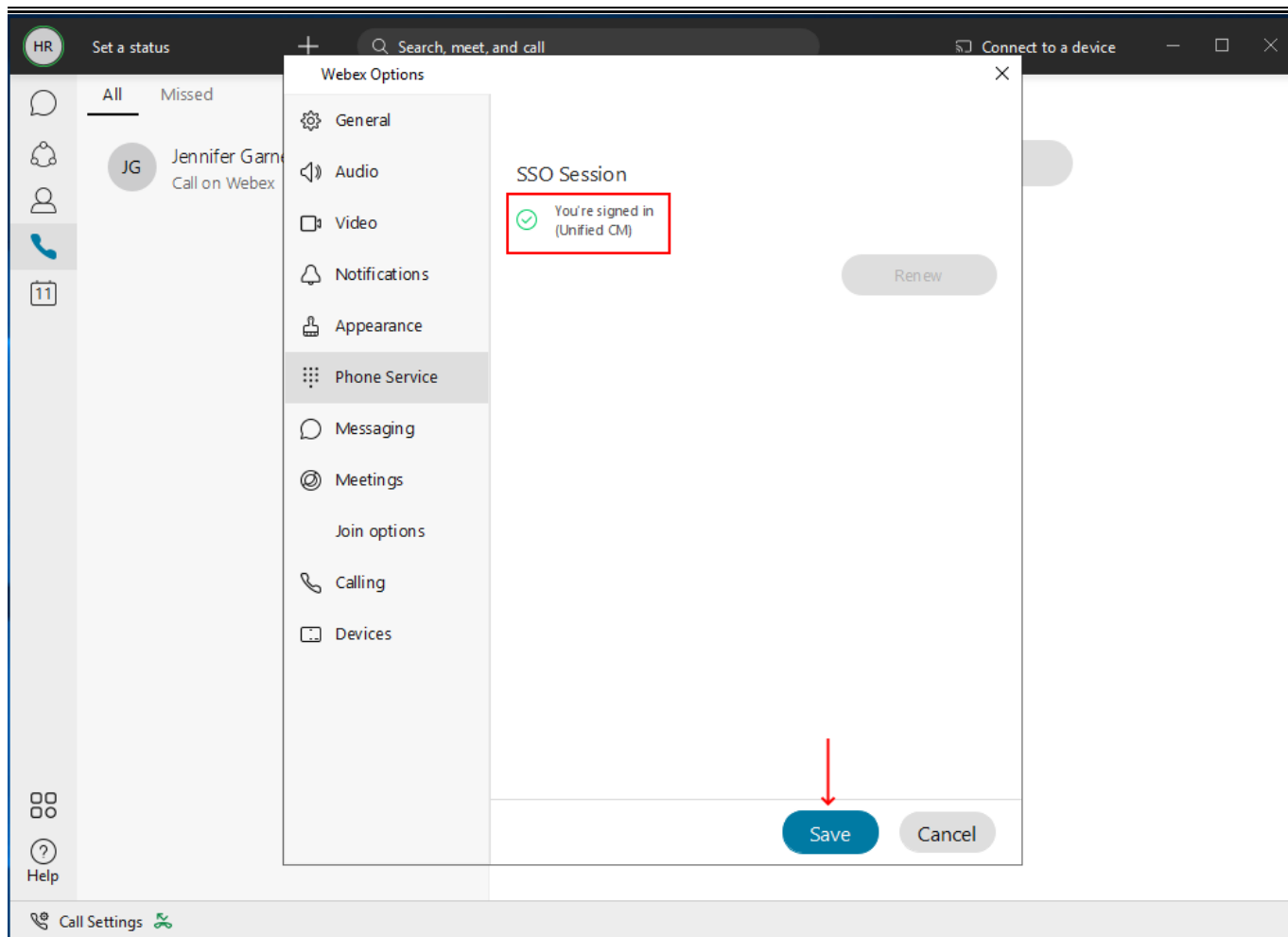
UC Manager Profiles UC Manager Profiles

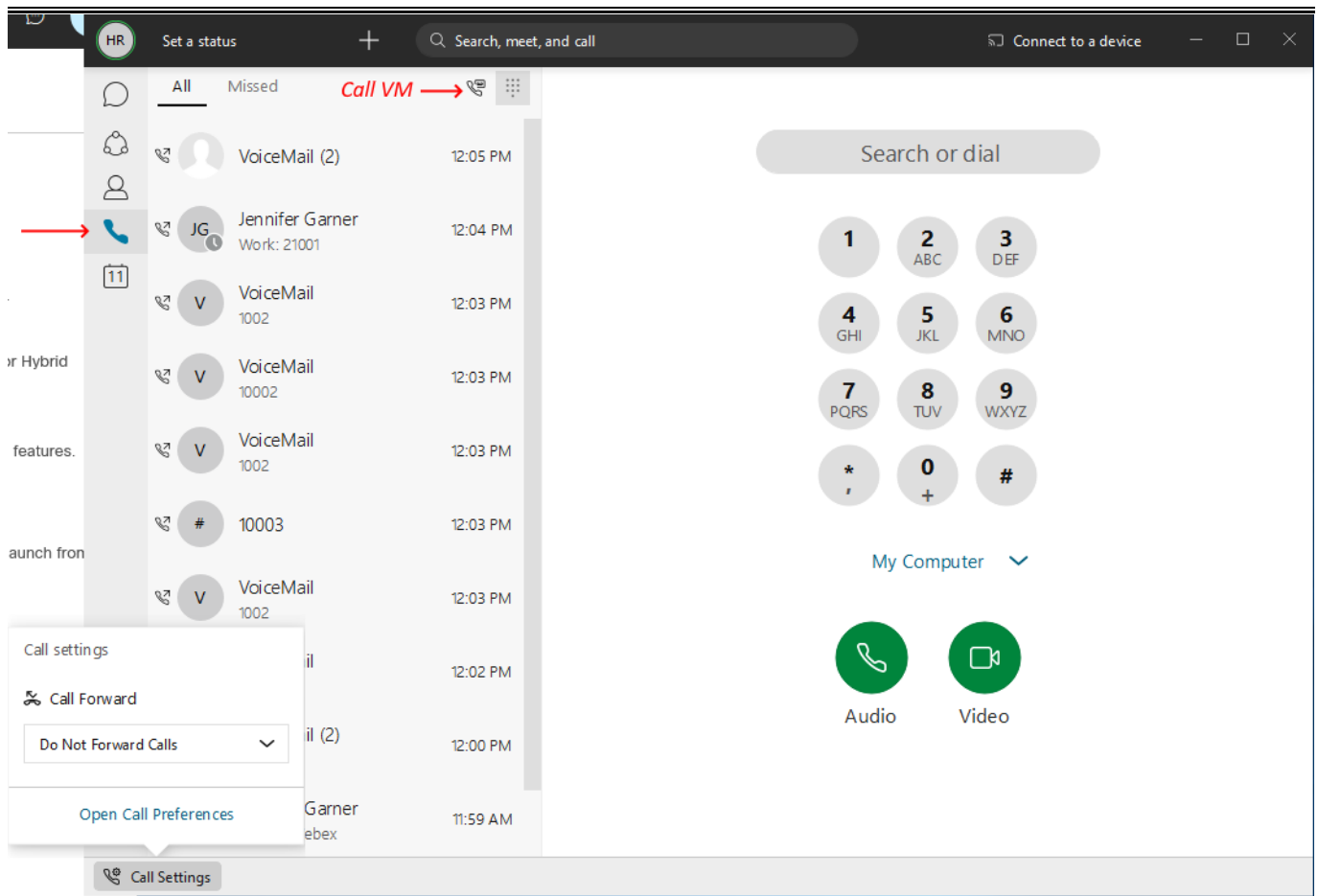
Cisco Webex Control Hub
Phone Configuration
Cisco Unified CM Administration
Navigation
Cisco Unified CM Administration
Go
admin
Search Documentation
About
Logout
System
Call Routing
Media Resources
Advanced Features
Device
Application
User Management
Bulk Administration
Help
Phone Configuration
Related Links: Back To Find/List
Go
Save
Delete
Copy
Reset
Apply Config
Add New
Status
Status: Ready
Association
Modify Button Items
1
Line [1] - 11003 in BANGALORE-INTERNAL-PT
2
Line [2] - Add a new DN
Unassigned Associated Items
Phone Type
Product Type: Cisco Unified Client Services Framework
Device Protocol: SIP
Real-time Device Status
Registration: Unknown
IPv4 Address: None
Device Information
Device is Active
Device is trusted
Device Name: CSFHRITHIK
Description: 11003 - Hrithik Roshan
Device Pool: BANGALORE-PHONES-DEVICE-POOL
Common Device Configuration: Standard Client Services Framework
Common Phone Profile: Standard Common Phone Profile
Calling Search Space: BANGALORE-PHONE-CSS
AAR Calling Search Space: < None >
Media Resource Group: < None >
List: < None >
User Hold MOH Audio Source: < None >
Network Hold MOH Audio Source: < None >
Location: Hub\_None
AAR Group: < None >
User Locale: < None >
Network Locale: < None >
Built In Bridge: Default
Device Mobility Mode: Default
Owner: User
Owner User ID: hrithik\_roshan
Mobility User ID: < None >
Primary Phone: CUCM-JASCEM2
Use Trusted Relay: Default
End User Configuration
Related Links: Back To Find List Users
Go
Save
Delete
Add New
User Information
User Status: Active Enabled LDAP Synchronized User
User ID: hrithik\_roshan
Self-Service User ID: 11003
PIN:
Confirm PIN:
Last name: Roshan
Middle name:
First name: Hrithik
Display name: Hrithik Roshan
Title:
Directory URI: hrithik\_roshan@ajcollab.com
Telephone Number: 11003
Home Number:
Mobile Number:
Pager Number:
Mail ID: hrithik\_roshan@ajcollab.com
Manager User ID:
Department:
User Locale: < None >
Associated PC/Site Code:
Digest Credentials:
Confirm Digest Credentials:
User Profile: Use System Default (Standard (factory default) UC
User Rank: 1-Default User Rank
Convert User Account
Convert LDAP Synchronized User to Local User
Service Settings
Home Cluster
Enable User for Unified CM IM and Presence (Configure IM and Presence in the associated UC Service Profile)
Include meeting information in presence (Requires Exchange Presence Gateway to be configured on CUCM IM and Presence server)
Presence Viewer for User
UC Service Profile: JABBER-SERVICE-PROFILE
Device Information
Controlled Devices: CSFHRITHIK SEPAAAAAAAAA2
Device Association
Line Appearance Association for Presence

HR
Set a status
+
Search, meet, and call
Connect to a device
All
Missed
JG Jennifer Garner
Call on Webex
Webex Options
General
Audio
Video
Notifications
Appearance
Phone Service
Messaging
Meetings
Join options
Calling
Devices
SSO Session
Sign in to use phone service (Unified CM)
Renew
Save
Cancel
Call Settings
Sign in to your phone services
Click Here or Go to Settings >> Phone Services

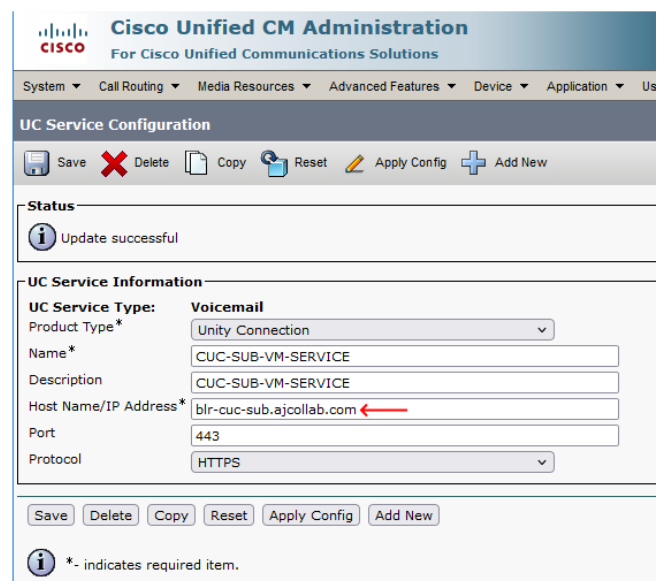
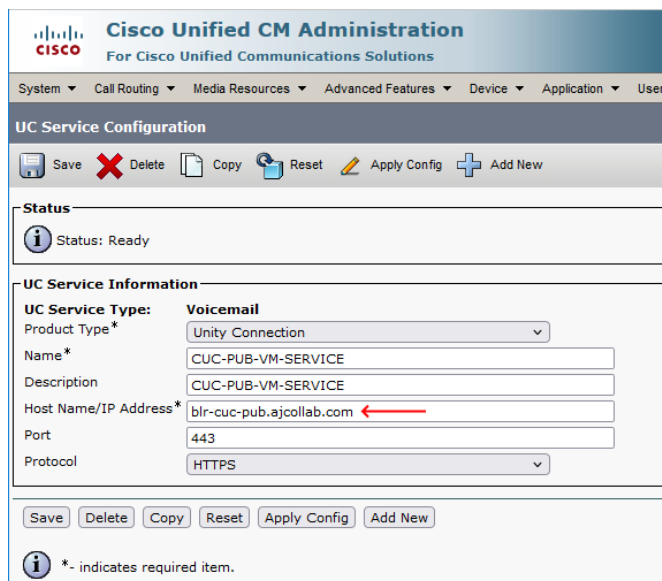


