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February 15 – 19, 2016 • Berlin, Germany

We're ready. Are you?

Best Practices for Migrating Previous Versions of Cisco Unified Communications Manager (CUCM) to Version 11.0

BRKUCC-2011

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Agenda

1. Session Objectives and Scope
2. CUCM 11.0 Upgrade Definition and Upgrade Path
3. CUCM License
4. Virtualized CUCM
5. System Level Upgrade

- Q&A

* Cisco Unified Communications Manager = CUCM = Unified CM = CallManager

* Cisco Prime License Manager = PLM = Cisco Enterprise License Manager = ELM

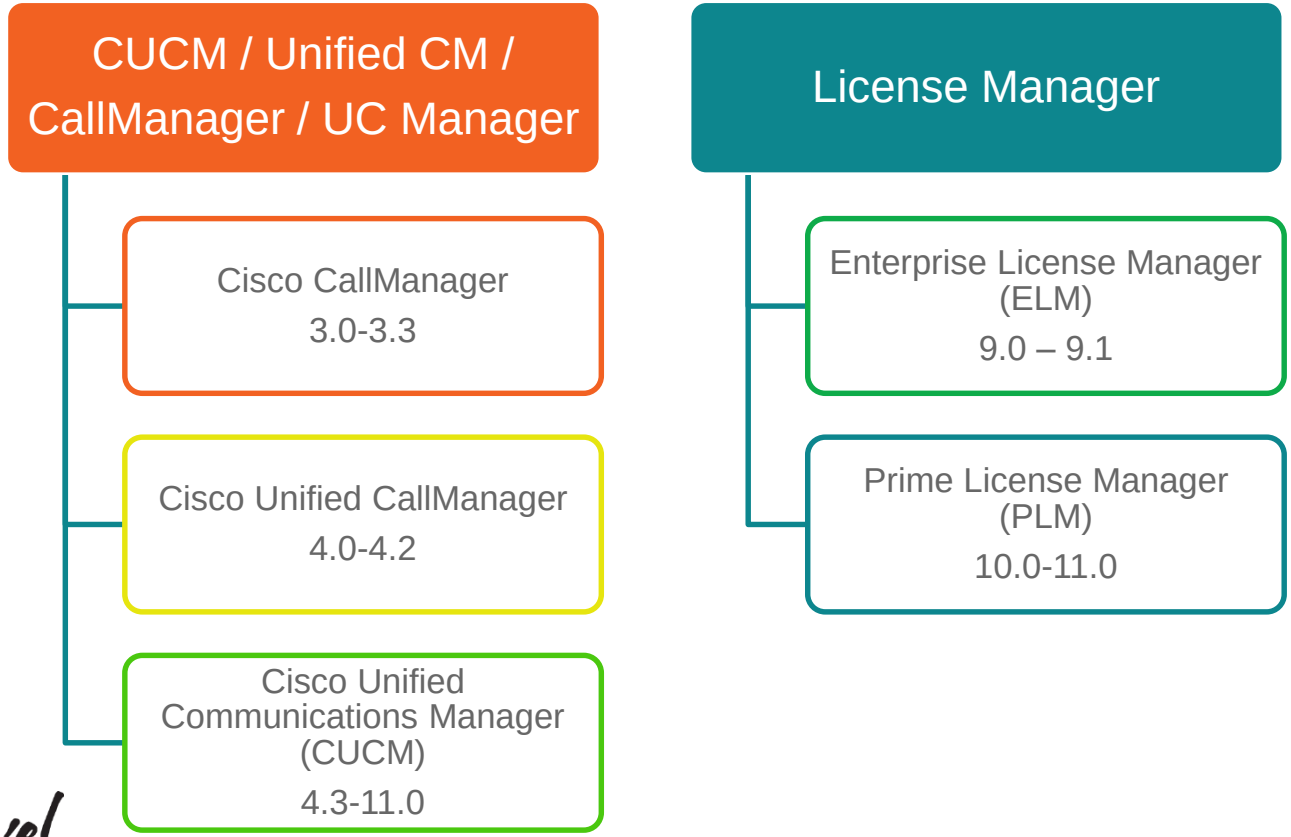
Session Objectives and Scope

1

Session Highlights

CUCM Migration	• Automated process with PCD • CUCM 10+ Virtualized ONLY (MCS → UCS)
Licensing and License Migration	• Manual process • Automated process
Prime Collaboration Deployment (PCD)	• CUCM Orchestration tool for operational tasks • Migrations, Upgrade, COP file installation, fresh installation or hostname/IP Address change

Solution Names and Versions



CUCM Platform Terminology

Reference

MCS, HP or IBM Servers

Appliance or bare metal servers

"Bare Metal CUCM"

vmware

TRC

CISCO

PCS

CISCO

Specs-Based

CISCO

hp invent

IBM

DELL

VMware Supported Servers

UC on UCS or UC virtualization

"Virtualized CUCM"

Session Scope

1 **Bare Metal CUCM** → **Virtualized CUCM 11.0**

2 **Virtualized CUCM** → **Virtualized CUCM 11.0**

- Platform conversion from bare metal CUCM to virtualized CUCM 11.0
- Upgrade or migrate to CUCM 11.0
- System level approach

CUCM 11.0 Upgrade Definition and Upgrade Path

2

CUCM Version, Build and Upgrade Schedule

CUCM Major/Minor Versions

CUCM Major Version	CUCM Minor Version
11.0	11.5
10.0	10.5
9.0	9.1
8.0	8.5 and 8.6
7.0	7.1
6.0	6.1
5.0	5.1

- Major and minor version upgrades requires active Cisco Software Support Service (SWSS)
- End of Sales support service contracts
  - Minor version upgrade requires active Essential Operate Service (ESW) contract
  - Major version upgrade requires active Unified Communication Software Subscription (UCSS) contract
- End of Sales (EOS) notice 

  - http://www.cisco.com/c/en/us/products/collateral/unified-communications/unified-communications-software-subscription/eos-eol-notice-c51-732026.html

End of Life/Support Notices and Release Selection

Milestone	Potential Activity	Summary
Before End-of-Sales Date	Ability to deploying new cluster	
After End-of-Sales Date	Start planning for upgrades	
End of SW Maintenance	Desire to complete the upgrade	

Deployment Models:

- Extended period on a single release with “Long-Life Release” (i.e. 10.5, 11.5, etc.)
- New features with “Short-Life Releases” (i.e. 11.0, 12.0, etc.)

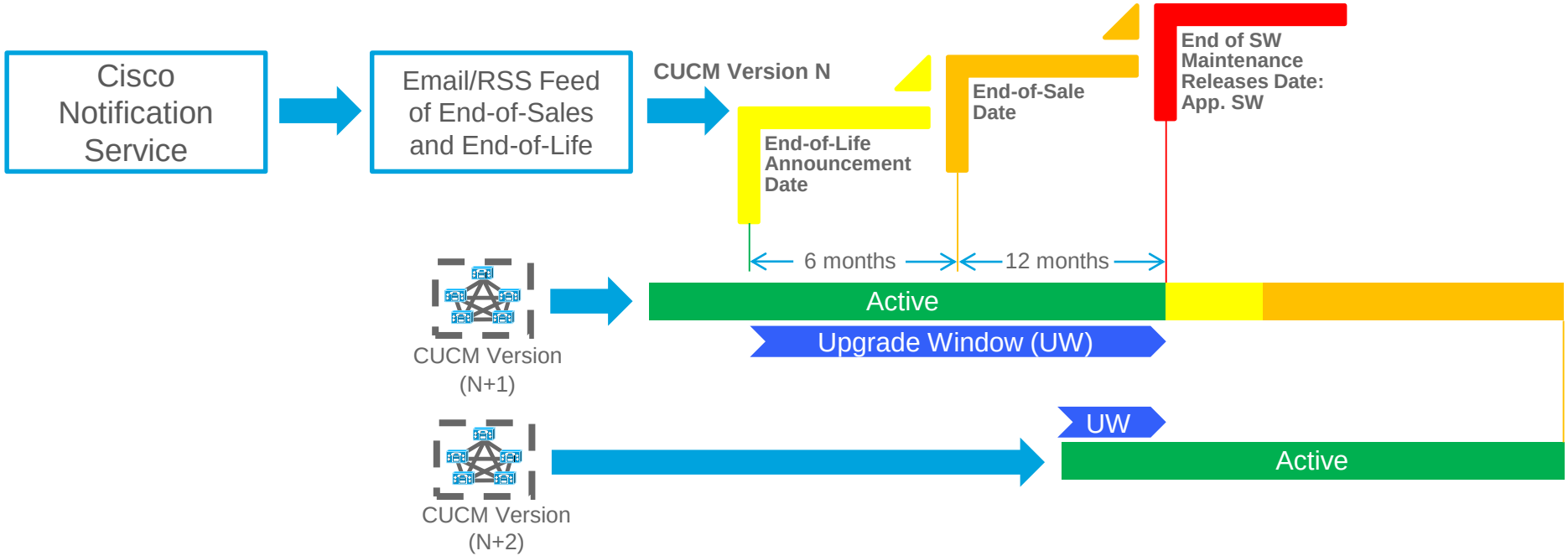
Upgrade Planning:

- Consistent release cycles New
- Predictable End of Sales/Support milestone durations

End-of-Life and End-of-Sale Notices
http://www.cisco.com/c/en/us/products/unified-communications/unified-communications-manager-callmanager/eos-eol-notice-listing.html

Sample Upgrade Schedule for Long-Life Release

New



Long-life release customers can upgrade to every Long-Life release or every other Long-life releases

Sample CUCM Versions and Builds

Reference

CUCM Version	CUCM Build
11.0(1a)SU1 NEW	11.0.1.21900-11
11.0(1a)	11.0.1.20000-2
10.5(2)SU3	10.5.2.13900-12
10.5(2)	10.5.2.10000-5
10.5(1)	10.5.1.10000-6
10.0(1)SU2	10.0.1.12900-2
10.0(1)SU1	10.0.1.11900-2
9.1(2)SU4	9.1.2.14900-14
9.1(2)SU2a	9.1.2.12901-3
9.1(2)SU2	9.1.2.12900-11
9.1(2)SU1	9.1.2.11900-12
9.1(2)	9.1.2.10000-28

(A.B.C.XYzzz-x)

(A) Major version (License)

10.5.2.10000-5

(B) Minor version (Long Life Release)

10.5.2.10000-5

(C) Maintenance release (Patch and/or Features)

10.5.2.10000-5

(X) Build (Patch)

10.5.2.10000-5

10.5.2.20000-5 (example)

(Y) FCS:0, ES or SU: 1-9

10.5.2.10000-5 (FCS)

10.5.2.11900-1 (ES or SU look at last three digits)

(zzz) FCS:000, ES: 001-899, SU: 900-999

10.5.2.10000-5 (FCS)

10.5.2.11001-5 (ES) (example)

10.5.2.11900-X (SU)

Upgrade Definition

Current CUCM Upgrade Process and Definition

L2 L2 Upgrade: Appliance/Virtual to Appliance/Virtual model

- Low complexity with possible shortest downtime
- Between CUCM versions with the same major RHEL versions
- (e.g. CUCM 10.0 to 11.0 or CUCM 10.5 to 11.0)

RU RU (Refresh Upgrade): Appliance/Virtual to Appliance/Virtual model with major RHEL version change (starting with RHEL 5)

- Medium complexity with possible longer downtime
- (e.g. CUCM 8.6 to 11.0 or CUCM 9.1 to 11.0)

PC Platform Change: Appliance to Virtualized model

- Variable complexity with variable downtime pending approach
- Single or multiple hop upgrade or migration
- (i.e. Bare metal servers that cannot run CUCM 10.0 or above)

L2 versus RU Upgrade

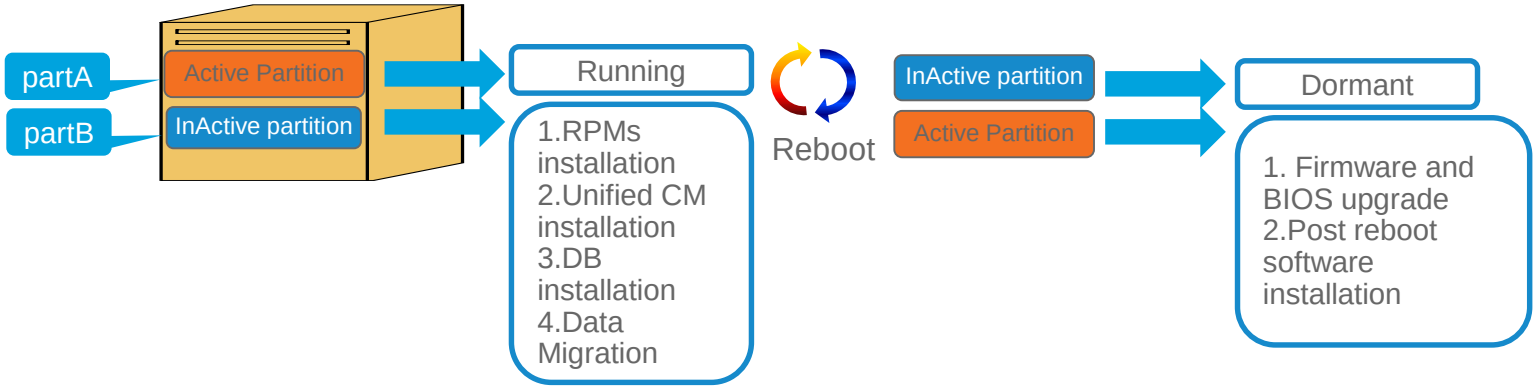
L2 Upgrade

- Active partition is running while software is upgraded on inactive partition
- Low downtime since upgrade can be done while system is functioning

RU Upgrade

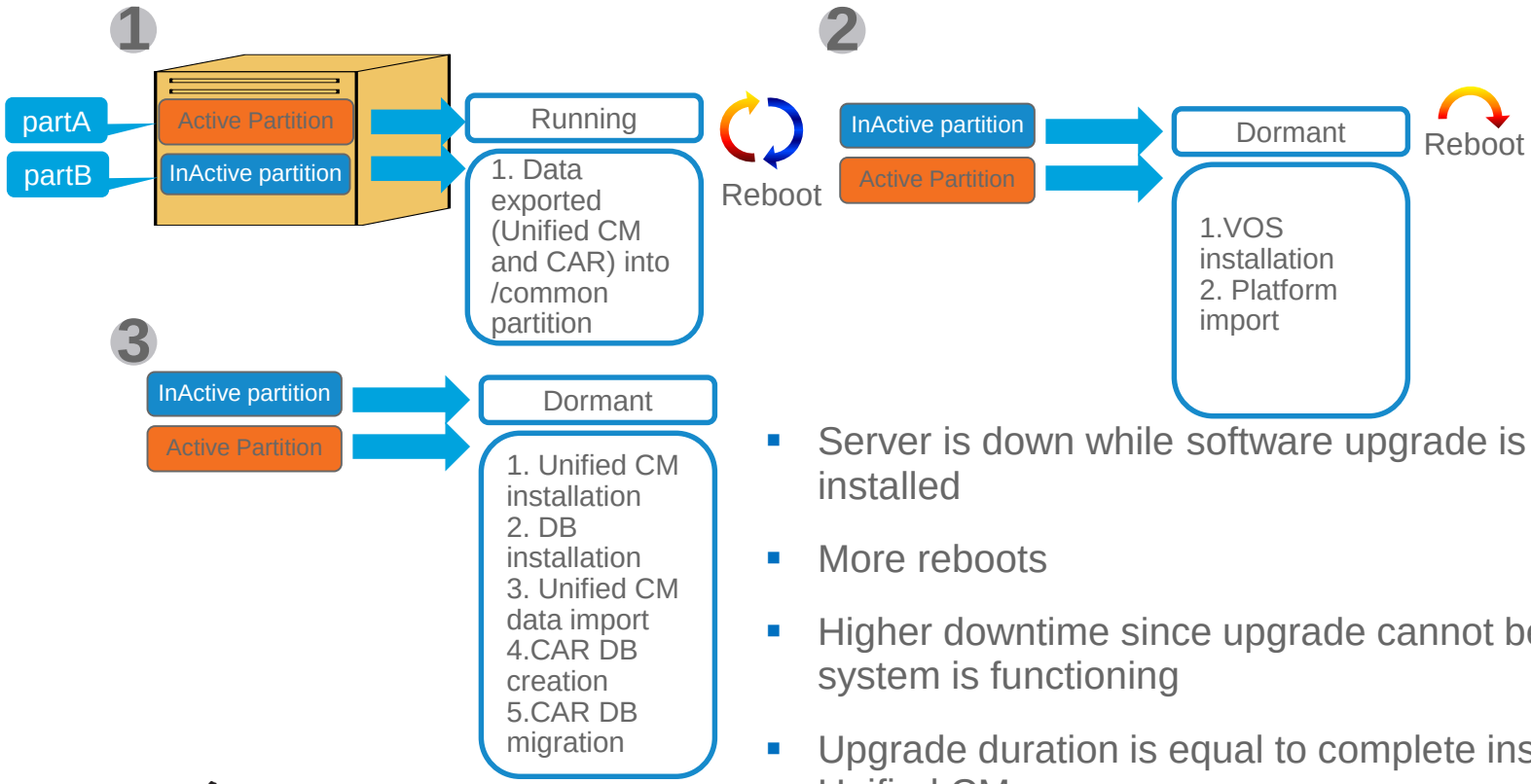
- Server is down while software is upgraded
- Higher downtime since upgrade cannot be done while system is functioning
- Upgrade Time is equal to complete installation of CUCM

L2 Upgrade



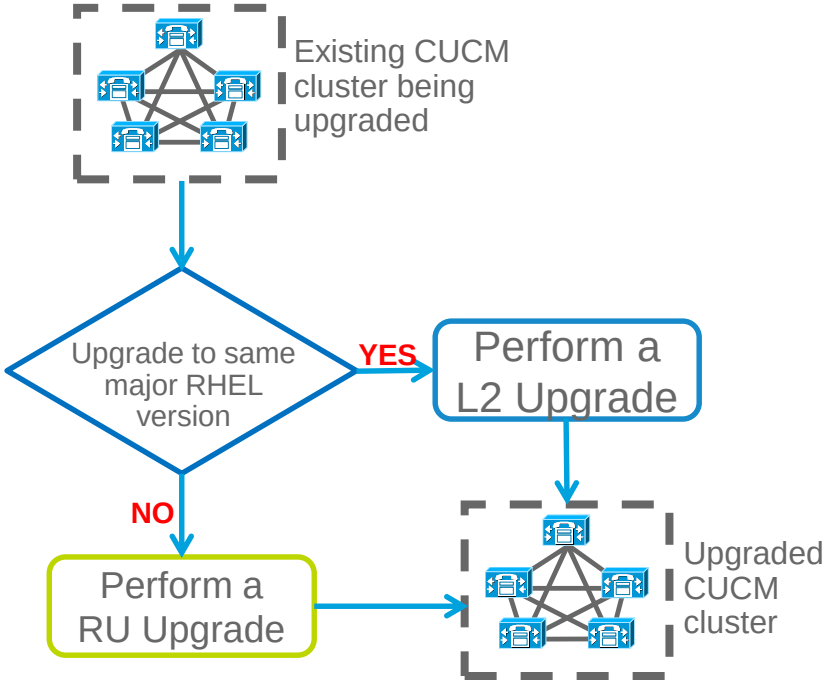
- Active partition is running while upgrade software is being installed on inactive partition
- Short downtime (20-30) min since upgrade can be done while system is functioning

Refresh Upgrade (RU)



- Server is down while software upgrade is being installed
- More reboots
- Higher downtime since upgrade cannot be done while system is functioning
- Upgrade duration is equal to complete installation of Unified CM

L2 and RU Upgrade: Appliance/Virtual to Appliance/Virtual Decision Tree



CUCM Version	RHEL Release
5.0(4)	RHEL 3 Update 6
5.1(x) & 6.X	RHEL 3 Update 8
7.0(1)	RHEL 4 Update 4
7.1(2)	RHEL 4 Update 6
7.1(3) & 8.0(x)	RHEL 4 Update 7
8.5	RHEL 4 Update 8
8.6*	RHEL 5 Update 5
9.X	RHEL 5 Update 7
10.0(1)	RHEL 6 Update 2
10.5(2)	RHEL 6 Update 5
11.0(1) New	RHEL 6 Update 6

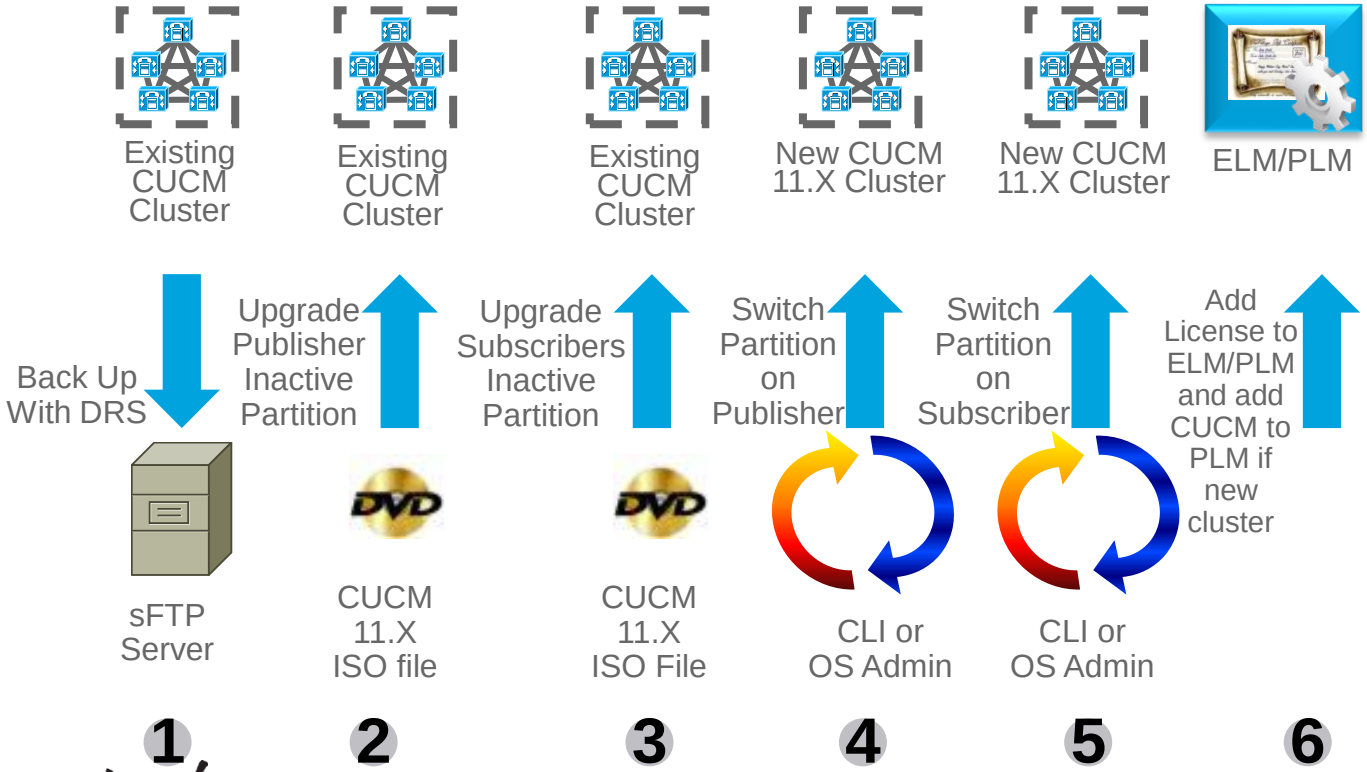
L2 L2 L2 RU

* RU starts with CUCM 8.6 or RHEL 5 for CUCM.

Refresh Upgrade (RU) and COP File

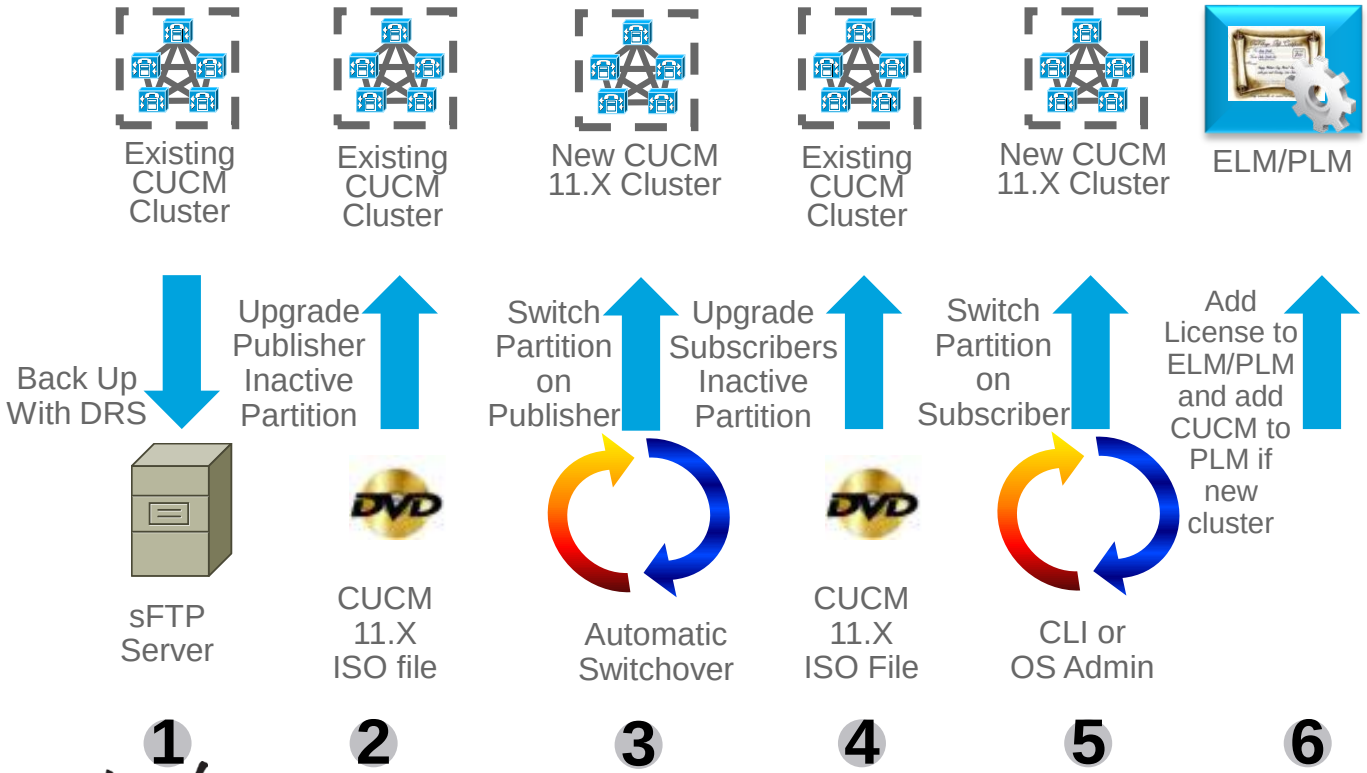
- Always Perform a DRS back up before upgrade
- Must Install the latest COP (ciscocm.refresh_upgrade_v1.5.cop.sgn) file on CUCM version 8.5 or earlier to allow for successful upgrade and limit switch version after upgrade
  - COP file is NOT required for CUCM version 8.6 or later to upgrade to 9.X +
  - Other COP file install(s) may be needed
    - ciscocm.free_common_space_v1.3.k3.cop.sgn (!!! Wipes Inactive Partition Clean !!!)
    - ciscocm.version3-keys.cop.sgn
- Track console to monitor progress of upgrade
- To minimize downtime, upgrade Publisher until completion, followed by dedicated MOH/TFTP servers and then backup Subscribers or secondary nodes and finally the primary Subscriber servers
  - Consider Automatically switch to new version after successful upgrade

In-Place L2 Upgrade Process



- Add version 11 of license for the appropriate ELM or PLM
  - Or Upgrade Standalone PLM to 11.0 First
- For 9.X to 11.X, upgrade IM&P after CUCM cluster is upgraded
- This scenario applies to virtualized CUCM only

In-Place RU Upgrade Process



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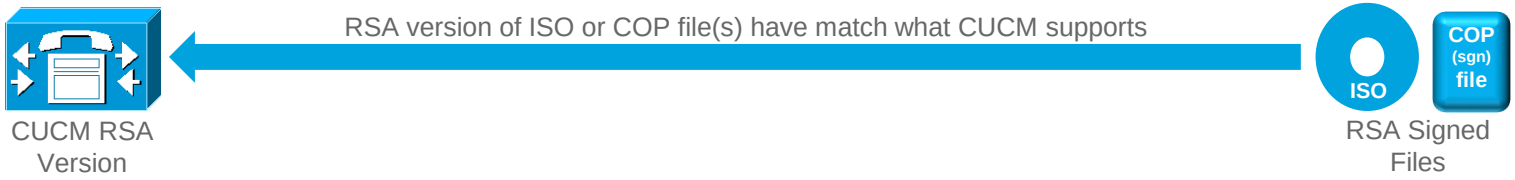
COP Files for Upgrades

CUCM and RSA (Rivest Shamir Adleman) Version

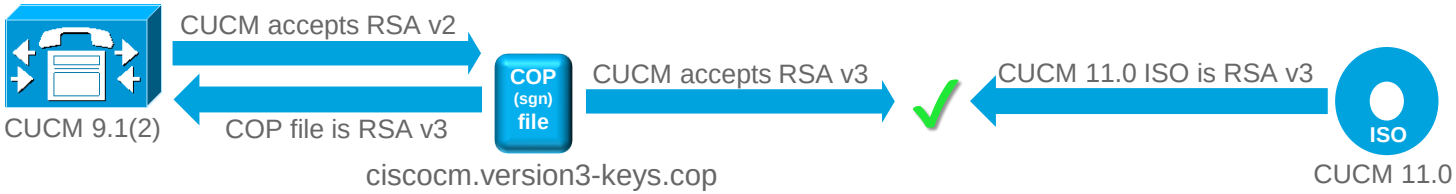


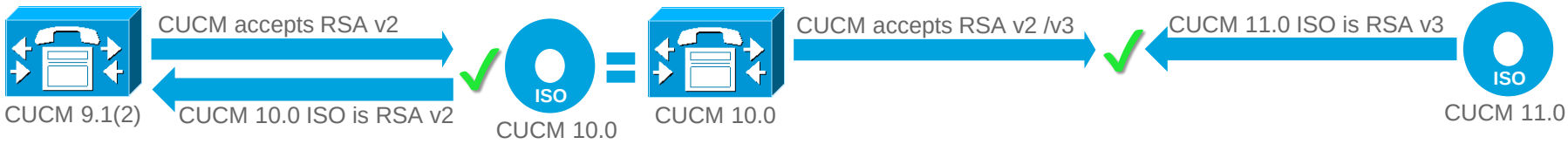
CUCM Build	RSA Version
< 8.5.1.17123-1	RSA v2
< 8.6.2.24122-1	RSA v2
< 9.1.2.11018-1	RSA v2
10.X	RSA v2 and v3
11.X	RSA v3

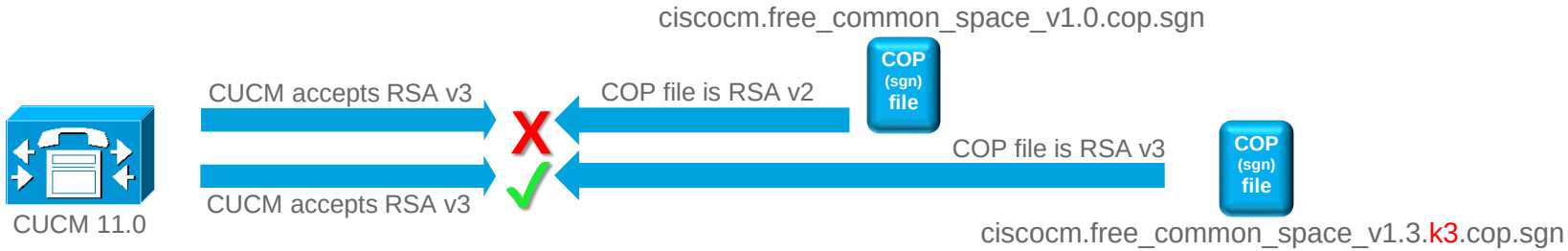
CUCM Build	Signed RSA Version
5.0(4) – 10.0(X)	RSA v2
10.5(1) or higher	RSA v3
ciscocm.free_common_space_v1.3.k3.cop.sgn	
Third party COP files need RSA v3 signature	

Only RSA v3 files can be added to CUCM 11.X and later

CUCM and ISO/COP Files







Verify that Third-party COP files have been signed with RSA v3 if installed onto CUCM 11.X or later:
2N, Ascom, Avara, BT, DoCoMo, Fujitsu, Intelbras, IP Blue, IP Trade, Mindshare, Mobile Heartbeat, Nokia, RIM, Sony, Speakerbus, Spectralink, Syn-Apps, Tandberg, Telecore, Telematrix, Verizon

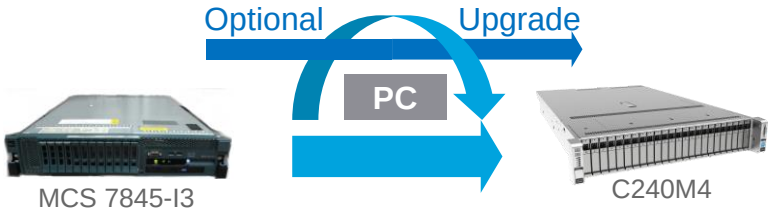
CUCM COP Files for Upgrade

Reference

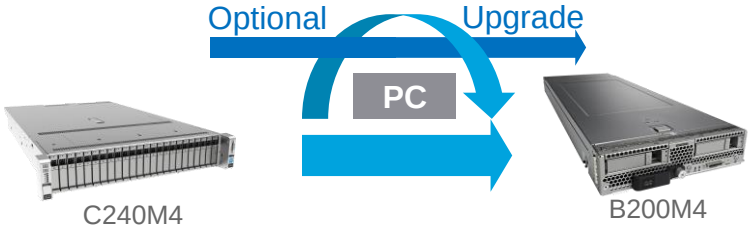
Curent Version	Target Version	
<8.5.1.17123-1 <8.6.2.24122-1 / 8.6(2)su5 <9.1.2.11018-1 / 9.1(2)su1	10.5(1) or higher	ciscocm.version3-keys.cop.sgn * 8.6(2)su5+ and 9.1(2)su1+ has v3 Keys pre-installed
8.5(x) or lower	8.6 or higher	ciscocm.refresh_upgrade_v1.5.cop.sgn
8.5(1), 8.6(2), 9.1(1), 9.1(2) or lower		ciscocm.vmware-disk-size-reallocation-1.0.cop.sgn
Any CUCM with <25GB available in Common	9.1(x) or higher	ciscocm.free_common_space_v1.3.**k3**.cop.sgn
6.1(4), 6.1(5), 7.1(3)	8.5(x)	ciscocm.allow_upgrade_to_unrestricted.cop.sgn

