



CHAPTER 3

Performing Your System Installation

This topic provides guidance for the installation order components for a Cisco Unified Communications IP telephony deployment. This information is to be used with the information from the planning and design phases as input to the implementation phase. The implementation phase drives the staging phases and deadlines of the system installation.

This document does not describe installation procedures for individual components. This information is included in the installation documents for the components. See the [Related Documentation](#) section for references to these documents.

This topic contains the following sections:

- [Deployment Models](#)
- [Installing Components](#)
- [Postinstallation Tasks](#)
- [Related Documentation](#)



Note

Many of the IP telephony component names have changed as part of Cisco Unified Communications System releases. The latest product names are used in this document, even when referencing products from previous releases.

Deployment Models

This section describes the general order of installation for each Cisco Unified Communications System deployment models. Because each model can include different components, compare these deployments to your deployment to best understand the installation process that is applicable in your environment.

The following sections provide the general installation sequence for the various IP telephony components for the following deployment models.

- [Unified Communications Manager IP Telephony Model](#)
- [Unified Communications Manager Business Edition IP Telephony Model](#)

Unified Communications Manager IP Telephony Model

This sections provide the general installation sequence for the various IP telephony components in the enterprise deployment models.

- [Single Site Model](#)
- [MultiSite Centralized with SRST or SRSV Model](#)
- [Multisite WAN Distributed Model](#)
- [Clustering over the WAN Model](#)

For more detailed information about these IP telephony deployment models, see:

http://www.cisco.com/cisco/web/docs/iam/unified/ipt851/Review_Tested_Site_Models.html

Also see the following documents:

- *System Description: Cisco Unified Communications Release 8.5(1)* at:
http://www.cisco.com/en/US/docs/voice_ip_comm/uc_system/UC8.5.1/system_description/SD851.pdf
- Solution Reference Network Design (SRND) document for various IP telephony components are available at:
<http://www.cisco.com/go/srnd>

After you determine the general installation sequence, use one of the installation strategies that is described in [Installing Components](#) to install your components.

Single Site Model

A single-site deployment refers to any scenario in which voice gateways, phones, and call processing servers (Cisco Unified Communications Manager) are located at the same site and have no WAN connectivity between any software modules.

For a single site deployment, install components in the following order:

1. Infrastructure Components such as:
 - Core switches
 - Access switches
 - Security Components
 - Cisco Unified Videoconferencing gateway and Multipoint Control Units (MCU)
 - Cisco Wireless LAN Controller(s) and Access Points
2. Directory and network service components such as
 - NTP server
 - DHCP server
 - DNS server
 - TFTP server
 - LDAP server
3. Network management applications such as:
 - Cisco Unified Provisioning Manager,
 - Cisco Unified Operations Manager
 - Cisco Unified Service Monitor
 - Cisco Unified Service Statistics Manager)
4. Call processing components such as:
 - Cisco Unified Communications Manager

- Cisco Unified IP Phones
 - Cisco IP Communicator
 - Cisco Unified Communications Manager-Session Manager Edition (Cisco UCM-SME) (optional)
 - Cisco Unified Intercompany Media Engine (optional)
5. Media resource components such as:
 - Music on Hold
 - Transcoders
 - Conferences Bridges
 - Media Termination Points (MTPs)
 - RSVP agents (optional)
 6. Cisco IOS Gatekeeper
 7. Voice and data gateways
 8. Cisco Messaging components such as
 - Cisco Unity Connection and optional Voice Recognition Server or
 - Cisco Unity components:
 - Windows Exchange 2007
 - Cisco Unity
 - Cisco Unified Messaging Gateway
 9. Mobility components such as:
 - Cisco Unified Mobility Advantage
 - Cisco Unified Mobile Communicator
 10. Cisco Unified MeetingPlace components
 11. Cisco Unified Contact Center Express, Cisco Unified IP Phone Agents
 12. Cisco Unified Presence and Cisco Unified Personal Communicator
 13. Cisco Unified Videoconferencing gateway and Multipoint Control Units (MCU)
 14. SCCP/SIP/H.323/H.320 video endpoints
 15. Cisco applications co-resident on MCS servers such as Cisco Security Agent
 16. Third-party on-board agents on MCS servers such as Antivirus, backup agent, and management agent
 17. Cisco and third-party adjunct applications or endpoints on other servers

