High Availability Upgrade Procedure for Cisco Unified Communications Manager Releases 8.0(2)—9.0(1) to 9.1(x)

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C H A P T E R 1

Introduction

This document provides procedures for performing a high availability upgrade to Cisco Unified Communications Manager (Unified Communications Manager) Release 9.1(x) from Releases 8.0(2) through 9.0(1).

About high availability upgrades

Perform the upgrade in two stages:

1 Virtualize the current Unified Communications Manager release.

2 Upgrade to Unified Communications Manager Release 9.1(x).

The procedures in this document support high availability for both stages of the upgrade.

This document is applicable to Unified Communications Manager clusters with the following environment:

- Any of the following Unified Communications Manager Releases are installed: 8.0(2) through 9.0(1).

- None of the current Media Convergence Server (MCS) servers support Unified Communications Manager Release 9.1(x).

- You require high availability during the upgrade process.

- No changes are required to the IP addresses or hostnames for the Unified Communications Manager upgrade. If you need to change IP addresses or hostnames, you must do so in a separate maintenance window, prior to the upgrade. For more information, see Changing the IP Address and Hostname for Cisco Unified Communications Manager, Release 9.1(1).

C H A P T E R 2

Upgrade preparation checklist

Review the following information and ensure that you have met all of the requirements for the upgrade to Release 9.1(x) before you begin:

Licensing

This upgrade procedure requires licenses for Unified Communications Manager Release 9.1(x) and for a virtualized version of your current release. The licenses required for this upgrade are as follows:

- Unified Communications Manager Node, Software Feature License, and device license based on the License MAC for the version of your virtual server
- Unified Communications Manager Release 9.1(x)

Before you upgrade to Unified Communications Manager Release 9.1(x) from earlier Unified Communications Manager versions, install all previously purchased license files before you begin the upgrade; otherwise, your unclaimed licenses will not be available to your upgraded Unified Communications Manager. You cannot re-install licenses after the upgrade.

To support high availability, Unified Communications Manager Release 9.x clusters operate in a full-featured demo mode for 60 days without a license. After 60 days, the clusters continue to operate and route calls, but the functionality to add or remove devices and users is disabled until valid licenses are available on the associated Enterprise License Manager (ELM).

Obtain the Software Feature License, Node, a device licenses based on the License MAC to be re-hosted to the virtual server. You can generate the License MAC prior to the upgrade by using the following tool:

Cisco Unified Communications Answer File Generator

Refer to the license documentation posted at the Upgrade Central for additional information:

https://communities.cisco.com/community/partner/collaboration/migration/blog/2013/04/15/license-migration

Refer to the following link to obtain the proper licenses:

Licensing User Interface

Compatibility verification

To determine if the versions of the devices and applications in use in your organization—such as endpoints, gateways, voicemail, presence, or other applications—are supported by Unified Communications Manager Release 9.1(x), review the following information:

Cisco Unified Communications System Release Summary Matrix for IP Telephony

Cisco Unified Communications Manager Software Compatibility Matrix

Cisco recommends that you consider the compatibility of applications such as Attendant console for upgrades.

For third-party applications, review the application catalog at the following link to verify that the application is supported by Unified Communications Manager Release 9.1(x). If your application is not listed in the catalog, confirm with your vendor that the application is compatible with Unified Communications Manager Release 9.1(x).

Developer Network Marketplace Solutions Catalog

Cisco highly recommends that you review the list of open caveats for your intermediate and targeted Unified Communications Manager releases that may impact functionality or integration with other applications. You can find the list of open caveats in the Release Notes at the following location:

Cisco Unified Communications Manager Release Notes

Virtualization requirements

You must design your Unified Computing Servers (UCS) system for virtualization. Most deployments require high availability and therefore you need to plan for the type and number of UCS servers. In addition, you must plan for storage, server connectivity, and the ESXi version. You can find details about designing a virtualized environment at the following link:

Before You Buy or Deploy—Considerations for Design and Procurement

UCS servers do not support external music-on-hold (MOH) sources; consider the impact on similar services when using the virtualized Unified Communications Manager cluster on UCS servers.