- Always Backup system before apply COP file
- Match RSA version of COP file to CUCM supported RSA version
- To check for COP file installed, use “show version active” in CLI or “Show > Software” in OS Admin

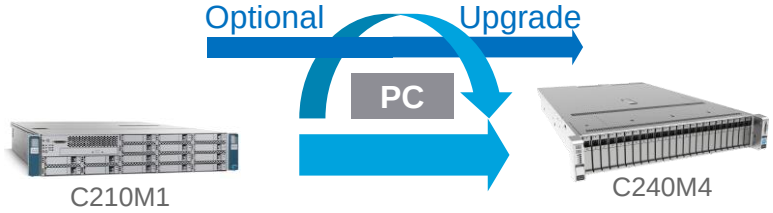
CUCM Platform Conversion (PC) with Examples



- Bare Metal or Appliance to Virtual Platform Conversion
- E.g. CUCM 10.X and later can only run virtualized
- E.g. MCS to UCS

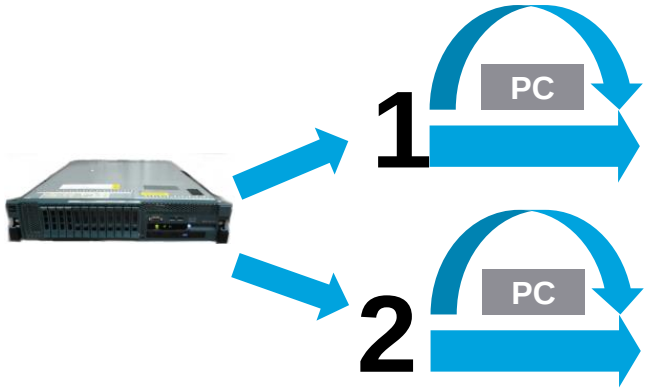


- Virtual to Virtual Platform Conversion
- E.g. Change from C-Series Rack Severs to B-Series Blade Servers



- Virtual to Virtual Platform Conversion
- E.g. Change older C-Series Rack Severs to current older C-Series Rack Severs

CUCM Platform Conversion (PC) Approaches



Cisco DRS (Disaster Recovery System):

Traditional method leveraging DRS backup and DRS restore to change platform only

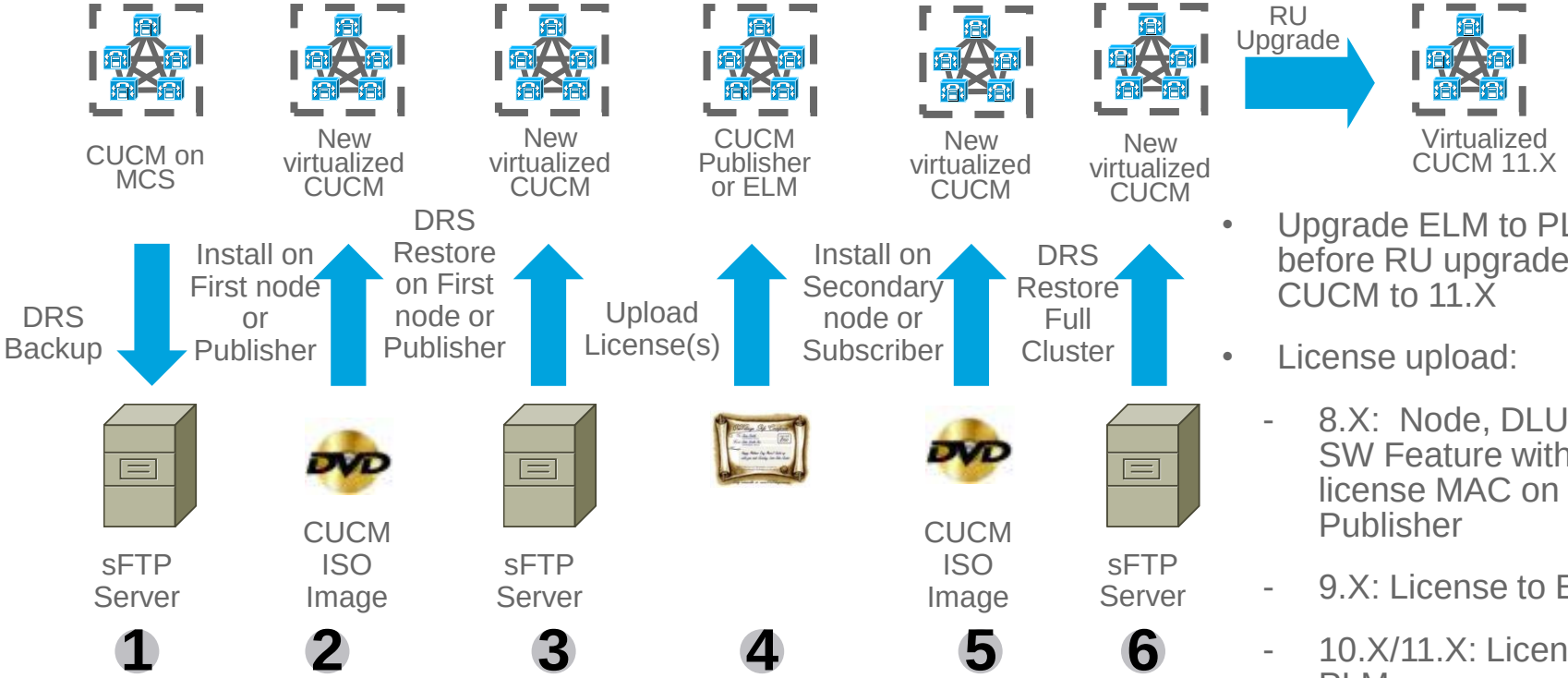
Cisco PCD (Prime Collaboration Deployment)

New method leveraging PCD to change platform and/or upgrade

Cisco DRS Approach

PC and Upgrade Using DRS for 8.0(2) - 9.1(2)

To 11.X



- Upgrade ELM to PLM before RU upgrade CUCM to 11.X
- License upload:
  - 8.X: Node, DLU and SW Feature with license MAC on Publisher
  - 9.X: License to ELM
  - 10.X/11.X: License to PLM

Replacing a Single Server or Cluster for Cisco Unified Communications Manager:
http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/install/11_0_1/replace/CUCM_BK_R13B8C48_00_replacing-a-single-server-cluster_1101.html

PC and Upgrade for 6.1(4), 6.1(5), 7.1(3) or 7.1(5)

To 11.X

- Leverage Jump Upgrade to by-pass MCS server limitation on running CUCM 8.X or later to get to CUCM version 9.1(2)
- RU upgrade to CUCM version 11.X
- For other CUCM clusters not on version 6.1(4), 6.1(5), 7.1(3) or 7.1(5), upgrade to the above releases

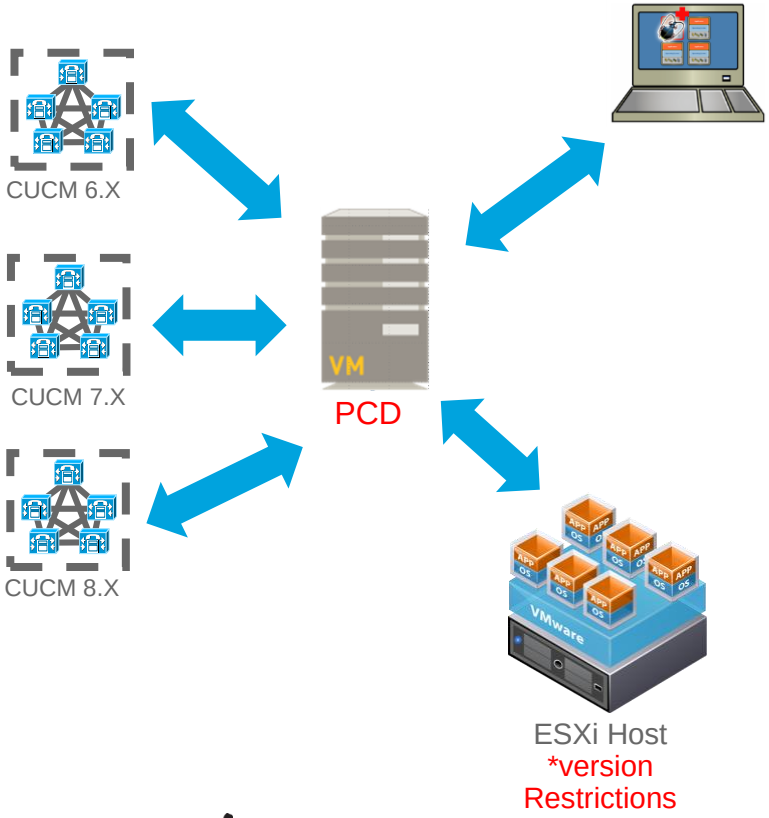
Detailed Jump Upgrade Process is in the appendix

Jump Upgrade Procedure:

https://supportforums.cisco.com/sites/default/files/legacy/3/6/1/15365163-Drive_to_Nine_Jump_upgrade_versions_4.1.3-7.1.5_to_9.1.2%5B2%5D.pdf

Cisco Prime Collaboration Deployment (PCD) Approach

Prime Collaboration Deployment (PCD)



- PCD is a VMware vApp used for management of Cisco collaboration applications:
  - CUCM
  - CUC
  - CUP / IM&P
  - CUCCX
- Management tasks (Upgrade, Switch Versions, Server Restart, Readdress, Install and Migrate) are based on collaboration application and version of the application
- VMware vApp is pre-configured virtual machine with OS and PCD application (1.5GB)
  - pcd_vApp_UCOS_11.0.1.20000-2_vmv7_v1.2.ova
  - PCD OVA containing preinstalled app ships as part of UCM media kit
- Available via PUT or TAC (NOT posted on CCO)
  - Updates are Posted on CCO under CUCM

CUCM Supported Tasks by PCD 11.0

Reference

Feature	CUCM 6.1(5)	CUCM 7.1(3), 7.1(5)	CUCM 8.0(1-3)	CUCM 8.5(1)	CUCM 8.6(1-2)	CUCM 9.x	CUCM 10.X	CUCM 11.X
Migration to 10.X/11.X New	X	X	X	X	X	X	X	X
Fresh Install							X	X
Upgrade + COP Install					X	X	X	X
Switch Version					X	X	X	X
Restart					X	X	X	X
Readdress (Hostname/IP Address Change)							X	X

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PCD Administration Guide:

http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/pcdadmin/11_0_1/CUCM_BK_PB6D9005_00_pcd-administration-guide-110/CUCM_BK_PB6D9005_00_pcd-administration-guide-110_chapter_011.html#CUCM_RF_S8D16CEC_00

CUP/IM&P Supported Tasks by PCD 11.0

Reference

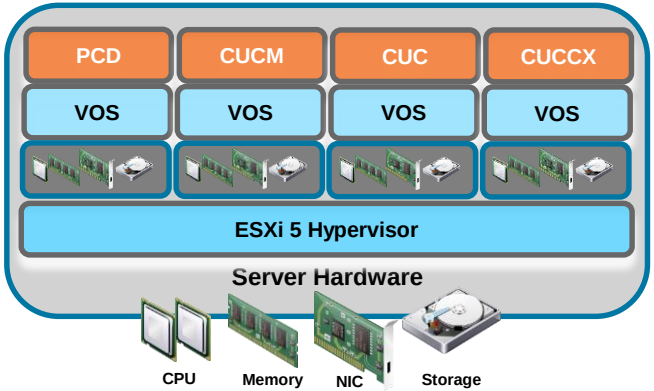
Feature	8.5(4)	8.6(3-5)	9.x	10.x	11.X
Migration to 10.X/11.X New	X	X	X	X	X
Fresh Install				X	X
Upgrade + COP Install		X	X	X	X
Switch Version		X	X	X	X
Restart		X	X	X	X
Readdress (Hostname/IP Address Change)					

PCD Administration Guide:

http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/pcdadmin/11_0_1/CUCM_BK_PB6D9005_00_pcd-administration-guide-110/CUCM_BK_PB6D9005_00_pcd-administration-guide-110_chapter_011.html#CUCM_RF_S8D16CEC_00

PCD Requirements

- Virtual machine virtual requirements
  - 2 vCPU
  - 4 GB vRAM
  - 80 GB vDisk
    - Consider Increasing after deployment
- VMware requirements
  - ESXi 4.1, 5.0, 5.1 and 5.5 NOT 6.0 
  - VMware API / License Requirements:
    - Cisco UC Virtualization Foundation, VMware vSphere Foundation, Standard Edition, Enterprise Edition, or Enterprise Plus Edition
    - CUCM-BE 6K and CUCM-BE 7K comes with Cisco UC Virtualization Hypervisor. Update to Cisco UC Virtualization Foundation



Product: VMware vSphere 5 Enterprise Plus Licensed
License Key: [redacted]
Expires: [redacted]

Product Features:
Unlimited virtual SMP
vCenter agent for VMware host
Reliable Memory
vShield Endpoint

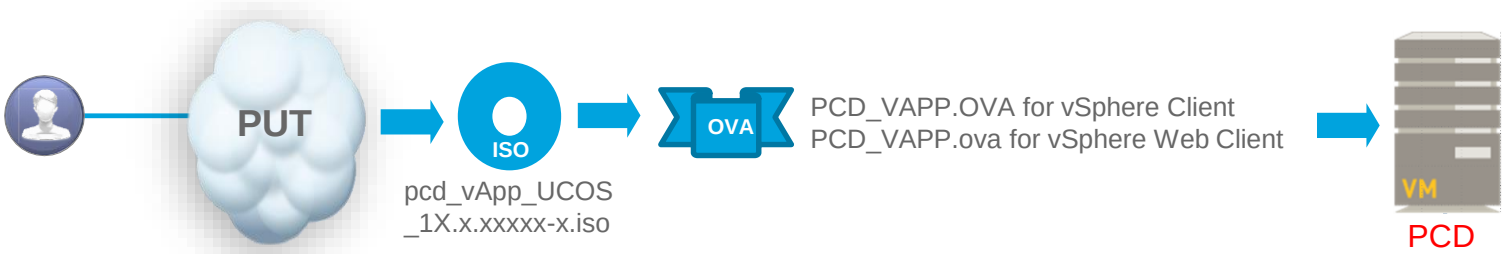
vSphere API
Storage APIs

vSphere HA
Hot-Pluggable virtual HW
vSphere vMotion
vSphere FT
vSphere Data Protection
vShield Zones
vSphere DRS
vSphere Storage vMotion
MPIO / Third-Party Multi-Pathing
vSphere Distributed Switch
vSphere Host Profiles
Remote virtual Serial Port Concentrator
vSphere Storage I/O Control
Direct Path vMotion
vSphere Storage APIs for Array Integration
Shared Smart Card Reader
vSphere Storage DRS
vSphere Profile-Driven Storage
vSphere vMotion Metro
vSphere Auto Deploy
vSphere View Accelerator
vSphere App HA
vSphere Flash Read Cache

PCD Administration Guide:
http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/pcdadmin/11_0_1/CUCM_BK_PB6D9005_00_pcd-administration-guide-110/cisco_prime_collaboration_deployment_configuration_and_administration.html

Ordering and Deploying PCD for Upgrade

Reference



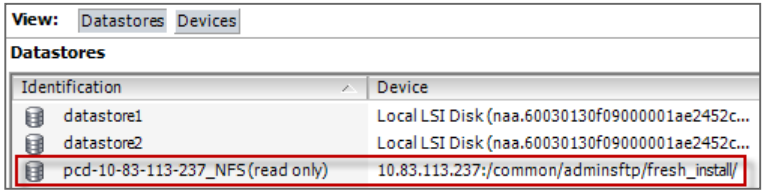
PCD Version	PCD Build
11.0(1)	11.0.1.20000-2 NEW
10.5(3)SU1	10.5.3.11900-3
10.0(1)	10.0.1.10000-14

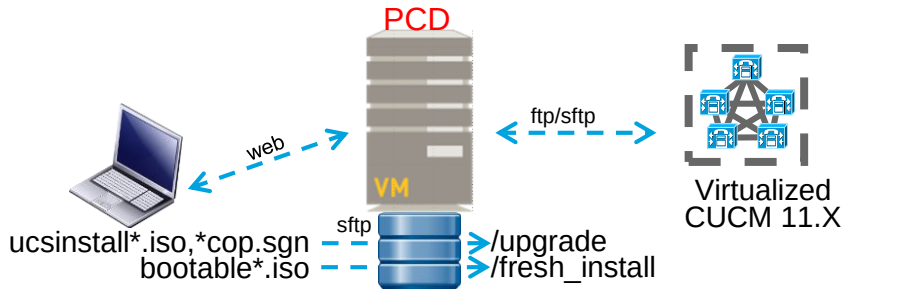
- Product Upgrade Tool (PUT) - www.cisco.com/upgrade
- PCD part of “CUCM Software Version 10.X/11.X for PUT Only”
- Download as pcd_vApp_UCOS_11.0.1.20000-2.iso

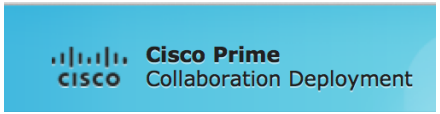
PCD Administration Guide:
http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/pcdadmin/10_5_1/CUCM_BK_U35347D2_00_pcd-administration-guide-1051.pdf

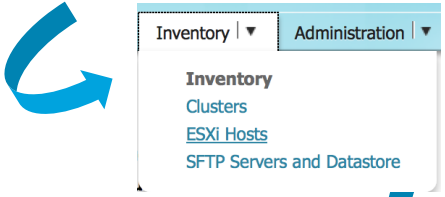
PCD Interactions with External Components

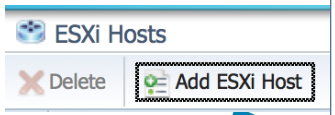
- PCD and VMware ESXi communication
  - ESXi host root credential
  - NFS mounts PCD /fresh_install directory
    - ESXi Support Limitations 5.x vs 6.0
    - ESXi License Requirements
  - Data center or server team coordination

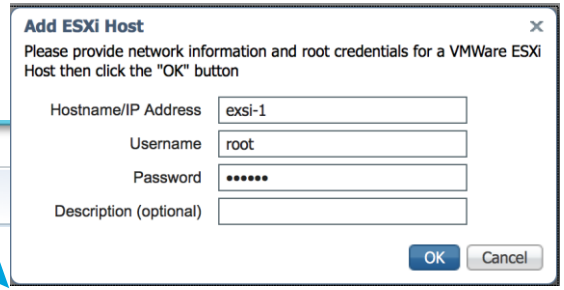






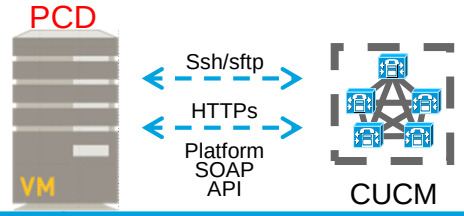




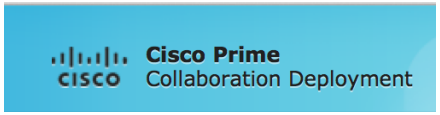


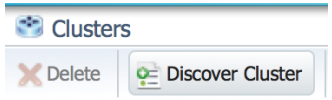
PCD Interactions with External Components Cont.

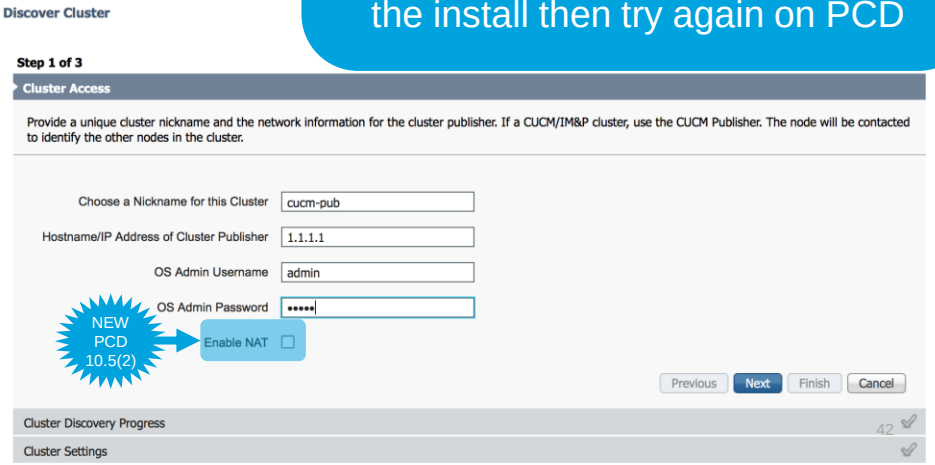
- PCD and CUCM communication
  - CUCM OS admin credential
    - Install ciscocm.ucmap_platformconfig.cop during Discovery and certain PCD Tasks such as Migration / Data Export
    - Platform SOAP API for certain PCD Tasks such as Restart, Upgrade, Switch Version
      - Requires Platform SOAP Services to be activated on CUCM 8.6 on all Nodes



If Discovery or Migration Task is stuck its possible this COP Install has stalled/failed.
Workaround: From Platform CLI or GUI “Assume control”, then cancel the install then try again on PCD

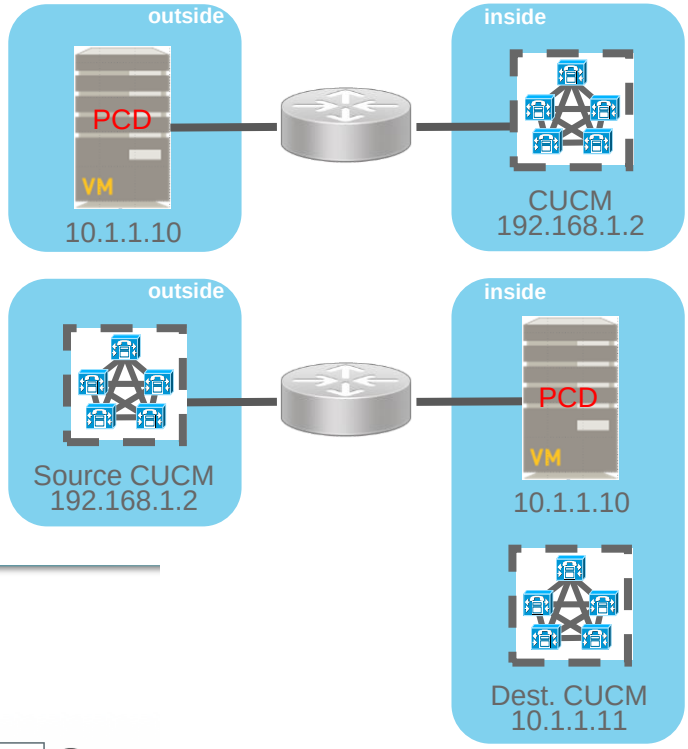


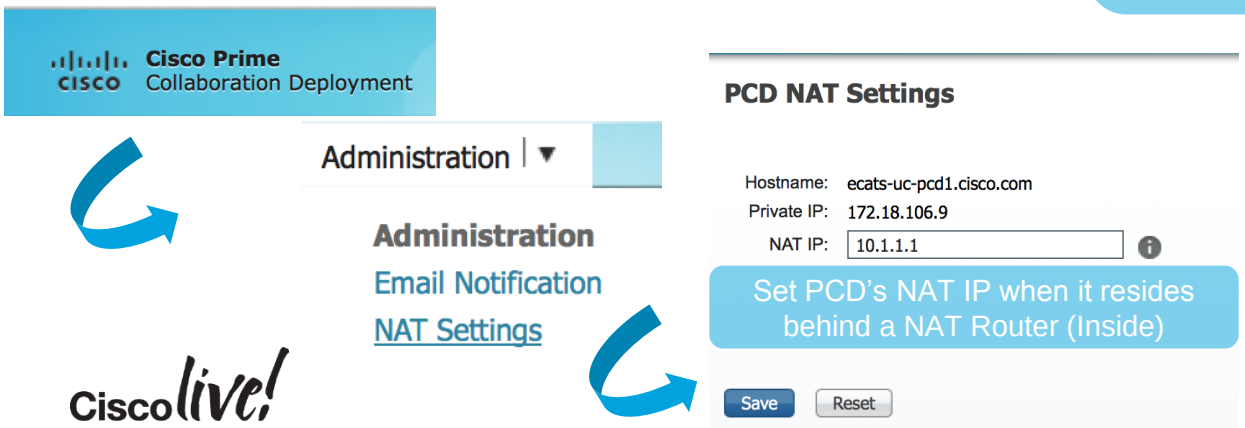




PCD Interactions with External Components Cont.

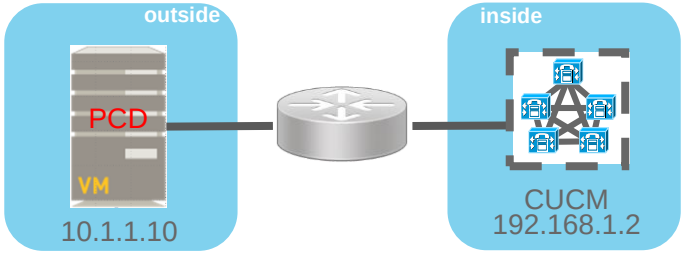
- PCD and CUCM communication
  - Static NAT support with PCD 10.5(2)+
    - PCD Behind NAT
    - CUCM Behind NAT
    - PAT not enough need 1 to 1 Static NAT

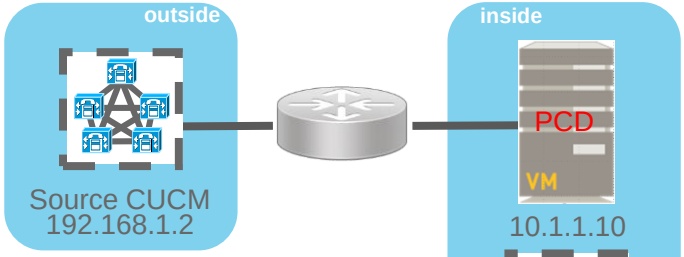


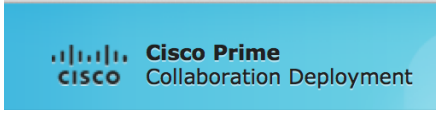


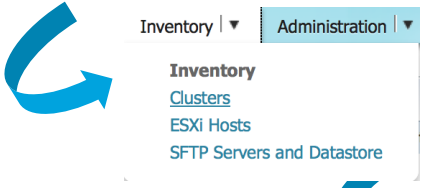
PCD Interactions with External Components Cont.

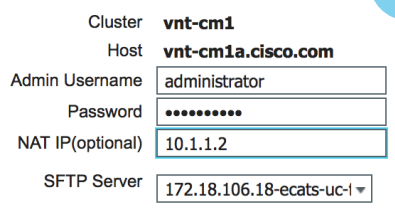
- PCD and CUCM communication
  - Static NAT support with PCD 10.5(2)+
    - PCD Behind NAT
    - CUCM Behind NAT
    - PAT not enough need 1 to 1 Static NAT





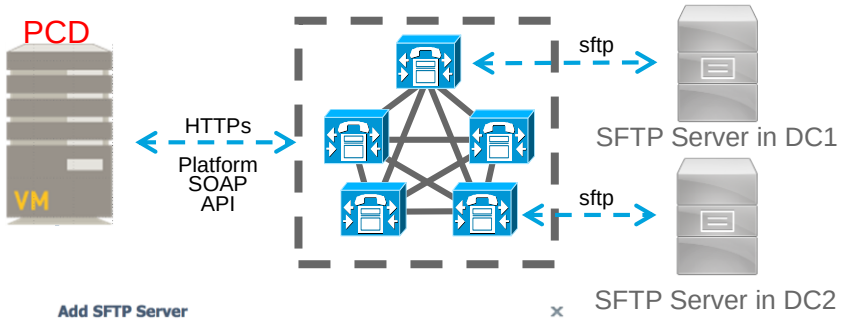


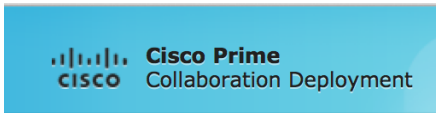


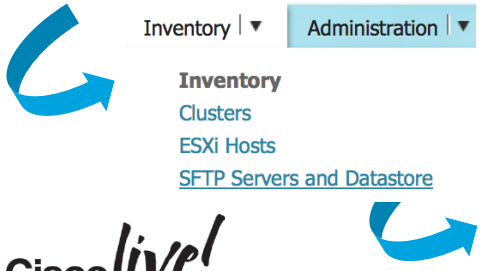


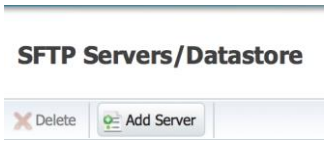
PCD Interactions with External Components Cont.

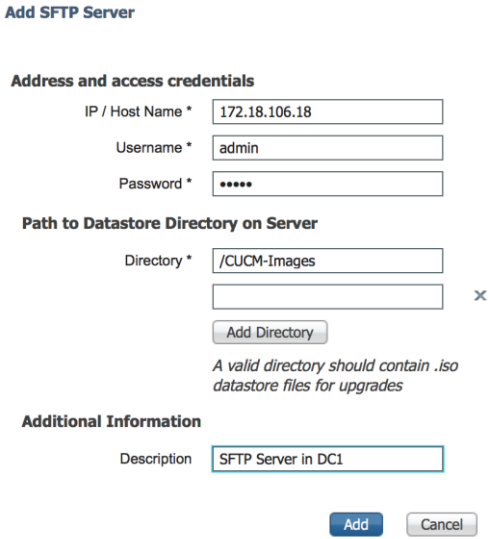
- PCD and CUCM communication
  - Remote SFTP Support for Upgrades or COP file Installs
    - Multi SFTP Server Support
  - Fresh Installs / Migrations must use PCD NFS Mount





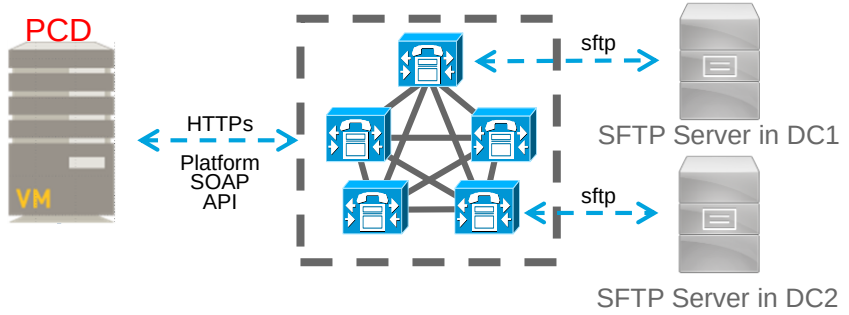


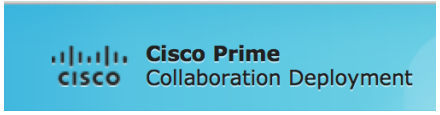


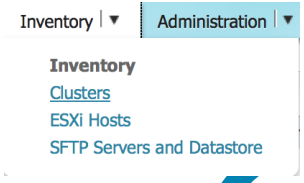


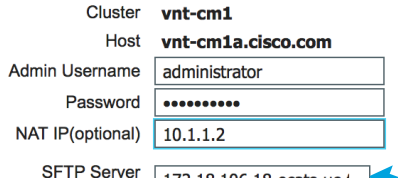
PCD Interactions with External Components Cont.

