C H A P T E R 6

IP Telephony Migration Options

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This chapter discusses how the individual Cisco Unified Communications family of applications can be migrated either from earlier releases or from existing third-party deployments. This chapter also describes several methods for migrating from separate standalone communication components to an integrated Cisco Unified Communications System. The topics discussed in this chapter are viewed from a customer or business viewpoint rather than a technical viewpoint that is based around which protocol to use or which features are required.

When considering any form of migration and/or upgrade, customers should first consult the *Cisco Unified Communications Compatibility Tool* (at http://tools.cisco.com/ITDIT/vtgsca/VTGServlet) to ensure a successful outcome. For example, some applications may start from such an early software release that a multi-step upgrade might be necessary. Similarly, server hardware along with software compatibility might require a combination of multi-step hardware and software upgrades.

Strong consideration should also be given to other Unified Communications applications because the system currently deployed might have multiple applications that have limited compatibility of interworking with each other.

What's New in This Chapter

Table 6-1 lists the topics that are new in this chapter or that have changed significantly from previous releases of this document.

Table 6-1   New or Changed Information Since the Previous Release of This Document

New or Revised Topic	Described in:	Revision Date
Migration from physical to virtual machines	Migrating from Physical Servers to Virtual Machines, page 6-5	June 28, 2012
Migration of Cisco IM and Presence	Cisco IM and Presence Migration, page 6-6	June 28, 2012
License migration and Cisco Enterprise License Manager (ELM)	Migrating Licenses to the Cisco Enterprise License Manager (ELM), page 6-7	June 28, 2012

Coexistence or Migration?

This is an important question that needs to be answered.

Coexistence typically means two or more systems coexisting for an extended period of time (for example, anything greater than six months). Under this scenario feature transparency, whether for PBX, voicemail, or other features, becomes a more significant consideration. Investment and/or upgrades to existing systems might be necessary in order to deliver the level of feature transparency required.

Migration typically occurs over a shorter period of time (for example, less than six months). Under this scenario users are more likely to tolerate a subset of existing features, knowing that the migration will be complete in a "short" period of time. Often existing system capabilities may be sufficient for this "short" period of time, therefore migration is often less costly when compared to coexistence.

Migration Prerequisites

Before implementing any Unified Communications service, customers should ensure that the underlying IP infrastructure is "UC ready," including redundancy, high availability, Quality of Service (QoS), in-line powered Ethernet ports, and so forth. For further details, refer to the chapter on Network Infrastructure, page 3-1.

Typically some kind of site or user-survey should be performed to ensure that all requirements (for example, fax/modems, environmental control systems, and so forth) are appropriately identified and accounted for.

Unified Communications Migration

There are two main methods for migrating to a Unified Communications system (or any individual Unified Communications service, for that matter):

Phased Migration

This method typically starts with a small trial focused around the Unified Communications service to be deployed. Once the customer is familiar with the Unified Communications service trial, then the migration starts by moving groups of users, one group at a time, to the production version of that Unified Communications service.

Parallel Cutover

This method begins similar to the phased approach; however, once the customer is satisfied with the progress of the trial, then a time and date are chosen for cutting-over all the users at once to the new Unified Communications service.

A parallel cutover has the following advantages over a phased migration:

- If something unexpected occurs, the parallel cutover provides a back-out plan that allows you to revert, with minimal effort, to the previous system, which is essentially still intact. For example, with phased migration from a PBX, service can be restored to the users simply by transferring the inbound PSTN trunks from the IP telephony gateway(s) back to the PBX.

- The parallel cutover allows for verification of the configuration of the Unified Communications service before the system carries live traffic. This scenario can be run for any length of time prior to the cutover of the Unified Communications service, thereby ensuring correct configuration of all user information such as phones, gateways, the dial plan, mailboxes, and so forth.

- Training can be carried out at a more relaxed pace by allowing subscribers to explore and use the Unified Communications service at their own leisure prior to the cutover.