MultiSite Centralized with SRST or SRSV Model

A multisite centralized with Unified SRST or Unified SRSV deployment refers to any scenario in which call processing servers (for example, Unified Communications Manager) are located at the same site, while any combination of voice gateways, and phones are located remotely across a WAN link or centrally.

For a multisite Centralized with Unified SRST or Unified SRSV deployment, the central site should be installed first. To install the central site, follow the guidelines in the [Single Site Model](#), page 3-2 section.

For each remote site, install components in the following order:

1. Access switches
2. Security Components such as Cisco Adaptive Security Appliance
3. Cisco Wireless LAN Controller(s) and Access Points
4. Cisco Unified Communications Manager Express or Unified SRST router or Unified SRSV router, Cisco Unified IP Phones, Cisco IP Communicator
5. Cisco Unified Videoconferencing gateway and Multipoint Control Units (MCU)
6. SCCP/SIP/H.323/H.320 video endpoints

Multisite WAN Distributed Model

In a multisite WAN distributed deployment model, each site has its own Unified Communications Manager cluster. However, as with the centralized call processing model, sites can be deployed with or without local voice gateways. Some deployments may contain a combination of distributed voice gateways (possibly for locally dialed calls) and centralized voice gateways (possibly for toll-free calls). The multisite distributed model includes several Unified Communications Manager cluster sites interconnected by ICT or H.323 trunks.

The installation of each site should be treated as a separate stage in the overall system installation.

To install each Unified Communications Manager site, follow the guidelines in the [Single Site Model](#) section.

For each remote site, install components in the following order:

1. Access Switches
2. Cisco Adaptive Security Appliance
3. Cisco Wireless LAN Controller(s) and Access Points
4. Cisco Unified Communications Manager Express or Unified SRST router or Unified SRSV router, Cisco Unified IP Phones, Cisco IP Communicator
5. Cisco Unified Videoconferencing gateway and Multipoint Control Units (MCU)
6. SCCP/SIP/H.323/H.320 video endpoints

Clustering over the WAN Model

In the clustering over the WAN model, the Unified Communications Manager cluster is distributed across several sites connected by a QoS-enabled WAN. This model provides the redundancy of the distributed model while offering the convenience of administering a single Unified Communications Manager cluster.

To install this model, install the central sites first, following the guidelines in the [Single Site Model](#) section for the central sites.



Note

Install clustered components in the same installation period and stage at each of the central sites.

Next install remote sites. For each remote site, install components in the following order:

1. Access Switches
2. Cisco Adaptive Security Appliance

3. Cisco Wireless LAN Controller(s) and Access Points
4. Cisco Unified Communications Manager Express or Unified SRST router or Unified SRSV router, Cisco Unified IP Phones, Cisco IP Communicator
5. Cisco Unified Videoconferencing gateway and Multipoint Control Units (MCU)
6. SCCP/SIP/H.323/H.320 video endpoints

Unified Communications Manager Business Edition IP Telephony Model

This section provides the general installation sequence for the various IP telephony components in medium business deployment model.

- [MultiSite Centralized with SRST Model](#)

For more detailed information about these IP telephony deployment models, see:

http://www.cisco.com/cisco/web/docs/iam/unified/ipt851/Review_Tested_Site_Models.html

MultiSite Centralized with SRST Model

A multisite centralized with SRST deployment refers to any scenario in which call processing servers (for example, Unified Communications Manager Business Edition) are located at the same site, while any combination of voice gateways, and phones are located remotely across a WAN link or centrally.