- PCD and CUCM communication
  - SFTP Server Details must be assigned to each CUCM Node
  - Default is localhost = PCD Local Folder /upgrade



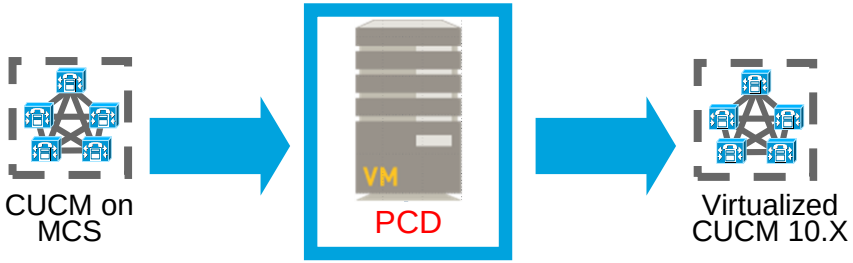






Automated Platform Conversion with PCD

To 10.X +

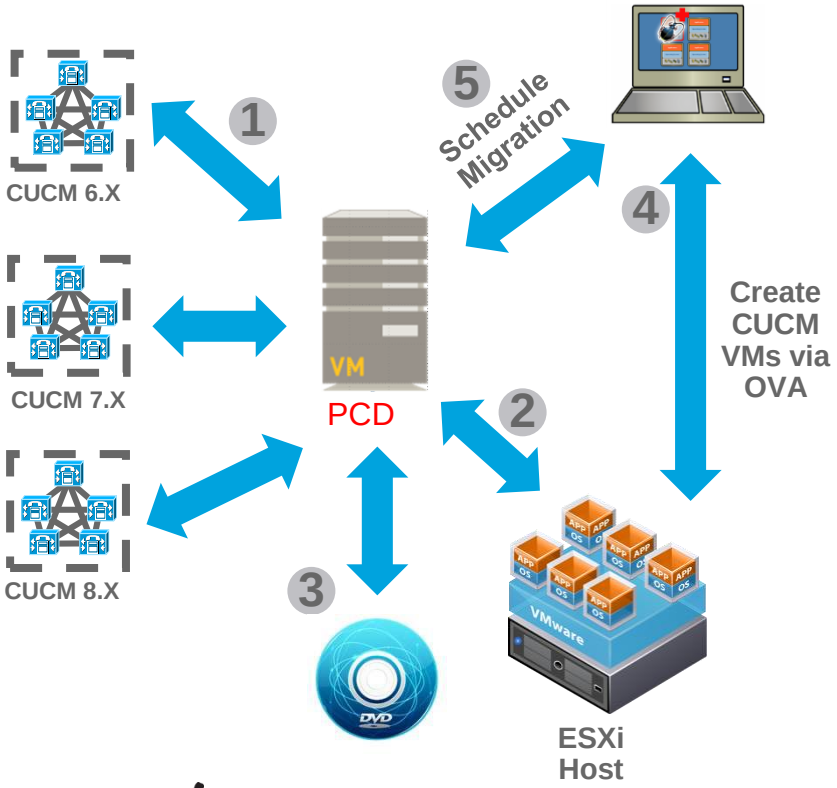


- Bare metal CUCM to virtualized CUCM (P2V)
  - Installs ciscocm.ucmap_platformconfig.cop & ciscocm.migrate-export-vX.Y.cop file to the source servers to export data
  - Builds a new migration cluster (Manual Task Required to deploy OVAs)
  - Exports and Imports data
- Same or different destination IP address and/or hostname
- Source or Destination Migration Cluster can be behind NAT
- Scheduled or immediate execution

Sample Powershell Script in Appendix**

NEW PCD 10.5(2)

Automated Platform Conversion with PCD

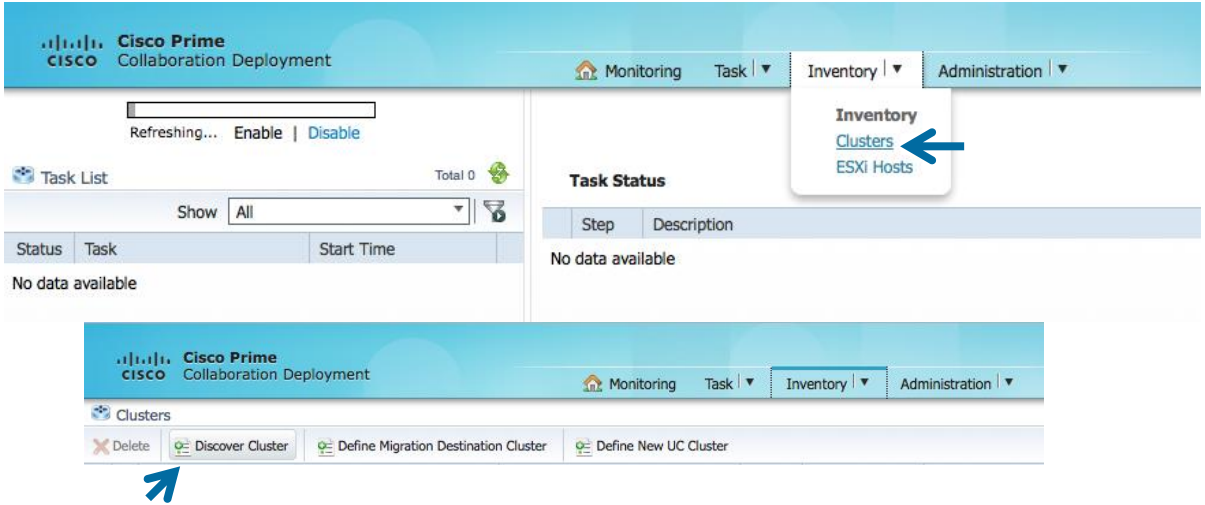


- CUCM Bootable ISO provided to ESXi Hosts via NFS service running on PCD
- Migration (M1) Steps

1. Add Source CUCM Clusters to PCD Inventory
2. Add ESXi Hosts to PCD Inventory
3. Add CUCM Bootable ISOs to PCD SFTP Server (adminsftp user / fresh_install folder)
4. Deploy Empty CUCM VM on ESXi Hosts via OVA
5. Map Physical Nodes to Virtual VMs and Schedule Migration Tasks

Reference

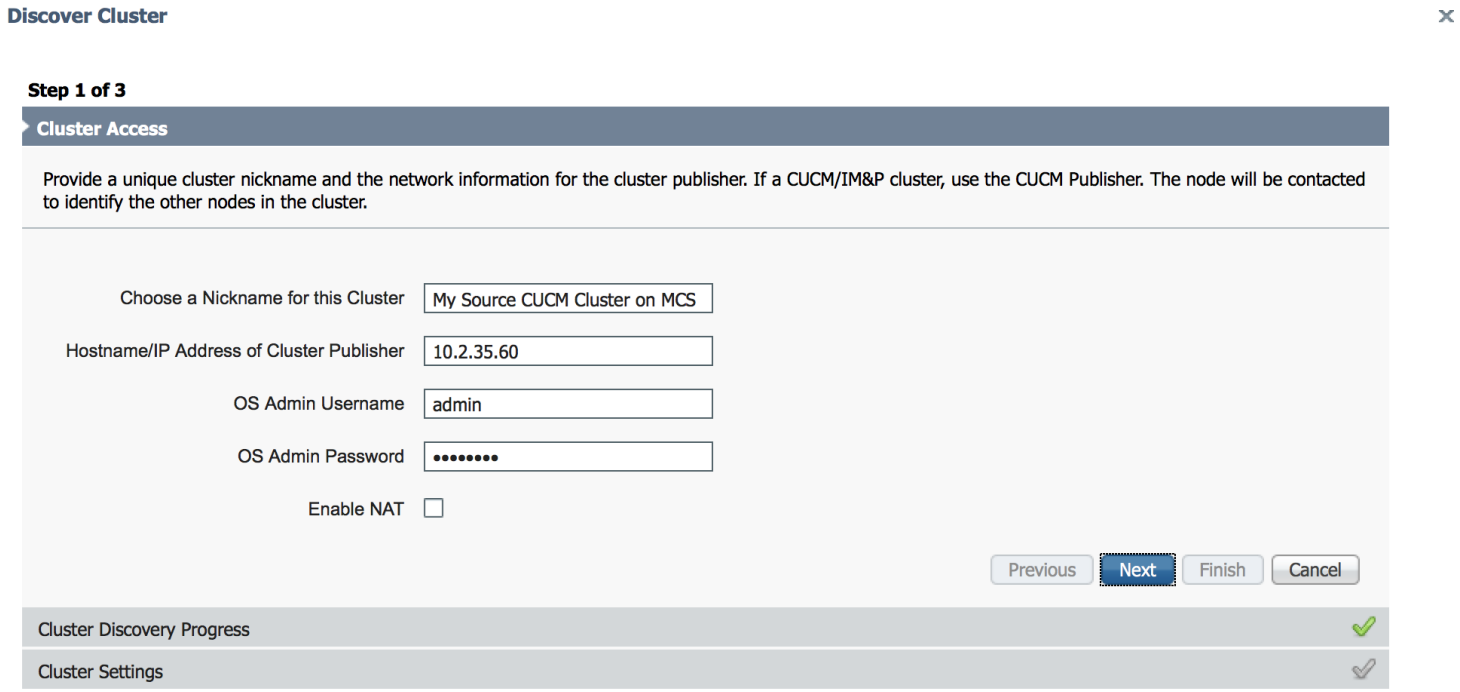
PCD Inventory Source Cluster Discovery



- First we need to Discover the Source CUCM 7.1(5) Cluster

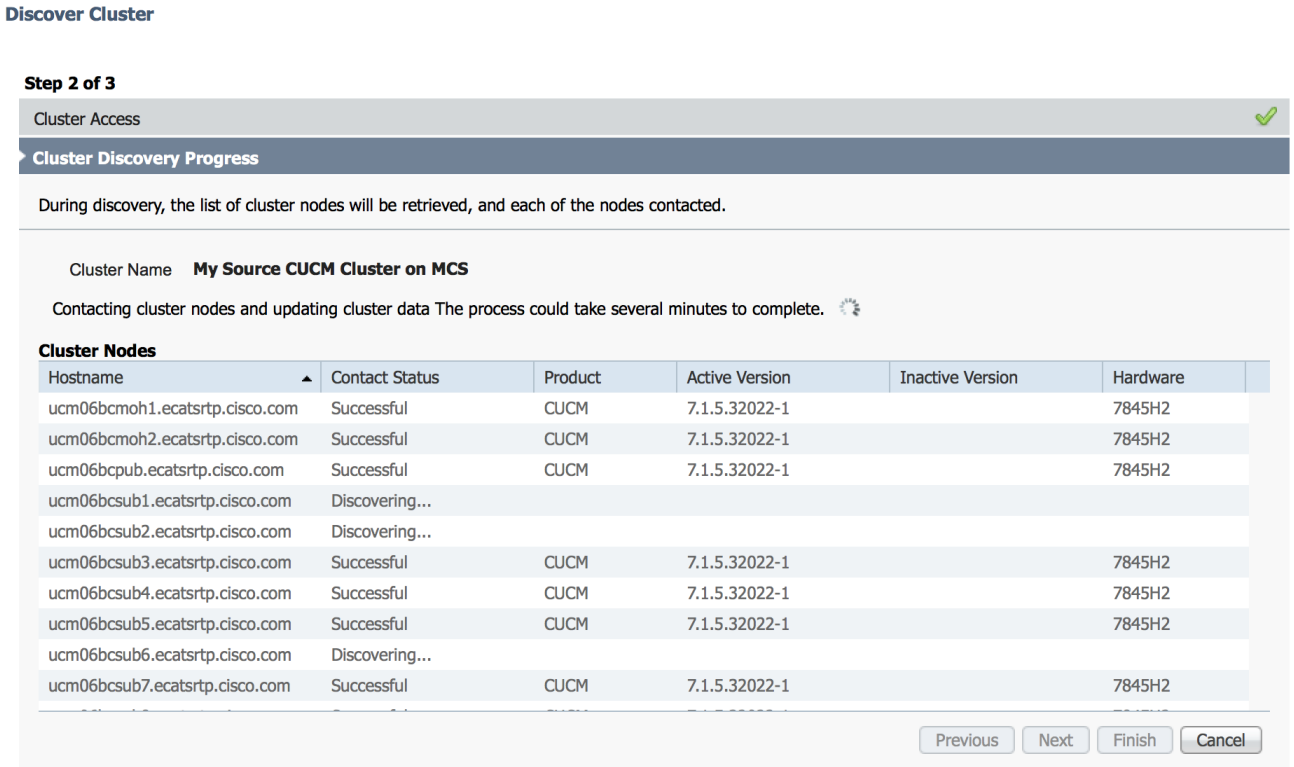
Reference

PCD Inventory Source Cluster Discovery – Step 1



Reference

PCD Inventory Source Cluster Discovery – Step 2

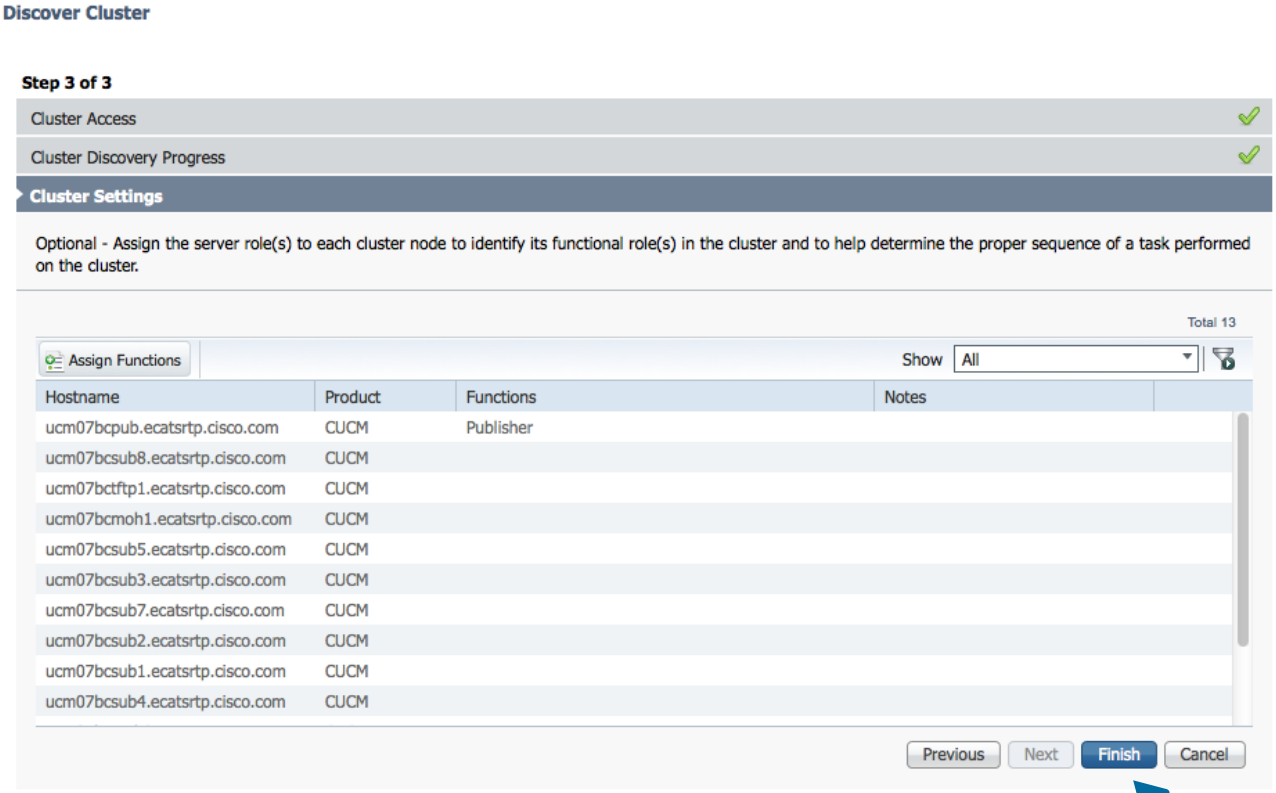


Installs these COP Files

- ciscocm.ucmap_platformconfig.cop
- ciscocm.migrate-export-v1.13.cop

Reference

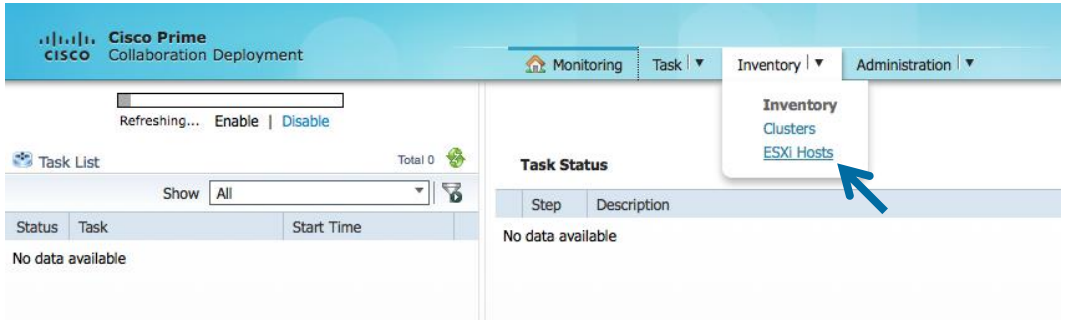
PCD Inventory Source Cluster Discovery – Step 3

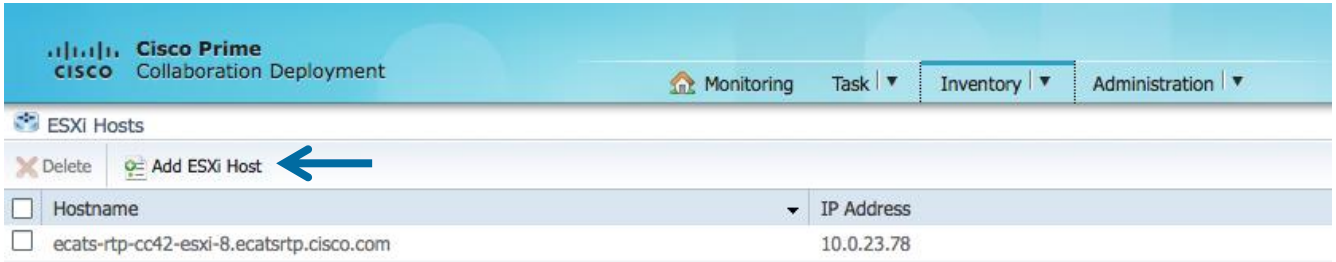


- This Step can be skipped
- Not Required for Migration Job

Reference

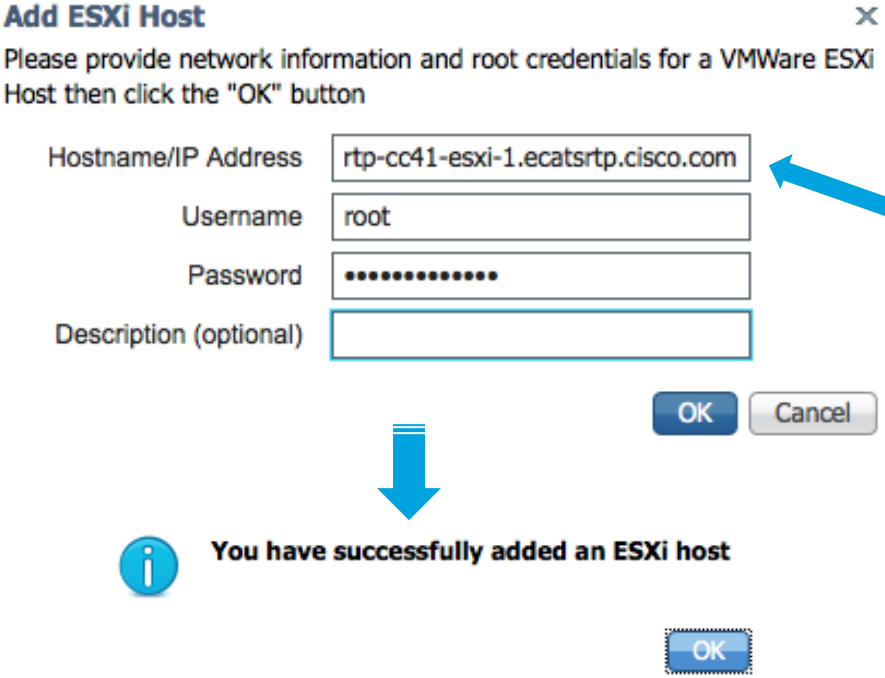
PCD Inventory ESXi Hosts

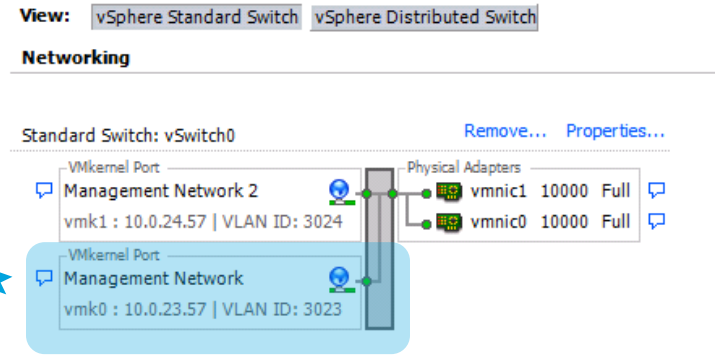


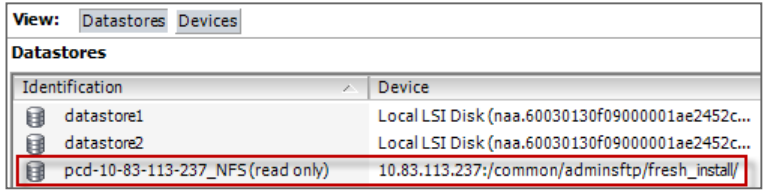


Reference

PCD Inventory Add ESXi Hosts

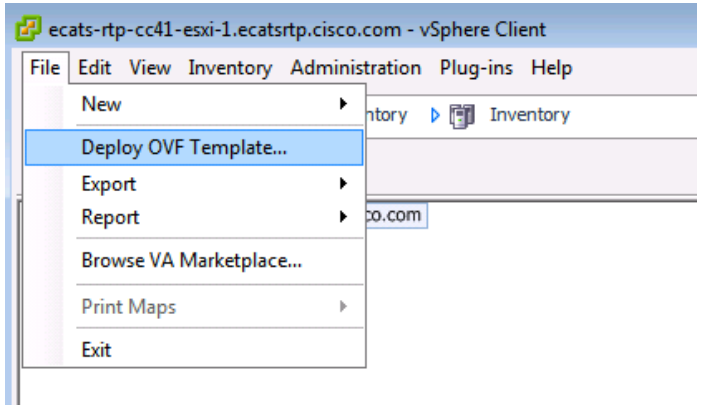


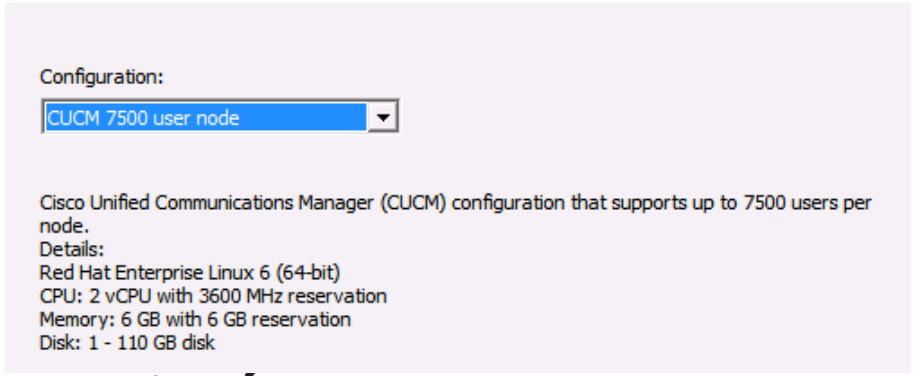




Reference

Deploy Destination CUCM Virtual Machines

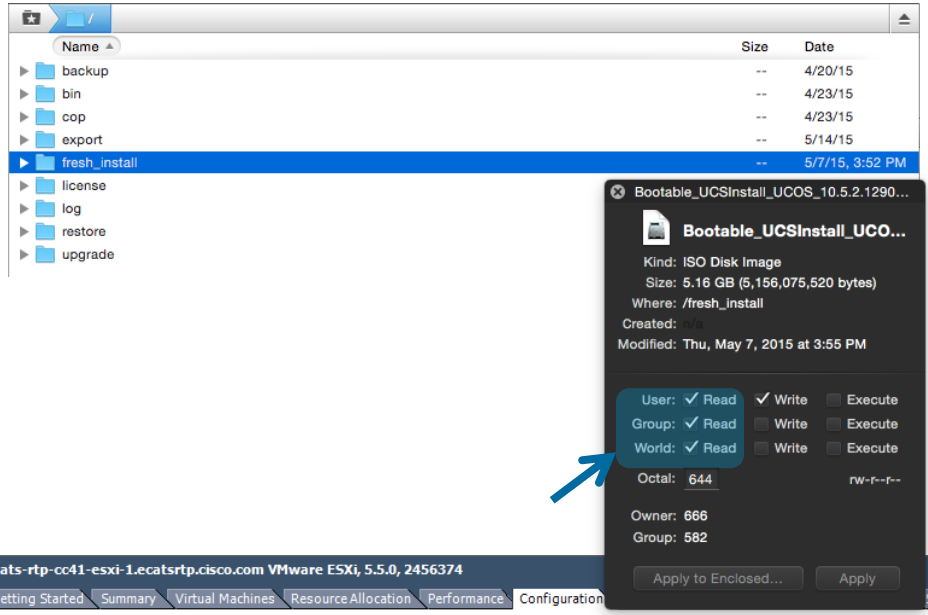




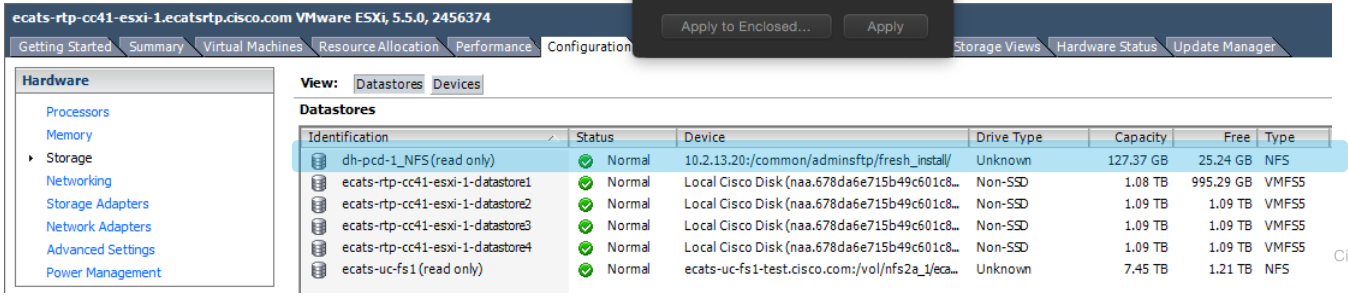
- Deploy CUCM using CUCM 10.0/11.0 OVA
  - cucm_10.5_vmv8_v1.8.ova
  - cucm_11.0_vmv8_v1.0.ova
  - 7500 / 10k User Configuration
- Deploy CUCM VMs to their assigned ESXi Hosts following Hardware Sizing Guidelines
  - Cisco Collaboration Virtual Machine Placement Tool
- These Empty CUCM VMs will be assigned to the Destination Migration Cluster in the following steps

Reference

Upload CUCM Bootable ISO to PCD Datastore

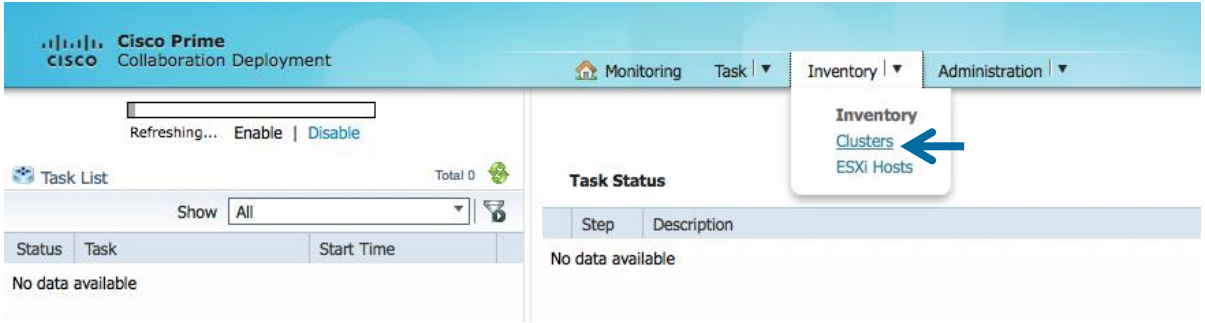


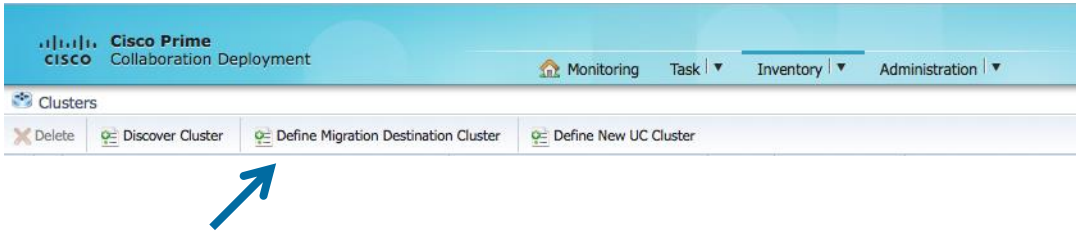
- Upload Bootable CUCM ISO Files to PCD fresh_install folder
- Use SFTP to connect to PCD
  - Username adminsftp
  - Password OS Admin password
- Make sure the Uploaded file has Group + World Read Access
- ESXi Hosts will mount PCD fresh_install folder as NFS datastore



Reference

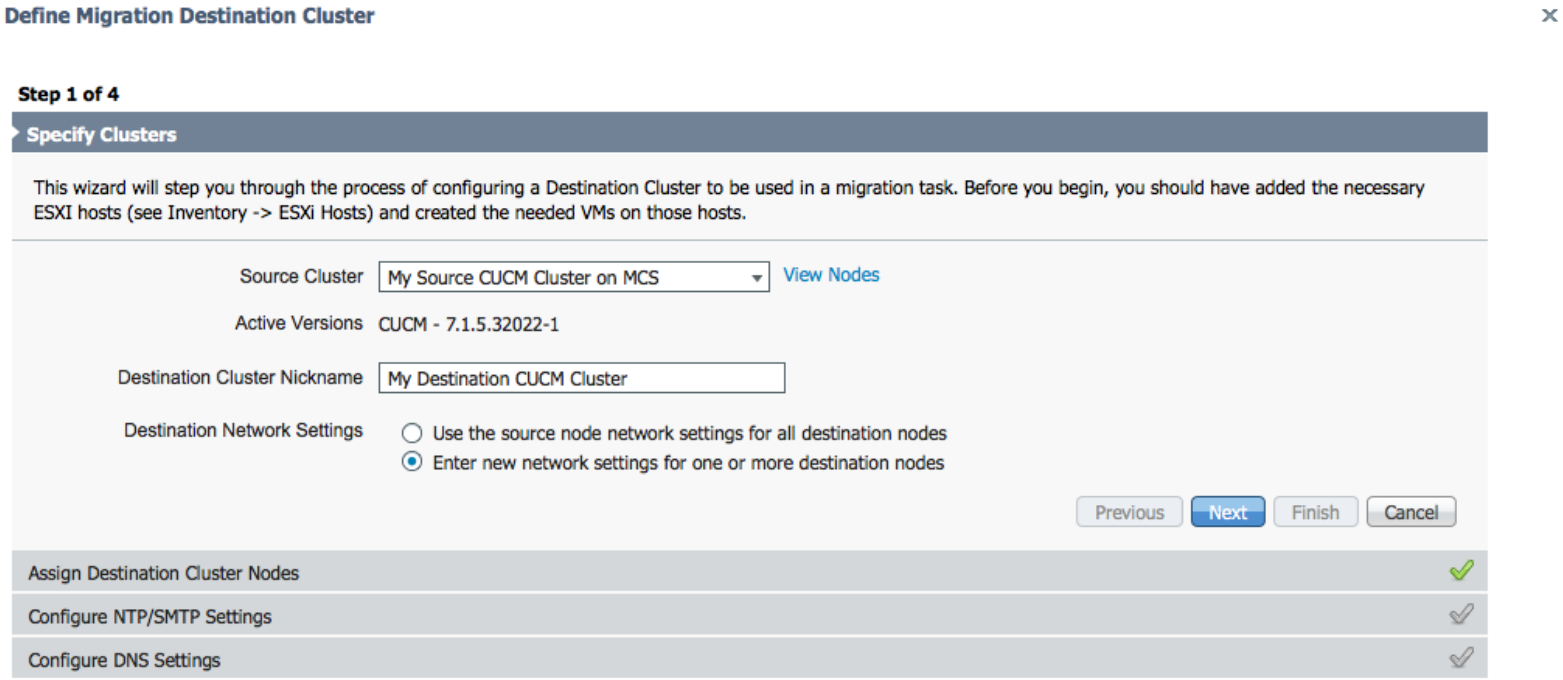
PCD Inventory Define Destination Cluster