- The system administrator does not have to make special provisions for "communities of interest." With a phased approach, you have to consider maintaining the integrity of features such as call pick-up groups, hunt groups, shared lines, and so forth. These associations can be easily accounted for when moving the complete Unified Communications service in a parallel cutover.

One disadvantage of the parallel cutover is that it requires the Unified Communications service, including the supporting infrastructure, to be fully funded from the beginning because the entire service must be deployed prior to bringing it into service. With a phased migration, on the other hand, you can purchase individual components of the system as and when they are needed, and this approach does not prevent you from starting with a small trial system prior to moving to full deployment.

Neither method is right or wrong, and both depend upon individual customer circumstances and preferences to determine which option is most suitable.

Example 6-1   Phased Migration for IP Telephony

This approach typically entails a small IP telephony trial that is connected to the main corporate PBX. The choice of which signaling protocol to use is determined by the required features and functionality as well as by the cost of implementation. Cisco Unified Communications Manager (Unified CM) can support either regular PSTN-type PRI or QSIG PRI as well as H.323 and SIP. Of these options, QSIG PRI typically provides the highest level of feature transparency between any two systems.

PSTN-type PRI provides for basic call connectivity as well as Automatic Number Identification (ANI). In some instances, the protocol also supports calling name information. This level of connectivity is available to all PBXs and therefore is considered to be the least costly option; that is, if the PBX can connect to the public network through PRI, then it can connect to Unified CM because Unified CM can be configured as the "network" side of the connection.

With either PSTN-type PRI or QSIG, the process for a phased migration is similar: move users from the PBX to Unified CM in groups, one group at a time, until the migration is complete.

The Cisco San Jose campus, consisting of some 23,000 users housed in approximately 60 buildings, was migrated to IP telephony in this manner and took just over one year from start to finish at the rate of one building per weekend. All users in the selected building were identified, and their extensions were deleted from the PBX on a Friday evening. At the same time, additions were made to the PBX routing tables so that anyone dialing those extension numbers would then be routed over the correct PRI trunk for delivery to Unified CM. During the weekend, new extensions were created in Unified CM for the users, and new IP phones were delivered to their appropriate office locations, ready for use by Monday morning. This process was repeated for each building until all users had been migrated.

Example 6-2   Parallel Cutover for IP Telephony

All IP phones and gateways are fully configured and deployed so that users have two phones on their desk simultaneously, an IP phone as well as a PBX phone. This approach provides the opportunity not only to test the system but also to familiarize users with their new IP phones. Outbound-only trunks can also be connected to the IP telephony system, giving users the opportunity to use their new IP phones to place external as well as internal calls.

Once the IP telephony system is fully deployed, you can select a time and date for bringing the new system into full service by transferring the inbound PSTN trunks from the PBX to the IP telephony gateways. You can also leave the PBX in place until such time as you are confident in the operation of the IP telephony system, at which point the PBX can then be decommissioned.

The Cisco San Jose campus voicemail service was provided by four Octel 350 systems serving some 23,000 users. Cisco Unity servers were installed and users' mailboxes were configured. Users had access to the their Unity mailbox by dialing the new access number, in order to allow them to record their name and greeting(s) as well as to allow them to familiarize themselves with the new Telephony User Interface (TUI). Approximately two weeks later, a Unified CM Bulk Administration Tool (BAT) update was carried out on a Friday evening to change the Call-Forward Busy and No-Answer (CFB/CFNA) numbers as well as the Messages button destination number for all users to the Unity system. Upon returning to work on Monday morning, users were serviced by Unity. The Octel 350 systems were left in place for one month to allow users to respond to any messages residing on those systems before they were decommissioned.

The Need for QSIG in Multisite Enterprises

While some enterprises consist of only one location, others consist of many sites, some of which may potentially be spread over large distances. PBX networks for multisite enterprises are usually connected using T1 or E1 PRI trunks (depending on location) running a proprietary protocol such as Avaya DCS, Nortel MCDN, Siemens CorNet, NEC CCIS, Fujitsu FIPN, or Alcatel ABC, among others. These proprietary networking protocols enable the PBXs to deliver a high level of feature transparency between end users.