- If you have enabled SSO in Webex and CUCM, the Phone Service Login not required









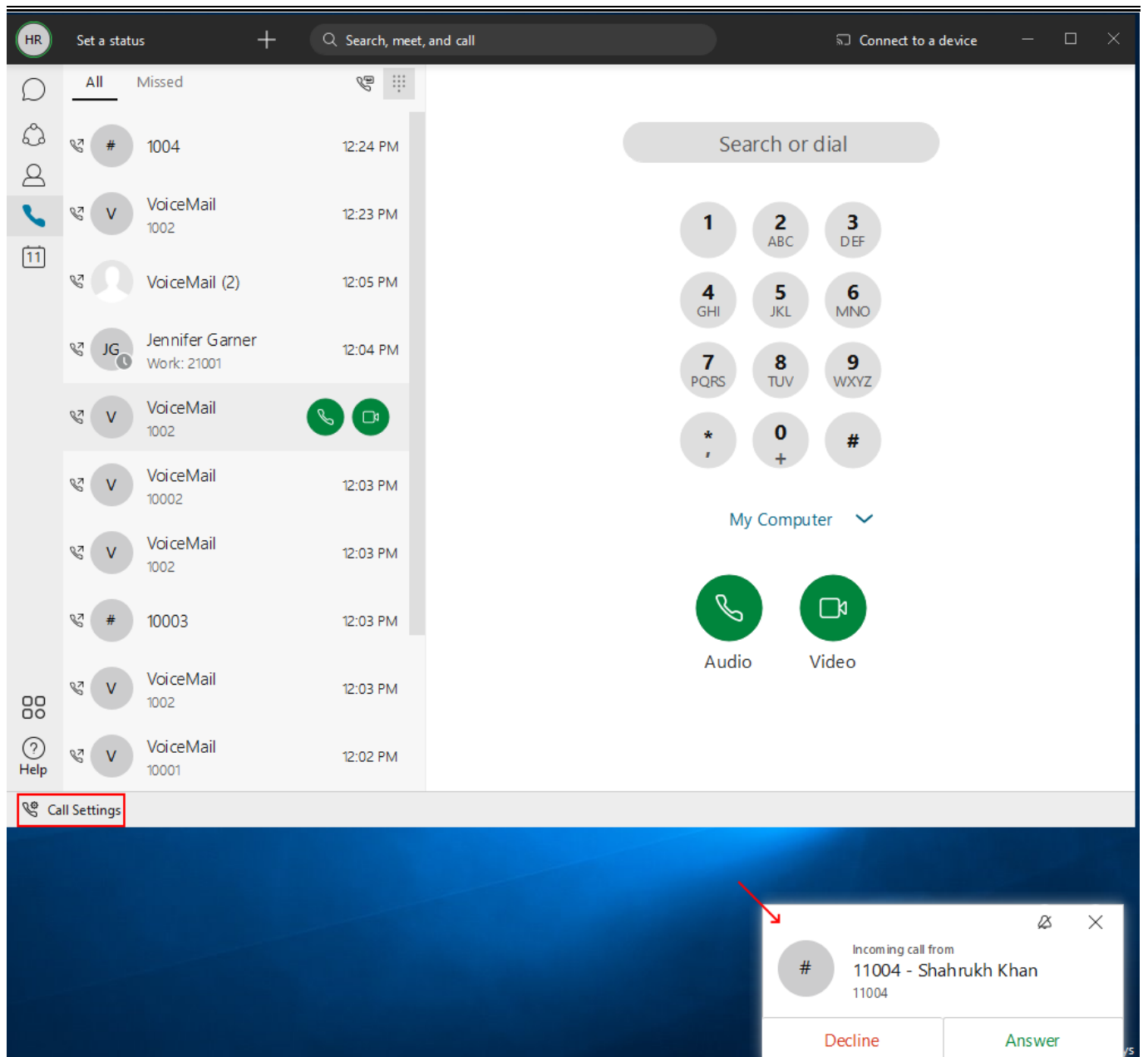


Note: To get the CUC synced, make sure the UC Service is configured with FQDN. Also, CUC Certificates has to be signed by CA and it should be trusted by the client computer. Teams client never ask for certificate expectation warning.





<div>             Cloud         </div> <div>Refresh</div>	<div>             Operational         </div>	<div>           Information taken from  <a href="https://status.webex.com">status.webex.com</a> </div>
<div>             Phone services         </div> <div>Test</div>	<div>             Softphone connected         </div>	<div> <div>  Desk phone server           </div> <div>             Status: Disconnected              Server: 192.168.121.2              Protocol: CTI           </div> <div>  Voicemail server           </div> <div>             Status: Disconnected              Server: 192.168.121.4              Port: 443              Protocol: VMREST(HTTPS)              Error: Http operation error(6):              Validation of the HTTPS certificate           </div> </div>



## UC Manager Profile

- If your default Webex domain is not the CUCM Domain, then the service discovery fails. For example, if you enabled Webex teams with your personal mail ID (Gmail.com) then the service discovery happens for Gmail.com and you don't get anything for \_cisco-uds from Gmail.com
- To overcome this issue, you can configure UC Manager Profile and hardcode the CUCM UDS Server details there along with CUCM voice domain

The screenshot displays the Cisco Webex Control Hub Administration Console. The browser address bar shows `https://admin.webex.com/settings`. The left sidebar contains a navigation menu with sections: Overview, MONITORING (Organization Health, Analytics, Troubleshooting), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The 'Organization Settings' option is highlighted with a red arrow. The main content area is titled 'Organization Settings' and includes a sub-section 'UC Manager Profiles'. This section contains a text block explaining that the profile defaults to the organization's domain and can be used for Jabber or Webex Teams (UCM) deployment. A blue 'Add Profile' button is present, with a red arrow pointing to it. Below this, the 'Directory Synchronization' section shows 'ajcollab.com' with a status of 'Operational' and a 'WIN-SERVER-01' entry. The 'User Security' section has a toggle for 'Force authentication when users change passwords' which is currently turned off. At the bottom, the 'People Insights' section is partially visible.

Cisco Webex Control Hub

Organization Settings

UC Manager Profiles

Your UC Manager Profile will default to your organization's domain. You can add UC manager Profiles for "Jabber in Team Messaging" or "Calling in Webex Teams (UCM)" deployment.

Add Profile

Directory Synchronization

New users will be automatically added from your directory when it synchronizes. Updates can be made directly in Cisco Directory Connector.

ajcollab.com

WIN-SERVER-01

Operational

User Security

When enabled, users who change their passwords will have to sign in to Webex again after the new passwords are detected by Directory Connector.

Force authentication when users change passwords

People Insights

When enabled users see comprehensive, real-time business and professional profiles.

Note: Allow 48 hours for changes to People Insights to show in their Webex profiles

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Cisco Webex Control Hub

https://admin.webex.com/settings

### UC Manager Profile

Enter a Voice Services Domain if you have SRV records but the login email domain is not used for service discovery. It's required for Mobile Remote Access (MRA), as well. You can also enter a UDS server if the Webex account user ID does not match the Unified CM user ID or Intercluster Lookup Service (ILS) is not enabled in a multiple Unified CM cluster deployment. With both values entered, Webex app uses UDS first for the premises and Voice Services for MRA.

**Profile Name**

AJCOLLAB-UCM

☒ Voice Services Domain

**Domain Name**

ajcollab.com

☒ UDS Server

**UDS Server Address**

192.168.11.1

**UDS Backup Server Address**

192.168.11.2

☒ Allow users to edit server address  
This option is only supported for Jabber.

Cancel Save

Troubleshoot Cisco Directory Connector

### People Insights

When enabled users see comprehensive, real-time business and professional profiles.

Note: Allow 48 hours for changes to People Insights to show in their Webex profiles

AJCOLLAB

Cisco Webex Control Hub

https://admin.webex.com/users

90%

Cisco Webex Control Hub

Overview

MONITORING

Organization Health

Analytics

Troubleshooting

MANAGEMENT

Users

Workspaces

Devices

Apps

Account

Organization Settings

SERVICES

Messaging

Meeting

Calling

Hybrid

AJCOLLAB

https://admin.webex.com

Users

All

	First Name	Last Name
<div></div>	admin	admin
<div></div>	Hrithik	Roshan
<div></div>	Jennifer	Garner
<div></div>	webex	admin

Hrithik Roshan

hrithik.roshan@ajcollab.com

Cancel

Save

Calling Behavior

Choose how this user makes calls in Webex.

Organization Setting: Calling in Webex (Unified CM)

Use the setting you've specified at the organization level.

Use my organization's domain

Calling in Webex

Make calls directly in Webex, backed by Webex Calling or Hybrid Calling.

Calling in Webex (Unified CM)

Make calls in Webex registered to Unified CM for midcall features.

Use my organization's domain

Use a UC Manager Profile for Calling

AJCOLLAB-UCM

Webex Calling app

Make calls in the Webex Calling app or through a cross-launch from Webex app.

Cisco Jabber app

Make calls in Cisco Jabber or through a cross-launch from Webex app.

Third-Party app

Make calls in a third-party calling app or through a cross-launch from Webex app.

1117

Cisco Webex Control Hub

https://admin.webex.com/settings

Cisco Webex Control Hub

7

?

A

Overview

MONITORING

Organization Health

Analytics

Troubleshooting

MANAGEMENT

Users

Workspaces

Devices

Apps

Account

Organization Settings

SERVICES

Messaging

Meeting

Calling

Hybrid

Organization Settings

Check Availability

Cancel

Calling Behavior

Calling Behavior

Choose how Webex handles calls when a user places a call from Webex directly.

☐ Calling in Webex

Make calls directly in Webex, backed by Webex Calling or Hybrid Calling.

☒ Calling in Webex (Unified CM)

Make calls in Webex registered to Unified CM for midcall features.

☐ Use my organization's domain

☒ Use a UC Manager Profile for Calling

AJCOLLAB-UCM

☐ Webex Calling app

Make calls in the Webex Calling app or through a cross-launch from Webex app.

☐ Cisco Jabber app

Make calls in Cisco Jabber or through a cross-launch from Webex app.

☐ Third-Party app

Make calls in a third-party calling app or through a cross-launch from Webex app.

UC Manager Profiles

UC Manager Profiles

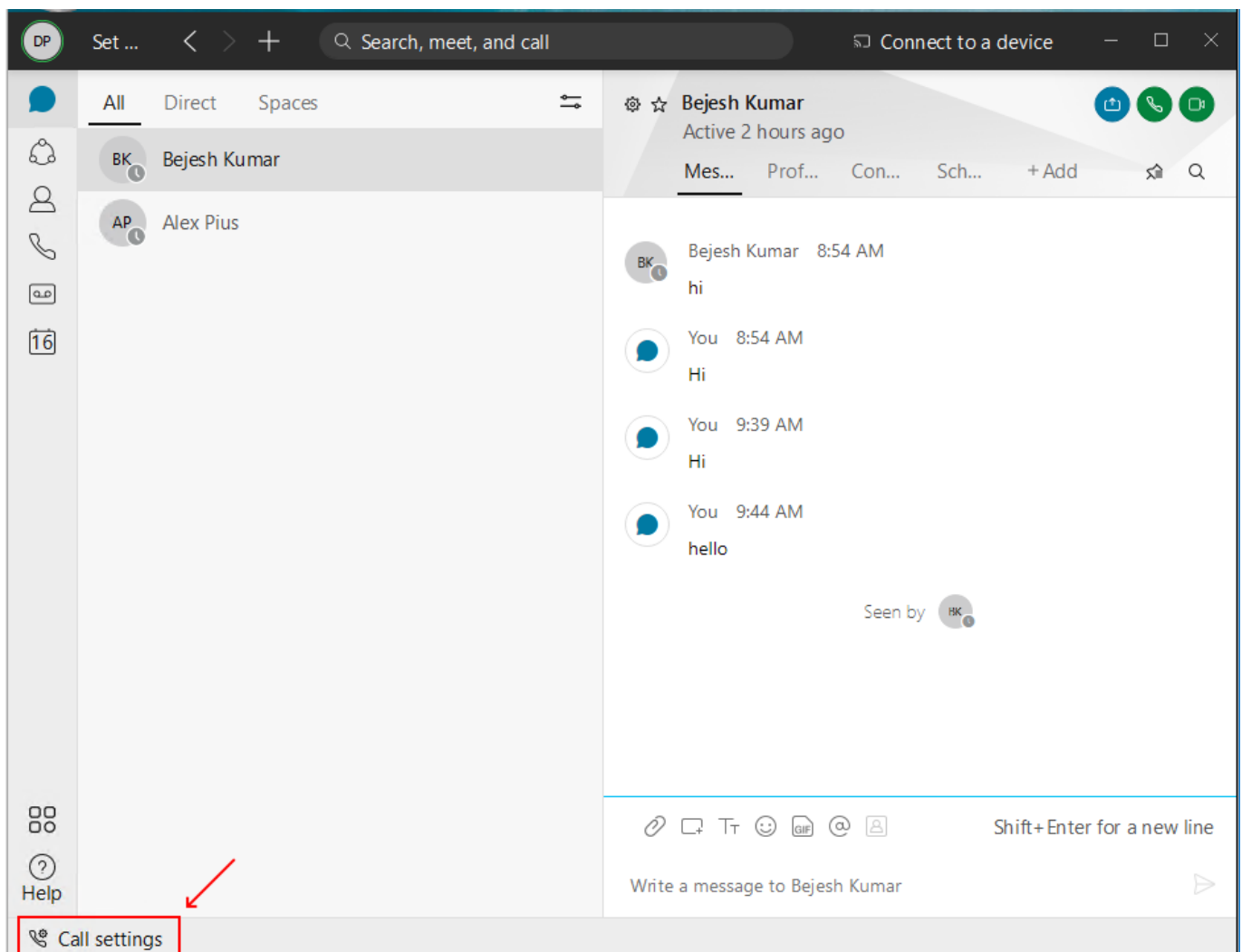
Your UC Manager Profile will default to your organization's domain. You can add UC manager Profiles for ".jabber