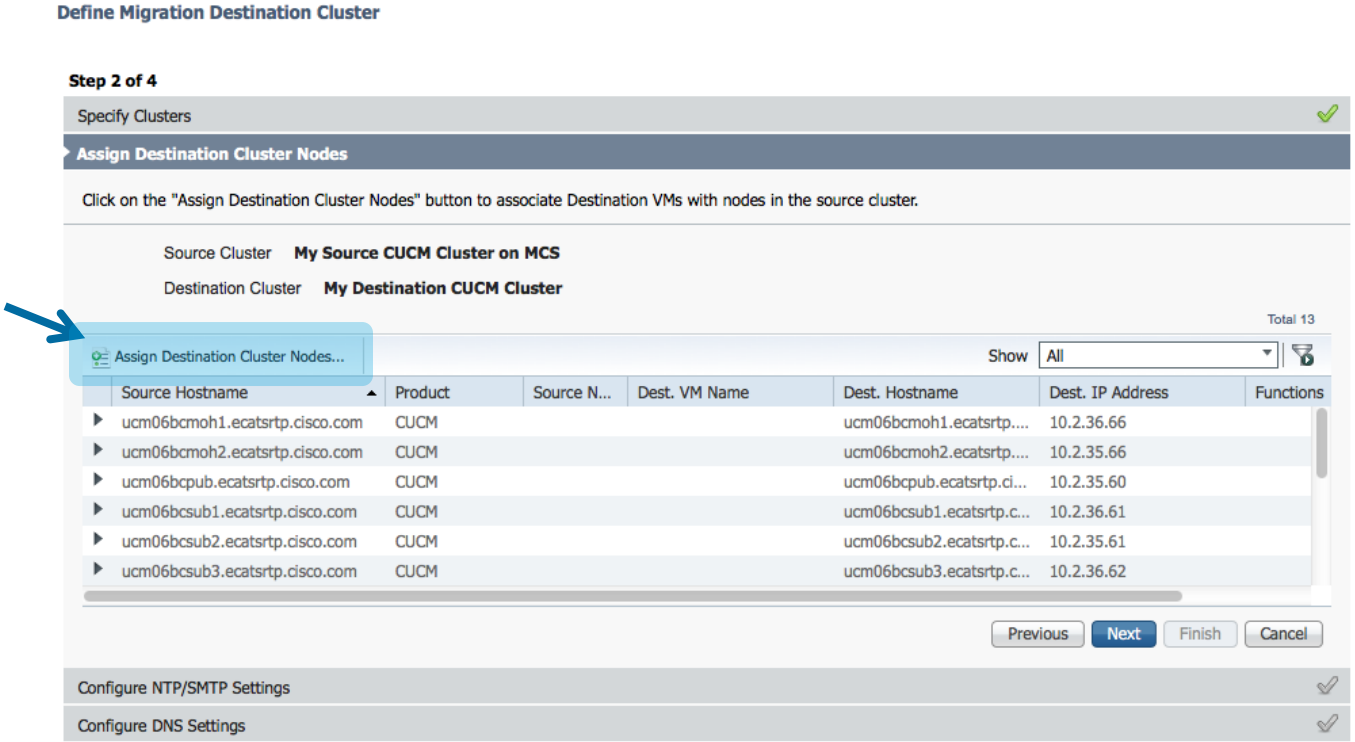
Reference

PCD Inventory Define Destination Cluster – Step 1

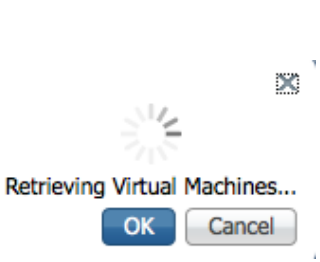


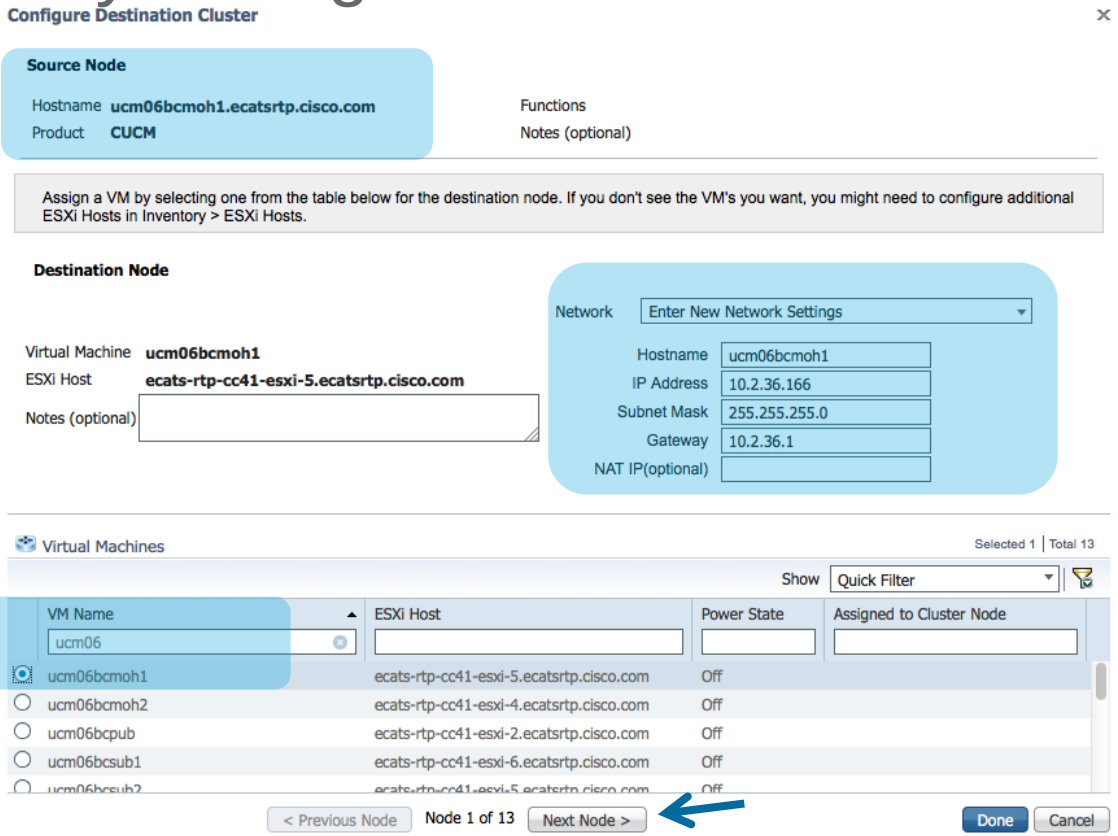
Reference

PCD Inventory Define Destination Cluster – Step 2



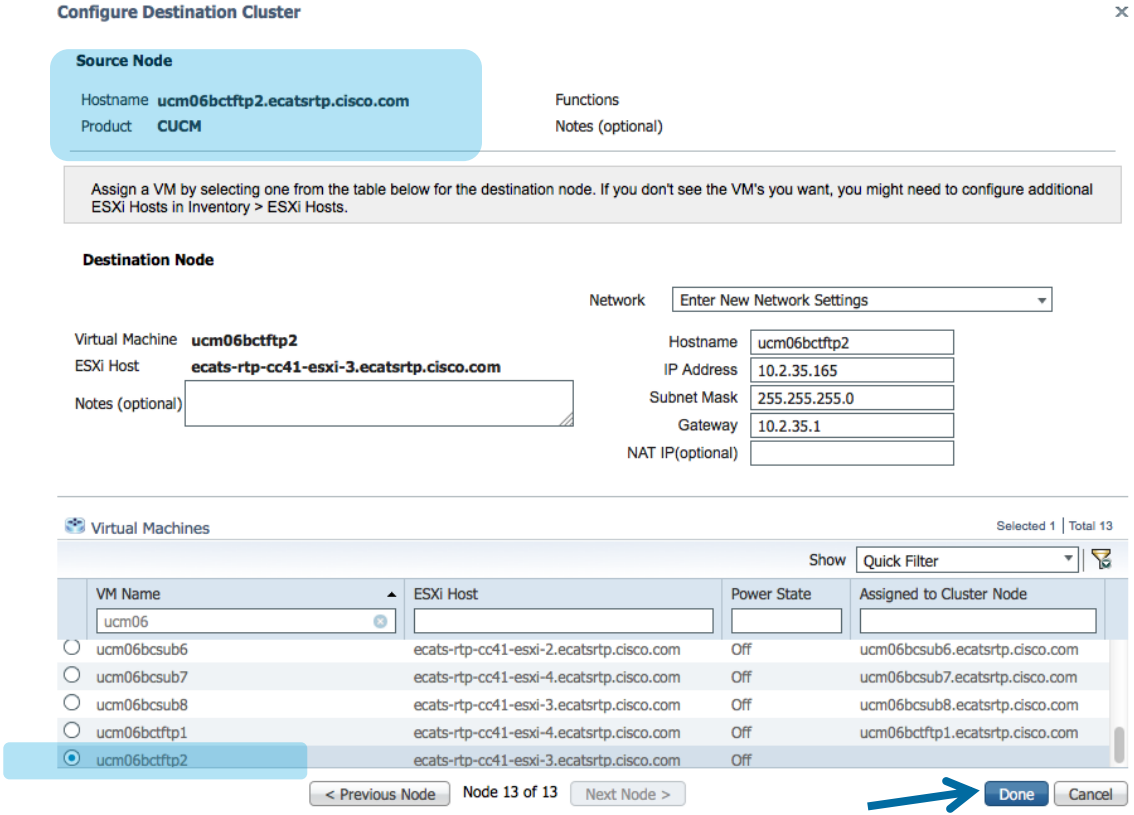
PCD Inventory Configure Destination Cluster