QSIG was developed to enable the interconnection of PBXs from different vendors, thereby allowing similar levels of feature transparency.

By supporting QSIG, Unified CM can be introduced into a large enterprise network while also maintaining feature transparency between users. PBX locations can then be converted to IP telephony whenever convenient.

However, unless you already have QSIG enabled on your PBX or have a specific need for its additional features and functionality, the cost of upgrading the PBX might be hard to justify if it will be retired within a short period of time. For example, why spend $30,000 on enabling the PBX for QSIG if you plan to retire the PBX in two or three months?

Summary of IP Telephony Migration

Although both methods of IP telephony migration work well and neither method is right or wrong, the parallel cutover method usually works best in most cases. In addition, large enterprises can improve upon either migration method by using QSIG to enable Unified CM to become part of the enterprise network.

Cisco has a lab facility dedicated to testing interoperability between Unified CM and PBX systems. The results of that testing are made available as application notes, which are posted at

http://www.cisco.com/go/interoperability

The application notes are updated frequently, and new documents are continuously added to this website. Check the website often to obtain the latest information.

Centralized Unified Communications Deployment

In the case of an enterprise that has chosen to deploy Unified Communications in a centralized manner, two options exist:

- Start from the outside and work inward toward the central site (that is, smallest to largest).

- Start from the central site and work outward toward the edges.

The majority of customers choose the first option because it has the following advantages:

- It gives them the opportunity to fully deploy all the Unified Communications services and then conduct a small trial prior to rolling Unified Communications out to the remote locations.

- The rollout of Unified Communications can be done one location at a time, and subsequent locations can be migrated when convenient.

- This option is the lowest cost to implement once the core Unified Communications services are deployed at the central site.

- IT staff will gain valuable experience during migration of the smaller sites prior to migrating the central site.

The remote sites should be migrated by the parallel approach, whereas the central site can be migrated using either the parallel or phased approach.

Which Unified Communications Service First?

This choice is very much dependent on the customer's individual business needs, and the Cisco Unified Communications solution allows for most of its individual services to be deployed independently of the others; for example, IP telephony, voice messaging, contact center, and collaboration can all be deployed independently from each others.

This capability provides the customer with great flexibility. Consider a customer who is faced with a voicemail system that has since gone end-of-support and is suffering various issues leading to customer dissatisfaction. Cisco Unity can often be deployed and integrated with the current PBX, thereby solving this issue. Once the new voicemail system is operating appropriately, then attention can turn to the next Unified Communications service, namely IP telephony.

Migrating from Physical Servers to Virtual Machines

This type of migration refers to migrating from a system with Cisco Unified Communications Manager (Unified CM) deployed on a physical cluster of Cisco Media Convergence Servers (MCS) to a system with Unified CM deployed on Cisco Unified Computing System (UCS) virtual machines. The simplest way to perform this type of migration is through the disaster recovery service (DRS) method; however, some customer environments might require another approach involving what is termed a "dead net." A dead net allows the new virtual machine system to be set up and tested in an isolated environment prior to bringing it into service. This means that the user data obtained from the initial backup process is considered as frozen, so any changes that have occurred prior to the backup will need to be re-entered. On the other hand, the DRS/server replacement method is performed on a cluster that is still operational and therefore carries more risk.

The DRS backup-and-restore server replacement method is carried out by performing a backup operation on each physical server in the Unified CM cluster and then restoring the backup to the corresponding virtual machine. This is a serial process, and depending upon the number of servers involved and the

available outage windows, it may take some time to complete. This approach is preferred over simply doing a re-import of the database through the Cisco Unified CM Bulk Administration Tool (BAT) and has the advantage that it fully captures the state of the cluster (for example, custom music-on-hold files, non-default TFTP firmware files, states of various Unified CM services, and so forth) at the time the backup is taken.