AJCOLLAB-UCM

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## Webex UCM Calling with Expressway (MRA Solution)

- Make sure you have the complete MRA configured as discussed in the Jabber RMA section
- Here the Teams CSF registers to CUCM just like Jabber CSF
- If you Jabber MRA configuration is correct, then there won't be any issues in Teams UCM Calling via MRA
- Make sure your Expressway E is signed by public CA (If you are in lab environment, Expressway E might be signed by Enterprise CA, so the Enterprise Root CA Certificate must be installed on the client OS where the Webex Teams software installed)




**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation Cisco Unified CM Administration



admin | Search Documentation | About | Log out

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

**Phone Configuration**
Related Links: Back To Find/List

Save Delete Copy Reset Apply Config Add New

**Status**  
*Status: Ready*

**Association**  
Modify Button Items  
1  **Line [1] - 11001 in BANGALORE-INTERNAL-PT**  
----- Unassigned Associated Items -----  
2  **Line [2] - Add a new DN**

**Phone Type**  
**Product Type:** Cisco Unified Client Services Framework  
**Device Protocol:** SIP

**Real-time Device Status**  
**Registration:** Registered with Cisco Unified Communications Manager blr-cucm-sub01.ajcollab.com  
**IPv4 Address:** 192.168.121.14 *Expressway-C IP Address*  
**Active Load ID:** Webex\_for\_Windows-41.6.0.19119  
**Download Status:** None

**Device Information**  
☒ Device is Active  
☒ Device is trusted  
Device Name\* CSFDPADUKONE  
Description 11001 - Deepika Padukone  
Device Pool\* BANGALORE-PHONES-DP [View Details](#)  
Common Device Configuration < None > [View Details](#)  
Phone Button Template\* Standard Client Services Framework  
Common Phone Profile\* Standard Common Phone Profile [View Details](#)  
Calling Search Space BANGALORE-PHONE-CSS  
AAR Calling Search Space < None >  
Media Resource Group List < None >  
User Hold MOH Audio Source < None >  
Network Hold MOH Audio Source < None >  
Location\* Hub\_None  
AAR Group < None >  
User Locale < None >  
Network Locale < None >  
Built In Bridge\* Default  
Device Mobility Mode\* Default [View Current Device Mobility Settings](#)



## Classic Webex Meeting Site Administration

- When the Webex was initially launched, the meeting accounts are managed via Webex Site Admin page
- The same can be now done from Control Hub

The screenshot displays the Cisco Webex Control Hub interface. The browser address bar shows the URL `https://admin.webex.com/meeting/sites`. The left sidebar contains a navigation menu with sections: Overview, MONITORING (Organization Health, Analytics, Troubleshooting), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The 'Meeting' option under SERVICES is highlighted with a red arrow. The main content area is titled 'Meeting' and shows a table with two columns: 'Site Name' and 'Subscription ...'. The first row is highlighted in blue and contains the values 'abvp-gax1e-sandb...' and 'trialSub.62559...'. A red arrow points to the 'Site Name' column header. To the right of the table, the site details for 'abvp-gax1e-sandbox.webex.com' are displayed. The details include: Site Information (Site Name, Subscription ID, User Management, Site Link Status, Audio Type), Version Information (Current Channel, Current Version, Expire Date), Licenses and Users (Users), and Site Usage Reports (View Reports). A 'Configure Site' button is located at the bottom of the details panel, highlighted with a red arrow.

Cisco Webex Control Hub

Log in - VMware ESXi

https://admin.webex.com/meeting/sites

90%

abvp-gax1e-sandbox.webex.com

Meeting

Site Name Subscription ...

abvp-gax1e-sandb... trialSub.62559...

Overview

Site Information

Site Name abvp-gax1e-sandbox.webex.com

Subscription ID trialSub.625590c4-c34f-4606-99f8-9daf55100f73

User Management Control Hub

Site Link Status Not Applicable

Audio Type Webex Audio

Version Information

Current Channel Latest Channel

Current Version latest

Expire Date

Licenses and Users

Users Bulk Manage

Site Usage Reports View Reports

Configure Site

AJCOLLAB

Cisco Webex Control Hub

Cisco Webex Control Hub

Log in - VMware ESXi

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🔗

📄

https://admin.webex.com/meeting/sites

80%

⋮

🛡️

☆

📄

🔍

☰

Cisco Webex Control Hub

🔔

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💬

A

🏠 Overview

MONITORING

📄 Organization Health

📊 Analytics

🔧 Troubleshooting

MANAGEMENT

👤 Users

📍 Workspaces

🖨 Devices

🧩 Apps

📁 Account

⚙ Organization Settings

SERVICES

💬 Messaging

🗨 Meeting

📞 Calling

🔄 Hybrid

Meeting

Site Name	Subscription ID	User M
abvp-gax1e-sandbox.webex.com	trialSub.625590c4...	Control

abvp-gax1e-sandbox.webex.com

Overview

Site Information

Site Name

Subscription ID

User Management

Site Link Status

Audio Type

Version Information

Current Channel

Current Version

Expire Date

Licenses and Users

Users

Site Usage Reports

Configure Site

📅

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Cisco Webex Control Hub

Log in - VMware ESXi

https://admin.webex.com/site/configure/abvp-gax1e- 80%

Cisco Webex Control Hub

Configure Webex Meetings Site

Cisco Webex Meetings Sites > Configure abvp-gax1e-sandbox.webex.com

Email All Hosts

Overview

MONITORING

Organization Health

Analytics

Troubleshooting

MANAGEMENT

Users

Workspaces

Devices

Apps

Account

Organization Settings

SERVICES

Messaging

Meeting

Calling

Hybrid

Common Settings

These settings apply across centers.

Site Options

Audio Settings

Branding

Collaboration Meeting Rooms (C...)

Company Addresses

Desktop Application

Disclaimers

Mobile

Navigation Customization

Scheduler

Security

Session Types

Site Information

Tracking Codes

User Privileges

Webex Meetings

Site Options

Default Options

Navigation Customization

Scheduling Templates

Webex Training

Site Options

Default Options

E-Commerce

Navigation Customization

Scheduling Templates

Webex Support

CSR Preferences

Branding

Customer Preferences

Default Options

Forms

Navigation Customization

Promotion

WebACD

Settings

Forms

Queues

Remote Access

Settings

Groups

Webex Events

Site Options

Default Options

E-Commerce

Navigation Customization

Reassignment

Registration Form

Scheduling Templates

Recordings

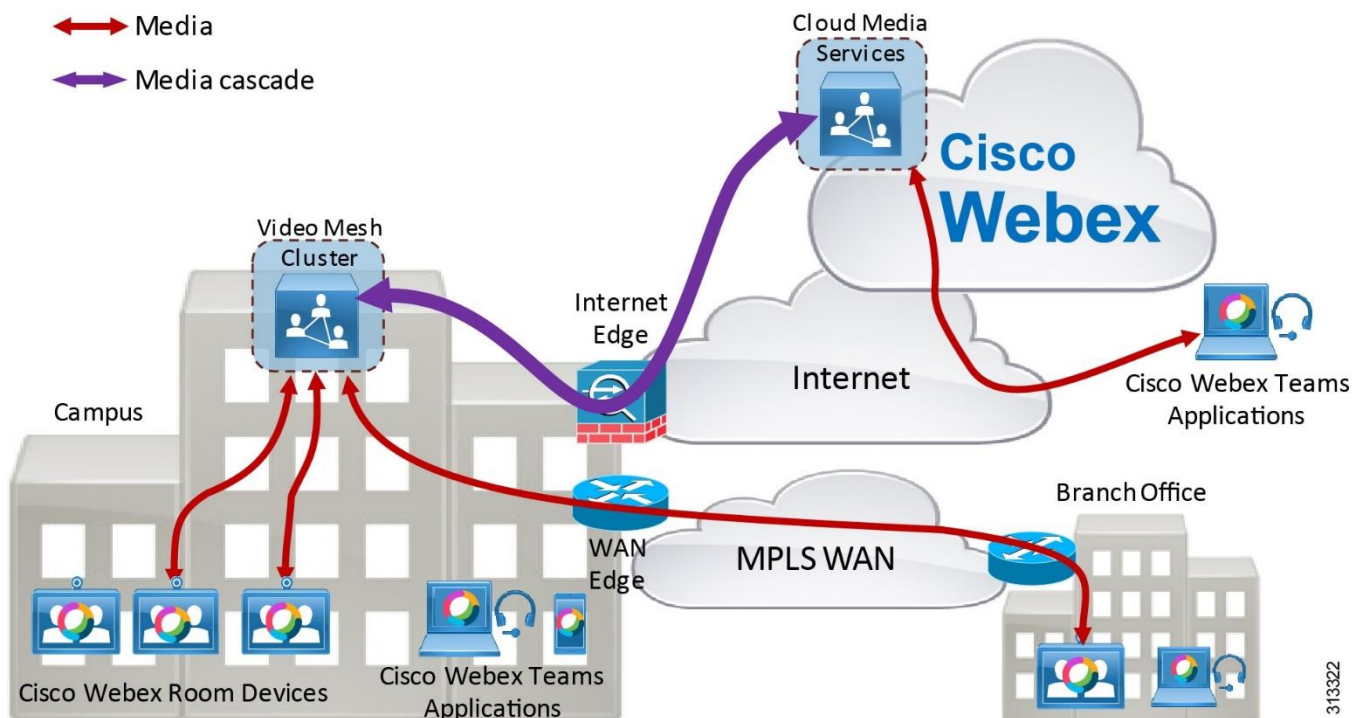
Recording Management

AJCOLLAB

---

## Webex Edge Video Mesh

- Solution that uses local resources for Webex Video Conferencing for on-premise attendees. Local media kept local there by saving internet bandwidth
- Extends the Cloud to on-premise, ideally 1:1 and multi-party meeting uses cloud resource always. Signaling and media go to and from Cloud
- Media flowing to the cloud uses huge internet bandwidth
- It was initially known as Hybrid Media Service



- The video mesh packages the cloud meeting capabilities to an on-premise virtual machine. Video Mesh node can be downloaded from Webex Control Hub
- Automatic overflow to the cloud if the video mesh node is full
- Video Mesh node combines all the participants video in to one compressed media and send to the cloud over internet via cascade link
- Can be deployed as single or cluster mode

### Devices that can connect to Video Mesh

Webex Registered TP Endpoints  
Webex Teams App  
CUCM Registered Devices (Phones, TPs, etc.)  
Expressway Registered TP Endpoints

### Devices that can't connect to Video Mesh

External participants from Teams App  
External participants from Webex registered TP  
Webex Registered UC Phone  
Webex Teams browser clients (teams.webex.com)

---

## Process

- When a device registered to Control Hub, it sends a round trip time to Webex Cloud. Webex will identify if there is any video mesh node available and then relay that information back to the device
- Device again does a round trip time test with video mesh node and prioritize the connectivity between Webex cloud and Video mesh
- Device prefers the lowest round trip time server to get connected for meeting and conference
- CUCM registered endpoints selects the video mesh based on route pattern

## [Lab] Deploying and Configuring Video Mesh Node

### Step 1: Download the Video Mesh Node

The screenshot shows the Cisco Webex Control Hub admin interface. The browser address bar displays `https://admin.webex.com/hybrid-services`. The left sidebar contains navigation menus for Overview, Monitoring, Management, and Services. The main content area is titled "Hybrid" and displays various service cards. The "Video Mesh" card is highlighted with a red box and a red arrow pointing to its "Set Up" button.

**Hybrid**

Manage resources that are registered to the cloud and view related configuration.

All Resources  
0 Resources

Workspaces  
Service  
[Edit settings](#)

Monitor network performance and on-premises video devices for diagnostics and troubleshooting.