Additionally, Cisco recommends that you review the documentation on virtualization support for Unified Communications Manager Release 8.0(2) and higher in the following locations:

Unified Communications in a Virtualized Environment

Unified Communications VMware Requirements

Software downloads

To prepare for the upgrade, download all of the software listed in the following table:

Software	Download location
Cisco Unified Communications Manager Release 9.1(x) upgrade image	http://software.cisco.com/download/navigator.html?mdfid=268439621&flowid=37562
Phone firmware for Unified Communication Manager Release 9.1(x)	
Cisco Unified Communications Manager Release 9.1(x) device package	
(Optional) Cisco Unified Communications Release 9.1(x) Locale Installer for your local language	
Virtual Server Template (OVA file) for your current Unified Communications Manager release	
Refresh Upgrade COP file for upgrading from Unified Communications Manager Release 8.5(1) to Unified CM Release 9.1(x)	
Cisco Unified Communications Manager Recovery software for your current Unified Communication Manager release	
Bootable version of your current Unified Communications Manager release from which to create the virtualized Unified Communications Manager nodes	http://tools.cisco.com/gct/Upgrade/jsp/index.jsp

Configuration and login information

Record the current configuration and login information for your Unified Communications Manager nodes in case any issues are encountered during the upgrade process. Before you gather the configuration information, review the Unified Communications Manager Real-Time Monitoring Tool (RTMT) and syslogs and address any errors.

You need to record the following information:

- IP addresses, hostnames, gateways, domain names, DNS servers, NTP servers, and SMTP information

- administrator, cluster security, and Certificate Trust List (CTL) security token passwords

- server versions and time zones

- all services running on each server and the associated activation status

- Call Detail Record server configuration and any additional information

- LDAP information and access details

- SNMP information

In addition, you must determine the registration counts by using the RTMT or the Unified Communications Manager device count summary. For each node, record the number of each device type that is displayed. For example, record the number of each type of registered IP phone, gateway, and each FXS, FXO, T1CAS, PRI, MOH, MTP, CFB, or XCODE device resource.

Cluster registration

This document assumes that the Unified Communications Manager cluster will have a publisher node and a TFTP node that will not have any registrations of IP phones or devices. All registrations will be to the primary Unified Communications Manager subscriber nodes in the cluster. The backup Communications Manager subscriber nodes will be used for full registration redundancy.

Note In a two node cluster deployment, the publisher node can also be the TFTP server and the backup subscriber.

Security tokens

If your cluster is a mixed-mode cluster, locate your existing security certificate tokens and record the token information.

To verify if you are running a secure cluster, use the steps in the Cisco Unified Communications Manager Security Guide for your current release.

Test plan

Create a test plan that you can execute prior to the upgrade and again directly afterwards. Your plan can include a set of tests that cover different use cases. Run the same tests before and after the upgrade. This approach provides a way to verify the expected functionality of Unified Communications Manager prior to and after the upgrade.

Create a backup

Cisco strongly recommends that you perform a Disaster Recovery System (DRS) backup up of your entire cluster before each upgrade. Upgrading without a current backup can result in lost data, lost node configuration, or disruption to services if there are complications during the upgrade process. For more information, see the Disaster Recovery System Administration Guide.

CHAPTER **3**

Preupgrade procedures

This section provides the following information:

Preupgrade procedures

Cisco recommends that you perform all upgrade and migration tasks during a maintenance window.

Procedure

Step 1 To shorten the upgrade time, delete or purge Call Detail Records (CDRs) or log files that you no longer need.

Step 2 If you are a partner, Cisco recommends that you contact the PDI help desk during the upgrade planning phase. The PDI team can review the upgrade plan, provide necessary support, and file a proactive TAC case on your behalf. To contact the PDI team, see http://www.cisco.com/go/pdihelpdesk.
If you choose to contact TAC directly, you must provide the following information for a proactive TAC case:

- complete output from the Unified Communications Manager upgrade readiness application (web or iPad version)

- information about contact persons and the maintenance window

- the upgrade plan

For more information, see http://tools.cisco.com/ServiceRequestTool/create/launch.do.

Step 3 Use the Cisco Unified Communications Manager License Count Utility to generate a license report and save it in CSV format.
To download the utility and its documentation, see Download Cisco Unified Communications Manager License Count Utility.

Step 4 Extend the database replication timeout value so that subscriber servers have sufficient time to request replication. For more information, see the *Pre-Upgrade Tasks* section in the Upgrade Guide for Cisco Unified Communications Manager, Release 9.1(1).

Step 5 Apply phone firmware that corresponds to Unified Communications Manager Release 9.1(x).