There are currently well defined processes for moving existing MCS severs to virtual machines, described as server replacement and IP readdressing. For details, refer to the latest version of *Replacing a Single Server or Cluster for Cisco Unified Communications Manager*, available at

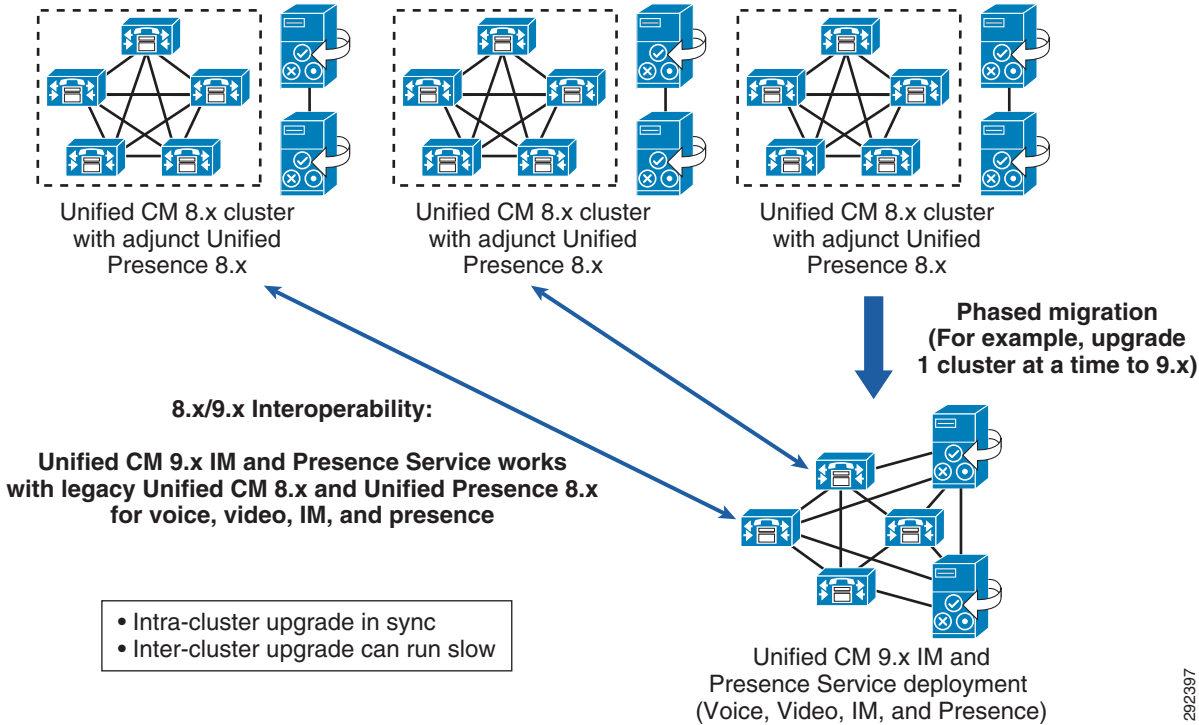http://www.cisco.com/en/US/products/sw/voicesw/ps556/prod_installation_guides_list.html

Cisco IM and Presence Migration

Migration of a Cisco Unified Presence deployment to Release 8.*x* is supported from Cisco Unified Presence 7.*x* only. User assignments on a Cisco Unified Presence cluster will be maintained on a per-server basis with migration from version 7.*x* to 8.*x*.

The following guidelines apply to migration of Cisco Unified Presence:

- Cisco Unified Presence 7.*x* deployments with more than one cluster require you to deactivate the presence engine on each server in the cluster before upgrading to Cisco Unified Presence 8.*x*. The presence engine should be reactivated only after you have completed all server upgrades to Cisco Unified Presence 8.*x*.