**Agents (0)**  
[Add agents](#)

**Network Monitoring**  
You can monitor your network performance and connection once you add an agent

**On-Premises Video Devices**  
You can monitor your on-premises video devices once you add an agent and upload the devices

● Setup not completed

● Not Operational

**Hybrid Calendar**  
 **Exchange**  
Use @webex or @meet in a meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.  
[View Prerequisites](#)  
[Set Up](#)

**Hybrid Calendar**  
 **Office 365**  
Use @webex or @meet in a meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.  
[View Prerequisites](#)  
[Set Up](#)

**Hybrid Calendar**  
 **Google**  
Use @webex or @meet in a meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.  
[View Prerequisites](#)  
[Set Up](#)

**Hybrid Message**  
Connect Webex Teams to UCM IM and Presence Service, so that Cisco Webex Teams users and Cisco Jabber users can direct message each other.  
[Set Up](#)

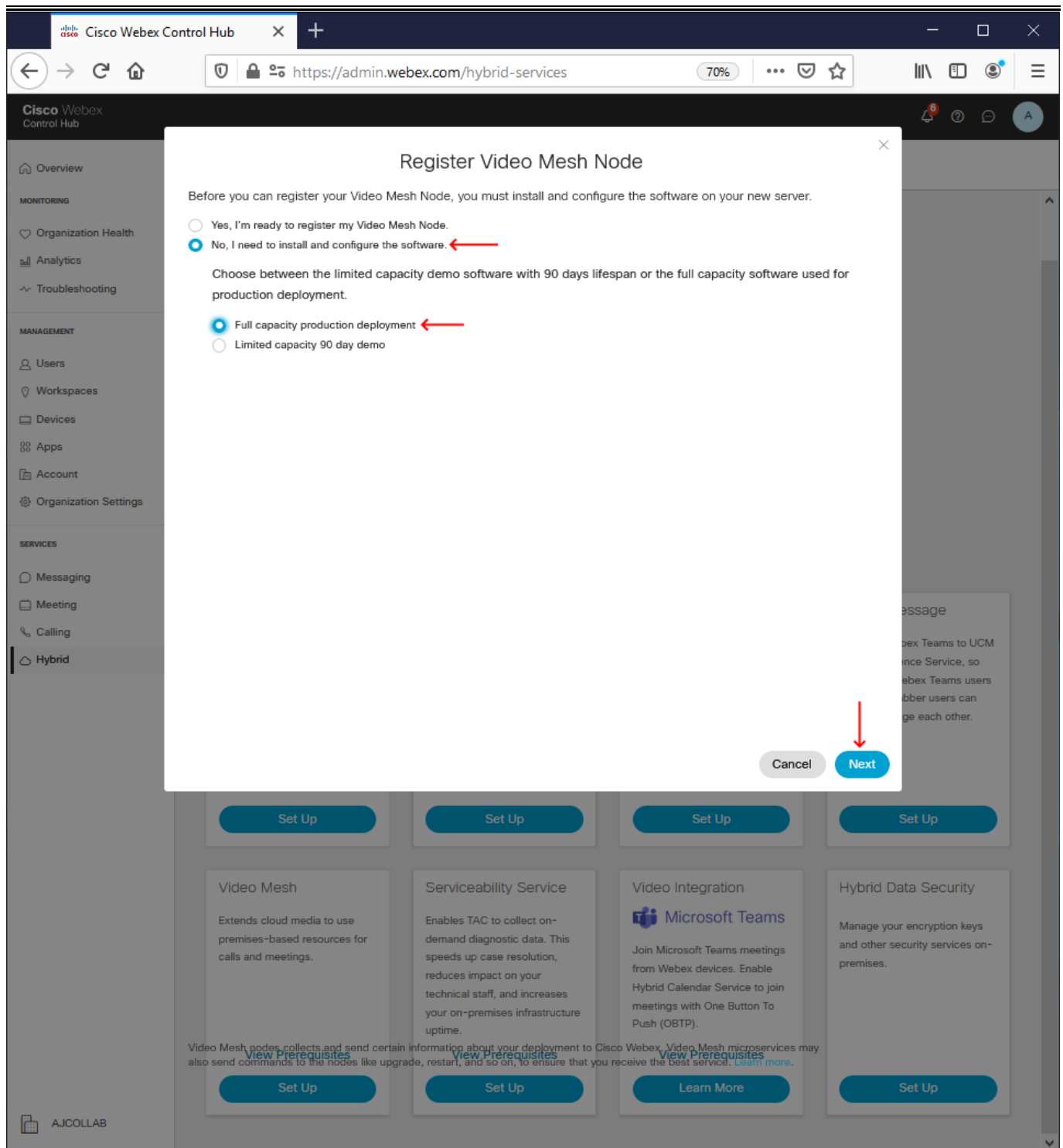
**Video Mesh**  
Extends cloud media to use premises-based resources for calls and meetings.  
[View Prerequisites](#)  
[Set Up](#)

**Serviceability Service**  
Enables TAC to collect on-demand diagnostic data. This speeds up case resolution, reduces impact on your technical staff, and increases your on-premises infrastructure uptime.  
[View Prerequisites](#)  
[Set Up](#)

**Video Integration**  
 **Microsoft Teams**  
Join Microsoft Teams meetings from Webex devices. Enable Hybrid Calendar Service to join meetings with One Button To Push (OBTP).  
[View Prerequisites](#)  
[Learn More](#)

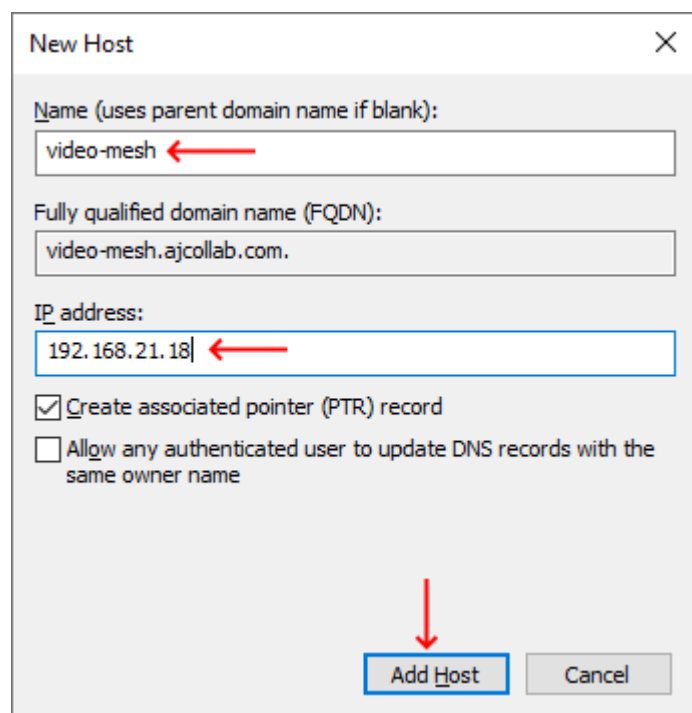
**Hybrid Data Security**  
Manage your encryption keys and other security services on-premises.  
[Set Up](#)

AJCOLLAB



Wait for the complete the download

## Step 2: Configure DNS A Record for the Video Mesh Node



**New Host** [X]

Name (uses parent domain name if blank):  
video-mesh

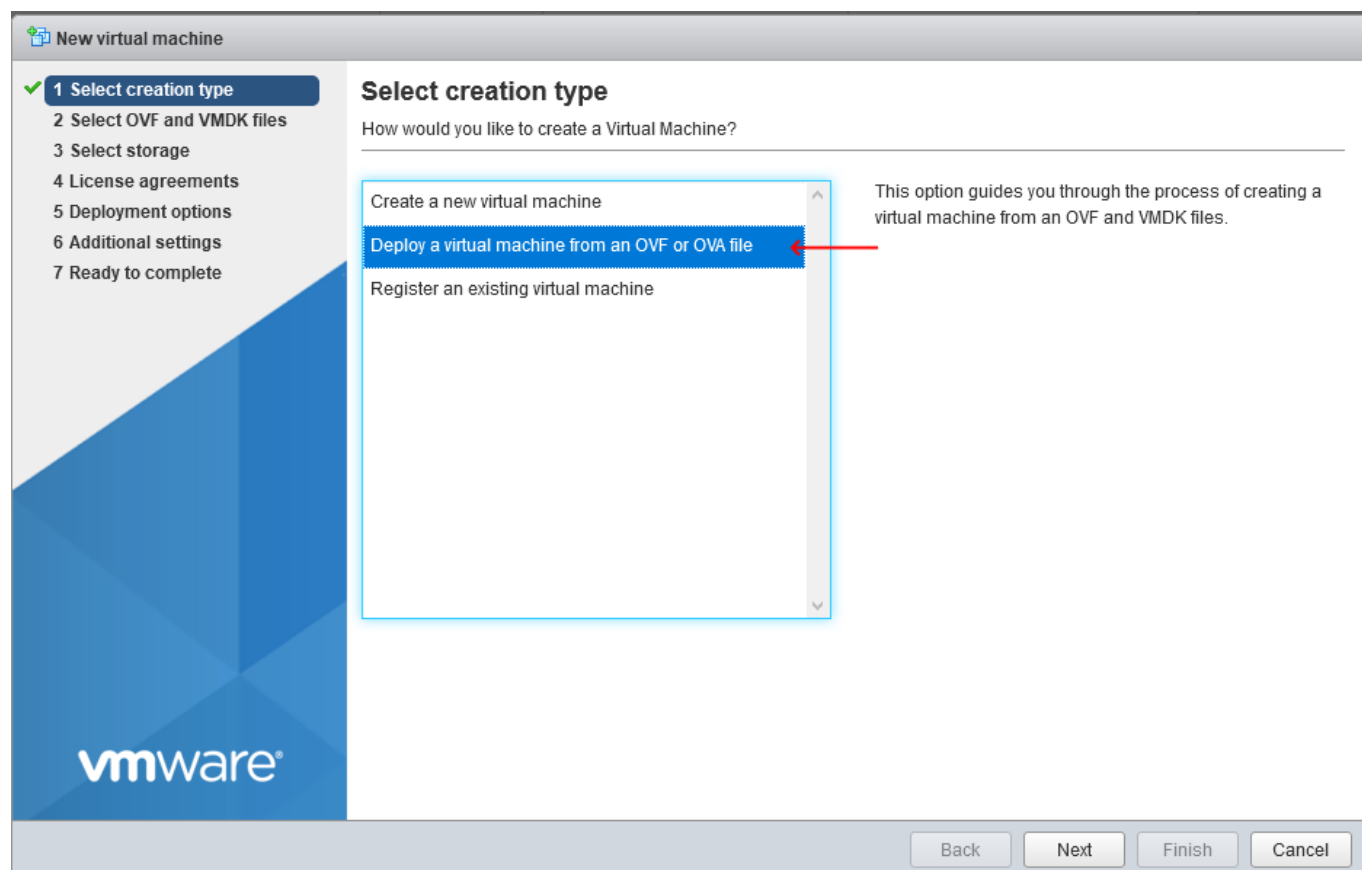
Fully qualified domain name (FQDN):  
video-mesh.ajcollab.com.

IP address:  
192.168.21.18

☒ Create associated pointer (PTR) record  
☐ Allow any authenticated user to update DNS records with the same owner name

**Add Host** Cancel

## Step 3: Build the VM in ESXi



**New virtual machine**

1 Select creation type  
2 Select OVF and VMDK files  
3 Select storage  
4 License agreements  
5 Deployment options  
6 Additional settings  
7 Ready to complete

**Select creation type**

How would you like to create a Virtual Machine?

- Create a new virtual machine
- Deploy a virtual machine from an OVF or OVA file**
- Register an existing virtual machine

This option guides you through the process of creating a virtual machine from an OVF and VMDK files.

vmware

Back Next Finish Cancel



New virtual machine - video-mesh\_192.168.21.18

1 Select creation type

2 Select OVF and VMDK files

3 Select storage

4 License agreements

5 Deployment options

6 Additional settings

7 Ready to complete

Select OVF and VMDK files

Select the OVF and VMDK files or OVA for the VM you would like to deploy

Enter a name for the virtual machine.

video-mesh\_192.168.21.18

Virtual machine names can contain up to 80 characters and they must be unique within each ESXi instance.

x videomesh\_demo.ova

vmware

Back

Next

Finish

Cancel

New virtual machine - video-mesh\_192.168.21.18

1 Select creation type

2 Select OVF and VMDK files

3 Select storage

4 Deployment options

5 Additional settings

6 Ready to complete

Deployment options

Select deployment options

Network mappings

Internal Interface Network

VM Network

External Interface Network

VM Network

Disk provisioning

☒ Thin ☐ Thick

Power on automatically

☒

vmware

Back

Next

Finish

Cancel

1129

New virtual machine - video-mesh\_192.168.21.18

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 Deployment options
- 5 Additional settings**
- 6 Ready to complete

### Additional settings

Additional properties for the VM

Networking Properties. [Note: These network settings are optional. If preferred, you can configure them using the node console or web interface after the node is deployed. Note that DHCP is not supported. See the documentation at [www.cisco.com/go/video-mesh](http://www.cisco.com/go/video-mesh) for guidance.] [Warning: The system performs minimum checks on these network values, so be careful as you enter these values.]