In the central site, install components in the following order:

1. Infrastructure Components such as:
 - Core switches
 - Access switches
 - Security Components
 - Cisco Unified Videoconferencing gateway and Multipoint Control Units (MCU)
 - Cisco Wireless LAN Controller(s) and Access Points
2. Call processing components such as:
 - Cisco Unified Communications Manager Business Edition/Cisco Unified Communications Manager with Cisco Unity Connection installed as a co-resident application
 - Cisco Unified IP Phones
 - Cisco IP Communicator
 - Cisco Unified Intercompany Media Engine (optional)
3. Media resource components such as:
 - Music on Hold
 - Transcoders
 - Conferences Bridges
 - Media Termination Points (MTPs)
 - RSVP agents (optional)
4. Cisco Unified Contact Center Express, Cisco Unified IP Phone Agents
5. Cisco Unified Business Attendant Console

For each remote site, install components in the following order:

1. Access switches
2. Security Components
3. Cisco Wireless LAN Controller(s) and Access Points
4. Cisco Unified Survival Remote Site Telephony router, Cisco Unified IP Phones, Cisco IP Communicator
5. Cisco Unified Videoconferencing gateway and Multipoint Control Units (MCU)
6. SCCP/SIP/H.323/H.320 video endpoints
7. Cisco Computer Telephony Interface (CTI) OS Agent and Supervisor Desktop
8. Cisco Unified Business Attendant Console and Cisco Unified Department Attendant Console

Installing Components

After you review the general installation sequence for the deployment model that you are installing, install your components based on the following installation strategies:

- [Single-Stage Installation \(Unified Communications Manager\)](#)—Recommended for small single-site or multisite enterprise installations.
- [Single-Stage Installation \(Unified Communications Manager Business Edition\)](#)—Recommended for small single-site or multisite Midmarket installations.
- [Multistage System Installation](#)—Recommended for large single-site or multisite enterprise installations.

See [Chapter 1, “Planning Your System Installation”](#) for additional information and for the software release versions of the components in the release set.



Note

After you install the software and applications, be aware that you may also need to install client software such as Cisco IP Communicator on the client desktops.

When you install each component, see the product-specific installation document for detailed information. See the [Related Documentation](#) section for a list of this documentation.

Single-Stage Installation (Unified Communications Manager)

The single-stage installation process is recommended for small single-site and multisite enterprise installations and can be performed in a single installation window.

[Table 3-1](#) lists the recommended order in which to install components. See [Chapter 1, “Planning Your System Installation”](#) for the software release versions of these components.

Table 3-1 *Single-Stage Installation Order for IP Telephony Components for Enterprise*

Installation Order	Component
1	Switches and routers
2	Security components

Table 3-1 *Single-Stage Installation Order for IP Telephony Components (continued) for*

Installation Order	Component
3	Wireless components
4	Directory and network services
5	Network management components
6	Call processing components
7	Media resources
8	Gatekeepers and voice and data gateways
9	Messaging components
10	Mobility components
11	Cisco Unified MeetingPlace components
12	Contact Center components
13	Presence/IM components
14	Videoconferencing components
15	Cisco applications coresident on MCS servers
16	Cisco and third-party applications on other servers

Single-Stage Installation (Unified Communications Manager Business Edition)

The single-stage installation process is recommended for small single-site and multisite midmarket deployment installations and can be performed in a single installation window.

[Table 3-2](#) lists the recommended order in which to install components. See [Chapter 1, “Planning Your System Installation”](#) for the software release versions of these components.

Table 3-2 *Single-Stage Installation Order for IP Telephony Components for Midmarket*

Installation Order	Component
1	Switches and routers
2	Security components
3	Wireless components
4	Network management components
5	Call processing components
6	Voice and data gateways
7	Media resources
8	Queuing and self-service components
9	Messaging components
10	Cisco Unified MeetingPlace components
11	Cisco and third-party applications on other servers

Multistage System Installation

A multistage system installation is the recommended approach for medium and large single-site and medium multisite installations. In this process, components are grouped for installation in several stages or installation windows. Within each installation window, there is a recommended order for installing each component.