- For Cisco Unified Presence 7.*x* deployments with more than one cluster, Cisco recommends upgrading all clusters to Cisco Unified Presence 8.*x* at the same time.

- Migrating Cisco Unified Presence deployments to version 8.*x* brings in a second standard protocol in XMPP, with the addition of the Jabber XCP architecture. Cisco Unified Personal Communicator 7.*x*, inter-domain federation with Microsoft Office Communications Server, and third-party applications all create SIP/SIMPLE subscriptions. The number of active SIP/SIMPLE subscriptions can be viewed using the Real-Time Monitoring Tool (RTMT) Active Subscription counter. Cisco Unified Presence 8.*x* manages these subscriptions using the SIP Federation Connection Manager. With a large number of active SIP/SIMPLE subscriptions (above 20,000), or if subscriptions begin to fail after upgrade, Cisco recommends increasing the SIP Federation Connection Manager service parameter Pre-allocated SIP stack memory (bytes) to twice the amount of its current default value.

- For Cisco Unified Communications System 9.0 and later releases, Cisco Unified CM and the Cisco IM and Presence Service are required to run the same version at all times.

- The Cisco IM and Presence Service (9.0 and later releases) supports backward compatibility, thereby providing customers who have multiple Cisco Unified Presence systems with the opportunity to upgrade those systems over a period of time. (See Figure 6-1.)

Figure 6-1   *Large Enterprise Migration with Backward Compatibility*

Migrating Licenses to the Cisco Enterprise License Manager (ELM)

Cisco Unified Communications System 9.0 and later releases move away from the Device License Unit (DLU) concept and implement user-based licensing, thereby matching what a customer actually purchases. This new licensing model is also under the management of the Cisco Enterprise License Manager (ELM). For more details on ELM, see the section on Enterprise License Manager, page 8-9.

For those products that support ELM, customers can continue to fulfill their licenses from the Cisco Product License Registration portal at http://www.cisco.com/go/license, and can now import them into the ELM instead of the individual product instances. Customers who have already deployed Cisco Unified Communications can use the following process (illustrated in Figure 6-2) to migrate existing licenses to Cisco Unified Communications System 9.*x* licenses:

1. Fully license all Unified Communications products prior to conversion to 9.*x*.

   Fulfill any unfulfilled Product Activation Keys (PAKs), and install licenses on the Unified Communications products. Product Activation Keys come with your product. Installing unfulfilled licenses prior to your migration to version 9.*x* will allow these unfulfilled licenses to be converted to new Unified Communications 9.*x* equivalent licenses.

   This step is necessary for the migration of all pre-9.0 licenses and must be done *prior* to the migration to version 9.*x*. After a system has been upgraded to version 9.*x*, any unfulfilled PAKs can no longer be used because Unified Communications 9.*x* uses a different licensing infrastructure.

Go to Product License Registration at http://www.cisco.com/go/license.

2. Order the Cisco Unified Communications System 9.*x* software.

This step is required only if the customer does not already have access to Unified Communications 9.*x* software through some alternate method (for example, Cisco Software Download website).

3. Receive the Cisco Unified Communications System 9.*x* software.

4. Upgrade the Unified Communications products (such as Cisco Unified Communications Manager and Cisco Unity Connection).

ELM will be installed as part of the upgrade. The upgrade must be done before migrating the licenses because ELM must be installed to perform the license migration.

5. Add Unified Communications product instances to the ELM product inventory. This is a normal part of the setup for Cisco Unified Communications Manager 9.*x* licensing and is needed for license migration.

When a product instance is added, current licensing information (including unused DLUs in the case of Unified CM) is automatically sent to ELM. This information is used by the ELM Upgrade Licenses (migration) utility to determine the types of user licenses to be migrated.

6. Use the ELM Upgrade Licenses (migration) utility to view and modify the licenses to be upgraded.

This step determines the actual licenses that will be migrated to the new Unified Communications System 9.*x* user licenses. It allows you to view the existing licenses, plan for license migration, select license migration, and generate an upgrade license request.