Hostname	video-mesh		
IP Address	192.168.21.18		
Subnet Mask	255.255.128.0		
Gateway	192.168.0.254		
DNS Servers	192.168.11.1		
NTP Servers	192.168.31.1		

Back Next Finish Cancel


New virtual machine - video-mesh\_192.168.21.18

- 1 Select creation type
- 2 Select OVF and VMDK files
- 3 Select storage
- 4 Deployment options
- 5 Additional settings
- 6 Ready to complete**

### Ready to complete

Review your settings selection before finishing the wizard

Product	Video Mesh Node
VM Name	video-mesh_192.168.21.18
Files	mfusion_2021.03.22.2384m_flatcar_DEMO-disk1.vmdk
Datastore	datastore1
Provisioning type	Thin
Network mappings	Internal Interface Network: VM Network, External Interface Network: VM Network
Guest OS Name	Unknown
Properties	Click to expand

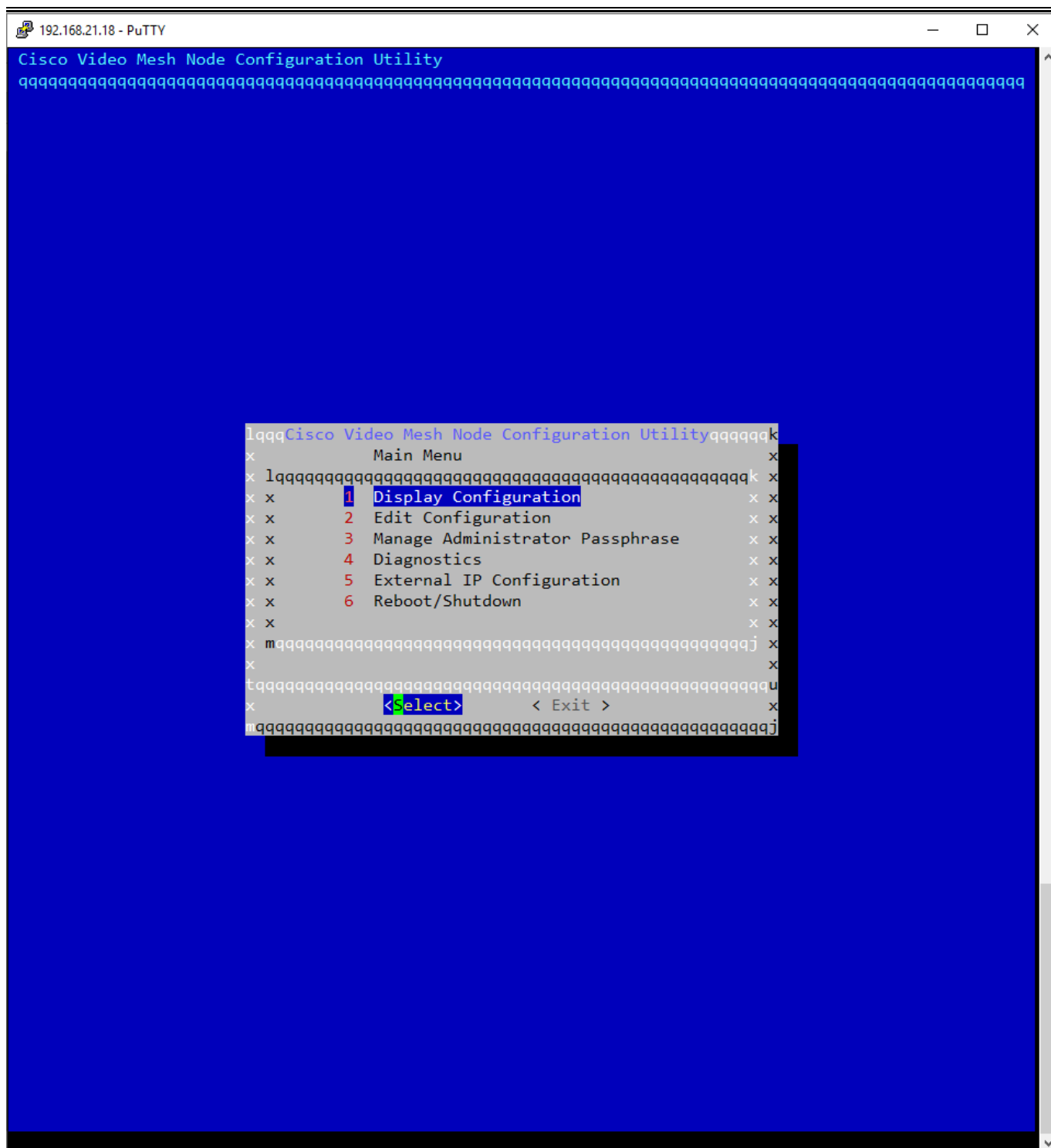
 Do not refresh your browser while this VM is being deployed.

Back Next Finish Cancel

```
video-mesh_192.168.21.18
SSH host key: SHA256:/qQ6K28A6Rs+URAzU+ENureqjY1KhMgAiFqEP83j/9E (RSA)
SSH host key: SHA256:747CkavSS8xUcSX39yLOef7ULX7d8Naxhm91aetpc1o (DSA)
SSH host key: SHA256:nihgZdBjnn8pIS50AI3zYs7KvmiOEWP6dbrCT08eybA (ECDSA)
SSH host key: SHA256:m3S9834TVYazUjiRWMLNr7b3eArmR9p1fyypP3A9hTQ (ED25519)
ens192: 192.168.21.18
ens224:

video-mesh login: [30.962393] docker0: port 3(veth59bfb74) entered blocking s
tate
[30.963419] docker0: port 3(veth59bfb74) entered disabled state
[30.964467] device veth59bfb74 entered promiscuous mode
[31.131204] SELinux: mount invalid. Same superblock, different security sett
ings for (dev mqueue, type mqueue)
[31.367989] eth0: renamed from veth56ff4fb
[31.379898] docker0: port 3(veth59bfb74) entered blocking state
[31.380931] docker0: port 3(veth59bfb74) entered forwarding state
[37.889711] docker0: port 4(vethe86bdb6) entered blocking state
[37.891018] docker0: port 4(vethe86bdb6) entered disabled state
[37.892343] device vethe86bdb6 entered promiscuous mode
[38.026309] SELinux: mount invalid. Same superblock, different security sett
ings for (dev mqueue, type mqueue)
[38.202139] eth0: renamed from veth28539ae
[38.212230] docker0: port 4(vethe86bdb6) entered blocking state
[38.213235] docker0: port 4(vethe86bdb6) entered forwarding state
```

- Default username is **admin** and password is **cisco**
- When you login via SSH for the 1<sup>st</sup> time, you may be challenged to reset the password



## Step 4: Register Video Mesh Node to Control Hub

Go to Hybrid Services >> Video Mesh >>

The screenshot shows the Cisco Webex Control Hub admin interface. The left sidebar contains a navigation menu with sections: Overview, MONITORING (Organization Health, Analytics, Troubleshooting), MANAGEMENT (Users, Workspaces, Devices, Apps, Account, Organization Settings), and SERVICES (Messaging, Meeting, Calling, Hybrid). The 'Hybrid' menu item is highlighted with a red arrow. The main content area is titled 'Hybrid' and displays several service cards. The 'Video Mesh' card is highlighted with a red box and has a red arrow pointing to its 'View Prerequisites' link. Other cards include Hybrid Calendar (Exchange, Office 365, Google), Hybrid Message, Serviceability Service, Video Integration (Microsoft Teams), and Hybrid Data Security. The top of the interface shows the browser address bar with the URL 'https://admin.webex.com/hybrid-services' and the page title 'Cisco Webex Control Hub'.

Cisco Webex Control Hub

esxi-primary - VMware ESXi

https://admin.webex.com/hybrid-services

### Register Video Mesh Node

Before you can register your Video Mesh Node, you must install and configure the software on your new server.

☒ Yes, I'm ready to register my Video Mesh Node.

☐ No, I need to install and configure the software.

Cancel Next

Set Up

Video Mesh

Extends cloud media to use premises-based resources for calls and meetings.

View Prerequisites

Set Up

Serviceability Service

Enables TAC to collect on-demand diagnostic data. This speeds up case resolution, reduces impact on your technical staff, and increases your on-premises infrastructure uptime.

View Prerequisites

Set Up

Video Integration

Microsoft Teams

Join Microsoft Teams meetings from Webex devices. Enable Hybrid Calendar Service to join meetings with One Button To Push (OBTP).

View Prerequisites

Learn More

Hybrid Data Security

Manage your encryption keys and other security services on-premises.

Set Up

Video Mesh nodes collect and send certain information about your deployment to Cisco Webex. Video Mesh microservices may also send commands to the nodes like upgrade, restart, and so on, to ensure that you receive the best service. [Learn more.](#)

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Cisco Webex Control Hub

esxi-primary - VMware ESXi

https://admin.webex.com/hybrid-services

### Register Video Mesh Node

Cluster

Cluster info

Create a new or select an existing Video Mesh Cluster where you want to add the Video Mesh Node.

☒ Create a new cluster

video-mesh-cluster

We recommend using the geographical location of the cluster as a name

☐ Select an existing cluster

Video Mesh Node

Enter the Internal FQDN or IP address of the Video Mesh Node that you want to register with Webex.

video-mesh.ajcollab.com

Cancel Next

meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

Set Up

Video Mesh

Extends cloud media to use premises-based resources for calls and meetings.

View Prerequisites

Set Up

Serviceability Service

Enables TAC to collect on-demand diagnostic data. This speeds up case resolution, reduces impact on your technical staff, and increases your on-premises infrastructure uptime.

View Prerequisites

Set Up

Video Integration

Microsoft Teams

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View Prerequisites

Learn More

Hybrid Data Security

Manage your encryption keys and other security services on-premises.

Set Up

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Cisco Webex Control Hub

esxi-primary - VMware ESXi

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🔒 <https://admin.webex.com/hybrid-services> 70% ⋮ 🛡️ ☆

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Cisco Webex Control Hub

🏠 Overview

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📄 Organization Health

📊 Analytics

🔧 Troubleshooting

MANAGEMENT

👤 Users

📍 Workspaces

📱 Devices

🔧 Apps

📁 Account

⚙️ Organization Settings

SERVICES

📄 Messaging

📄 Meeting

📄 Calling

📄 Hybrid

🔔 0

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Configure Video Mesh Cluster

Upgrade Schedule

Upgrade Schedule

Select the upgrade schedule for this cluster. When an upgrade is available, the connectors automatically upgrade during time that you select.

Time (12-hour) 03:00 AM

Frequency Daily

Time Zone United States: America/Los\_Angeles

Back Next

meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

Set Up

meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

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View Prerequisites

Learn More

Hybrid Data Security

Manage your encryption keys and other security services on-premises.

Set Up

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Cisco Webex Control Hub

esxi-primary - VMware ESXi

https://admin.webex.com/hybrid-services

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Cisco Webex Control Hub

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Hybrid

### Configure Video Mesh Node

#### SIP TLS Configuration

SIP TLS Configuration

⚠ This setting is done at the cluster level and is not available until you enable media encryption for your entire organization under the Video Mesh settings.

Trusted SIP sources

Enter the Common Name (CN) or any FQDNs that are present in the Subject Alternative Name on the CallManager certificate (typically the FQDN of the Unified CM). These entries are identified as trusted SIP sources and are allowed to send secure SIP calls to Webex Video Mesh.

Enter the trusted SIP sources...

Back Next

meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

Set Up

meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

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Learn More

Hybrid Data Security

Manage your encryption keys and other security services on-premises.

Set Up

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Cisco Webex Control Hub

esxi-primary - VMware ESXi

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https://admin.webex.com/hybrid-services

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☰

Cisco Webex Control Hub

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📅 Meeting

📞 Calling

🌐 Hybrid

Close

### Continue Video Mesh Registration

Next, click Go to Node to continue the registration of the Video Mesh node to the Webex cloud.

After you complete this step, the node will be visible in Control Hub and ready to use.

When the node is ready, go to your Webex site and enable Video Mesh for the Media Resource Type. See [this documentation](#) for more guidance.

Node Internal IP Address/FQDN: **video-mesh.ajcollab.com**  
Cluster: **video-mesh-cluster**

Back

Go to Node

meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

Set Up

meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

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meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

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View Prerequisites

Learn More

Hybrid Data Security

Manage your encryption keys and other security services on-premises.

Set Up

📄

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Cisco Webex Control Hub

Webex Video Mesh Node

3:22 until your session times out

← → × 🏠

🔒 https://video-mesh.ajcollab.com/?clusterName=video-mesh-cluster


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# Cisco Webex

## Video Mesh Node

Redirecting to the Cloud



By using Cisco Webex Services you accept the [Terms of Service](#) and [Privacy Statement](#). © 2019 Cisco and/or affiliates. All rights reserved.

hercules-r.wbx2.com

Cisco Webex Control Hub


Enable Hybrid Services


2:50 until your session times out

← → ↺ 🏠

🔒 https://hercules-r.wbx2.com/fuse\_redirect#access\_token=NTizODNI...

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 Cisco Webex Hybrid Services



## Webex Video Mesh Node

### Allow Access to Webex Video Mesh Node


Permissions are required to allow your Cisco Webex organization to create, read, update, and delete user accounts, as well as read and update information about your organization.