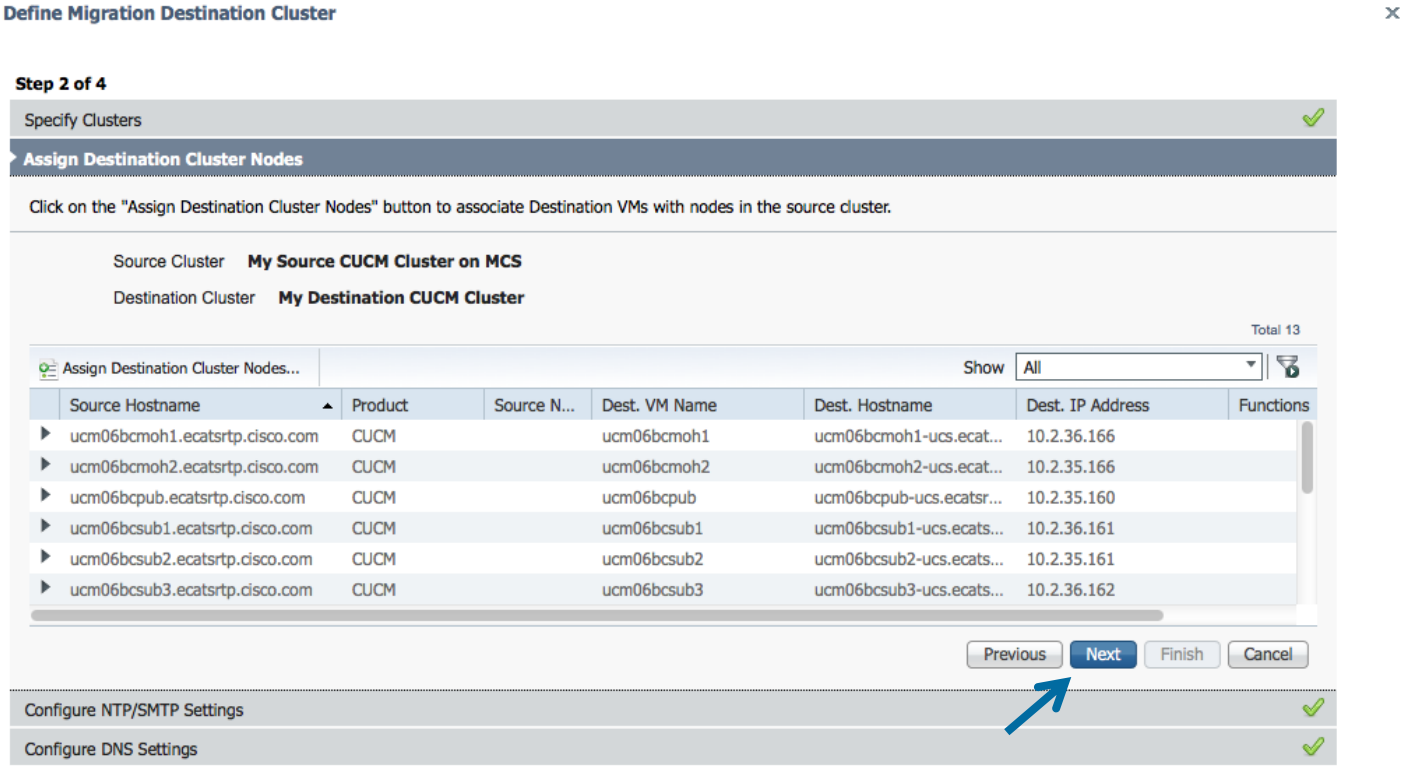
Reference

PCD Inventory Configure Destination Cluster



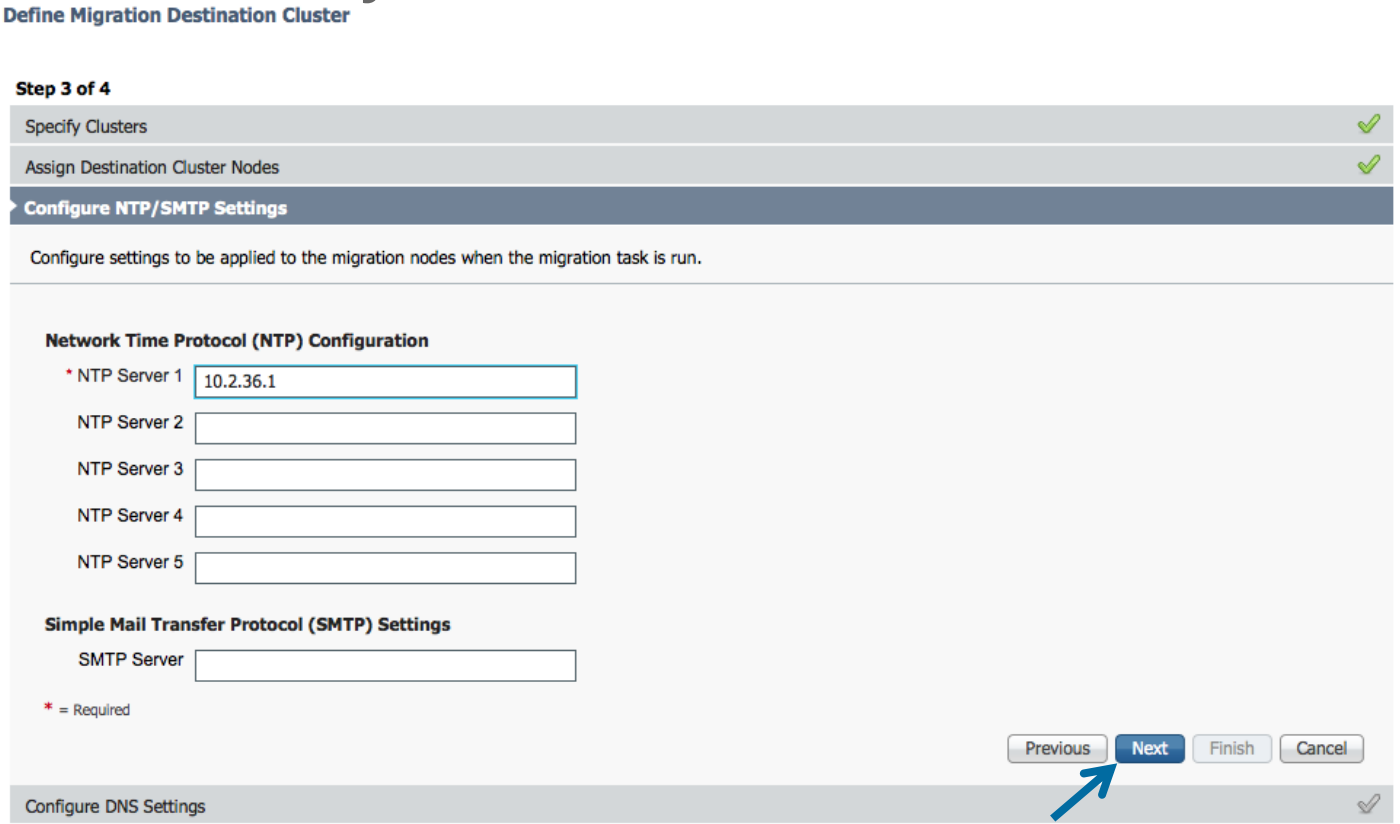
Reference

PCD Inventory Define Destination Cluster



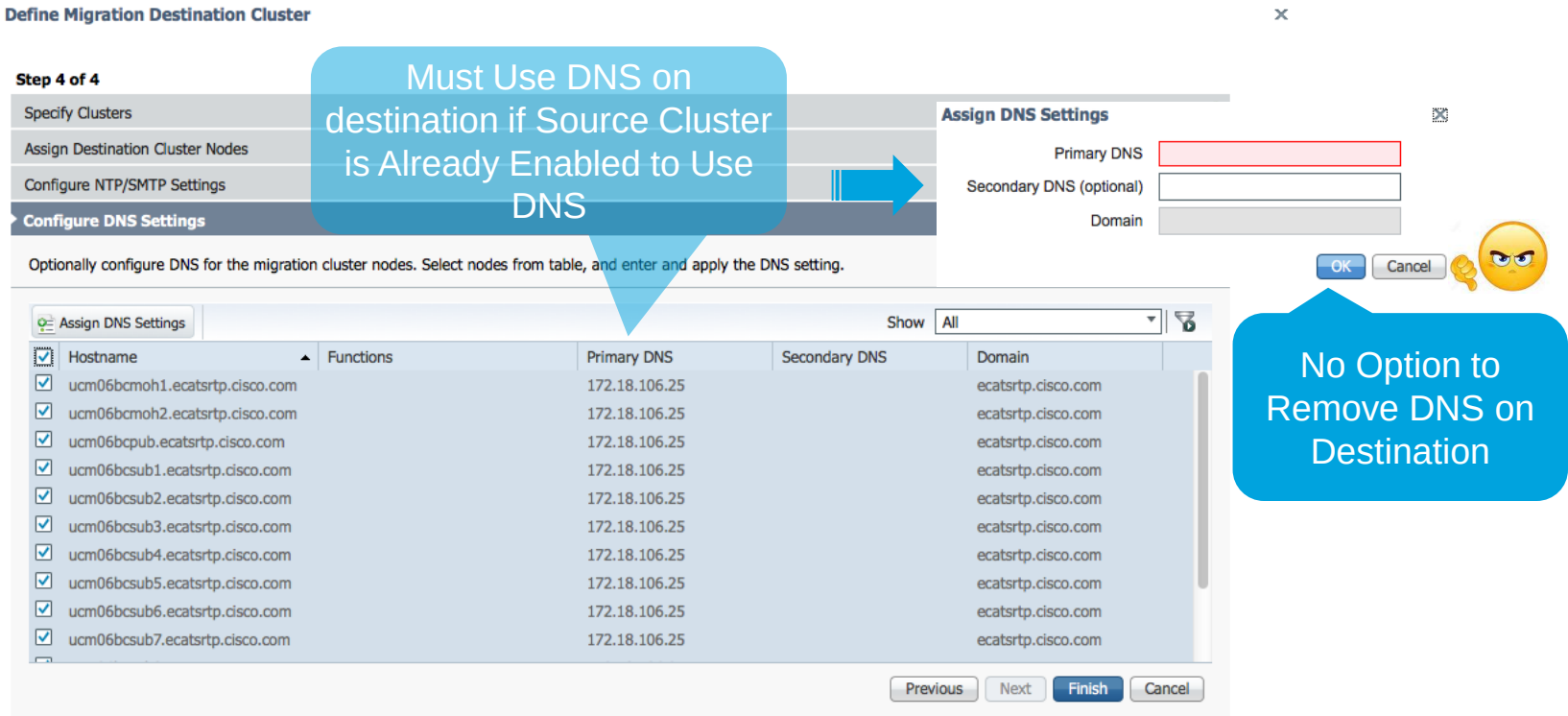
Reference

PCD Inventory Define Destination Cluster – Step 3



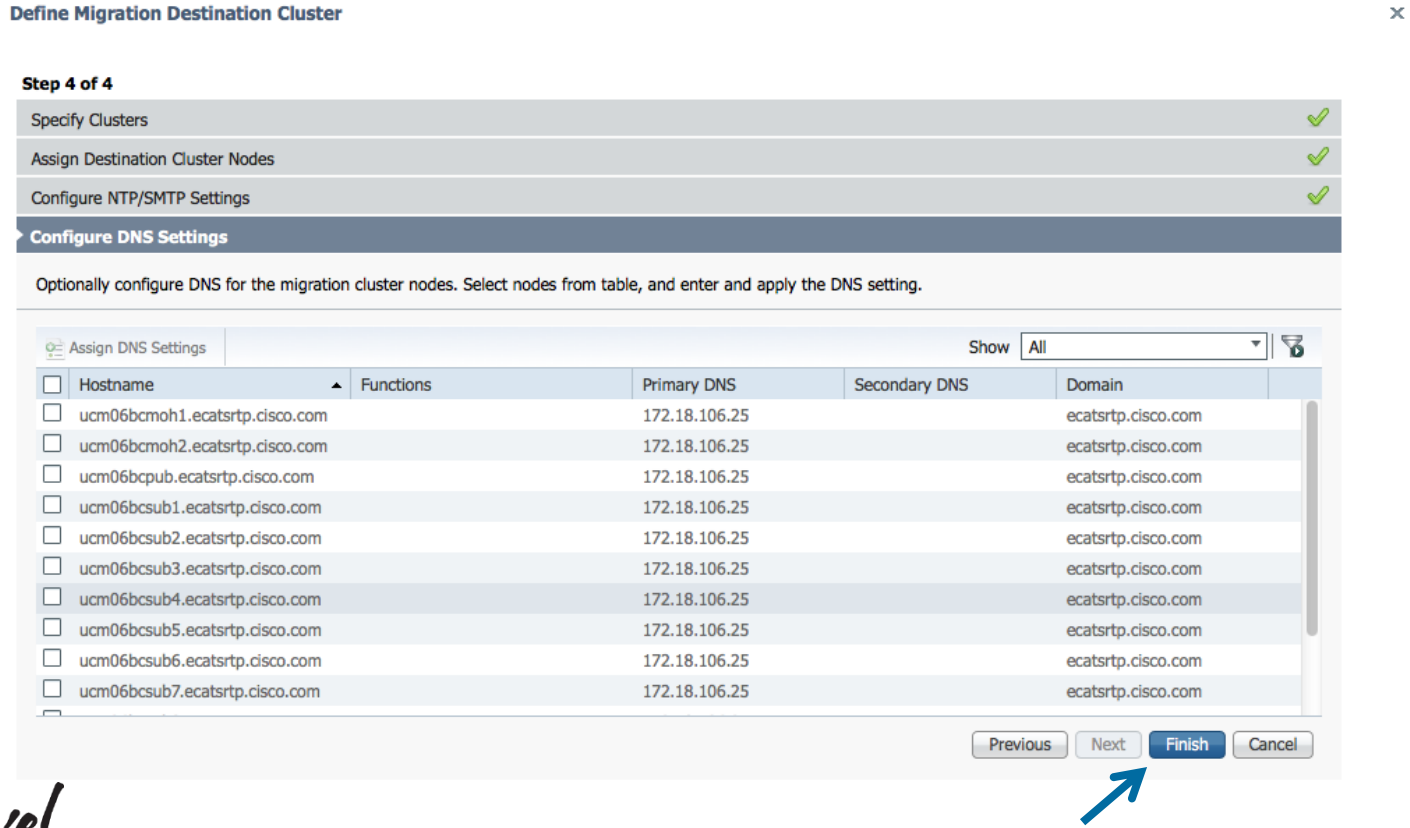
Reference

PCD Inventory Define Destination Cluster – Step 4



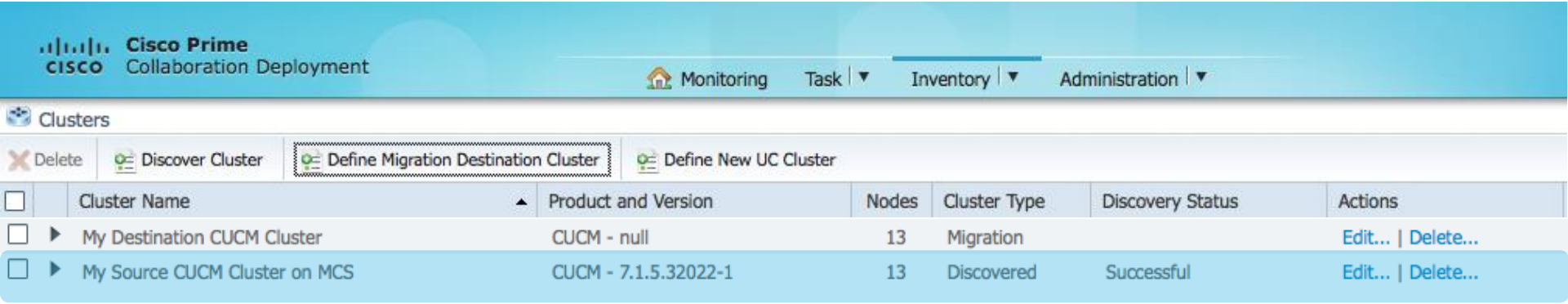
Reference

PCD Inventory Define Destination Cluster – Step 4



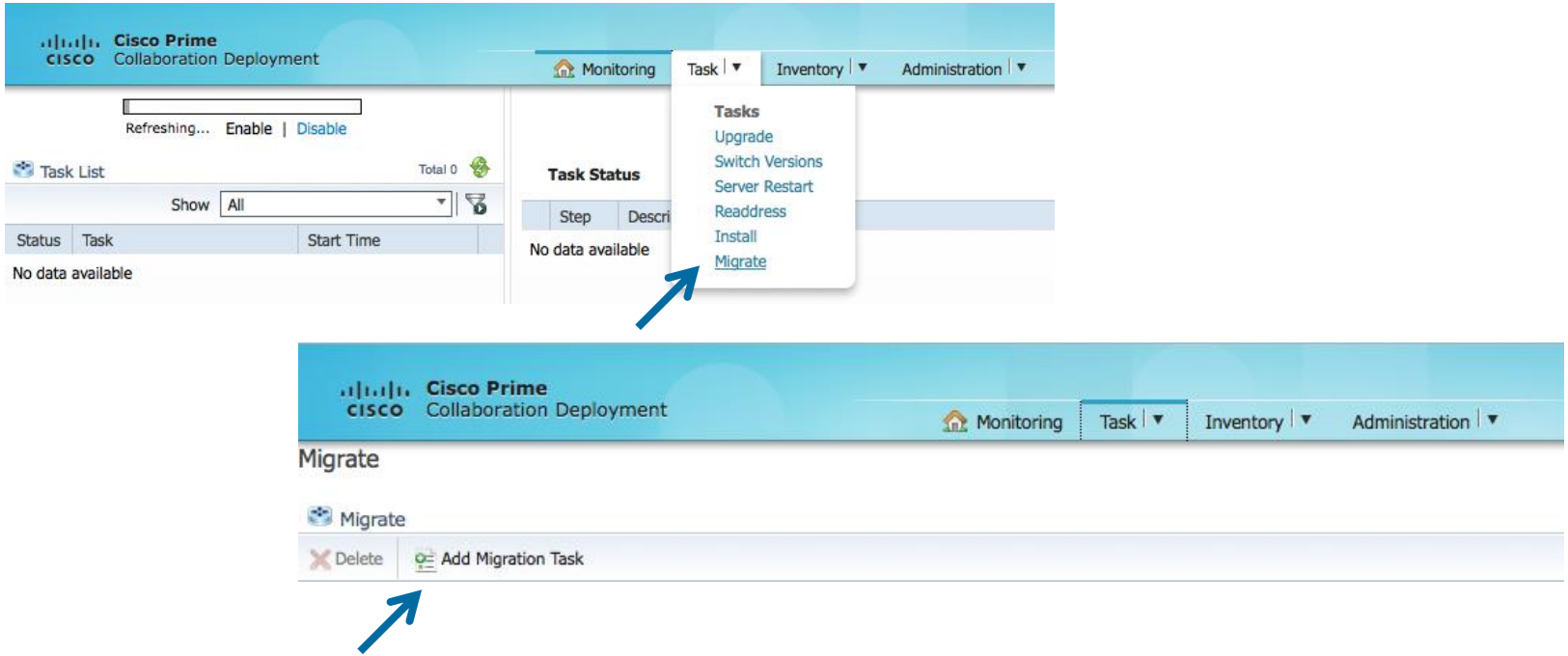
Reference

PCD Inventory Define Destination Cluster



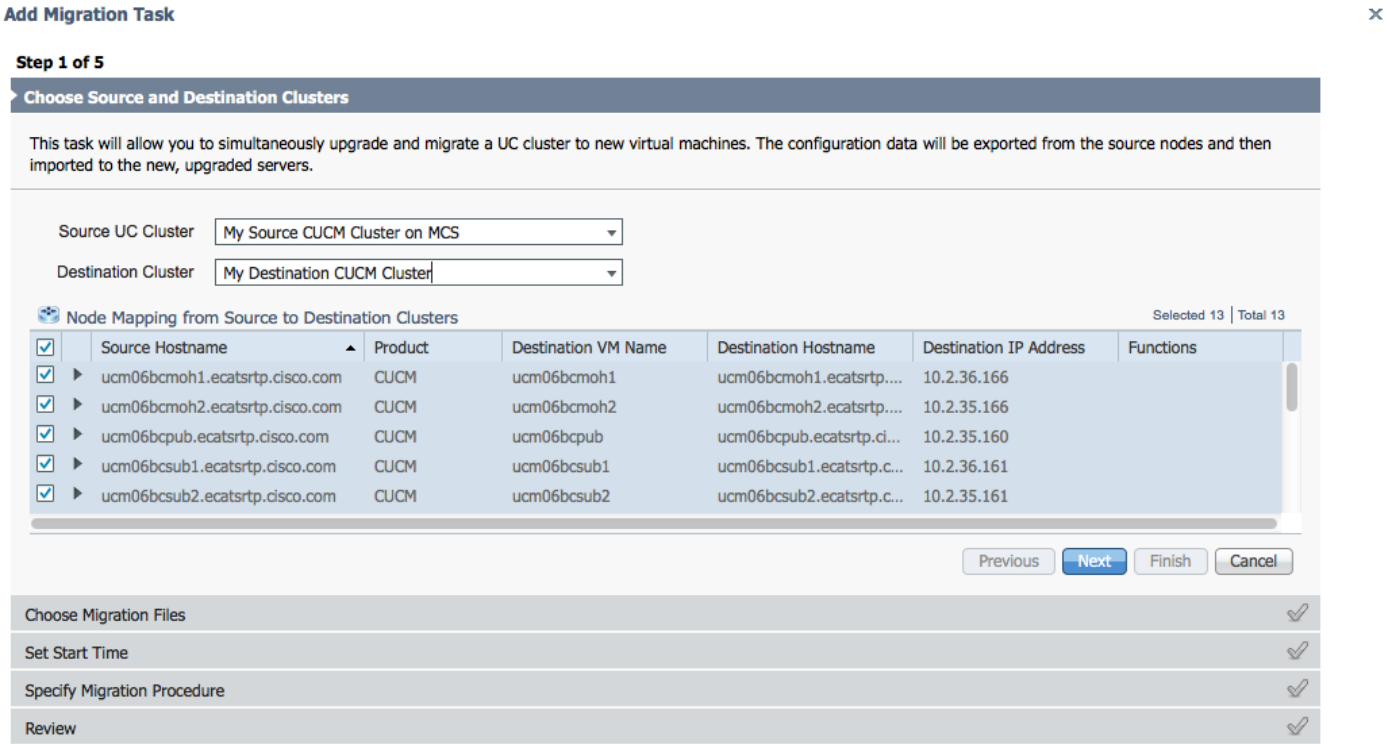
Reference

PCD Add Migration Task



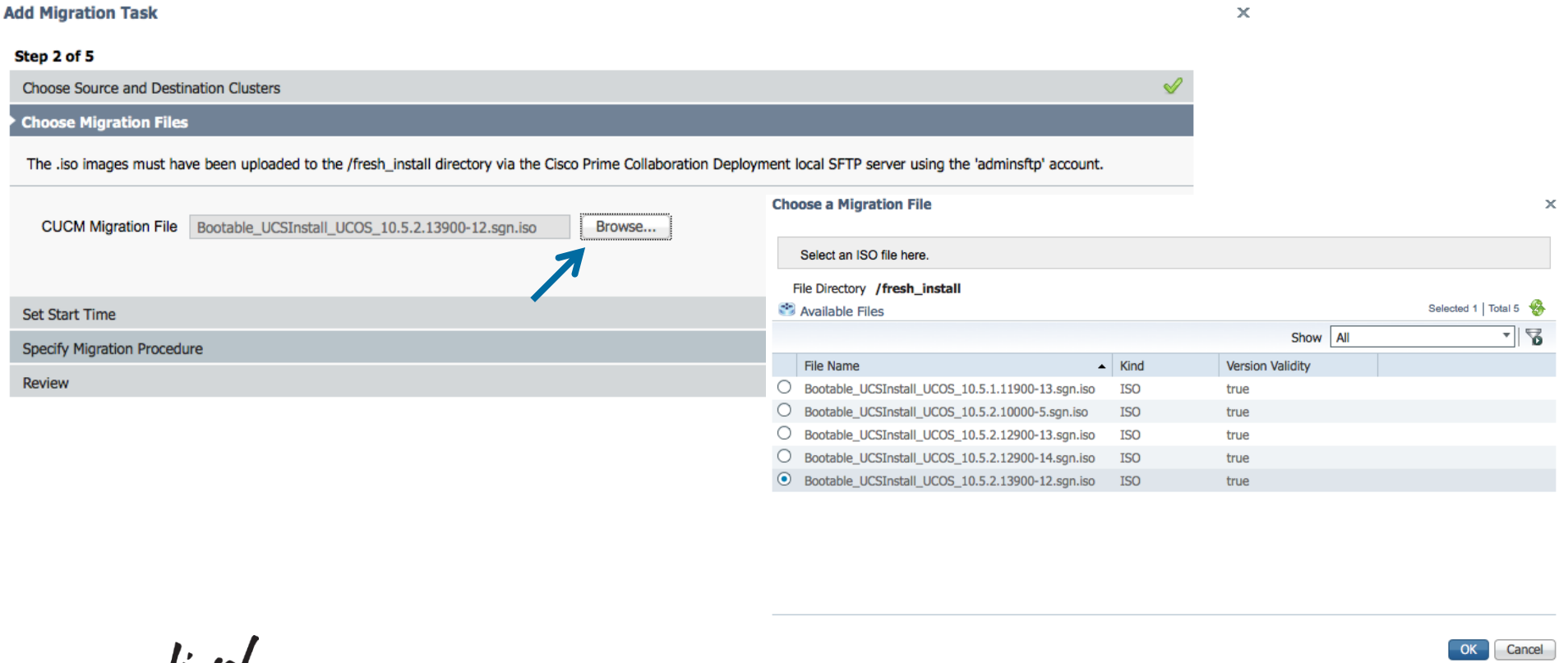
Reference

PCD Add Migration Task – Step 1



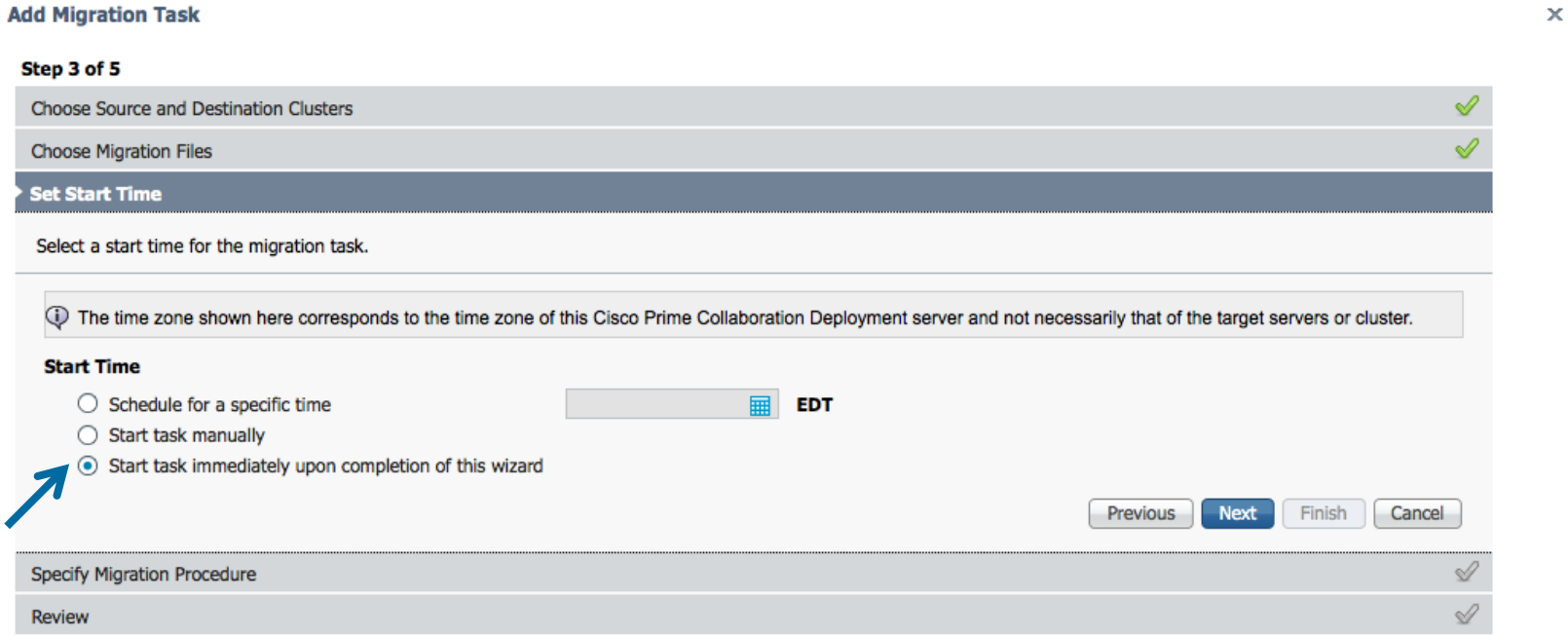
Reference

PCD Add Migration Task – Step 2



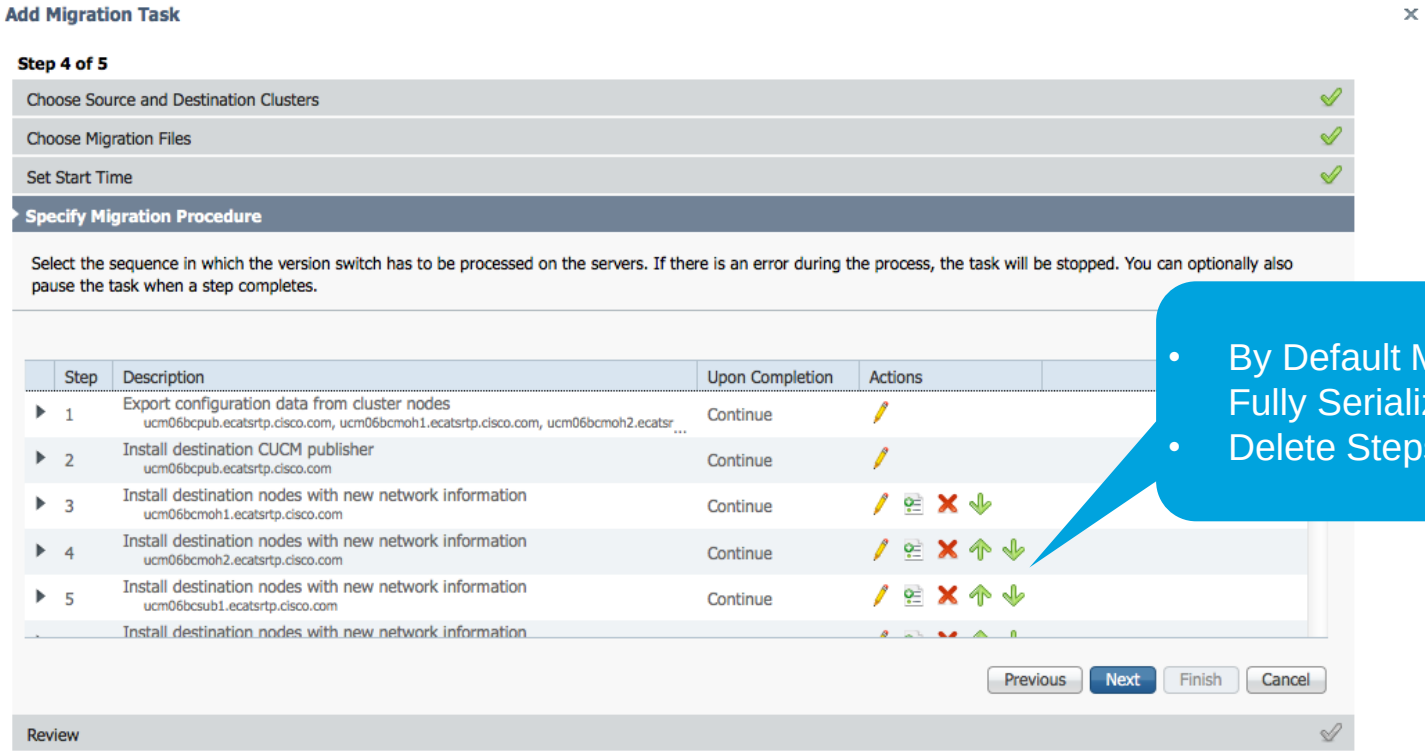
Reference

PCD Add Migration Task – Step 3



Reference

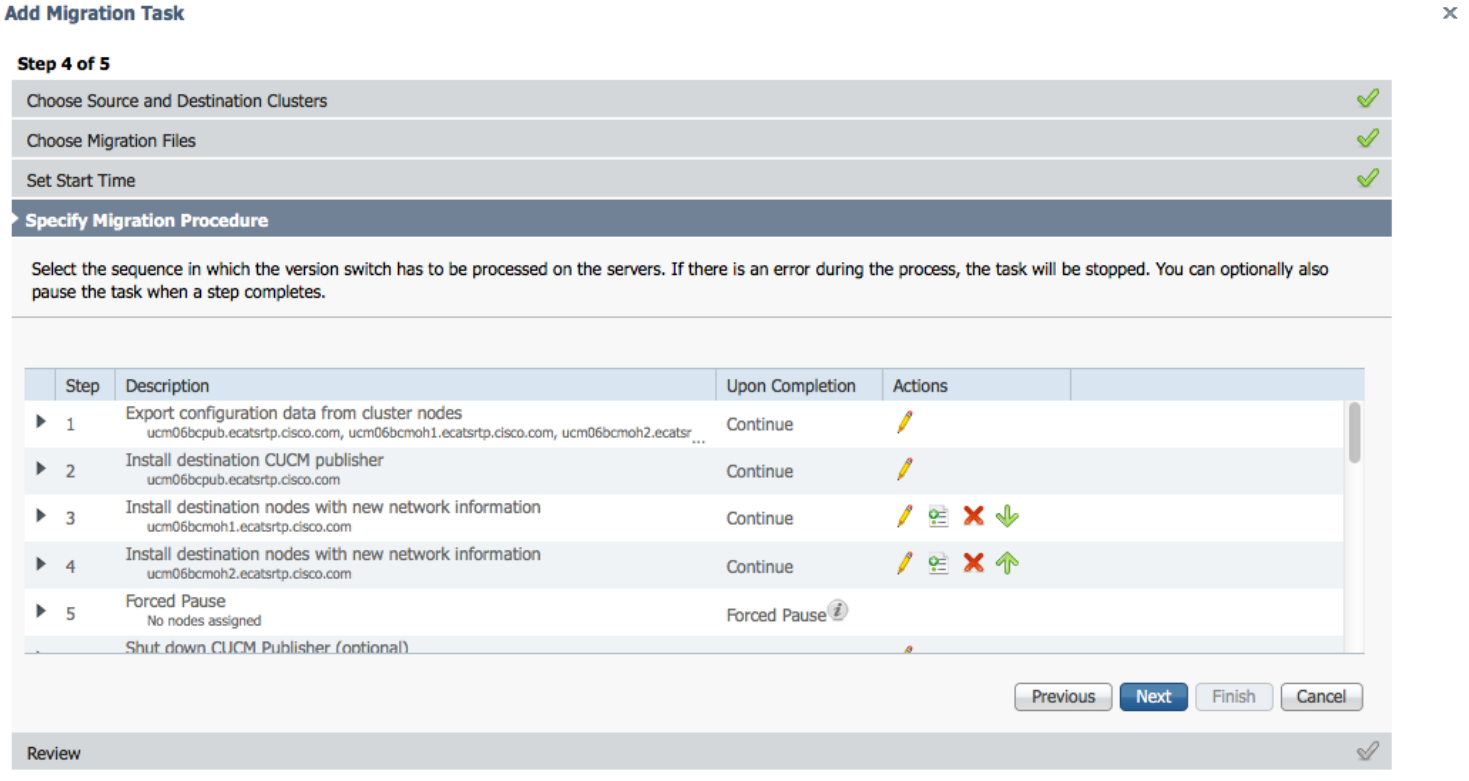
PCD Add Migration Task – Step 4



- By Default Migration is Fully Serialized
- Delete Steps 6 - 14

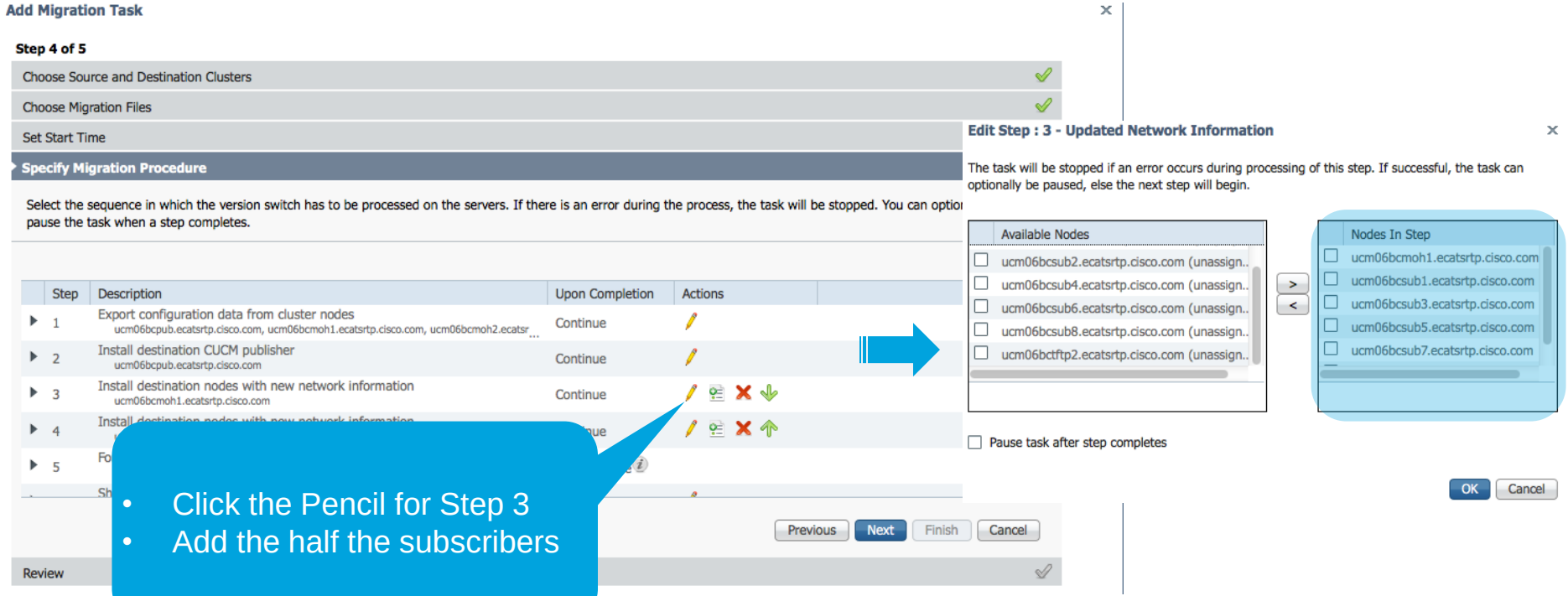
Reference

PCD Add Migration Task – Step 4



Reference

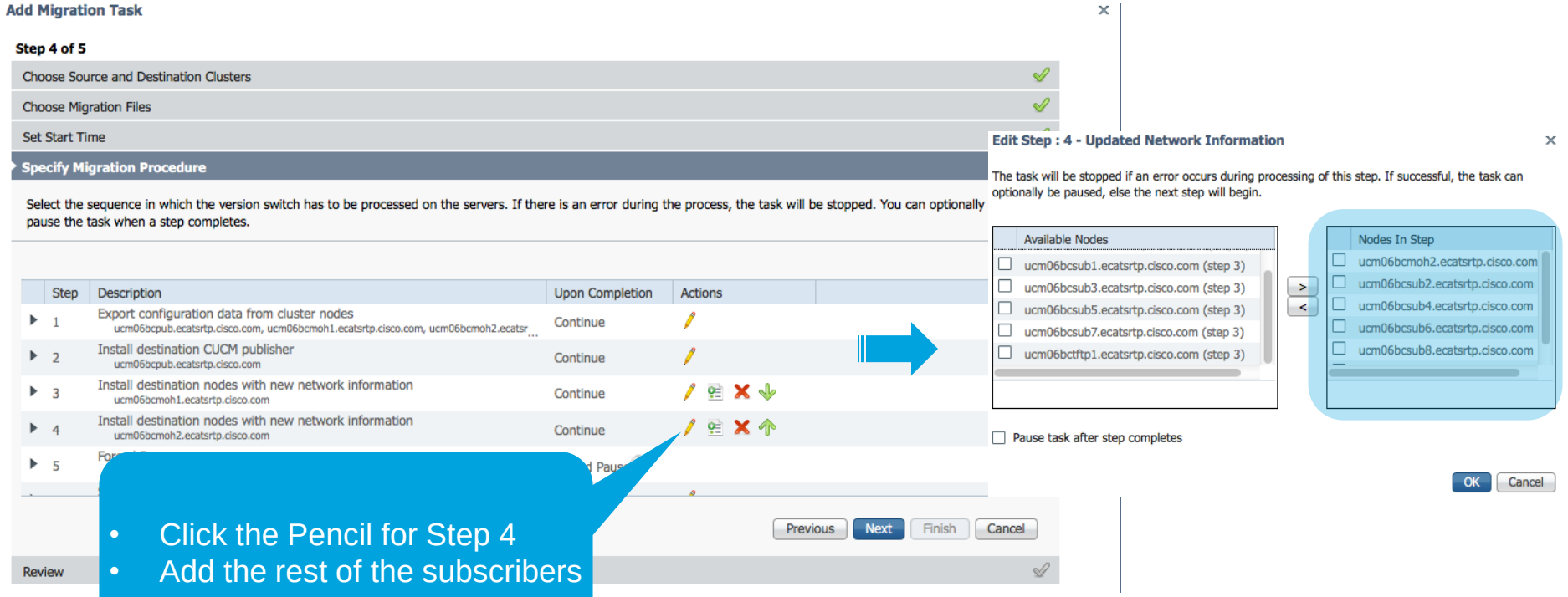
PCD Add Migration Task – Step 4



- Click the Pencil for Step 3
- Add the half the subscribers

Reference

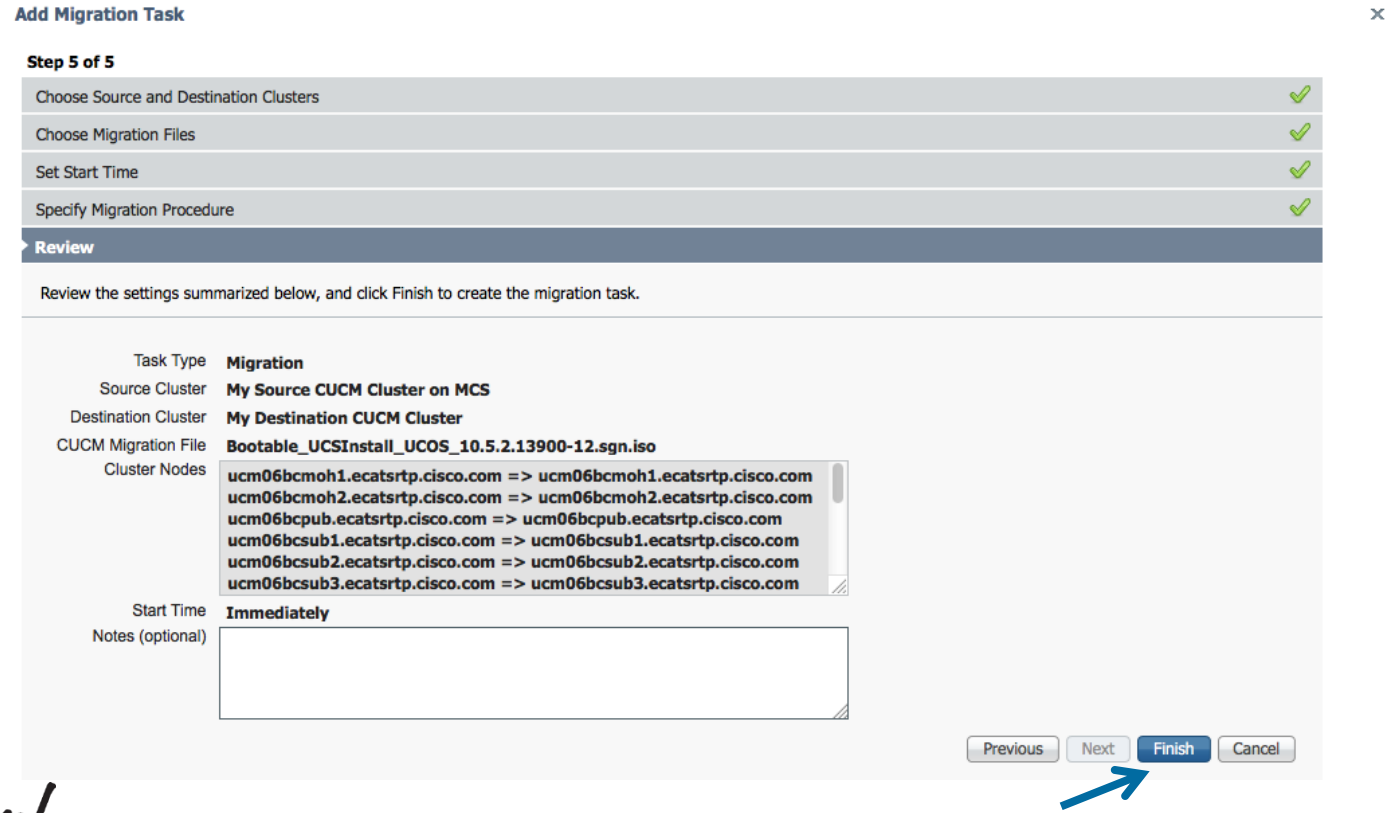
PCD Add Migration Task – Step 4



- Click the Pencil for Step 4
- Add the rest of the subscribers

Reference

PCD Add Migration Task – Step 5



PCD Considerations and Planning

- Cisco UC Virtualization Hypervisor with BE6K and BE7K
- Root access to ESXi Hosts
- ESXi Support for PCD itself (Not supported with ESXi 6.0 yet)
- Allow network traffic to and from PCD
  - Static NAT required, Inside to Outside ← → Outside to Inside
- For L2/RU upgrade does not automate COP file installation
  - ciscocm.version3-keys.cop.sgn
  - ciscocm.refresh_upgrade_v1.3.cop.sgn
- Might do a hybrid of manual and PCD upgrade due other applications
- Inspect PCD logs via activelog tomcat/logs/ucmap/log4j/ucmap*.log

PCD Administration Guide:

http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/pcdadmin/11_0_1/CUCM_BK_PB6D9005_00_pcd-administration-guide-110/cisco_prime_collaboration_deployment_configuration_and_administration.html

Upgrade Path

Direct L2 Upgrade (Virtualized to Virtualized)

- The CUCM versions that will support a L2 upgrade to 11.X
- Short or minimal downtime
- Pre-upgrade RSA keys COP file (ciscocm.version3-keys.cop.sgn) not required

Direct RU Upgrade (Virtualized to Virtualized)

- Longer downtime
- Medium upgrade complexity
- Pre-upgrade RSA keys COP file (ciscocm.version3-keys.cop.sgn) is required for certain versions

  * See “CUCM COP Files for Upgrade” slide for reference

Appliance to Virtualized CUCM 11.X (DRS)

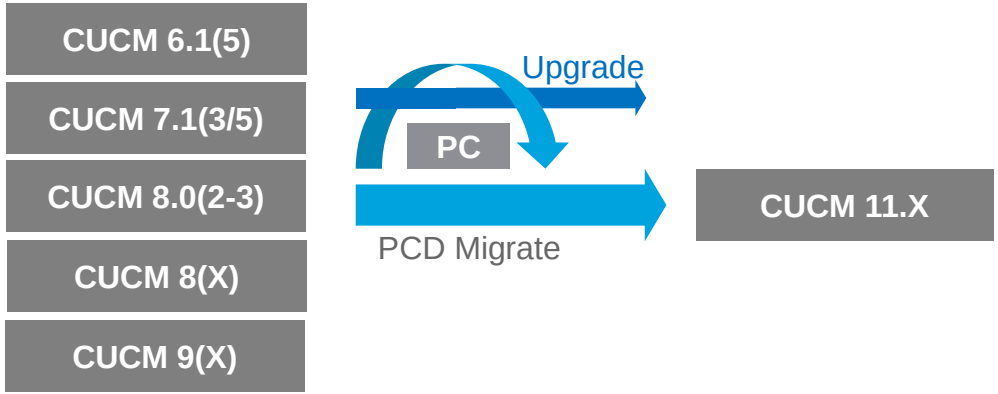
Reference

Platform Number	Supported Normal Mode	Supported Bridge	Not Supported	Upgrade Strategy
1	6.1-7.1	8.0	8.5-9.1	Jump upgrade, upgrade to 11.X
2	6.1-7.1	8.0-8.5	8.6-9.1	Jump upgrade, upgrade to 11.X
3	6.1-8.0	NA	8.5-9.1	Jump upgrade or upgrade to 8.0 to change platform, upgrade to 11.X
4	6.1-8.0	8.5	8.6-9.1	Jump upgrade or upgrade to 8.0 to change platform, upgrade to 11.X
5	6.1-8.0	8.5-9.1	NA	Jump upgrade or upgrade to 8.0 to change platform, upgrade to 11.X
6	6.1-8.5	8.5-9.1	NA	Jump upgrade or upgrade to 8.0 to change platform, upgrade to 11.X
7	7.1-9.1	NA	NA	Jump upgrade or upgrade to 9.1 to change platform, upgrade to 11.X

- Jump upgrade process is preferred due to licenses acquisition complexity and the many steps involved

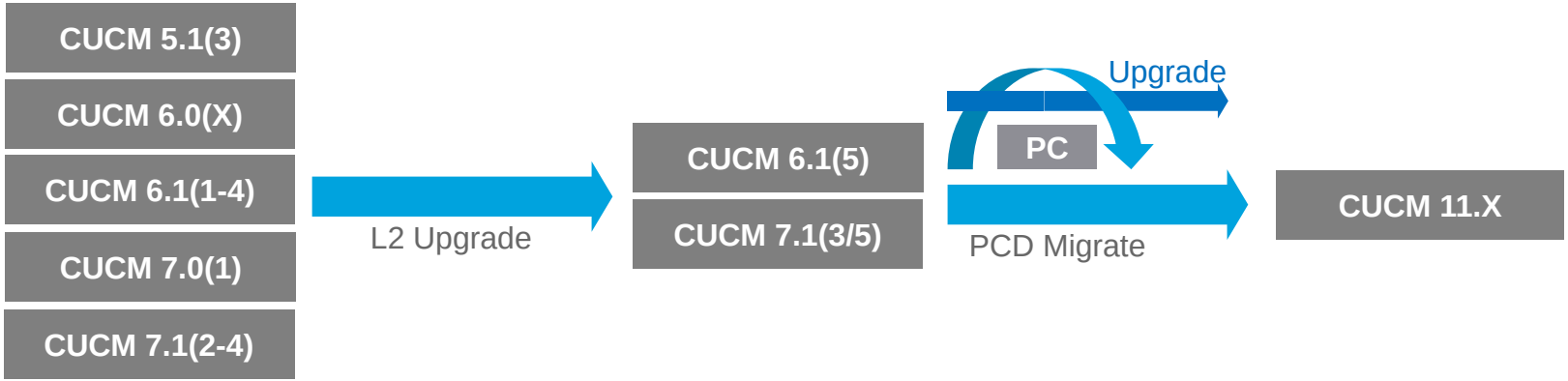
Supported Cisco Unified Communications Manager Releases by Server:
http://www.cisco.com/en/US/partner/prod/collateral/voicesw/ps6790/ps5748/ps378/prod_brochure0900aecd8062a4f9.html

Appliance to Virtualized CUCM 11.X (PCD Migrate)



- Same or different IP addresses
- Same or different IP hostnames

Appliance to Virtualized CUCM 11.X (PCD Migrate)

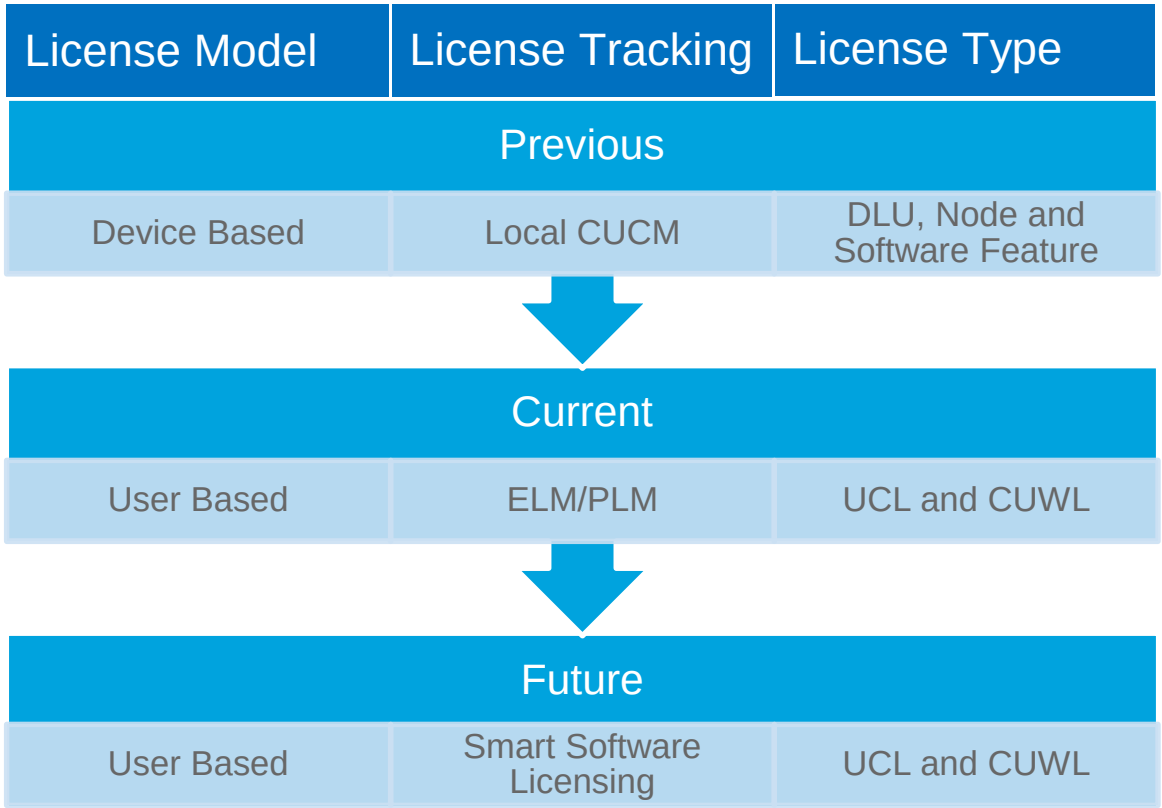


- Multiple hops
- Same or different IP addresses
- Same or different IP hostnames

CUCM License

3

CUCM License Evolution



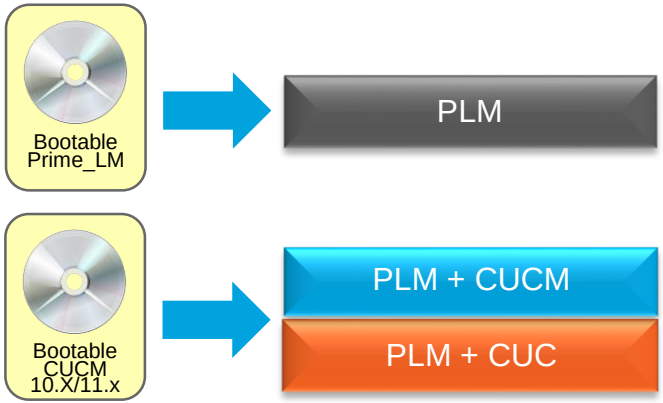
- Overview of CUCM Licensing

Cisco Unified Communications 11.0 and 10.x Licensing Solution Overview
http://www.cisco.com/c/en/us/products/collateral/unified-communications/unified-communications-licensing/product_solution_overview0900aecd806cc7a4.html

Current CUCM 9.X and Later User Based License

Prime License Manager (PLM)

Cisco Prime License Manager (PLM)



PLM Implementation	Products
Standalone	PLM
Co-resident with CUCM	PLM + CUCM
Co-resident with CUCMBE 6K	PLM + CUCMBE 6K
Co-resident with CUC	PLM + CUC

- PLM is a centralized enterprise-wide license management solution for Cisco collaboration applications
  - CUCM, CUCM SME and CUCMBE 6K
  - Cisco Unity Connection (CUC)
  - Cisco Emergency Responder (CER) New 10.X
- PLM deployment can be standalone or co-resident with CUCM, CUCM-BE 6K or CUC
- In PLM 10.5(1)SU1, PLM can be removed from the product

Cisco Prime License Manager User Guide:
http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/plm/11_0_1/userguide/CPLM_BK_U2C0C808_00_user-guide-rel-1101.html

License Manager Versions and Builds

Reference

License Manager

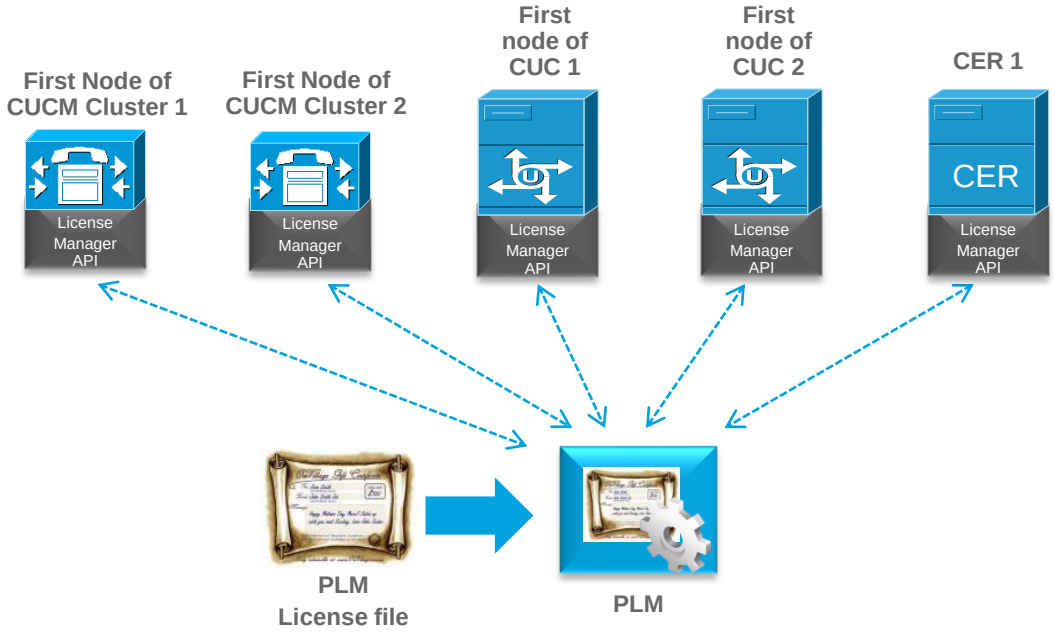
- Enterprise License Manager (ELM) 9.0 – 9.1
- Prime License Manager (PLM) 10.X-11.X

Version	Build
Same as CUCM	Same as CUCM
e.g. 9.1(2) SU3	9.1.2.13900-10

Version	Build
11.0(1) NEW	11.0.1.10000-2
10.5(2)	10.5.2.10000-6
10.5(1)	10.5.1.10000-9
10.0(1)	10.0.1.1000-19
Co-resident: same build as CUCM	Standalone: Different build as CUCM

- ELM is built into CUCM ISO
- PLM is built into CUCM ISO or as independent ISO with standalone deployment

License Manager Architecture 11.0

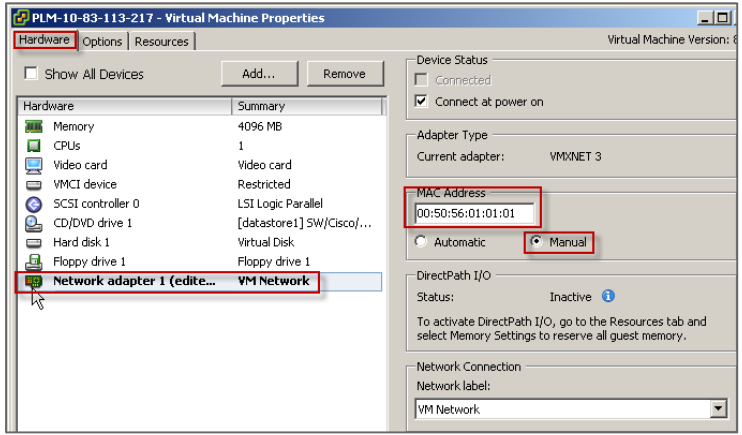


- License Manager API in CUCM 11.X, CUC 11.X and CER 11.X interacts with PLM for license request and approval
- License Manager API was added CUCM in version 9.0, CUC in version 9.0 and CER in version 10.0

License Manager Product Support and Usage

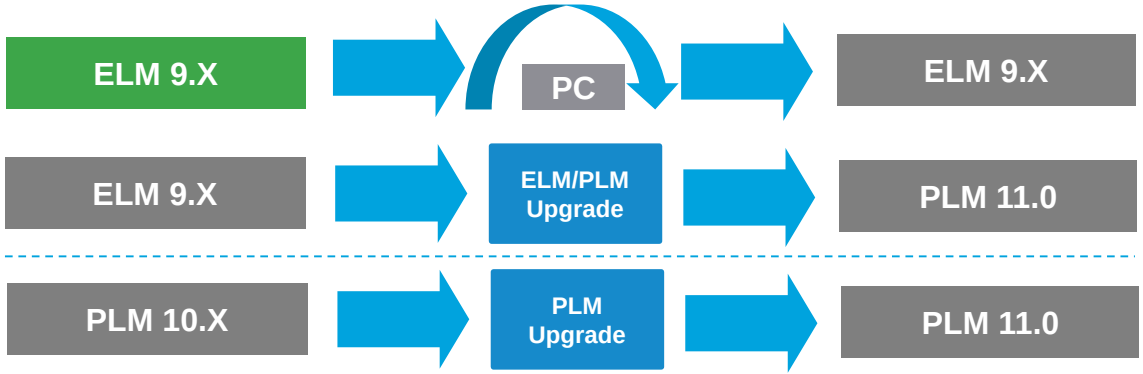
Product Version	ELM 9.X (Bare Metal or Virtualized)	PLM 10.X (Virtualized)	PLM 11.X (Virtualized)
CUCM 9.X / CUC 9.X	Yes	Yes	Yes
CUCM 10.X / CUC 10.X	Yes w/ License Definition (1 or 2)	Yes	Yes
CUCM 11.X / CUC 11.X	Yes w/ License Definition (2)	Yes w/ License Definition (3)	Yes
CER 10.X	No	Yes	Yes
CER 11.0	No	Yes w/ License Definition (3)	Yes

1. License Definition for 9.1 = elm_LicenseDef_9_1_v1.cop.sgn
2. License Definition for 9.1 = elm_LicenseDef_9_1_v2.cop.sgn
3. License Definition for 10.X = license-def-11-for-PLM-10x.def



- For CER 10.X/11.X, use PLM
- Use license definition file to support the higher version of the products (CUCM, CUC and CER)
- For virtualized PLM and virtualized CUCM with co-resident PLM, manually set MAC address since license is partly based on MAC address (Edit virtual machine settings > Machine Network adapter > Manual) before requesting license file