As mentioned earlier, this Upgrade Licenses (migration) conversion can be done only once; therefore it is very important to correctly determine the licenses to be migrated.

7. Generate a License Migration Request.

The License Migration Request contains the license information determined from the previous step and also contains identifying information of the ELM to which the new Unified Communications System 9.*x* user licenses will be tied. This information generated from the request is then provided to the Cisco Product License Registration site to generate the new licenses.
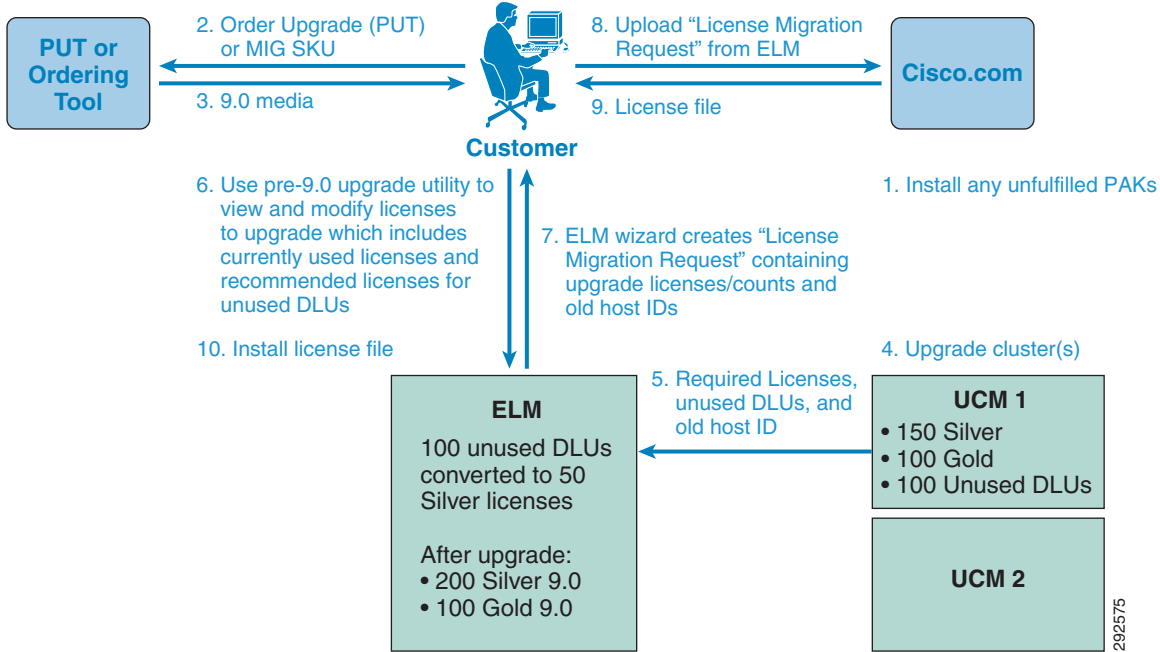
8. Submit the License Migration Request to Product License Registration. Go to Cisco Product License Registration site at http://www.cisco.com/go/license. Select **Get New**, and then **Migration License** and **Cisco Unified Communications 9.0**. Paste the contents of the License Migration Request from ELM into the request, and complete the request.

✎
Note   Once this request is submitted, no further changes can be made to the type and quantity of licenses, other than by purchasing new additional licenses.

9. Receive the license file. The license file is generated from the submitted request and sent by email from license@cisco.com.

10. Install the license file. Install the license file sent from Cisco onto ELM. From ELM License Management, go to **Licenses > Install License Fil**e. The pre-9.0 licenses have now been migrated and are available for use.

Figure 6-2   *Process for Upgrading Pre-9.0 Cisco Unified Communications Systems*

References

- Download software — Get the latest updates, patches, and releases of Cisco software.

  http://www.cisco.com/cisco/software/navigator.html

- Product License Registration

  http://www.cisco.com/go/license