**Organization**  
AJCOLLAB

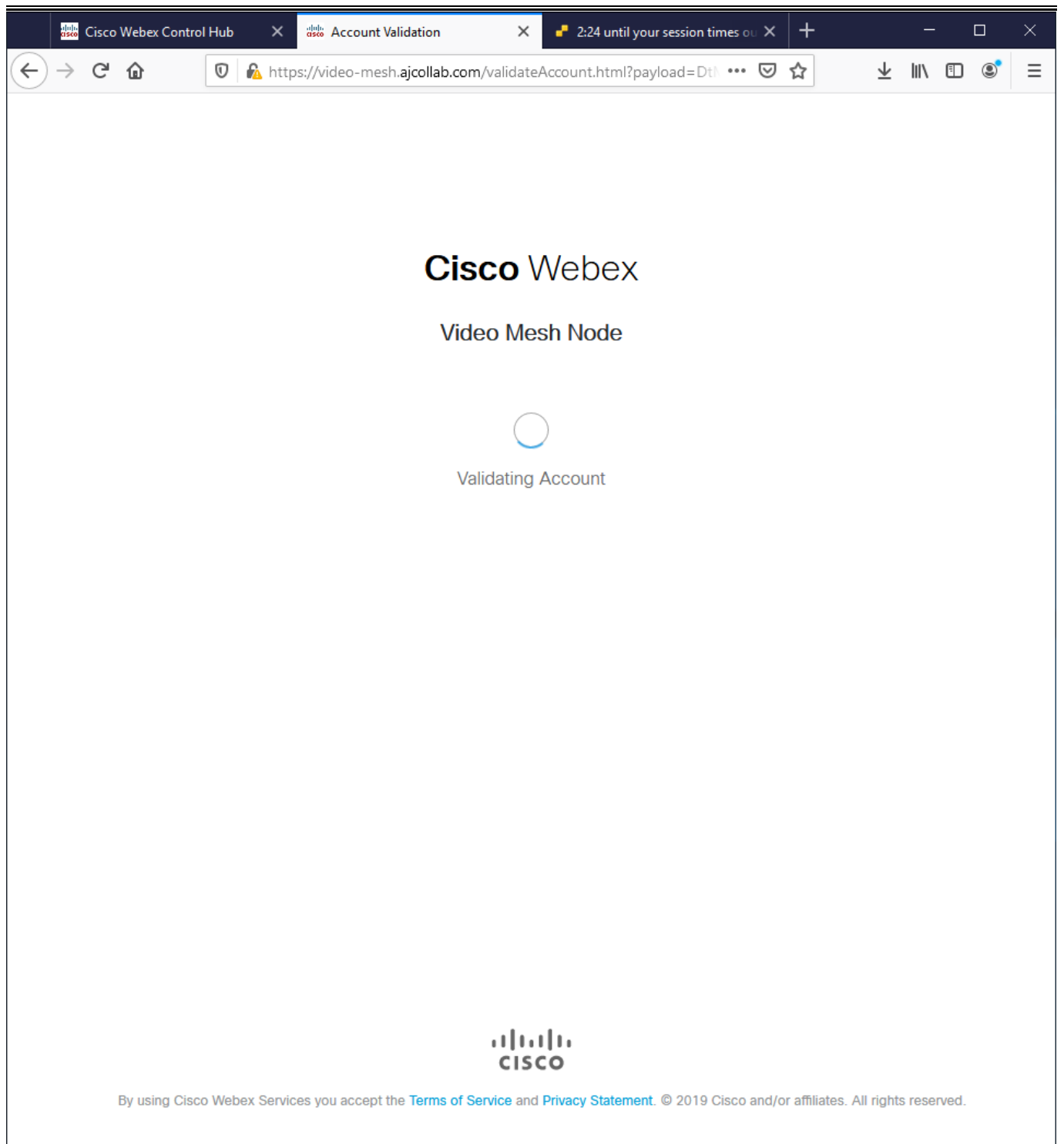
**FQDN or IP Address**  
video-mesh.ajcollab.com

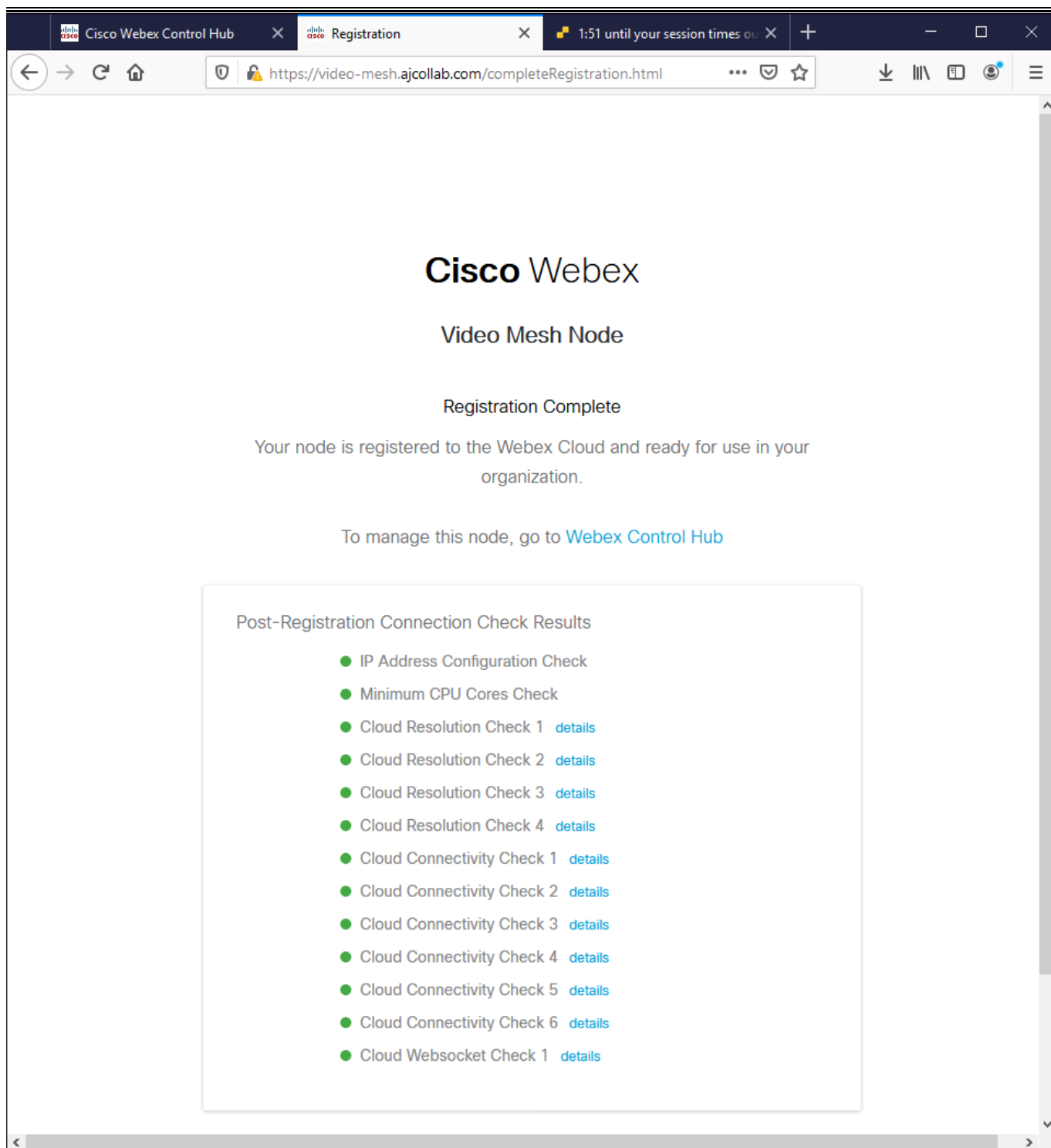
☒ Allow Access to the Webex Video Mesh Node  
*Only allow access to hosts you know and trust*

Continue



By using Cisco Webex Services you accept the [Terms of Service](#) and [Privacy Statement](#).





## Step X: Enable meetings on Video Mesh Node

The screenshot shows the Cisco Webex Control Hub administration interface. The browser tabs include 'Cisco Webex Control Hub' and 'Log in - VMware ESXi'. The address bar shows the URL: <https://admin.webex.com/site/configure/abvp-gax1e->. The page title is 'Cisco Webex Control Hub'. The left sidebar contains navigation links for Overview, Monitoring (Organization Health, Analytics, Troubleshooting), Management (Users, Workspaces, Devices, Apps, Account, Organization Settings), and Services (Messaging, Meeting, Calling, Hybrid). The main content area is titled 'Common Settings' and shows the breadcrumb: 'Cisco Webex Meetings Sites > Configure abvp-gax1e-sandbox.webex.com > Common Settings'. The 'Cloud Collaboration Meeting Room Options' section includes the 'Interactive Voice Response URI' and a dropdown menu for 'Media Resource Type' set to 'Video Mesh'. Below this, there are checkboxes for 'Use a pilot number', 'Disable Hybrid VoIP', 'Enable video call-back' (selected), 'Allow call-in and call-back teleconferencing from Cisco Webex Teams applications' (selected), and 'Enable Short Video Address'. The 'Webex Assistant Configuration' section has checkboxes for 'Enable Webex Assistant' and 'Automatically turn on the Webex Assistant by default whenever users start meetings'. The 'Schedule Meeting Options' section includes checkboxes for 'Users can let other users schedule meetings on their behalf', 'When scheduling a meeting, users can choose an alternate host (or a cohost)', 'Allow users to let anyone with a host account on this site host their scheduled or Personal Room meetings', 'Video conferencing systems in my organization can start and join meetings without a prompt', and 'Allow users to change this preference'. There are also radio buttons for 'Quick Scheduler is default (also contains a link to Advanced Scheduler, Meetings only)' (selected) and 'Advanced Scheduler is default (Meetings only)'. An 'Update' button is located at the bottom right of the settings area.

- Now Webex Registered TP Endpoint and On premise Teams Client can use Video Mesh Node but not the CUCM Registered endpoints



Find and List Phones

Cisco Webex Control Hub

https://admin.webex.com/hybrid-services80%

Cisco Webex Control Hub

6

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Hybrid

Hybrid

On-Premises Re...

Manage resources that are registered to the cloud and view related configuration.

All Resources

View

Hybrid Calling for?

Workspaces

Service

Edit settings

Setup not completed

Video Mesh

Resources

View all

Service

Edit settings

Operational

Events

Webex Monitor...

Hybrid Calendar

Exchange

Use @webex or @meet in a meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

Set Up

Hybrid Calendar

Office 365

Use @webex or @meet in a meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

Set Up

Hybrid Calendar

Google

Use @webex or @meet in a meeting location to insert join details, show upcoming meetings in the Webex app, and provide One Button to Push (OBTP) to join.

View Prerequisites

Set Up

Hybrid Message

Connect Webex Teams to UCM IM and Presence Service, so that Cisco Webex Teams users and Cisco Jabber users can direct message each other.

Set Up

Serviceability Ser...

Enables TAC to collect on-demand diagnostic data. This speeds up case resolution, reduces impact on your technical staff, and increases your on-premises infrastructure uptime.

Video Integration

Microsoft Teams

Join Microsoft Teams meetings from Webex devices. Enable Hybrid Calendar Service to join meetings with One Button To Push (OBTP).

Hybrid Data Sec...

Manage your encryption keys and other security services on-premises.

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Find and List Phones

Cisco Webex Control Hub

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Cisco Webex

Control Hub

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< Webex Video Mesh

Resources Settings

🔍 Search

Select filters ▾

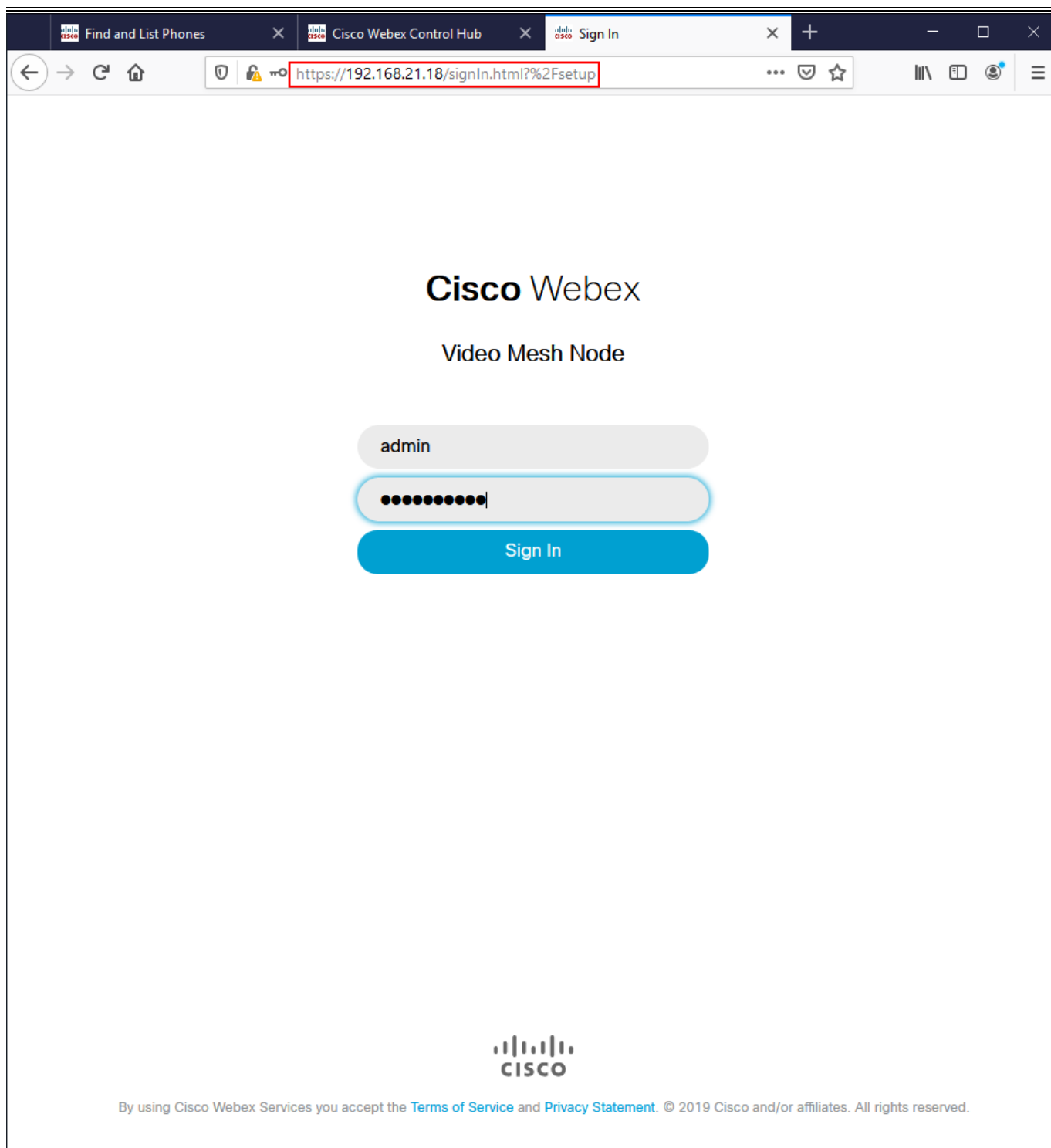
1 Clusters

Cluster Name	Status	Number of nodes	Notes
📄 video-mesh-cluster	● Operational	1	🔔 Alarms