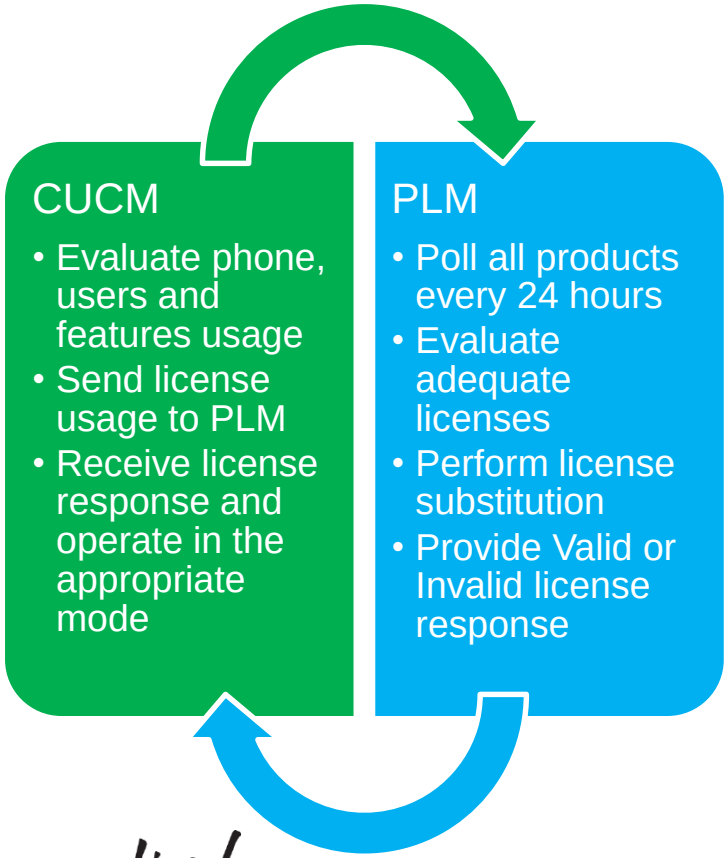
ELM to PLM Upgrade



- Use “Replacing a Single Server for Cisco Unified Communications Manager” procedure to change from bare metal ELM to virtualized ELM. No PCD migration support.
- Use ELM/PLM upgrade COP file (elm_Elm_v9_1_1_PlmUpgrade.cop.sgn) to allow for ELM to PLM10.X/11.X upgrade
- Use pre-upgrade RSA keys COP file (ciscocm.version3-keys.cop.sgn) to upgrade to PLM 10.5 and later for 9.X
- Re-host license by using Product License Registration (www.cisco.com/go/license)

Replacing a Single Server or Cluster for Cisco Unified Communications Manager:
http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/install/11_0_1/replace/CUCM_BK_R13B8C48_00_replacing-a-single-server-cluster_1101.html

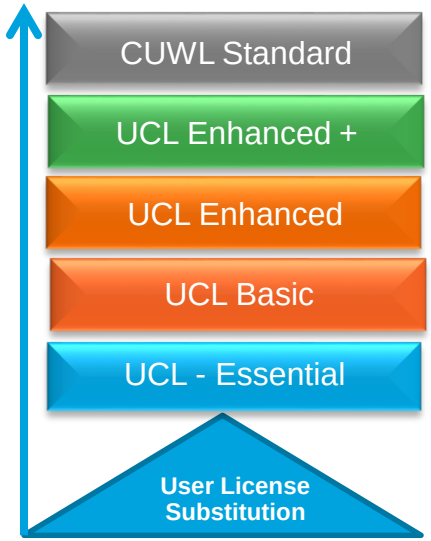
CUCM and PLM Interaction



- PLM polls all registered CUCM clusters
- CUCM cluster evaluates license usage and sends license usage back to PLM
- PLM evaluate all CUCM cluster responses to see if there is adequate licenses for the requested types
- PLM performs license substitution if does not have adequate license of the requested type
- PLM response back to with either valid or invalid (not enough licenses) to all CUCM clusters
- CUCM receives the response from PLM and function accordingly

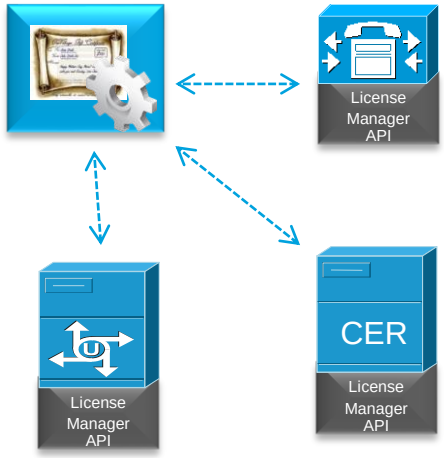
Detailed CUCM and ELM/PLM interactions with signaling are in the appendix

PLM License Substitution



- Licenses are based on hierarchical model where lower feature license can be covered by a higher feature license
  - I.E. UCL Basic can be covered by UCL Enhance
  - I.E. UCL Enhance can be covered by UCL Enhance Plus
- PLM evaluates ALL system license requirements on a per product (CUCM, CUC and CER) basis and respond back with one consistent response to ALL registered systems
  - VALID: adequate license
  - INVALID: inadequate license
- Centralize and enterprise-wide licensing view per product set

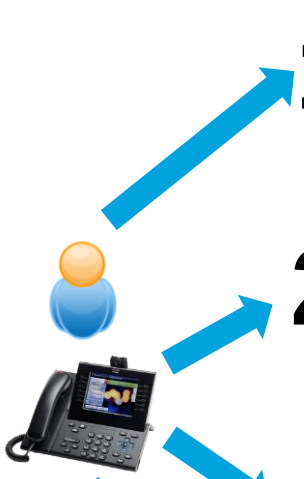
Grace Period and License Overage



	Grace Period	Behavior when license is exceeded
CUCM 9.X-11.0	60	**License Overage:** • System function normally • Existing phones cannot be de-provisioning • Additional phones cannot be provisioned
CUC 9.X-10.5	60	**Expire:** • System will not take calls • Users cannot retrieve messages • Additional users or mailboxes cannot be provisioned
CUC 11.0	60	**Expire:** • System will take calls • Send or receive voicemails • Additional voicemail boxes can not be provisioned New 11.0
CER 10.X-11.0	60	**License Overage:** • Responder system stops tracking and updating the phone Location

CUCM License Usage

CUCM License Usage



1 User

- Extension mobility users: No license
- Extension mobility user with Unified Mobility (SNR): UCL Basic license

2 Device

- Device without Owner User ID association: UCL
- Based on the device
- E.g. Public space phones, shared workspace phones, etc.

3 User / Device

- Device with Owner User ID association: UCL or CUWL
- Based on the model of device and the number of devices assigned to the user
- I.e. 1- 2 devices: UCL, 3 -10 devices: CUWL

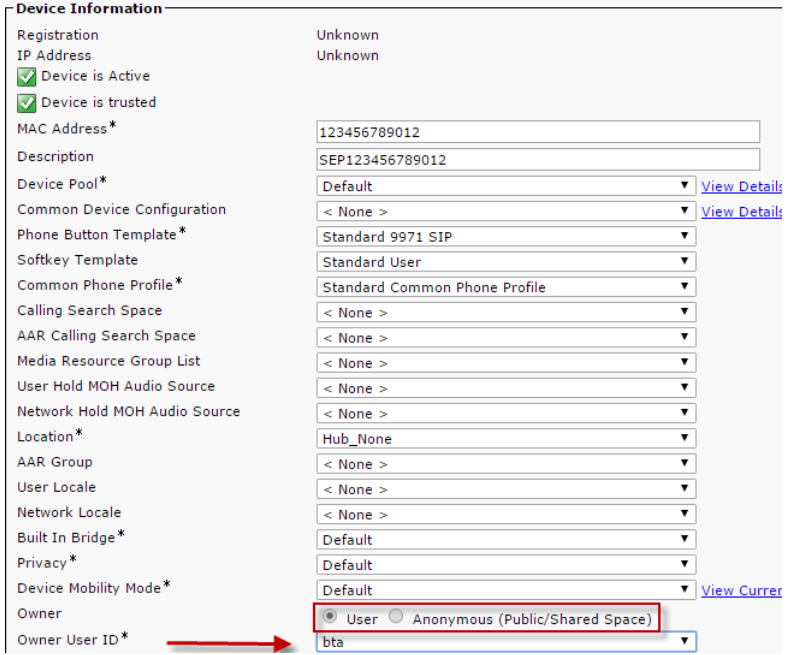
4 TelePresence

- TelePresence (TP) device
- E.g. CTS, MX, SX, TX, etc.

List of devices and associated license are in the appendix

Device and Owner User ID Association

Device > Phone > Device Name

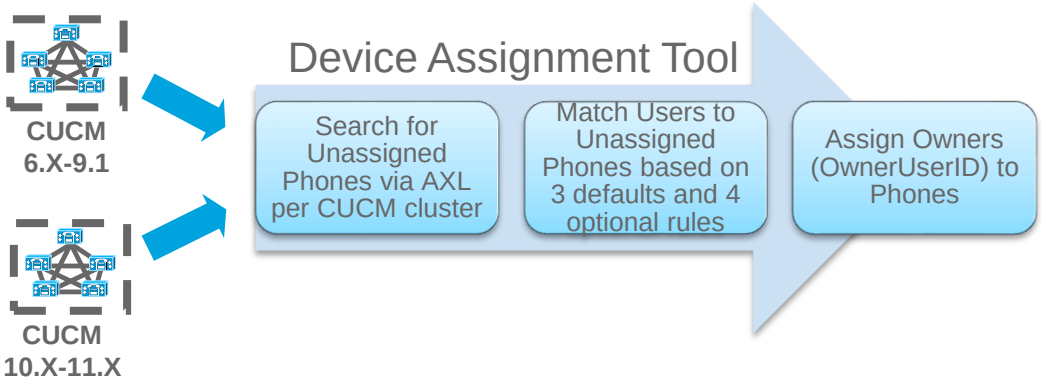


- Device with Owner User ID field configured potentially uses less licenses
  - I.E. Extension mobility user with Unified Mobility feature and a phone uses one license
  - I.E. Multiple phones with the same Owner ID field
- Owner User ID Field:
  - CUCM 9.1(1a) or earlier: User or None
  - CUCM 9.1(2) or later: User or Anonymous
- Previous Methods:
  - BAT, Run SQL via CLI, UDS and AXL
  - Links in the Appendix

Recommend to perform this task before upgrading to CUCM 9.X or later

Cisco Device Assignment Tool (DAT)

Cisco Device Assignment Tool (DAT)



- Pre-upgrade or post-upgrade of CUCM 9.0 and later releases
- Align OwnerUserID to IP Phones for User Based Licensing (CUCM 9.0 and later releases).
- Windows PC (7 and later) or Apple Mac (OSX 10.8 and later) Java application

Device Name	OwnerUserID	CUCM Version
SEP123456789012	None	9.1(1a) or earlier
SEP098765432109	Anonymous	9.1(2) or later

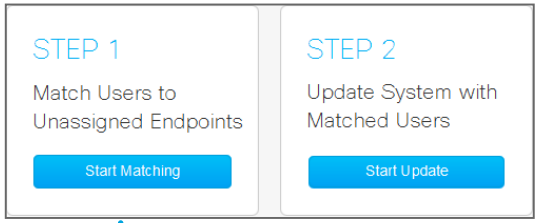
Device Name	OwnerUserID
SEP123456789012	UserX
SEP098765432109	UserY

Device Assignment Tool 11.5
https://software.cisco.com/download/release.html?mdfid=285963825&flowid=&softwareid=282204704&release=DAT&relind=AVAILABLE&rellifecycle=&reltype=latest

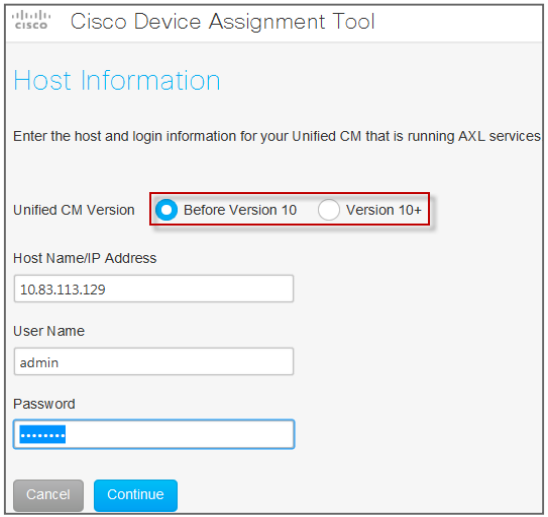
Cisco Device Assignment Tool (DAT)

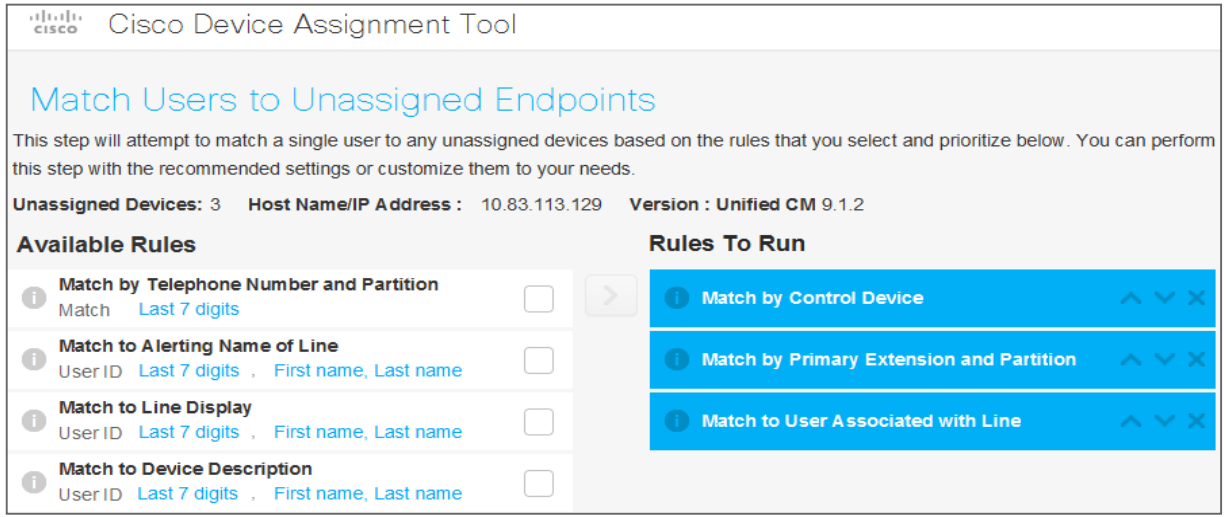
Reference

DAT
(UdatApplication.jar)



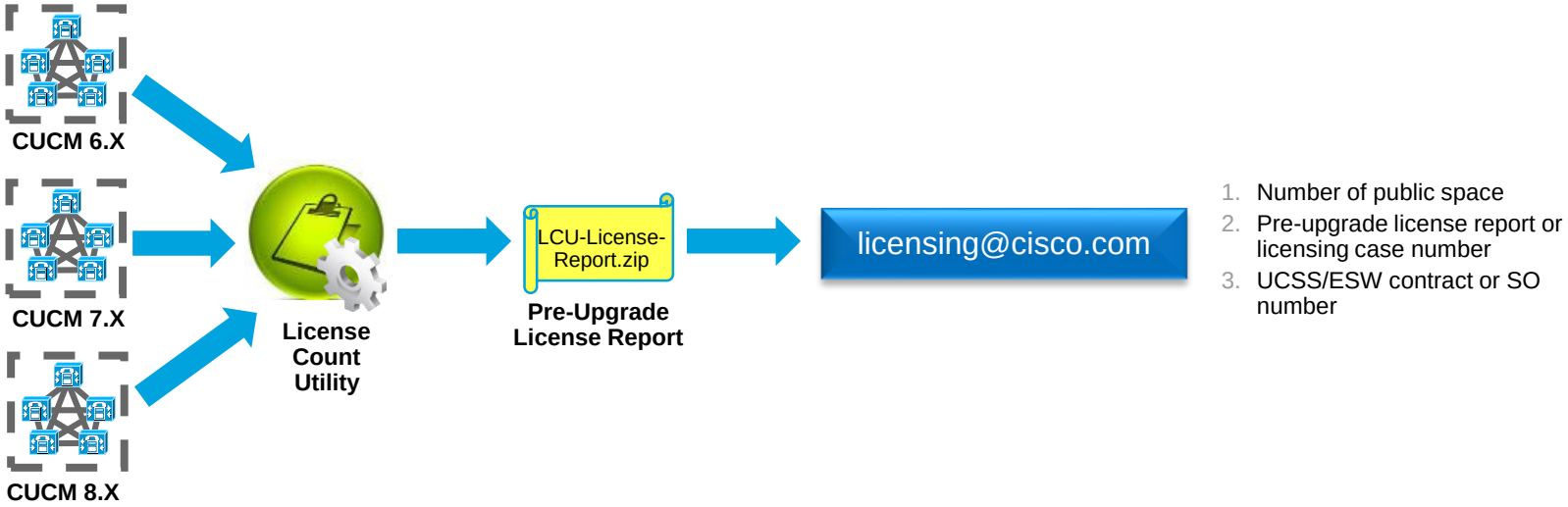
- Based on sequence of 7 rules or manually edited xls file





License Migration from Device Based License to User Based License (9.X or later)

License Count Utility (UCT) for CUCM 6.X-8.X



- Perform AXL calls to existing CUCM (6.X, 7.X and 8.X) clusters for current license and license usage and generate pre-upgrade license report
- Report can be send to licensing@cisco.com
- Include number of public space, license case number / MAC address and UCSS/ESW or SO number, if send directly to licensing@cisco.com

License Count Utility 9.1.2 (LCUZIP-Ver9.1.2.zip):
https://software.cisco.com/download/release.html?mdfid=285963825&flowid=&softwareid=282204704&release=LCU&relind=AVAILABLE&rellifecycle=&reltype=latest

Opening Licensing Case

Web

- https://survey.opinionlab.com/survey/s?s=10422
- Type of problem = Licensing

Email

- licensing@cisco.com

Phone

- 1-800-553-2447
- Option 3, License Support

Virtualized CUCM

4

Appliance to Virtualized CUCM

4

Appliance to Virtualization Conversion

1. Server platform selection
2. VMware ESXi requirements
3. Conversion of appliance to virtual machine or OVA
4. Leverage “Unified Communications in a Virtualized Environment” on docwiki

1. Server Platform Selection

Packaged Collaboration Solution

- Business Edition 6000
- Business Edition 7000

TRC

- UC on UCS

Specs-Based

- UC on UCS
- 3rd-Party

Any Server

Less — **Choices (Leverage Existing Investment)** — More

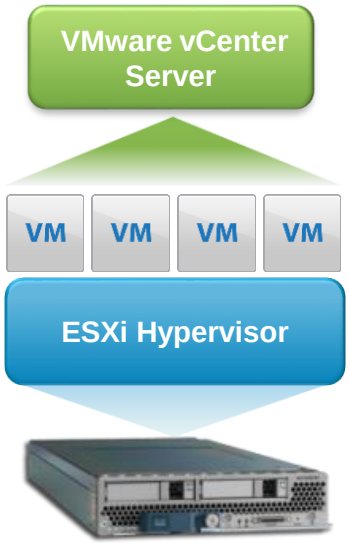
More — **Assurance Simplicity** — Less

More — **Ease of Deployment** — Less

UC Virtualization Supported Hardware

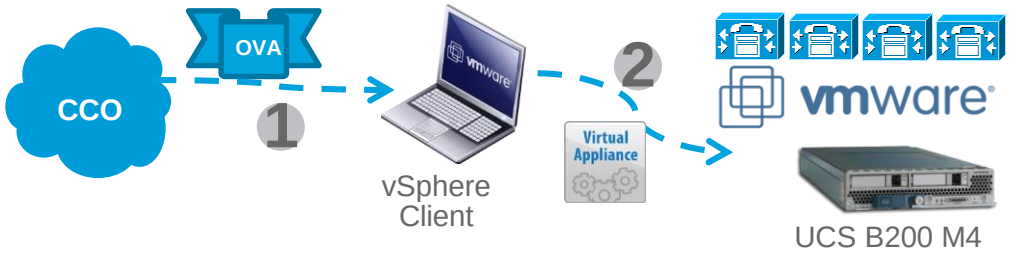
http://docwiki.cisco.com/wiki/UC_Virtualization_Supported_Hardware#B200_M2_TRC.231

2. VMware ESXi Requirements



- ESXi Hypervisor: 4.0, 4.1, 5.0, 5.1, 5.5 and 6.0 New
  - Check Specific UC Application Vmware support on docwiki
- ESXi Edition: VMware vSphere Hypervisor, Cisco UC Virtualization Hypervisor, VMware vSphere Hypervisor Foundation, Cisco UC Virtualization Foundation, Standard, Enterprise or Enterprise Plus
- VMware vCenter: Essential, Foundation or Standard
  - Recommended for large deployment. centralize management, license management, etc.
  - Mandatory for Specs-Based deployment
- VMware acquisition: Cisco, Partner or VMware
  - https://www.vmware.com/files/pdf/vsphere_pricing.pdf

Cisco Virtual Template (OVA) File



- Open Virtual Archive (OVA): Portable virtual appliance that defines configuration (memory, storage space, etc.) for a virtual machine and is a compressed version of OVF
- Cisco will provide OVA files with Virtual Machine Hardware Version (VMV) 7 and VMV8 on CCO for collaboration applications deployment
- Deploy the latest OVA version and the highest available VMV version that matches to ESXi version

3. Conversion of Appliance to Virtual Machine or OVA

MCS Server Model	Maximum Number of Phone	OVA Deployment Size	vCPU
7845-I3 or earlier	10000	10000	4
7845-I3 or earlier	7500	7500	2
7845-I2/H2 or earlier	7500	7500	2
7825-I5 or earlier	1000	2500	2
7825-I5 or earlier	1000	1000	2
7816-I5 or earlier	500	1000	2
7828-I5 or earlier	500	1000	2

- Smaller MCS server converts to a standard 2500 device OVA or restricted performance CPU OVA on CUCMBE 6K
- MCS and C series both has similar direct attached storage (DAS)
- Storage option for redundancy: FC SAN

Restricted performance CPU (CUCMBE 6K)

ESXi and Collaboration OVA Version

ESXi Version	VMware Virtual Machine Hardware Version (VMV)	Recommended Cisco OVA VMV Version
4.0	7	7
4.1	7	7
5.0	8	8
5.1	9	8
5.5	10	8
6.0	11	8

Collaboration Application	Collaboration Application Version	VMV Version	Cisco OVA Version
cucm_11.0_vmv8_v1.0.ova			
CUCM	11.0	8	1.8

- Use matching collaboration application OVA file to correct corresponding ISO file
  - plm_11.0_vmv8_v1.1.ova → Bootable_CiscoPrimeLM_64bitLnx_11.0.1.11001-4.sgn.iso
  - cucm_11.0_vmv8_v1.0.ova → Bootable_UCSInstall_UCOS_11.0.1.20000-2.sgn.iso
- VM Version can be upgraded, but cannot be downgraded

Appliance versus Virtualization Support

Reference

Feature	Appliance	Virtual
Music on Hold (live source)	USB audio (unicast and multicast)	IOS or Barix (multicast only)
Install and upgrade error logs	USB	Virtual serial port
Answer file (platformConfig.xml)	USB	Virtual floppy
UPS via USB	APC UPS via USB	UPS on UCS/ESXi
Back up	Tape	Secure ftp
eToken encryption key	USB on client and not server	USB on client and not server
SMDI	Serial port	NA

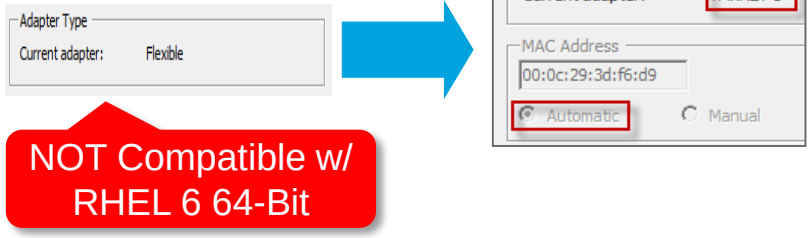
- Take these support considerations into account when virtualizing CUCM

Virtual to Virtualized CUCM

4

CUCM 9 to CUCM 10/11 OVA Change

Features	CUCM 9.X	CUCM 10.X/11.X
RHEL Guest OS	5 (32bit)	6 (64 bit)
Adapter Type	Flexible	VMXNet3



- CUCM must be Powered OFF
- Change the Guest OS from RHEL 5 (32 bit) to Guest OS 6 (64 bit)
- Change Network adapter type from Flexible to VMXNET3
  - Automatic MAC: Edit VMX file in the VM machine directory. Instruction in link below
  - VMware vSphere PowerCLI for both automatic and manual MAC. Instruction in link below
  - Sample Powershell Script in Appendix**

CUCM 10.0 OVA:

http://www.cisco.com/web/software/283088407/108296/cucm_10.0_vmv8_v1.7.ova.README.txt

CUCM 11.X OVA vRAM Change

New 11.X

Product	Scale (users)	vCPU	vRAM (GB)	vDisk (GB)
CUCM 10.X	10,000	4	6	1 x 110
	7,500	2	6	1 x 110
	2,500	1	4	1 x 80
	1,000	2	4	1 x 80

Product	Scale (users)	vCPU	vRAM (GB)	vDisk (GB)
CUCM 11.X	10,000	4	8	1 x 110
	7,500	2	8	1 x 110
	2,500	1	6	1 x 80
	1,000	2	6	1 x 80

- Shutdown CUCM
- Change vRAM for the virtual machine
- Power up
- Upgrade to 11.0
- Large deployment have seen memory usage being high with previous OVA settings (LowAvailableVirtualMemory Alert)

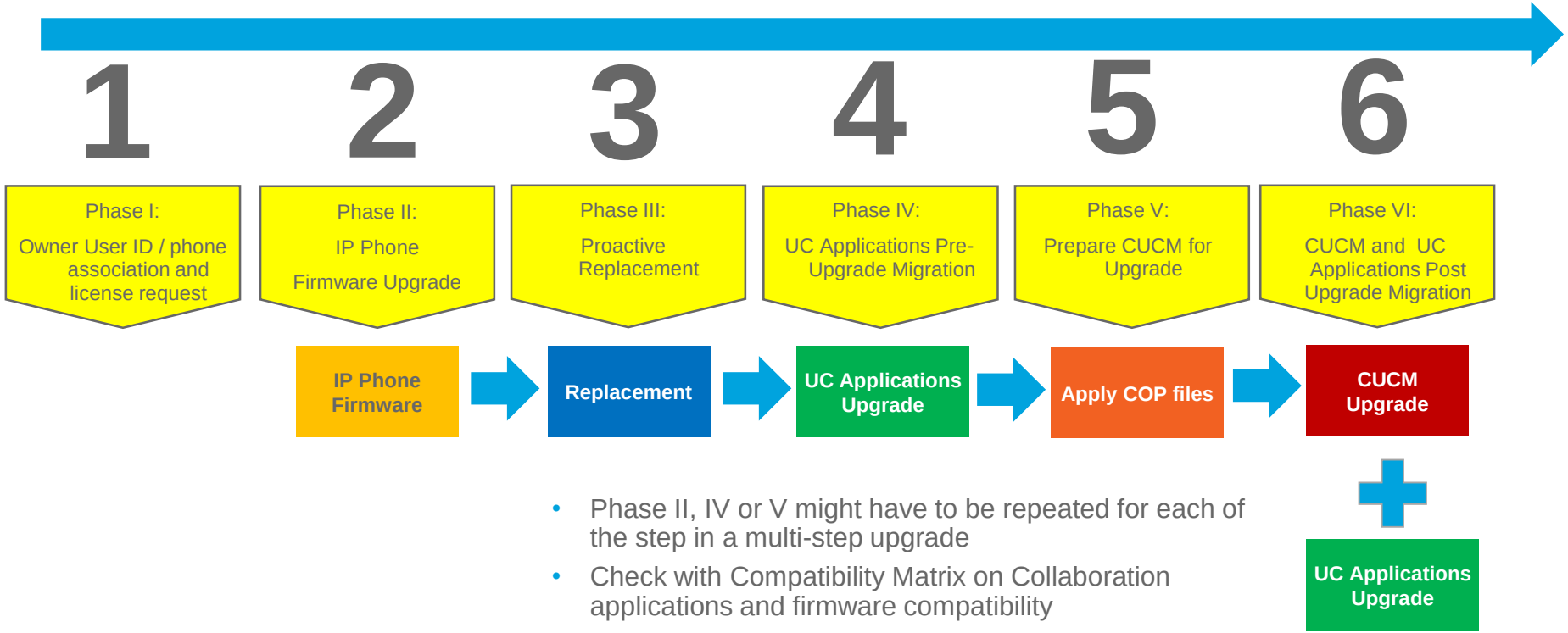
CUCM 11.0 OVA:

http://www.cisco.com/web/software/283088407/126036/cucm-11.0.ova.readme.txt

System Level Upgrade

5

Overall Upgrade Strategy to Minimizing Down Time



- Phase II, IV or V might have to be repeated for each of the step in a multi-step upgrade
- Check with Compatibility Matrix on Collaboration applications and firmware compatibility

Migration Recommendations

- Develop a comprehensive plan for the migration
- Partners can use PDI Helpdesk for migration plan review
  - http://www.cisco.com/web/partners/tools/pdihd.html
- Break the upgrade into phases to minimize downtime
- Open a Global Licensing Operations (GLO) case with specific tags for fast results
  - https://communities.cisco.com/community/partner/collaboration/migration/blog/2013/05/30/how-to-get-the-efficient-support-for-drive-to-9
- Open a proactive TAC case for the upgrade
  - http://cisco.com/tac/caseopen
- Check Unified Communications Virtualization docwiki often due to frequent changes

Questions ?

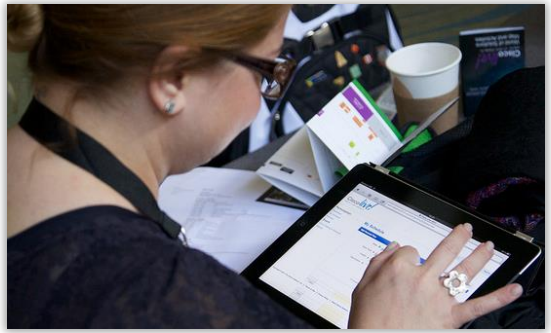
Call to Action

- Visit the World of Solutions for
  - Cisco Campus – Collaboration
  - Walk in Labs – Troubleshooting Cisco Jabber
  - Technical Solution Clinics
- Meet the Engineer
  - Available the rest of the day
- Lunch and Learn Topics
- DevNet zone related sessions

Complete Your **Online Session Evaluation**

- Please complete your online session evaluations after each session. Complete 4 session evaluations & the Overall Conference Evaluation (available from Thursday) to receive your Cisco Live T-shirt.