The phones download their new firmware after an upgrade. However, you can apply new firmware files to the endpoints in a controlled manner prior to the upgrade to minimize phone downtime after an upgrade. Applying new firmware to phones in groups eliminates the load on the TFTP server after the upgrade and accelerates the upgrade of the individual devices. Afterwards, restart the TFTP service on the Unified Communications Manager servers, and restart the IP Phones in a controlled order to minimize downtime. Because the phones cannot be used for calls when their firmware is being upgraded, Cisco recommends that you use a maintenance window outside of your Unified Communications Manager upgrade window to upgrade phone firmware.

Note You may need to upgrade some phones to an interim firmware release before you upgrade to the phone firmware corresponding to Release 9.1(x). Please refer to the Release Notes for additional information.

The Cisco Unified Communications System Release Summary Matrix for IP Telephony summarizes the phone firmware version recommended with all Cisco Unified Communications Manager releases.

CHAPTER **4**

Upgrade process

Cisco Unified Communications Manager supports virtualization from Releases 8.0(2) and higher. You can virtualize your current release and then upgrade directly to Communications Manager Release 9.1(x).

Use the following procedures to complete the upgrade process:

Virtualize your current release

To virtualize your current release prior to upgrading to Unified Communications Manager Release 9.1(x), perform the following steps:

Before You Begin

Procedure

Step 1 Stop all configuration tasks. Do not perform any configuration tasks during the upgrade.

Step 2 Disable extension mobility for the cluster.

Step 3 Perform a DRS backup of your current cluster.

Step 4 For every node in your cluster, create virtual machines using the Virtual Server Template (OVA file) recommended for your current release.
Cisco recommends that you deploy the same OVA file throughout your entire cluster. There are two different releases of OVA files available on Cisco.com. Version 7 OVAs (vm7) are for installing in an ESXi 4.X environment, while version 8 OVAs (vm8) are for installing in ESXi 5.X environments. Choose the correct OVA release based on the environment in which the virtualized UC applications will be deployed.

Step 5 Shut down your existing MCS publisher node and install it using the same IP Address, hostname, and security password as a virtual machine on a UCS server.

Step 6 Restore the Unified Communications Manager data on the virtualized publisher node.

Step 7 Transfer the physical MAC license from the MCS to the virtualized license MAC on the new UCS using the steps described in *Obtaining New Licenses* in Cisco Unified Communications Manager on virtualized servers. Re-host the new license on the virtual machine.
At this point, only the publisher node is running in virtualized mode.

Step 8 To minimize the downtime for phone services, **reboot the remaining Unified CM nodes** starting with the TFTP nodes, followed by all the backup Unified Communications Manager nodes. Verify that the backup subscriber nodes are functional and database replication from the publisher node to the backup subscriber nodes is functioning. For more information, see the *Upgrade Tasks* section in the Upgrade Guide for Cisco Unified Communications Manager, Release 9.1(1).
Note You must reboot the remaining nodes in the cluster to synchronize the database with the virtualized publisher node after a DRS restore.

Step 9 Reboot all of the primary subscriber nodes.
At this point, all the IP phones and devices will switch registrations to the secondary subscriber nodes and continue operation for calls. The TFTP nodes and subscriber nodes running on MCS servers have a publisher that is the only server that is running in a virtualized mode.

Step 10 Shut down and then replace each Unified Communications Manager node in the order recommended in Replace a Single Server or Cluster for Cisco Unified Communications Manager Release 9.1(1). Start with the TFTP nodes, and then proceed to replace all the backup subscriber nodes.

Step 11 Install each Unified Communications Manager node as virtual machine on UCS servers using the same IP Addresses, hostnames, and security passwords as on your MCS servers.

Step 12 Restore Unified Communications Manager data on each virtualized node and reboot each one.

Step 13 Verify that database replication is complete between the virtualized publisher node, the virtualized TFTP nodes, and the virtualized backup subscriber nodes running on UCS servers.

Step 14 Configure the phones in the cluster to use the backup subscriber nodes for registration by changing the order in the Unified Communications Manager group.

Step 15 Shut down all of the primary subscriber nodes.
At this point, all of the IP phones and devices will switch registrations to the secondary subscriber nodes and continue operation for calls.

Step 16 Install all of the primary subscriber nodes as virtual machines on UCS servers using the same IP Addresses, hostnames, and security passwords as on your MCS servers.