📄

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https://VIDEO-MESH-NODE-IP-OR-FQDN/signIn.html?%2Fsetup



Cisco Unified CM Console
Cisco Webex Control Hub
Webex Video Mesh Node Setup
+

https://192.168.21.18/setup/#overview
90%

# Cisco Webex Video Mesh Node

- Overview
- Network
- Trust Store & Proxy
- Server Certificate
- Troubleshooting
- Administration

admin

## Overview

### Call Status

2

calls

### Node Details

Type	Video Mesh Node
Image	Demo
Deployment Type	DEMO
Release Channel	Stable
Provisioning	Cloud
Version	2021.03.22.2384m.3
OS Version	2765.2.1 (Flatcar)
QoS	On
Maintenance Mode	Off
Proxy Type	None

### Node Health

CPU	12 cores
Memory	3.22GB of 7.78GB used (41.36%)
Disk Space	11.93GB of 38.22GB used (33%)
Uptime	Up 1 hour, 35 minutes
Management Service	Active
Messaging Service	Active
NTP Sync	Active

### Network Settings

Hostname	video-mesh
Interface	ens192
MAC	00:0c:29:cf:86:69
IP	192.168.21.18/17
Gateway	192.168.0.254
DNS	192.168.11.1
NTP	192.168.31.1
Dual IP	Disabled

### Registration Details

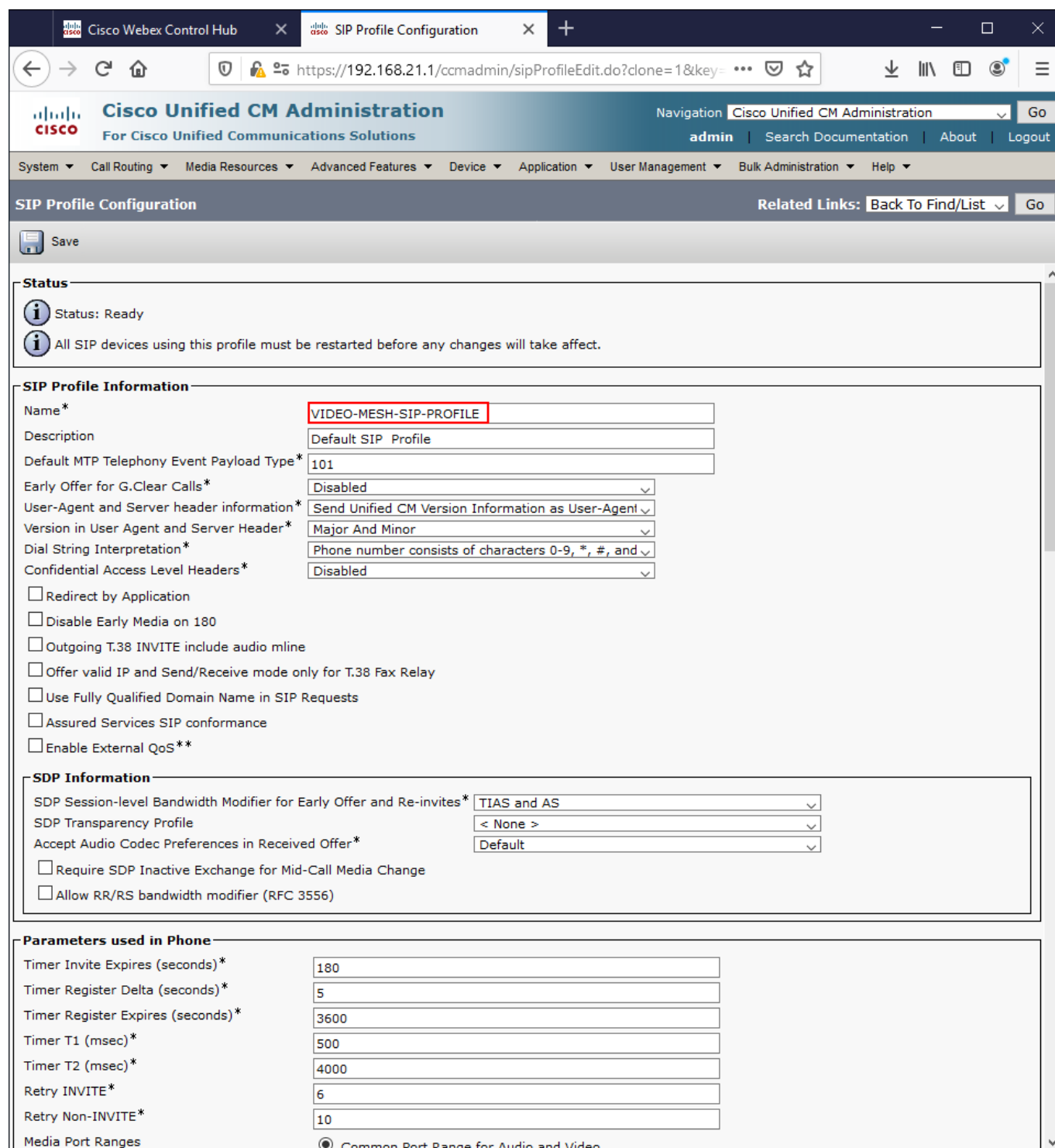
Registered	Yes
Organization	AJCOLLAB
Org ID	7f6cfa1e-9b9d-477e-a6a3-4574b65ad006

### Connectivity Tests

Webex Cloud Resolution	Pass
3rd Party Cloud Resolution	Pass
Webex Cloud Connectivity	Pass
3rd Party Cloud Connectivity	Pass

## Step X: Configure CUCM for Video Mesh

Device >> Device Settings >> SIP Profile >> Copy Standard SIP Profile >>



Cisco Webex Control Hub x SIP Profile Configuration x

https://192.168.21.1/ccmadmin/sipProfileEdit.do?clone=1&key=...

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

Navigation: Cisco Unified CM Administration Go  
admin | Search Documentation | About | Logout

System ▾ Call Routing ▾ Media Resources ▾ Advanced Features ▾ Device ▾ Application ▾ User Management ▾ Bulk Administration ▾ Help ▾

**SIP Profile Configuration** Related Links: Back To Find/List Go

Save

**Status**

- Status: Ready
- All SIP devices using this profile must be restarted before any changes will take affect.

**SIP Profile Information**

Name\* VIDEO-MESH-SIP-PROFILE

Description Default SIP Profile

Default MTP Telephony Event Payload Type\* 101

Early Offer for G.Clear Calls\* Disabled

User-Agent and Server header information\* Send Unified CM Version Information as User-Agent

Version in User Agent and Server Header\* Major And Minor

Dial String Interpretation\* Phone number consists of characters 0-9, \*, #, and

Confidential Access Level Headers\* Disabled

☐ Redirect by Application

☐ Disable Early Media on 180

☐ Outgoing T.38 INVITE include audio mline

☐ Offer valid IP and Send/Receive mode only for T.38 Fax Relay

☐ Use Fully Qualified Domain Name in SIP Requests

☐ Assured Services SIP conformance

☐ Enable External QoS\*\*

**SDP Information**

SDP Session-level Bandwidth Modifier for Early Offer and Re-invites\* TIAS and AS

SDP Transparency Profile < None >

Accept Audio Codec Preferences in Received Offer\* Default

☐ Require SDP Inactive Exchange for Mid-Call Media Change

☐ Allow RR/RS bandwidth modifier (RFC 3556)

**Parameters used in Phone**

Timer Invite Expires (seconds)\* 180

Timer Register Delta (seconds)\* 5

Timer Register Expires (seconds)\* 3600

Timer T1 (msec)\* 500

Timer T2 (msec)\* 4000

Retry INVITE\* 6

Retry Non-INVITE\* 10

Media Port Ranges ☒ Common Port Range for Audio and Video

Cisco Webex Control Hub SIP Profile Configuration

https://192.168.21.1/ccmadmin/sipProfileEdit.do?clone=1&key=...

**Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

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**SIP Profile Configuration** Related Links: Back To Find/List Go

Save

Caller ID DN  
Caller Name

**Trunk Specific Configuration**

Reroute Incoming Request to new Trunk based on\* Never ▾  
 Resource Priority Namespace List < None > ▾  
 SIP Rel1XX Options\* Disabled ▾  
 Video Call Traffic Class\* Mixed ▾  
 Calling Line Identification Presentation\* Default ▾  
 Session Refresh Method\* Invite ▾  
 Early Offer support for voice and video calls\* Best Effort (no MTP inserted) ▾

☐ Enable ANAT  
☐ Deliver Conference Bridge Identifier  
☐ Allow Passthrough of Configured Line Device Caller Information  
☐ Reject Anonymous Incoming Calls  
☐ Reject Anonymous Outgoing Calls  
☐ Send ILS Learned Destination Route String  
☐ Connect Inbound Call before Playing Queuing Announcement

**SIP OPTIONS Ping**

☐ Enable OPTIONS Ping to monitor destination status for Trunks with Service Type "None (Default)"  
 Ping Interval for In-service and Partially In-service Trunks (seconds)\* 60  
 Ping Interval for Out-of-service Trunks (seconds)\* 120  
 Ping Retry Timer (milliseconds)\* 500  
 Ping Retry Count\* 6

**SDP Information**

☐ Send send-receive SDP in mid-call INVITE  
☐ Allow Presentation Sharing using BFCP  
☐ Allow iX Application Media  
☐ Allow multiple codecs in answer SDP

Save

**i** \*- indicates required item.  
**i** \*\*- setting only takes effect if the External QoS Enabled Service Parameter is set to true.

System >> Security >> SIP Trunk Security Profile >> Copy 'Non Secure SIP Trunk Profile'

Cisco Webex Control Hub
SIP Trunk Security Profile Config
+

https://192.168.21.1/ccmadmin/sipTrunkSecurityProfileEdit.do?c

Cisco Unified CM Administration  
For Cisco Unified Communications Solutions

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admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

SIP Trunk Security Profile Configuration Related Links: Back To Find/List Go

Save

**Status**  
*i* Status: Ready

**SIP Trunk Security Profile Information**  
Name\* VIDEO-MESH-SIP-TRUNK-SIP-SEC-PROFILE  
Description Non Secure SIP Trunk Profile authenticated by null String  
Device Security Mode Non Secure  
Incoming Transport Type\* TCP+UDP  
Outgoing Transport Type TCP  
☐ Enable Digest Authentication  
Nonce Validity Time (mins)\* 600  
X.509 Subject Name  
Incoming Port\* 5060  
☐ Enable Application level authorization  
☐ Accept presence subscription  
☐ Accept out-of-dialog refer\*\*  
☐ Accept unsolicited notification  
☐ Accept replaces header  
☐ Transmit security status  
☐ Allow charging header  
SIP V.150 Outbound SDP Offer Filtering\* Use Default Filter

Save


*i* \*- indicates required item.  
*i* \*\*If this profile is associated with an EMCC SIP trunk, Accept Out-of-Dialog REFER is enabled regardless of the setting on this page

Create a Region and Device Pool for the VIDEO-MESH-SIP-TRUNK

Cisco Webex Control Hub

Trunk Configuration

https://192.168.21.1/ccmadmin/trunkEdit.do?prod=95&proto=...

 **Cisco Unified CM Administration**  
For Cisco Unified Communications Solutions

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admin | Search Documentation | About | Logout

System Call Routing Media Resources Advanced Features Device Application User Management Bulk Administration Help

Trunk Configuration Related Links: Back To Find/List Go

Save

Status

Status: Ready

Device Information

Product: SIP Trunk

Device Protocol: SIP

Trunk Service Type: None(Default)

Device Name\* VIDEO-MESH-SIP-TRUNK

Description VIDEO-MESH-SIP-TRUNK

Device Pool\* VIDEO-MESH-SIP-TRUNK-DP

Common Device Configuration < None >

Call Classification\* OnNet

Media Resource Group List < None >

Location\* Hub\_None

AAR Group < None >

Tunneled Protocol\* None

QSIG Variant\* No Changes

ASN.1 ROSE OID Encoding\* No Changes

Packet Capture Mode\* None

Packet Capture Duration 0

☐ Media Termination Point Required

☒ Retry Video Call as Audio

☐ Path Replacement Support

☐ Transmit UTF-8 for Calling Party Name

☐ Transmit UTF-8 Names in QSIG APDU

☐ Unattended Port

☐ SRTP Allowed - When this flag is checked, Encrypted TLS needs to be configured in the network to provide end to end security. Failure to do so will expose keys and other information.