- All surveys can be completed via the Cisco Live Mobile App or the Communication Stations



Thank you

Appendix

- W1 Upgrade
- Bridge Upgrade
- Jump Upgrade
- License Acquisition
- L2 and RU Upgrade in Detail
- Detailed ELM/PLM License
- User Count Tool
- License Conversion
- Phone and License Usage

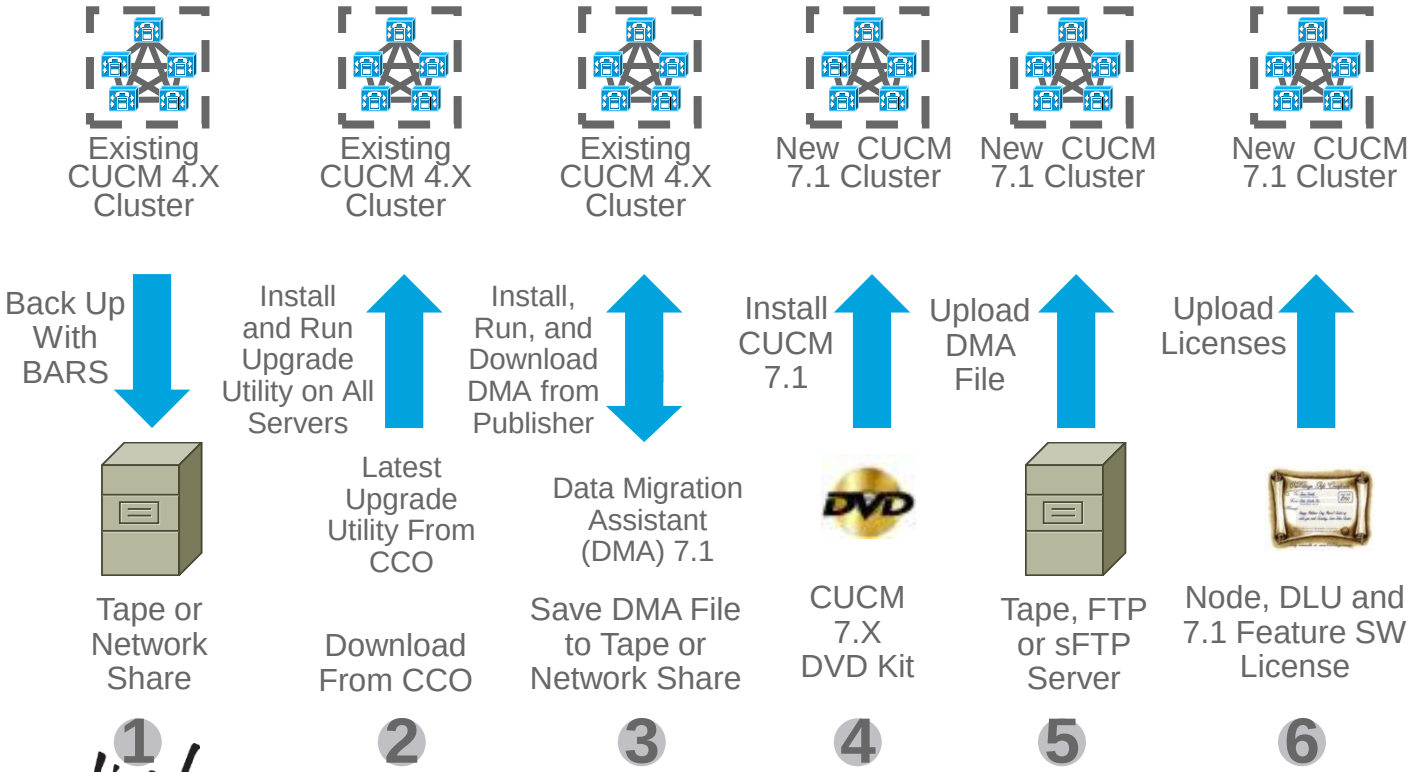
Appendix

- ELM 9.1
- PLM 10.X
- Previous Methods for Owner User ID
- License Management Models with PLM
- Refresh Upgrade (RU) for MCS 7825 and MCS 7828
- L2 and RU Upgrades for CUCM 9.X and CUCM 10.X
- RU Upgrades for CUCM 11.X

Appendix

- RU COP File
- RSA COP File
- Detailed PCD
- CUCM-BE5K Migration
- Sample PowerShell Script to Update CUCM 10.X/11.X virtual machines

W1 Upgrade: Windows to Appliance Model



Not covered in detail in this session

- CUCM 7.1 software availability can be an issue since CUCM 7.1 has EOS (End of Sales)

CUCM Migration Definition

Bridge Bridge Upgrade: Appliance to Appliance model

- Upgrade is allowed with Cisco CallManager service “Not Running”
- Long downtime due non-functional system and a platform change
- (e.g. Older servers that cannot newer version of CUCM)

Up to 9.1(2)

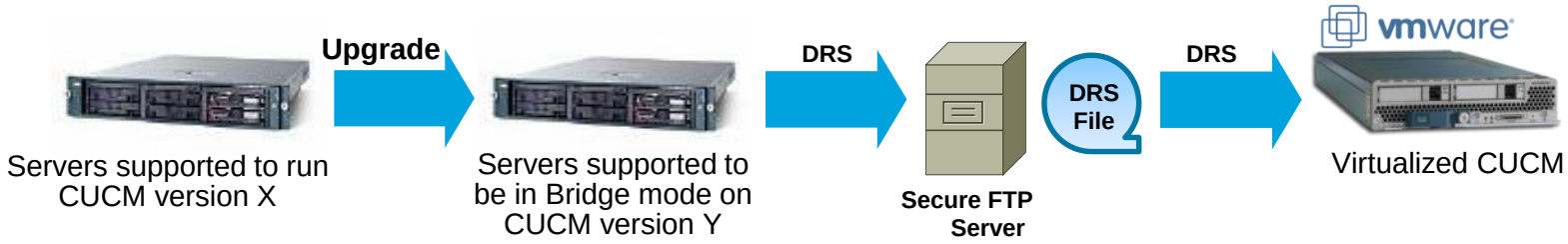
Jump Jump Upgrade: Appliance to Virtualized model

- Virtualized CUCM with 6.1(4), 6.1(5), 7.1(3) and 7.1(5) for lab upgrade
- Minimal downtime due to lab upgrade
- (e.g. Older servers that cannot upgrade to 8.0(3) or later to virtualized)

To 9.1(2) ONLY

Bridge Upgrade

To 8.0(2) – 9.1(2)



- Server platform change for discontinued servers that cannot run latest CUCM version
  - Allows for a successful upgrade with Cisco CallManager service in in “Not Running” state
  - Platform change is done with DRS backup and restore
  - Use case include appliance to appliance and appliance to virtualized
- Requires rehost of license file due to MAC or License
  MAC change caused by server change
  - For a virtualized environment, use Answer File Generator to proactively obtain license file

Jump Upgrade

Servers that cannot run CUCM 8.0(2) or later to virtualized

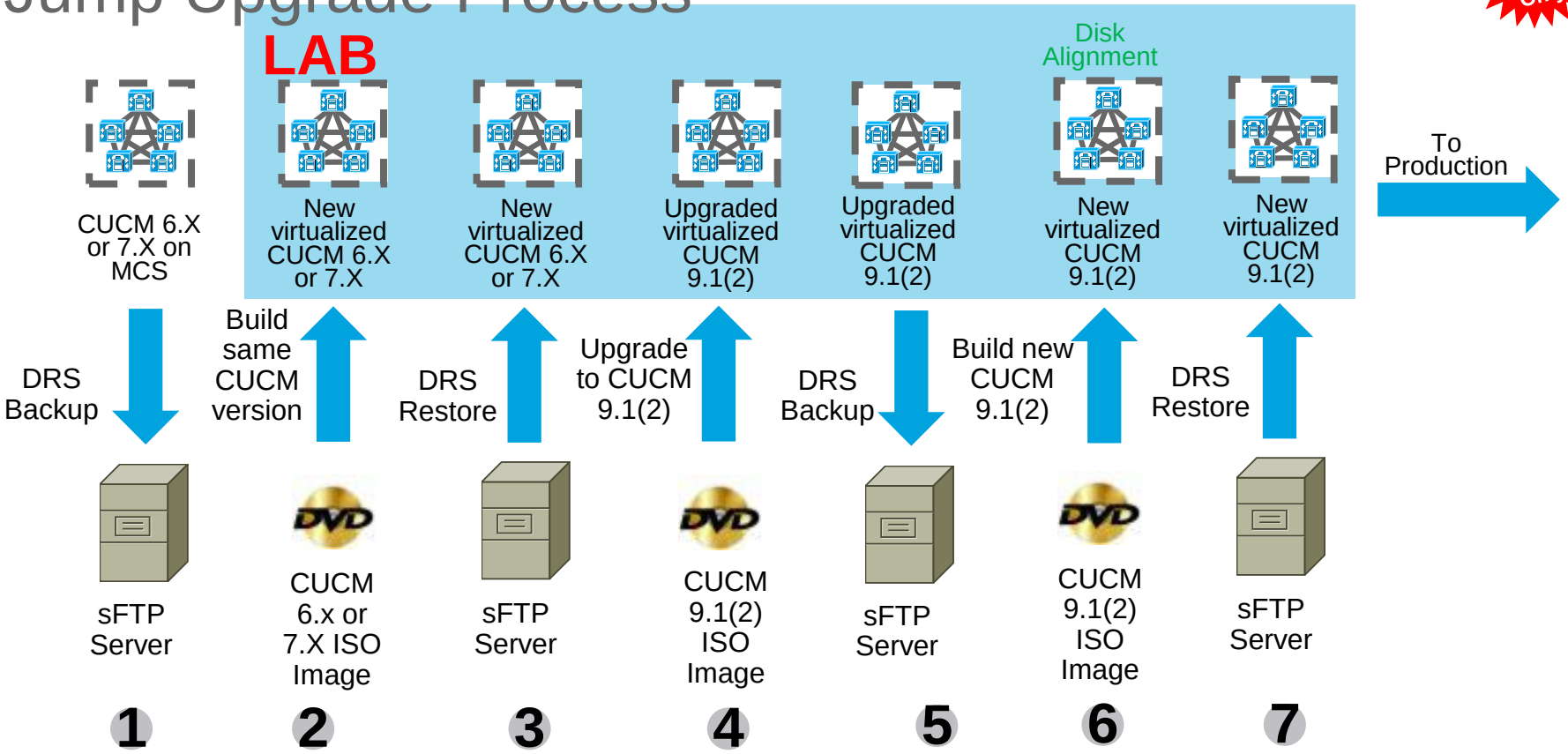
Jump Upgrade Process

Virtualized CUCM 9.1(2)

To 9.1(2) Only

- Upgrade process of multiple steps:
  - Upgrade from CUCM 6.1(4), 6.1(5), 7.1(3) or 7.1(5) ONLY
  - Upgrade to CUCM 9.1(2) ONLY
  - Lab migration ONLY
- Allows bare metal CUCM at version 6.1(4), 6.1(5), 7.1(3) or 7.1(5) migrating to virtualized CUCM at version 9.1(2)
  - Minimal down time
  - Database lockdown time (i.e. No MACD)
  - No license required for interim upgrades

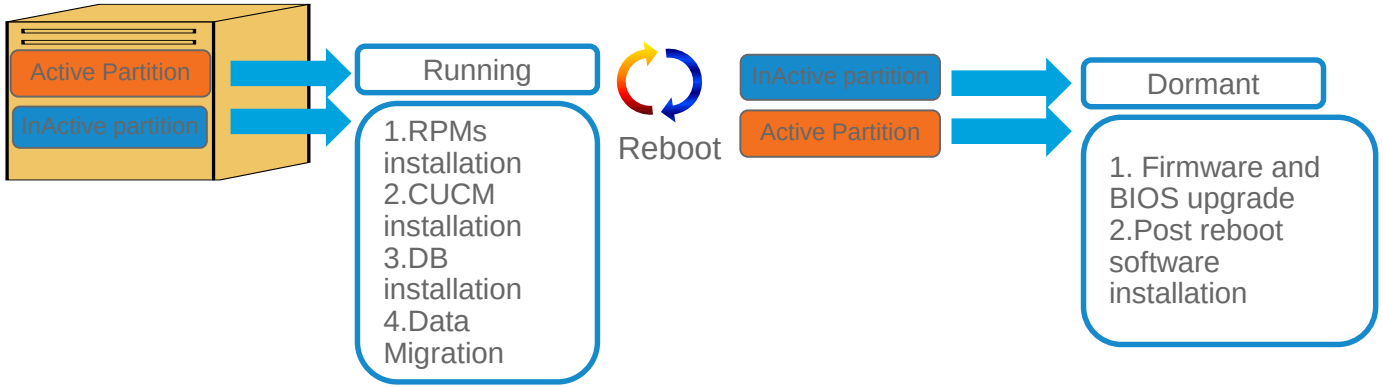
Jump Upgrade Process



License Acquisition with CUCM 5.X to 8.X

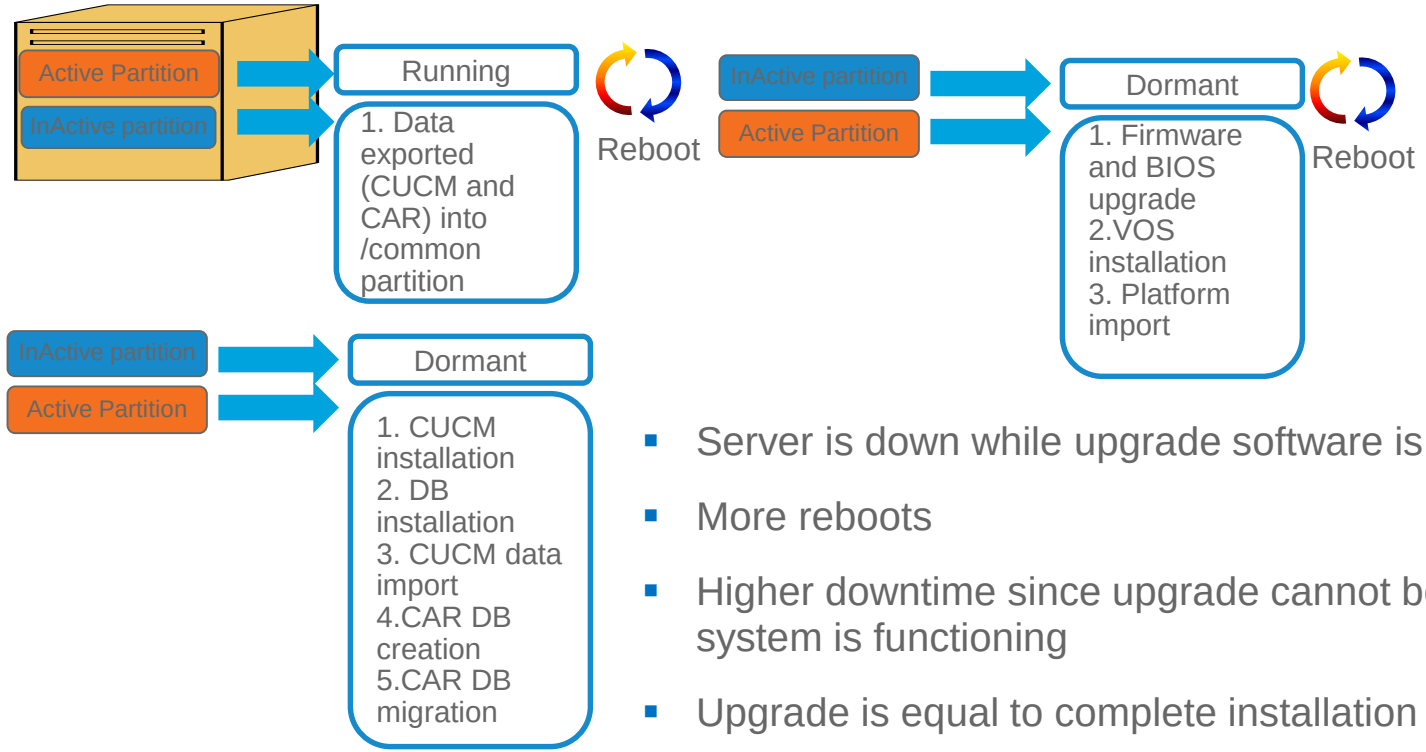
- Product Upgrade Tool site = http://tools.cisco.com/gct/Upgrade/jsp/index.jsp
- Product License Registration site = https://tools.cisco.com/SWIFT/LicensingUI/Home
- License files are uploaded and managed on the first node or Publisher of the cluster
- License files are locked to the MAC address of the first node or Publisher of the cluster
- License enforcement is perform on CUCM

L2 Upgrade: Appliance to Appliance Model



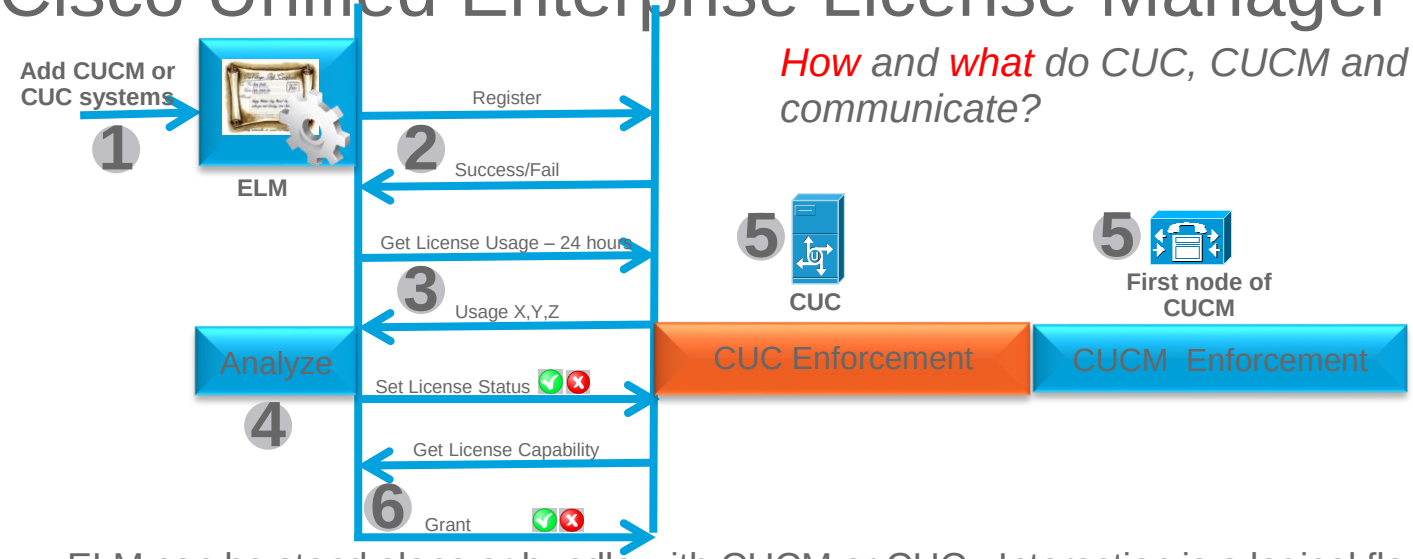
- Active partition is running while upgrade software is being install on inactive partition
- Low downtime since upgrade can be done while system is functioning

Refresh Upgrade (RU): Appliance to Appliance Model



- Server is down while upgrade software is being install
- More reboots
- Higher downtime since upgrade cannot be done while system is functioning
- Upgrade is equal to complete installation of CUCM

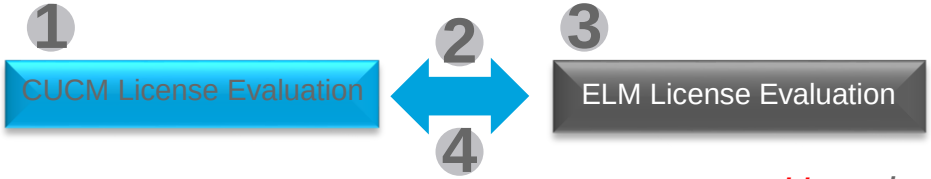
Cisco Unified Enterprise License Manager



How and what do CUC, CUCM and ELM communicate?

- ELM can be stand alone or bundle with CUCM or CUC. Interaction is a logical flow
- CUCM and CUC sends license usage to ELM
- ELM handles the license grant or revoke based licensing logic
- CUCM and CUC perform license enforcement based ELM response
- CUCM and CUC enforcement rules are different

Process of CUCM and ELM Communications

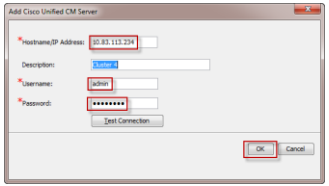


How does CUC, CUCM and ELM know what to communicate?

- 1. CUCM evaluates users to phones usage and feature usage to derives at UCL/CUWL usage
- 2. CUCM sends UCL/CUWL usage to ELM
- 3. ELM evaluates license request, perform evaluation and license substitution before sending a respond to CUCM (VALID or INVALID)
- Next slides will go over the HOW CUCM and ELM know how to evaluates license usage in details

Using User Count Tool as Planning Tool to Migrate

1



2

Clusters | License Report

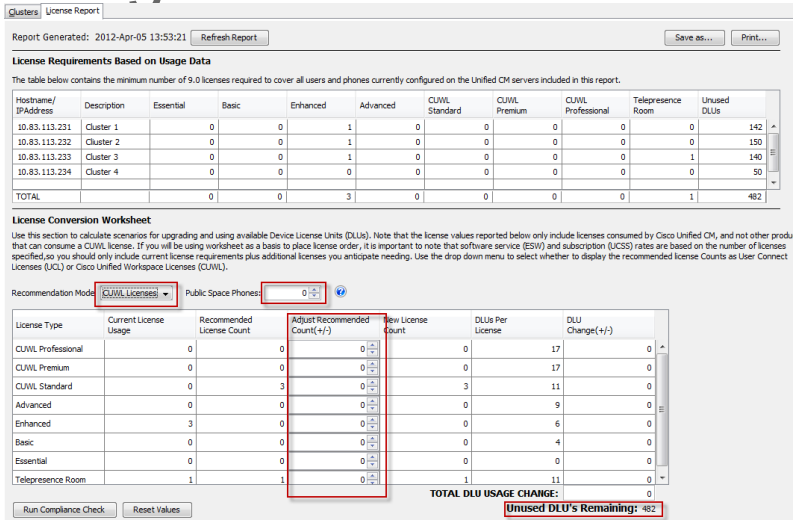
Welcome to the Cisco License Count Utility. This utility will connect to the Cisco Unified CM servers you define below and generate a report of license usage that can be viewed, printed or saved. Begin by adding servers- if you have clusters, only add the publishers-- and then press Generate Report.

Add... | Edit | Delete... | Generate Report

Hostname/IP address	Description	Version (Last Known)	Last Connection Status	Include in Report
10.83.113.231	Cluster 1	8.6.2	Successful	☑
10.83.113.232	Cluster 2	9.0.0	Successful	☑
10.83.113.233	Cluster 3	7.1.5	Successful	☑
10.83.113.234	Cluster 4	6.1.5	Successful	☑

- 1. Cluster > Add: Add system in User Count Tool (UCT) using IP/hostname of system and AXL credential
- 2. Cluster: Ensure that system connected successfully
- Check versions of CUCM that the tool detects

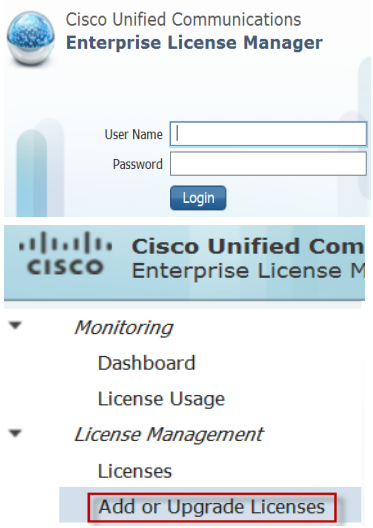
Using User Count Tool as Planning Tool to Migrate



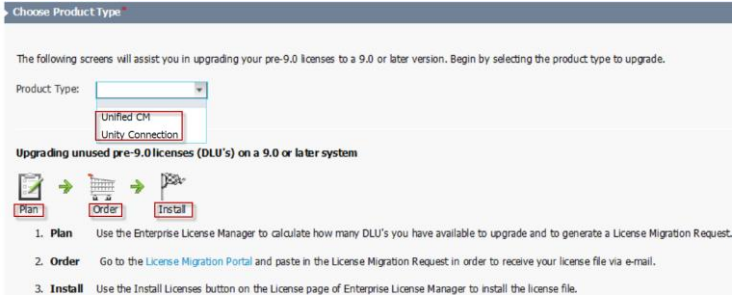
- The resulted UCL and CUWL will be the basis for ESW and UCSS renewal for next renewal cycle
- Use this planning tool to perform proactive license resolution prior to the actual upgrade
- Save the report(s) in csv format so that they can be use in the actual conversion in ELM during upgrades:
  - Per systems
  - Migration phase(s)

- Cluster > Generate Report: Generate report of ALL systems and the corresponding UCL/CUWL usage
- UCL and CUWL mode
- CUWL mode has Public Space Phones
- Adjustment can and should be perform to reflect the migrated systems entitled licenses
- Remain DLU does not need to be zero

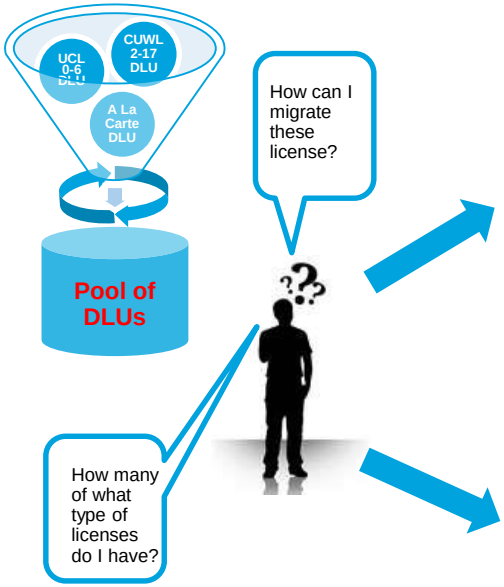
Use ELM Upgrade Wizard for License Upgrade



- Upgrade License Wizard: License Management > Add or Upgrade License > Upgrade License
  - Plan, Order and Install
- Plan:
  - Select CUCM or CUC for migration
  - Select what systems to migrate
  - Conversion is exactly like UCT so use saved UCT reports to adjust UCL/CUWL requirements
- Order allows for license acquisition by capturing text from ELM
- Install is to install the license file



License Conversion



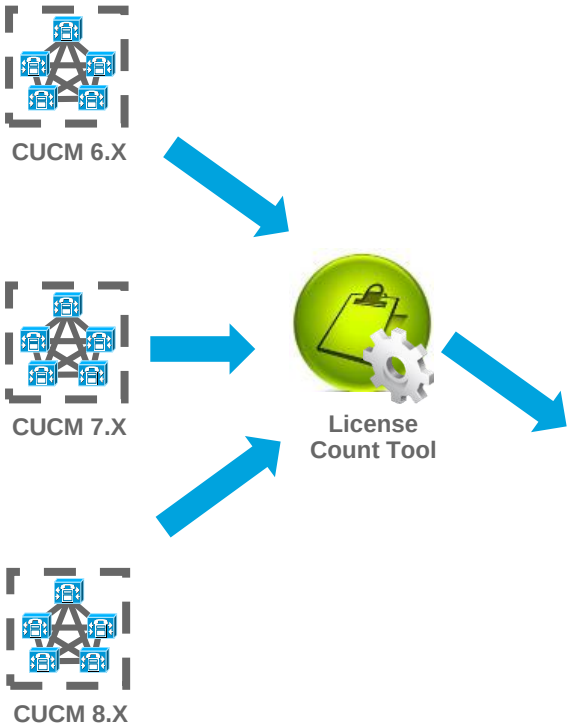
1 Manual

- For CUCM, CUC included with CUWL or standalone CUC
- Work with Global License Operation (GLO) licensing@cisco.com
- Manually provide data of current system to get new license file from GLO
- Documentation of process at: https://communities.cisco.com/docs/DOC-33804

2 Automated

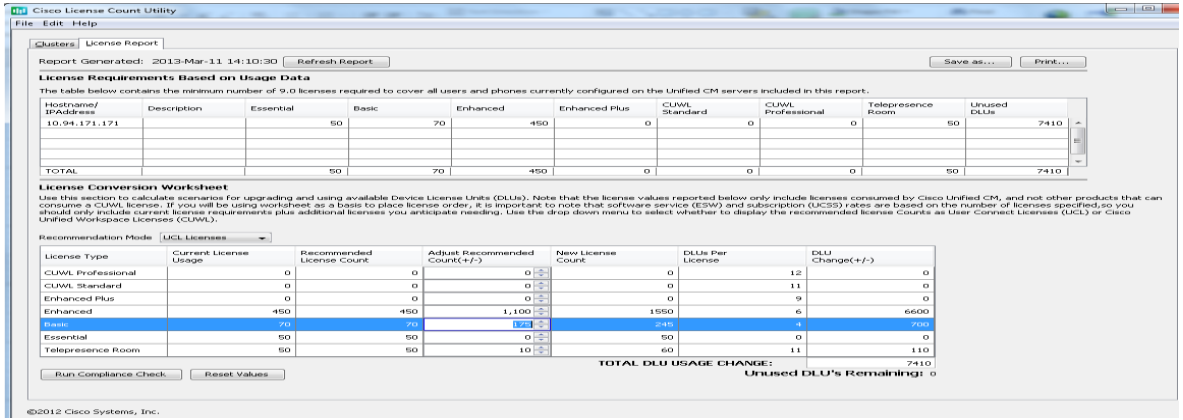
- Standalone CUC
- Upgrade CUC to 9.X
- Self service license request using Product License Registration
- Documentation of process at: http://www.cisco.com/en/US/products/ps6509/products_tech_note09186a0080bf5921.shtml

License Count Utility (UCT) for CUCM 6.X-8.X



- Available on CCO
- Perform AXL calls to existing CUCM clusters for licensing information, recommends CUCM 9.X license usage, provides option for unused DLU to CUCM 9.X license and generate report.

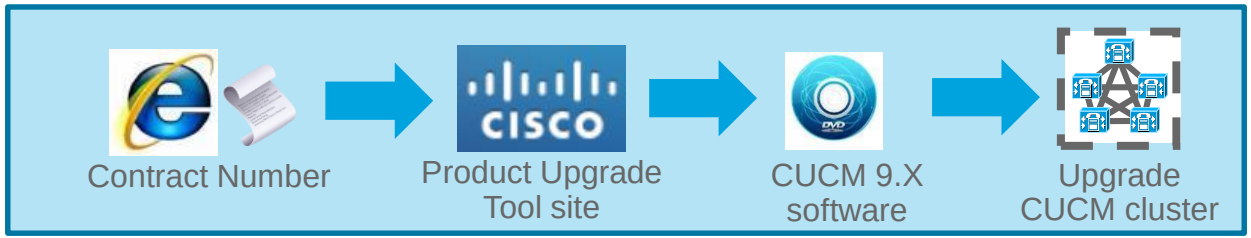
Detailed screen capture of UCT are in the appendix



1. Data for Manual License Migration

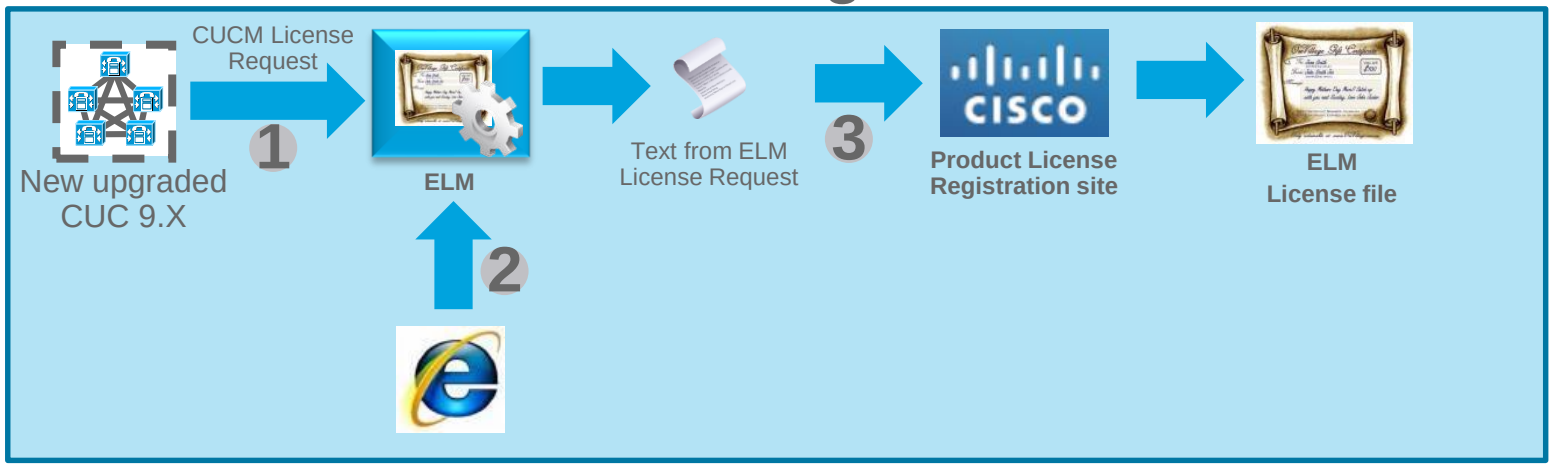
- Working with Global Licensing Operation (GLO) at licensing@cisco.com
- Provide current system usage
  - Migrated system(s): ELM Usage Report
  - CUCM 6.X to 8.X: License Report with License Count Utility (UCT)
  - CUCM 3.X to 5.X: Print screen of system usage
- Provide
  - Active ESW/UCSS contract number
  - Site information
  - Contact information for email and support contract
  - MAC Address/License MAC from current CUCM system
  - ELM generated license request
  - Email to send licenses or software with contact information
  - Intended CUCM 9.X user count and features for unused DLU

2. Automated License Migration with ELM



- Log into Product Upgrade Tool site = http://tools.cisco.com/gct/Upgrade/jsp/index.jsp to order upgrade kit
- Obtain upgrade software. There is an electronic version for download
- Upgrade CUCM cluster to 9.X and run licenses in Overage mode for 60 days before license is required for ELM

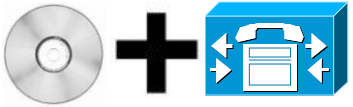
2. Automated License Migration with ELM



- 1. In ELM, add the new upgraded CUC 9.X and get upgrade license request
- 2. In ELM Upgrade wizard: License Management > Add or Upgrade Licenses > Upgrade Licenses
  - Go through license planning for UCL and CUWL request based on DLU
  - Capture license request text
- 3. Go to:
  - Product License Registration site = https://tools.cisco.com/SWIFT/LicensingUI/Home
  - Go to Migration License section and select Register for Upgrade/Migrate License

Overview of CUCM 9.1 Installation

CUCM
9.X DVD KIT



MCS-781X
MCS7825
MCS7828
MCS7835
MCS7845

INSTALLATION PROCESS (PROCEED)

1 Apply SR, ES or SU

Upgrade During Installation
i.e., 9.1(1a) to 9.1(2)

2 Basic Install

New Installation, New Server—Flash Cut or New Server—Migration

Installation Logs

- To capture installation logs failure, a USB key is required for physical servers
  - Plug USB key into the physical server
  - Accept dumping of logs
- In a virtualized environment, dump logs is via serial port of VM
  - Add serial port when VM is off before CUCM 8.X installation
  - On failure, edit guest OS to connect to a temporary file to virtual serial port
  - Accept dumping of logs
  - Download 7zip from http://www.7-zip.org/download.html to unzip the tar file
  - Remove serial port after a successful installation of Unified CM 8.X

CUCM 9.X Phone License

License	Phone Type (2)	# of Devices (3)	Features (1)
Essential UCL	Analog, 3905, 6901, VGC Phone, ATA186, ATA187	1	EM
Basic UCL	6911, 6921, CUC-RTX, Analog, 3905, 6901, VGC Phone, ATA186, ATA187	1	EM, SNR
Enhance UCL	12S, 12SP, 12SP+, 30SP+, 30VIP, 3911, 3951, 6941, 6945, 6961, 7902, 7905, 7906, 7910, 7911, 7912, 7920, 7921, 7925, 7926, 7931, 7935, 7936, 7937, 7940, 7941, 7941G-GE, 7942, 7945, 7960, 7961, 7961G-GE, 7962, 7965, 7970, 7971, 7975, 7985, 8941, 8945, 8961, 9951, 9971, Cius, E20, ISDN BRI Phone, Third-party SIP Device, CIPC, CUPC, CIM, CSF, EX60, EX90, Jabber (Android/iPhone/iPpad), CUMC, IIM, Nokia S60, H.323 Client, VXC 6215, 6911, 6921, CUC-RTX, Analog, 3905, 6901, VGC Phone, ATA186, ATA187 , Analog, 3905, 6901, VGC Phone, ATA186, ATA187	1	EM, SNR
Enhance UCL Plus	Same as Enhance UCL	2	EM, SNR

CUCM 9.X Phone License

License	Phone Type (2)	# of Devices (3)	Features (1)
CUWL Standard	12S, 12SP, 12SP+, 30SP+, 30VIP, 3911, 3951, 6941, 6945, 6961, 7902, 7905, 7906, 7910, 7911, 7912, 7920, 7921, 7925, 7926, 7931, 7935, 7936, 7937, 7940, 7941, 7941G-GE, 7942, 7945, 7960, 7961, 7961G-GE, 7962, 7965, 7970, 7971, 7975, 7985, 8941, 8945, 8961, 9951, 9971, Cius, E20, ISDN BRI Phone, Third-party SIP Device, CIPC, CUPC, CIM, CSF, EX60, EX90, Jabber (Android/iPhone/iPpad), CUMC, IIM, Nokia S60, H.323 Client, VXC 6215, 6911, 6921, CUC-RTX, Analog, 3905, 6901, VGC Phone, ATA186, ATA187 , Analog, 3905, 6901, VGC Phone, ATA186, ATA187	10	EM, SNR
TelePresence	TelePresence	1	

CUCM 10.0 Licensing Summary Cont.