Step 17 Restore Unified Communications Manager data on each virtualized primary subscriber node and reboot all primary subscriber nodes. Verify that database replication completed without errors between virtualized primary subscriber nodes and the virtualized publisher nodes.

Step 18 Configure the phones in the cluster to use the primary subscriber nodes for registration by changing the order in the Unified Communications Manager group. Reset the devices using the device pool in an ordered manner or restart the Unified Communications Manager service on the backup subscriber nodes to allow devices to register with the primary subscriber nodes.
At this point, all the IP phones and devices will register with the primary subscriber nodes and continue operation for calls.

Step 19 If you have a secure cluster, update the CTL files. For more information, see the *Update CTL File* section in Cisco Unified Communications Manager Security Guide, Release 9.0(1) .

Step 20 Reinstall the COP file enablers for any custom device types that do not ship with Unified Communications Manager. For more information, see Upgrade Guide for Cisco Unified Communications Manager, Release 9.1(1).

Step 21 (Optional) Reinstall any locales that were installed on the Unified Communications Manager. For more information, see Upgrade Guide for Cisco Unified Communications Manager, Release 9.1(1).

Step 22 Run your post-upgrade test plan.
At this point, the entire Unified Communications Manager Release 8.5(1) cluster is virtualized on UCS servers.

Step 23 Backup your virtualized Unified Communications Manager Release 8.5(1) running on UCS servers.

What to Do Next

Proceed to

Upgrade your virtualized cluster to Release 9.1(x)

Use the following procedure to upgrade to Release 9.1(x) from virtualized Unified Communications Manager Releases 8.0(2) through 9.0(1) .

The upgrade from Release 8.0(2) through Release 8.5(1) is a refresh upgrade. A refresh upgrade is required in situations where incompatibilities exist between the old and new software releases.

Refresh upgrades require the node to reboot early in the upgrade process, and also require the node to be offline while the new software is installed. When you perform a refresh upgrade, plan your downtime accordingly. The node is offline much longer than in an L2 upgrade. A typical refresh upgrade takes between 1 and 4 hours per server, depending on the size of the database.

Before You Begin

Before you begin, ensure that you have completed the .

Procedure

Step 1 Stop all configuration tasks. Do not perform any configuration tasks during the upgrade.

Step 2 Disable extension mobility for the cluster.

Step 3 If you are upgrading from Release 8.0(2) through Release 8.5(1), complete the following steps:

a) Install the refresh upgrade COP files on all nodes.

b) Upgrade the publisher node from the current release to Release 9.1(x); choose **run new version** at the completion of the upgrade.

c) When the publisher node upgrade is complete, upgrade the dedicated TFTP nodes, followed by the backup subscriber nodes. Choose **run new version** at the completion of the upgrade. For more information, see the *Upgrade Tasks* section in the Upgrade Guide for Cisco Unified Communications Manager Release 9.1(1)

d) Verify that the database replication for the cluster completed without errors. Use the Cisco Unified Reporting or Cisco Real Time Monitoring Tool (RTMT); for more information, see the *Upgrade Tasks* section of the Upgrade Guide for Cisco Unified Communications Manager, Release 9.1(1).

    e) Shut down and change the virtual machine Guest OS version to **Red Hat Enterprise Linux 5 (32-bit)**. For more information, see Release Notes for Unified Communications Manager, Release 9.1(1).

    f) Configure the phones and devices in the cluster to use the backup subscriber nodes for registration by changing the order in the Unified Communications Manager group.

    g) Restart the primary subscriber nodes and upgrade them from your current release to Release 9.1(x). Choose **run new version** at the completion of the upgrade. For more information, see the *Upgrade Tasks* section in the Upgrade Guide for Cisco Unified Communications Manager Release 9.1(1)

    h) Proceed to step 5.

Step 4 If you are upgrading from Release 8.6(1) through Release 9.0(1), complete the following steps:

    a) Upgrade the publisher node from your current release to Unified Communications Manager Release 9.1(1) and choose **No** for automatic reboot.

    b) When the publisher node upgrade is complete, upgrade the dedicated TFTP nodes, followed by the backup subscriber nodes and the primary subscriber nodes. Choose **No** for automatic reboot.

    c) Switch the publisher node to the upgraded partition.

    d) Switch the dedicated TFTP node to the upgraded partition.

    e) Switch the backup subscriber nodes to the upgraded partition.

    f) Configure the phones and devices in the cluster to use the backup subscriber nodes for registration by changing the order in the Unified Communications Manager group.

    g) Switch all of the primary subscriber nodes to the upgraded partition.

    h) Verify that the primary subscriber nodes are upgraded and that database replication completed without errors.