The grouping of the components into the stages may vary depending on the size of the networks being upgraded. For smaller networks, several installation windows may be collapsed into a single installation window. Additional stages may be necessary for larger sites.

After each installation window and before initiating the next installation stage, we recommend that you verify that the operation of all basic and critical call types remain unaffected. We also recommend that you maintain a list of components that have been installed and the ones yet to be installed.

[Table 3-3](#) lists the recommended order in which to install components. See [Chapter 1, “Planning Your System Installation”](#) for the software release versions of these components.

Table 3-3 Multi-Staged System Installation Order for IP Telephony Components

Stage	Component Groupings	Installation Order of Components in Each Stage
1	Switches, Routers and Security components	<ol style="list-style-type: none"> 1. Core Switches 2. Access Switches 3. Cisco Adaptive Security Appliance (ASA) 5540 Services
2	Wireless components	<ol style="list-style-type: none"> 1. Cisco Aironet Access Point 1240AG
3	Directory and network services	<ol style="list-style-type: none"> 1. Domain Controllers (including Active Directory) 2. LDAP Directory 3. NTP Server 4. DHCP Server 5. DNS Server 6. TFTP Server
4	Network Management applications	<ol style="list-style-type: none"> 1. Cisco Unified Provisioning Manager 2. Cisco Unified Operations Manager 3. Cisco Unified Service Monitor 4. Cisco Unified Service Statistics Monitor
5	Call processing components	<ol style="list-style-type: none"> 1. Cisco Unified Communications Manager (includes ATA) 2. Cisco Unified IP Phones 3. Cisco Unified Communications Manager-Session Management Edition (optional) 4. Cisco Intercompany Media Engine (optional) 5. Cisco IP Communicator 6. Cisco Emergency Responder

Table 3-3 Multi-Staged System Installation Order for IP Telephony Components (continued)

Stage	Component Groupings	Installation Order of Components in Each Stage
6	Gatekeepers and voice and data gateways	<ol style="list-style-type: none"> 1. Cisco Unified Communications Manager Express 2. IOS Gateways (SIP, MGCP, and H.323) 3. IOS Gatekeepers 4. Cisco Unified Border Element
7	Media resources	<ol style="list-style-type: none"> 1. Conference bridges 2. Transcoders 3. Music-On-Hold servers 4. Media termination points 5. RSVP Agents
8	Cisco MeetingPlace components	<ol style="list-style-type: none"> 1. Cisco Unified MeetingPlace components
9	Cisco Unity components	<ol style="list-style-type: none"> 1. Cisco Unity components 2. Cisco Unity Express 3. Cisco Unity TSP 4. Microsoft Exchange Server 5. Domain Controller (including Active Directory) 6. Cisco Unity Connection 7. Cisco Unified Messaging Gateway
10	Mobility components	<ol style="list-style-type: none"> 1. Cisco Unified Mobility Advantage 2. Cisco Unified Mobile Communicator
11	Contact Center Components	<ol style="list-style-type: none"> 1. Cisco Unified Contact Center Express Unified IP Phone Agents
12	Presence/Messaging components	<ol style="list-style-type: none"> 1. Cisco Unified Presence 2. Cisco Unified Personal Communicator
13	Cisco Unified Application Environment component	<ol style="list-style-type: none"> 1. Cisco Unified Application Environment
14	Video conferencing components	<ol style="list-style-type: none"> 1. SCCP/ H.323 /H.320 Video Endpoints 2. IP/VC Gateway and MCUs 3. Cisco VT Advantage (Video PC Endpoint)
15	Cisco applications coresident on MCS servers	<ol style="list-style-type: none"> 1. Depends on the applications being upgraded
16	Third-party on-board agents on MCS servers	<ol style="list-style-type: none"> 1. Depends on the applications being upgraded
17	Cisco and third-party applications on other servers	<ol style="list-style-type: none"> 1. Depends on the applications being upgraded

Postinstallation Tasks

After you complete the tasks in the implement phase and install the IP telephony components in the Cisco Unified Communications System release set, be aware of the following postinstallation phases and related tasks.