UCL **Enhanced / Enhanced Plus**
CUWL **Standard**
CUWL **Professional**

UCL **Basic**

UCL **Essential**


Fax


Analog


3905


6901


6911


6921


7821


69xx


78xx


79xx


792x


7937 / 8831


89xx


99xx


DX650


EX60 / EX90


Jabber Desktop


Jabber Mobile


Third Party SIP

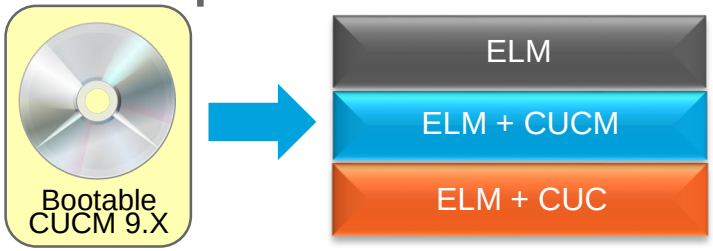
TelePresence Room


TX / CTS / T Series


MX / Profile Series


System Codecs and Quickset Platforms

Enterprise License Manager (ELM)



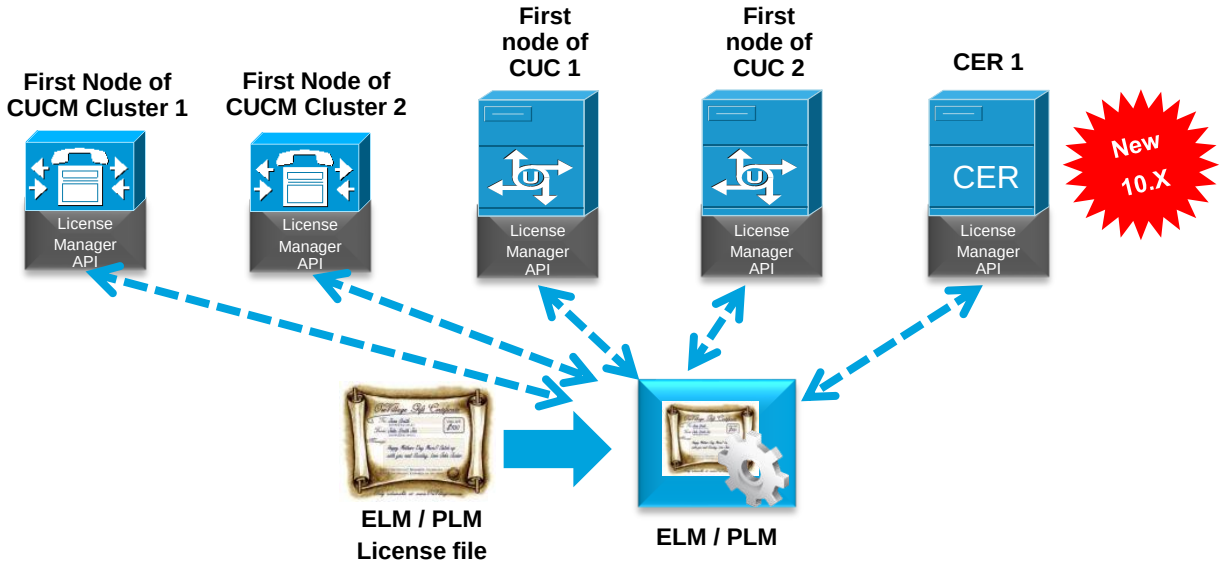
ELM Implementation	Products
Standalone	ELM
Co-resident with CUCM	ELM + CUCM
Co-resident with CUC	ELM + CUC

9.X

- ELM is a centralized enterprise-wide license management solution for Cisco collaboration applications
  - CUCM
  - Cisco Unity Connection (CUC)
- ELM deployment can be standalone or co-resident with CUCM or CUC with the same ISO file
- License file is uploaded onto ELM instead of CUCM or CUC and is based on ELM MAC address and host ID
- License file is cumulative and is based on products (CUCM or CUC)

Enterprise Manager User Guide:
http://www.cisco.com/c/en/us/td/docs/voice_ip_comm/cucm/elmuserguide/9_1_2/CUCM_BK_E92F409A_00_elm-user-guide-912/CUCM_BK_E92F409A_00_elm-user-guide-912_chapter_011.html

License Manager Architecture 9.X and 10.X

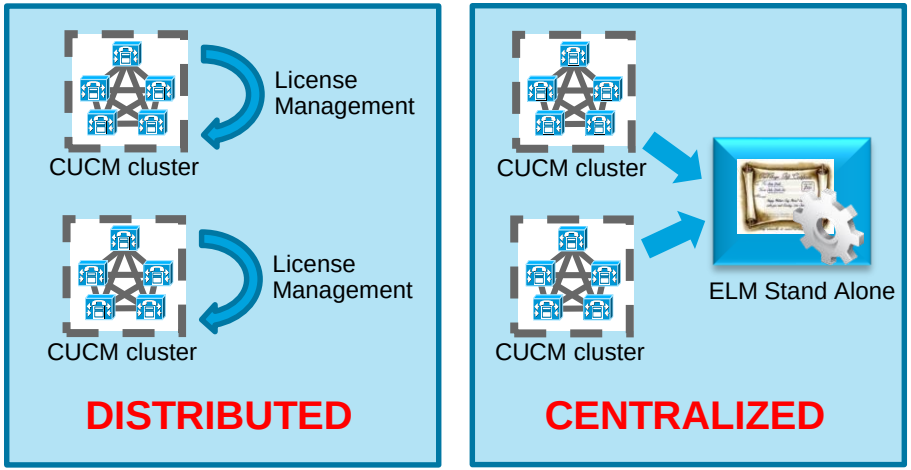


- License Manager API added to CUCM 9.X/10.X and CUC 9.X/10.X to interact with ELM / PLM for license request and approval
- License Manager API added to CER 10.X to interact with PLM for license request and approval
- Electronic fulfillment supports License Feature and Version Upgrades in PLM 10.X

Previous Methods for Owner User ID

- BAT: http://www.cisco.com/c/en/us/support/docs/voice-unified-communications/bulk-administration-tool/110967-bat-00.html
- CLI SQL on logged in users: https://crystalclearinsanity.wordpress.com/2014/03/07/cucm-set-device-owner-id-to-em-logged-in-user-id-via-sql/
- CLI SQL: http://pandaeatsbamboo.blogspot.com/2014/01/associate-existing-phones-to-users-with.html
- UDS and AXL: http://samiamsam.com/2014/06/24/cisco-api-series-the-uds-api-with-a-side-of-axl/

License Management Models with PLM



- PLM provides for both distributed and centralized license management model
  - Separate virtual machine for ELM (recommended)
  - Separate virtual machines based on UC applications, site or line of business
  - Co-resident to CUCM or CUC corporate wide or based on UC applications, site or line of business
- Consideration when designing a licensing solution
  - 60 days overage and redundancy/re-host (registration ID and MAC) of ELM

Refresh Upgrade (RU) for MCS 7825 and MCS 7828 (CUCM 8.6 & 9.X Upgrade)

Reference

8.6 / 9.X

MCS-7825 H3/H4
MCS-7825-I3/I4/I5
MCS-7828-H3
MCS-7828-I3/I4/I5

RU

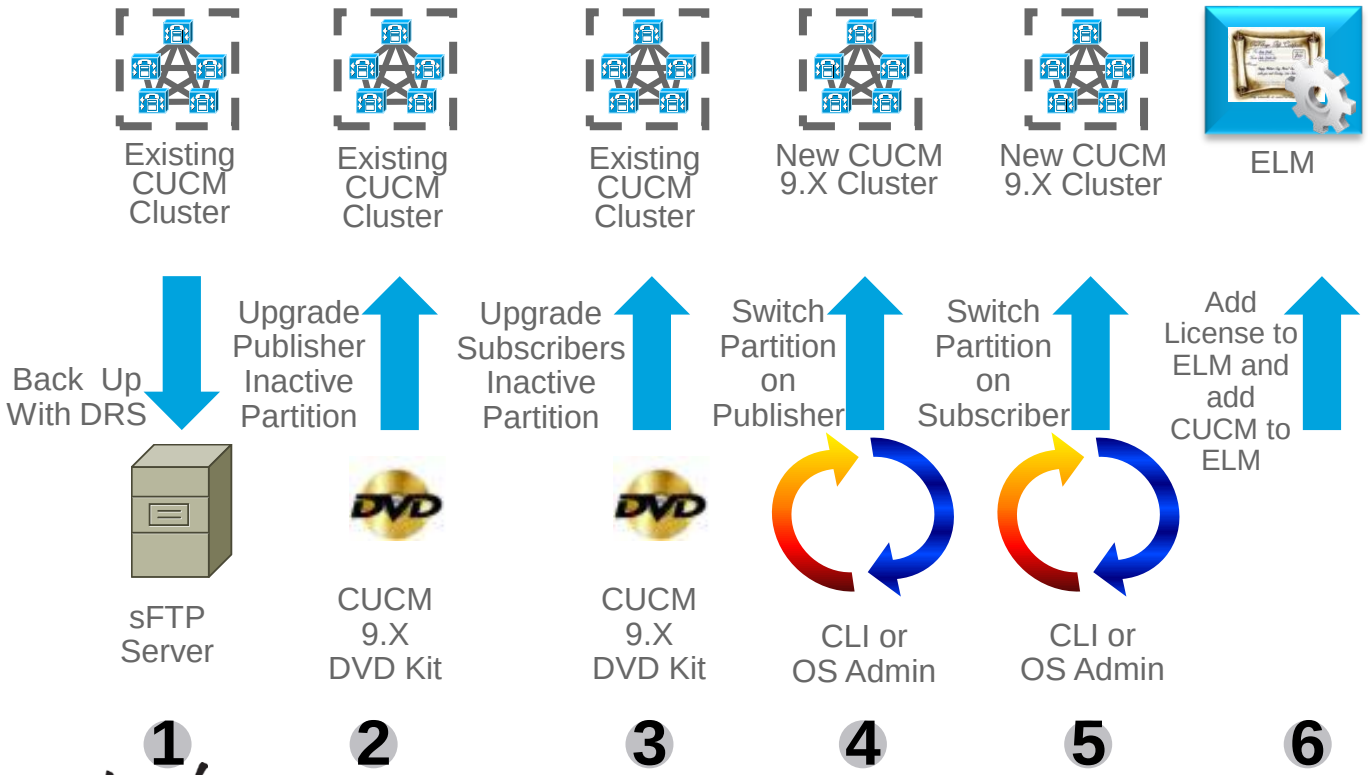
MCS-7825 H3/H4
MCS-7825-I3/I4/I5
MCS-7828-H3
MCS-7828-I3/I4/I5

- Software raid and OS reinstallation by RHEL 5 requires USB key
  - CUCM- 16 GB USB drive. CUC and CUCM BE 5000 – 128 GB USB drive
  - External power USB drive. One per server. Do not remove until upgrade completes
- DRS back up before upgrade. USB data cannot be restore from new installation
- Reinstallation and DRS restore as the only reversion method
- Check memory required per server (MCS7825 – 4GB, MCS7828 – 6GB) before upgrade
- Recommend to virtualize at this point if possible

Upgrade and Migration Caveats with Diskspace

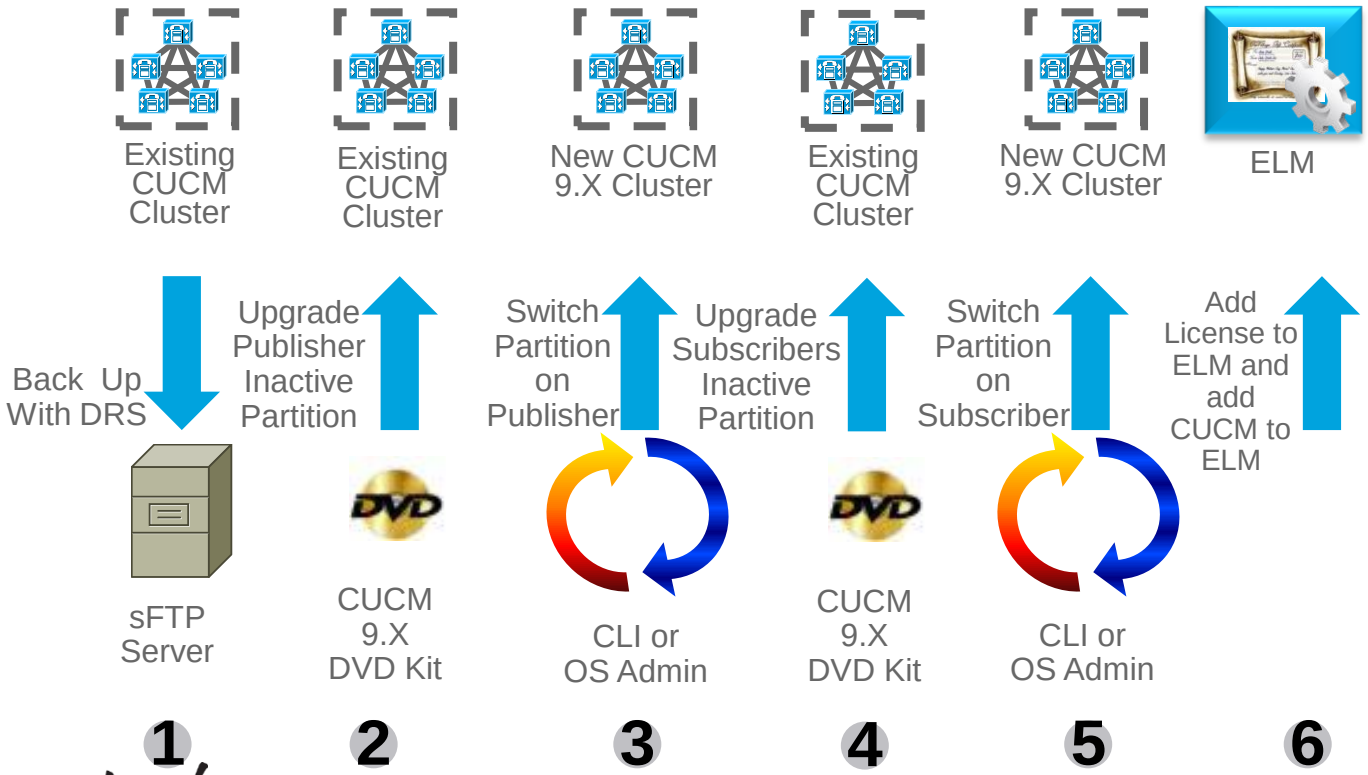
Upgrade Definition	Scenario
W1 Upgrade	Windows to appliance upgrade up to CUCM 7.1(5)
L2 Upgrade	Appliance to appliance upgrade within same major RHEL release (before CUCM 8.6)
RU Upgrade	Appliance to appliance upgrade between major RHEL releases (starting with CUCM 8.6)
Bridge Upgrade	Servers too old to run latest CUCM version. Use DRS file to change platform to continue upgrade
Jump Upgrade	Servers too old to run CUCM version 8.0(2) or later to virtualized. Virtualized in lab to perform upgrade
Manual Platform Change	Changing servers platform. Typically from bare metal servers to virtualized environment
Automated Platform Change w/ PCD	

In-Place L2 Upgrade Process



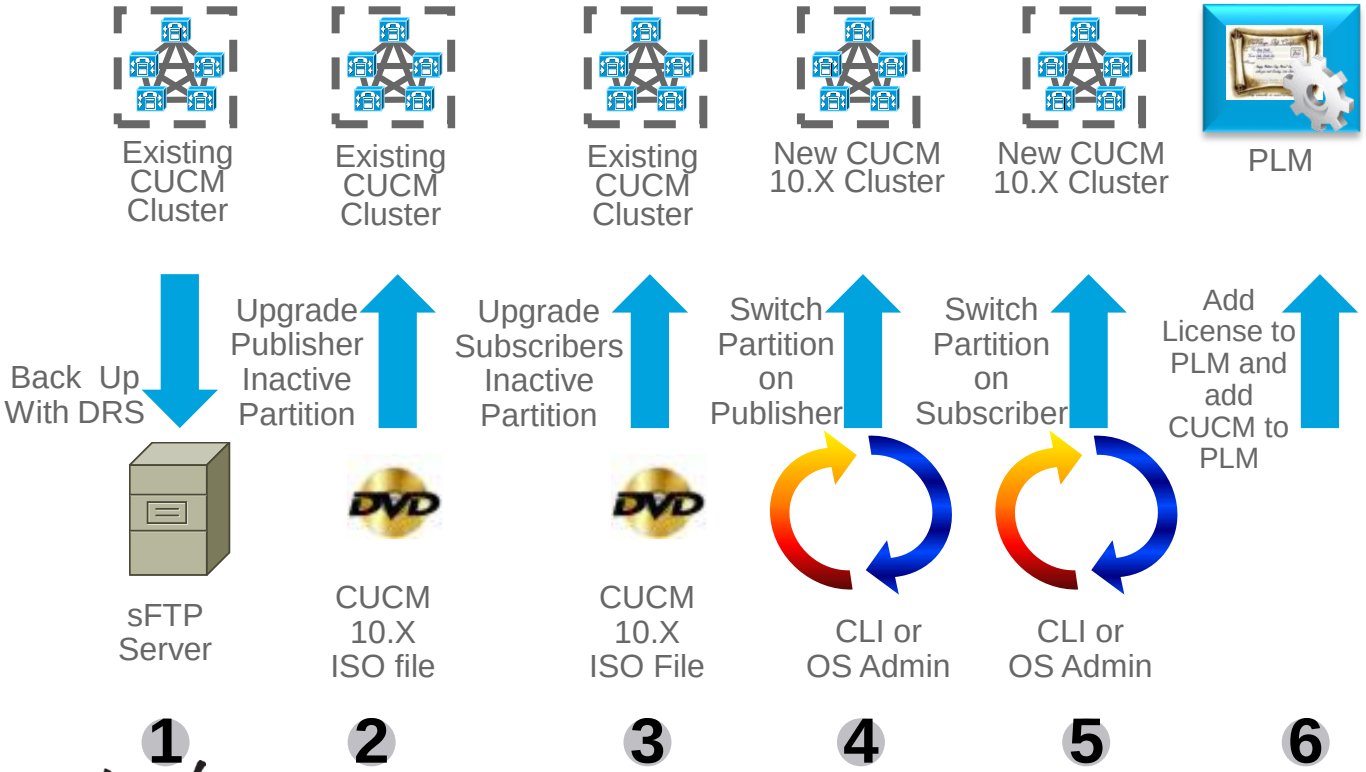
- Version 9 of license manager is Enterprise License Manager (ELM)
- ELM license is required only when going from 8.X or earlier to 9.X
- This scenario applies to both bare metal and virtualized CUCM

In-Place RU Upgrade Process



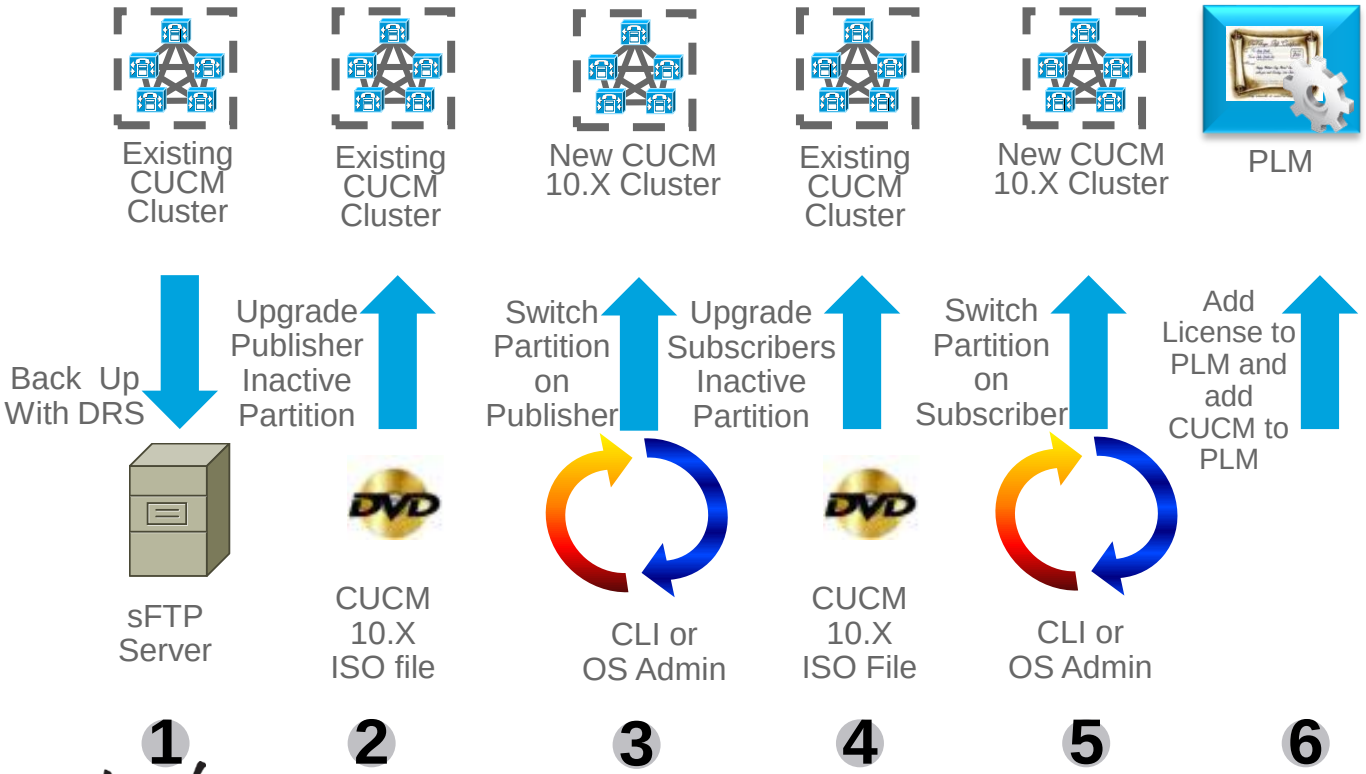
- Version 9 of license manager is Enterprise License Manager (ELM)
- ELM license is required only when going from 8.X or earlier to 9.X
- This scenario applies to both bare metal and virtualized CUCM

In-Place L2 Upgrade Process



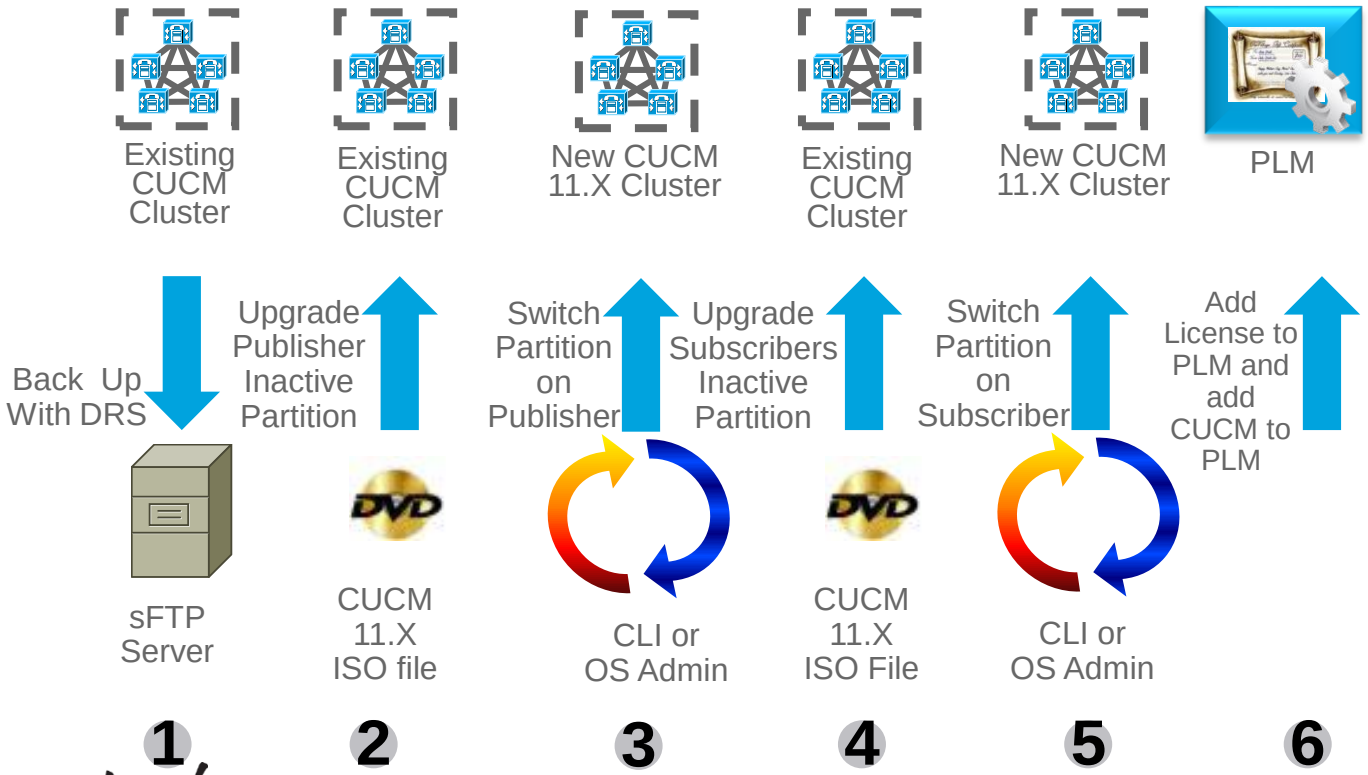
- Version 10 of license manager is Prime License Manager (PLM)
- PLM license is required only when going from 9.X or earlier to 10.X
- This scenario applies to virtualized CUCM only
- For 10.X to 10.5, upgrade IM&P after CUCM cluster is upgraded

In-Place RU Upgrade Process



- Version 10 of license manager is Prime License Manager (PLM)
- PLM license is required only when going from 9.X or earlier to 10.X
- This scenario applies to virtualized CUCM only
- For 9.X to 10.X, upgrade IM&P after CUCM cluster is upgraded

In-Place RU Upgrade Process



- Add version 11 of license for the appropriate ELM or PLM
- For 9.X to 11.X, upgrade IM&P after CUCM cluster is upgraded
- This scenario applies to virtualized CUCM only

Refresh Upgrade (RU) and COP File

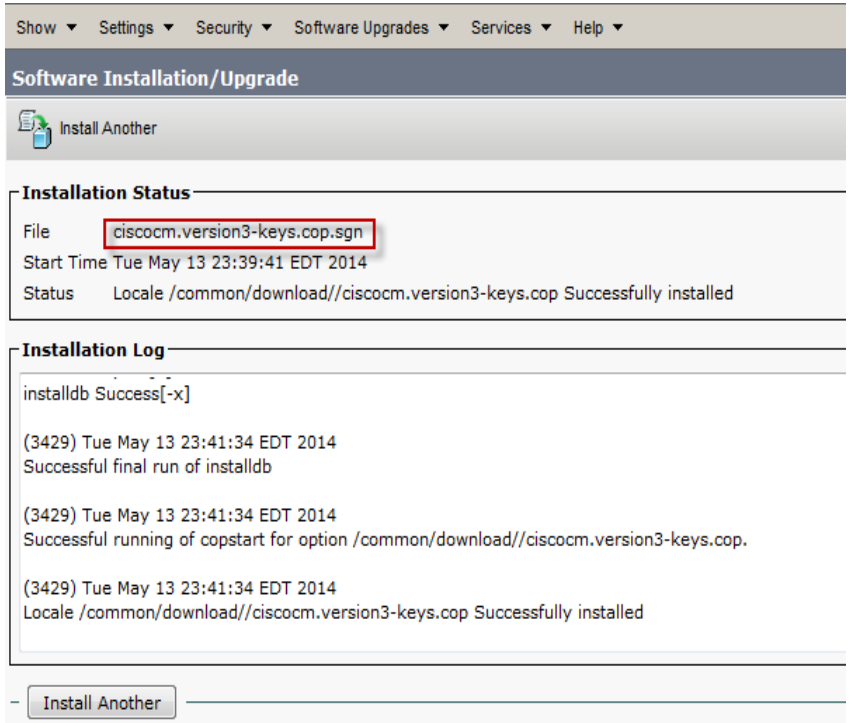
- Perform a DRS back up before upgrade
- Install Refresh Upgrade COP file v1.5 (ciscocm.refresh_upgrade_v1.5.cop.sgn) file on all CUCM servers. Also for CUC, CUCM-BE 5K and IME
  - Active version is CUCM 8.5 or earlier (i.e. No need for CUCM 8.6, 9.X or 10.X)
  - Upgrade to CUCM version 8.6 or later (e.g. Required for upgrade from CUCM version 8.5 to 10.5)
  - No reboot is required
  - Installation fails if changes are already in CUCM code (e.g. ES that already have this code change)
  - CLI: “show version active” or OS Admin: “Show > Software” to see installed COP file(s)
- Track console of server to monitor progress of upgrade – IP KVM, HP ILO, or IBM RSA for bare metal server or virtual machine console for virtual machine
- CUCM RU COP file is for CUCM version 8.5 or earlier. Other collaboration solutions RU might be at a different release (e.g. CUP 8.6(1) to CUP 8.6(4) requires CUP RU COP file v1.01)
- * RU COP file might be use once for older releases while RU can occur several times due to change in RHEL version

CUCM Refresh Upgrade COP File v1.5

https://software.cisco.com/download/release.html?mdfid=285963825&flowid=50402&softwareid=282204704&release=COP-%2520Files&relind=AVAILABLE&rellifecycle=&reltype=latest

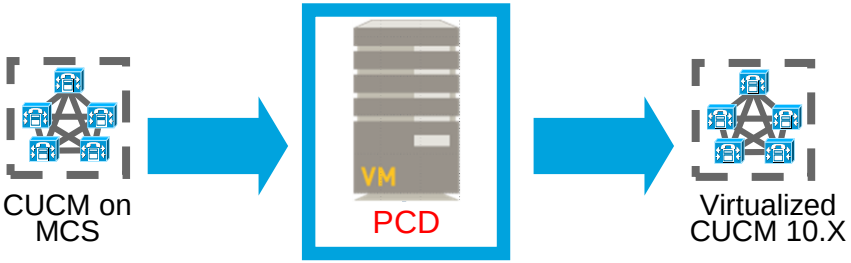
CUCM 10.5 Pre-Upgrade COP File

New 10.5



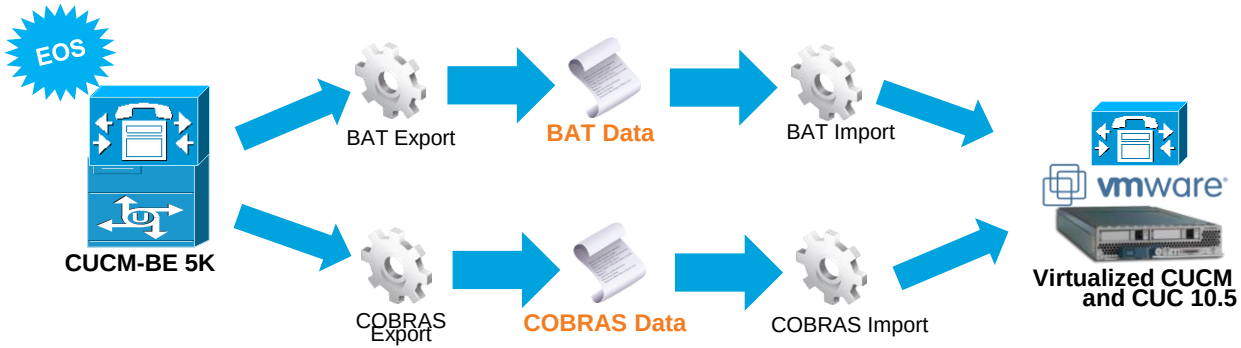
- Pre-Upgrade RSA keys Cisco Options Package (COP) file (ciscocm.version3-keys.cop.sgn) for software integrity protection
- Install Pre-Upgrade COP file (ciscocm.version3-keys.cop.sgn) file on all CUCM servers. Also for IM&P 10.5 and PLM 10.5
  - Active version is 9.1(2) or earlier (i.e. No need for CUCM 10.0)
  - Upgrade to CUCM version 10.5 or later (e.g. Required for upgrade from CUCM version 8.6 to 10.5)
  - No reboot is required
  - CLI: “show version active” or OS Admin: “Show > Software” to see installed COP file(s)
- PCD does not automate this COP file installation
- Install RU COP file prior to the Pre-Upgrade COP file

2. Automated Platform Conversion with PCD



- Bare metal CUCM to virtualized CUCM (P2V)
  - Install ciscocm.ucmap_platformconfig.cop file to the source servers to export data
  - Build new cluster
  - Import data
- Same or different destination IP address and/or hostname
- Scheduled or immediate execution

CUCM-BE 5K to CUCM-BE 6K or CUCM/CUC



- Upgrade CUCM-BE to version CUCM-BE 10.5
- Export data:
  - BAT for call control and COBRAS for messaging
- Build virtualized CUCM and CUC
- Import data:
  - BAT for CUCM and COBRAS for CUC

Sample PowerShell Script to update CUCM 10.0 Virtual Machines

```
### Remember to Shutdown your CUCMs first ###
$vCenter = ”vcenter1.cisco.com"
$vFolder = ”UCM10"

Get-vc -server $vCenter
Get-Folder $vFolder | get-vm | Set-VM -GuestID "rhel6_64Guest" -confirm:$false
Get-Folder $vFolder | get-vm | get-networkadapter | set-networkadapter -type "vmxnet3" -confirm:$false
$folder = Get-Folder $vFolder | Get-View
Get-View -SearchRoot $folder.MoRef -ViewType VirtualMachine | %{$_.reload()}
## Alernatively one CUCM VM at a time
Get-VM -Name ”cucm1" | Set-VM -GuestID "rhel6_64Guest" -confirm:$false
Get-VM -Name ”cucm1" | get-networkadapter | set-networkadapter -type "vmxnet3" -confirm:$false
Get-View -ViewType VirtualMachine -Filter @{"Name" = ”cucm1"} | %{$_.reload()}
```

Sample PowerShell Script to Deploy CUCM VMs in Bulk to use as PCD Migration Destination

```
### Deploy a Blank CUCM choosing the Deployment Size and convert to Template First###
$vCenter = ”vcenter1.cisco.com”
$vFolder = ”UCMDestination-Folder”

$template = "cucm_10.5_vmv8_v1.8.ova_7.5k”
$vmNames = @{}

$vmNames[”ucmdestpub"] = @("ecats-rtp-cc42-esxi-1.ecatsrtp.cisco.com","ecats-rtp-cc42-esxi-1-
datastore1”,”Vlan123")
$vmNames[”ucmdestsub1"] = @("ecats-rtp-cc42-esxi-1.ecatsrtp.cisco.com","ecats-rtp-cc42-esxi-2-
datastore1”,”Vlan124")

Get-vc -server $vCenter
foreach ($vmName in $vmNames.keys)
{
$vm = New-VM -Name $vmName -Location $vFolder -Template $template -Host $vmNames[$vmName][0] -Datastore
$vmNames[$vmName][1] -Confirm:$false
###### Deploy CUCM with Local Vswitch Example
# get-NetworkAdapter -VM $vm | Set-NetworkAdapter -NetworkName $vmNames[$vmName][2] -Confirm:$false
###### Deploy CUCM with Distributed VSwitch Example
$myNetworkAdapter = Get-NetworkAdapter -VM $vm
$myVirtualPortGroup = Get-VirtualPortGroup -VirtualSwitch "uc-cseries" -name $vmNames[$vmName][2]
Set-NetworkAdapter -NetworkAdapter $myNetworkAdapter -Portgroup $myVirtualPortGroup -Confirm:$false
}
Echo Done
```

We’re ready. Are you?