Step 5 Verify that database replication is complete between the publisher node and the primary subscriber nodes in the cluster after the upgrade to Release 9.1(x).

Step 6 Configure the phones in the cluster to use the primary subscriber nodes for registration by changing the order in the Unified Communications Manager group. Reset the devices using the device pool in an ordered manner or restart the Unified Communications Manager service on the backup subscriber nodes to allow devices to register with primary subscriber nodes.
At this point, all the IP phones and devices will register with the primary subscriber nodes and continue operation for calls.

Step 7 If you have a secure cluster, update the CTL files. For more information, see the *Update CTL File* section in Cisco Unified Communications Manager Security Guide, Release 9.0(1) .

Step 8 Install the Release 9.1(x) dial plans and locales as recommended in the Unified CM 9.1(1) upgrade guide.

Step 9 If you changed any database replication timeout values as recommended in the pre-upgrade procedures, restore the timeout to the default value.

Step 10 Enable the extension mobility that you disabled at the beginning of this procedure.

Step 11 Migrate your current licenses to the Release 9.1(x) license. You have 60 days to complete this licensing step. For information about obtaining 9.1(x) licenses, see https://tools.cisco.com/SWIFT/LicensingUI/Home.

Step 12 Run your post-upgrade test plan.
Once your test plan is executed successfully, your upgrade is complete.

Rollback procedures

Rollback process

If you encounter an issue during your upgrade and need to rollback to the pre-upgrade version, see Upgrade Guide for Cisco Unified Communications Manager, Release 9.1(1).

If you are reverting your cluster to a release prior to 8.0(x), review the following documents, which explain important security-related changes:

Migrating IP Phones Between Clusters with CUCM 8 and ITL Files

Rolling Back the Cluster to a Pre-8.0 Release

When the rollback is completed, execute your test plan again to make sure all services and features are functioning as expected.

High Availability Upgrade Procedure for Cisco Unified Communications Manager Releases 8.0(2)—9.0(1) to 9.1(x)

C H A P T E R 6

Related information

- Links and references, page 15

Links and references

For additional information, refer to the following documents:

Installation, upgrade, and migration

Installing Cisco Unified Communications Manager Release 8.0(2)

Installing Cisco Unified Communications Manager Release 8.5(1)

System Installation and Upgrade Manual for IP Telephony, Cisco Unified Communications System Release 9.0(1)

Cisco Unified Communication Manager Release 9.1 Migration and Upgrade Guide

Upgrade Guide for Cisco Unified Communications Manager, Release 9.1(1)

Cisco Unified Communications Manager on Virtualized Servers

Compatibility

Supported Servers for Releases of Cisco Unified Communications Manager (Including Business Edition 3000/5000/6000 and Session Manager Edition) and Cisco Intercompany Media Engine

Network design and deployment

Cisco Unified Communications System 9.x SRND

Software downloads

Download Software Center for Cisco Unified Communications Manager Utilities and COP Files

Licensing

Enterprise License Manager User Guide 9.1(1)

Cisco Software Licencing Portal Changes Quick Reference Guide

Release information

Release Notes for Cisco Unified Communications Manager 8.0(3)

Release Notes for Cisco Unified Communications Manager Release 8.5(1)

Release Notes for Cisco Unified Communications Manager, Release 9.1(1)

New and Changed Document for Cisco Unified Communications Manager Release 9.1(1)

Release Notes for phone firmware. The Cisco Unified Communications System Release Summary Matrix for IP Telephony summarizes the phone firmware version recommended with all Cisco Unified Communications Manager releases.

Disaster recovery

Disaster Recovery System Administration Guide for Release 6.1(2)

Disaster Recovery System Administration Guide for Cisco Unified Communications Manager Release 7.0(1)

Disaster Recovery System Administration Guide for Release 7.1(2)

Disaster Recovery System Administration Guide for Release 8.0(2)

Disaster Recovery System Administration Guide for Release 8.5(1)

Troubleshooting

Database Replication Error in Cisco Unified Communications Manager