Consider Traffic on This Trunk Secure\* When using both sRTP and TLS

Route Class Signaling Enabled\* Default

Use Trusted Relay Point\* Default

☐ PSTN Access

☒ Run On All Active Unified CM Nodes

Intercompany Media Engine (IME)

E.164 Transformation Profile < None >

MLPP and Confidential Access Level Information

MLPP Domain < None >



Trunk Configuration
Cisco Webex Control Hub
Webex Video Mesh Node Setup

https://192.168.21.1/ccmadmin/trunkEdit.do?prod=95&proto=11&...

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Save

Called Party Transformation CSS < None >
☒ Use Device Pool Called Party Transformation CSS
Calling Party Transformation CSS < None >
☒ Use Device Pool Calling Party Transformation CSS
Calling Party Selection\* Originator
Calling Line ID Presentation\* Default
Calling Name Presentation\* Default
Calling and Connected Party Info Format\* Deliver URI and DN in connected party, if available
☐ Redirecting Diversion Header Delivery - Outbound
Redirecting Party Transformation CSS < None >
☒ Use Device Pool Redirecting Party Transformation CSS

**Caller Information**

Caller ID DN
Caller Name
☐ Maintain Original Caller ID DN and Caller Name in Identity Headers

**SIP Information**

**Destination**
☐ Destination Address is an SRV

Destination Address 1\* 192.168.21.18
Destination Address IPv6
Destination Port 5060

MTP Preferred Originating Codec\* 711ulaw
BLF Presence Group\* Standard Presence group
SIP Trunk Security Profile\* VIDEO-MESH-SIP-TRUNK-SIP-SEC-PROFILE
Rerouting Calling Search Space < None >
Out-Of-Dialog Refer Calling Search Space < None >
SUBSCRIBE Calling Search Space < None >
SIP Profile\* VIDEO-MESH-SIP-PROFILE View Details
DTMF Signaling Method\* No Preference

**Normalization Script**

Normalization Script < None >
☐ Enable Trace

Parameter Name Parameter Value
1

**Recording Information**

Route Group Configuration
Cisco Webex Control Hub
Webex Video Mesh Node Setup
+
-
□
×

https://192.168.21.1/ccmadmin/routeGroupEdit.do

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Route Group Configuration
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Save Delete Add New

**Status**  
Status: Ready

**Route Group Information**  
Route Group Name\* VIDEO-MESH-RG  
Distribution Algorithm\* Top Down

**Route Group Member Information**  
**Find Devices to Add to Route Group**  
Device Name contains Find  
Available Devices\*\*  
BLR-SME-SIP-TRUNK  
CUC-PUB-SIP-TRUNK  
CUC-SUB-SIP-TRUNK  
IMP-SIP-TRUNK  
VIDEO-MESH-SIP-TRUNK  
Port(s) None Available  
Add to Route Group

**Current Route Group Members**  
Selected Devices (ordered by priority)\*  
VIDEO-MESH-SIP-TRUNK (All Ports)  
Add Expressway B2B Trunk if available for Edge Audio if Video Mesh is overloaded  
Reverse Order of Selected Devices  
Removed Devices\*\*\*

**Route Group Members**  
VIDEO-MESH-SIP-TRUNK

Save Delete Add New

\*- indicates required item.  
\*\*Select device, select port, and click Add to Route Group  
\*\*\*Will be removed from Route Group when you click Save

Route List Configuration
Cisco Webex Control Hub
Webex Video Mesh Node Setup

https://192.168.21.1/ccmadmin/routeListTwoEdit.do?key=76795faa-c

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Route List Configuration Related Links: Back To Find/List Go

Save Delete Copy Reset Apply Config Add New

**Status**  
Update successful

**Route List Information**  
Registration: Registered with Cisco Unified Communications Manager cucm-sub01.ajcollab.com  
IPv4 Address: 192.168.21.2  
☒ Device is trusted  
Name\* VIDEO-MESH-RL  
Description VIDEO-MESH-RL  
Cisco Unified Communications Manager Group\* SUB01-SUB02-CUCM-GROUP  
☒ Enable this Route List (change effective on Save; no reset required)  
☒ Run On All Active Unified CM Nodes

**Route List Member Information**  
Selected Groups\*\* VIDEO-MESH-RG  
Add Route Group  
Removed Groups\*\*\*

**Route List Details**  
VIDEO-MESH-RG

Save Delete Copy Reset Apply Config Add New

*i* \*- indicates required item.  
*i* \*\*Ordered by highest priority  
*i* \*\*\*Will be removed from Route List when you click Save

SIP Route Pattern Configuration

Cisco Webex Control Hub

Webex Video Mesh Node Setup

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<https://192.168.21.1/ccmadmin/sipRoutePatternEdit.do?key=a229a2>

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**SIP Route Pattern Configuration**
Related Links: [Back To Find/List](#) [Go](#)

Save
  Delete
  Copy
  Add New

**Status**

Add successful

**Pattern Definition**

Pattern Usage

Domain Routing

IPv4 Pattern\*

\*.webex.com

IPv6 Pattern

Description

VIDEO MESH CALL

Route Partition

< None > ▾

SIP Trunk/Route List\*

VIDEO-MESH-RL

(Edit)

☐ Block Pattern

**Calling Party Transformations**

☐ Use Calling Party's External Phone Mask

Calling Party Transformation Mask

Prefix Digits (Outgoing Calls)

Calling Line ID Presentation\*

Default ▾

Calling Line Name Presentation\*

Default ▾

**Connected Party Transformations**

Connected Line ID Presentation\*

Default ▾

Connected Line Name Presentation\*

Default ▾

Save

Delete

Copy

Add New

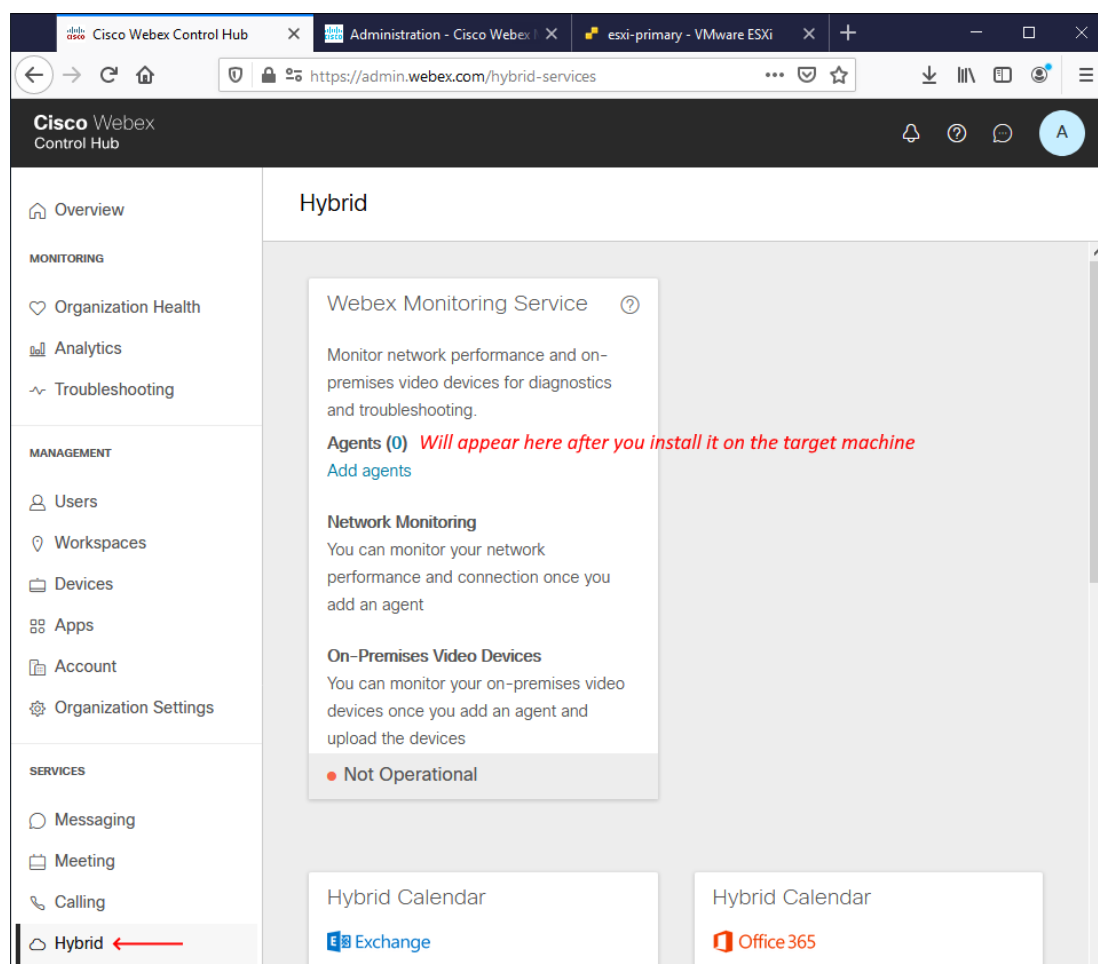
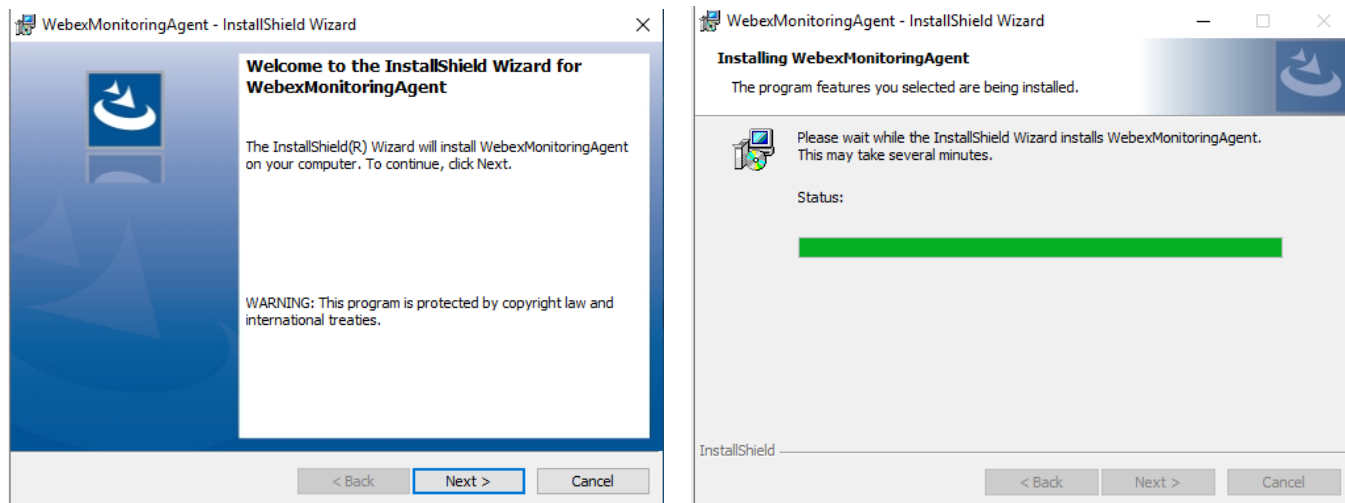
\*- indicates required item.

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## Webex Monitoring Hybrid Service

- Works on Windows Machines, Administrator installs an agent on target machine
- Agent self-register with cloud and provide service statistics and matrices of Webex service for that machine
- Agent captures the network statistics in every 15 minutes and send to Webex Cloud. Control Hub can retrieve those information

Go to Hybrid Services >> Webex Monitoring Service >> Download and install the agent



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## About the Author



Abdul Jaseem V. P is working as a Consulting Engineer at Cisco TAC Collaboration team Bangalore, India. He has 8 plus years of experience in VoIP, Collaboration and Networking industry. He is from a South Indian state called Kerala, Malappuram district.

He is an expert in Cisco Unified Communications Manager (CUCM), Cisco Unity Connection (CUC), IM and Presence (IMP), Unified Contact Center Express (UCCX), Voice Gateways, PRI, SIP, Cisco Unified Border Element (CUBE),

Expressways, Cisco Meeting Server (CMS), Telepresence and Webex Control Hub.

He started his career as a Desktop Support Technician in a retail supermarket chain located at Dammam, Saudi Arabia. 2 years later he came back to India, worked as a Technical Trainer and then Escalation Engineer at different organizations supporting UC and Collaboration Technology.

He is CCIE Collaboration #59174 certified and holds other industry standard certifications such as vmware VCP, DevNet, AWS Solution Architect Associate and Certified Kubernetes Administrator. Good at Automation and API development, received multiple awards from Cisco for innovation and automation.

This guide is the result of his many sleepless night and personal sacrifice during 2020 COVID-19 situation. Any corrections or suggestion, feel free to contact him via LinkedIn.