**Note**

See the Cisco Unified Communications System Technical Information Site at <http://www.cisco.com/go/unified-techinfo> for comprehensive system-level deployment and lifecycle model information.

Implement Phase

Configure the newly-installed IP telephony system using the configuration information available at: http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

Operate Phase

Ensure that the newly installed IP telephony system is fully operational by performing tasks that include the following:

- Manage the newly installed network by conducting:
 - Fault and performance management at the platform level—Use the Real-Time Monitoring Tool (RTMT), which is a client application, to monitor CPU, memory, disk space, processes, and critical services.
 - Network management at the system level—Use Unified Operations Manager to perform SNMP/HTTP polling, track device and inventory status, and monitor logical relationships and physical connectivity in the network.
- Conduct Day 1 operations (cutover to customer) tasks such as:
 - Train administrators to support end-users to use the newly installed IP telephony system.
 - Provide documentation including as-builts, equipment inventory lists, topology diagrams, unique design or feature considerations, and others.
 - Explain the engagement process with Technical Assistance Center (TAC) support and tasks to perform prior to contacting TAC.
- Conduct Day 2 operations (post-cutover) tasks such as:
 - Enforce security with the appropriate antivirus security software, where applicable.
 - Provision for system password synchronization and maintenance.
 - Implement data backup and restore. For more information, see Backing up and Restoring Components at: http://www.cisco.com/cisco/web/docs/iam/unified/ipt851/Backing_Up_and_Restoring_Components.html
 - Plan for release set management and system and security patches updates.

Optimize Phase

During this phase, perform system optimizations tasks such as:

- Tune and resize the network for better performance.
- Perform configuration cleanup procedures such as deleting user IDs that are no longer in use.
- Set trace logs and reporting levels to ensure optimal performance.

Related Documentation

The following sections list compatibility guides and installation documentation for Cisco Unified Communications System components:

- [Compatibility Guides](#)
- [Component Release Notes and Installation and Upgrade Documents](#)

For information about support for legacy products and third-party product interoperability with Cisco Unified Communications contact center products, see the Cisco Interoperability Portal at:

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

Compatibility Guides

The following documentation provides information about compatibility of components:

- For information about support for legacy products and third-party product interoperability with Cisco IP telephony products, see the Cisco Interoperability Portal at:
<http://www.cisco.com/go/interoperability>
- Cisco Unified Communications Compatibility Tool:
<http://tools.cisco.com/ITDIT/vtgsc>
- Cisco Unified Communications Manager Compatibility Information:
http://www.cisco.com/en/US/products/sw/voicew/ps556/products_device_support_tables_list.html
- Cisco Unified Contact Center Express Software and Hardware Compatibility Guide:
http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/crs/express_compatibility/matrix/crscomtx.pdf
- Cisco Unified Communications Manager Express and Cisco IOS Software Version Compatibility Matrix:
http://www.cisco.com/en/US/docs/voice_ip_comm/cucme/requirements/guide/33matrix.htm
- Cisco Computer Telephony Integration Option:
http://www.cisco.com/en/US/products/sw/custcosw/ps14/prod_technical_reference_list.html
- Cisco 7800 Series Media Convergence Servers:
http://www.cisco.com/en/US/products/hw/voiceapp/ps378/prod_brochure_list.html
- UCS and MCS Server Models Supported by Cisco Unified Communications Manager Releases
http://www.cisco.com/en/US/prod/collateral/voicew/ps6790/ps5748/ps378/prod_brochure0900acd8062a4f9.html
- Cisco Unified Communications Virtualization (including links to UCS hardware information):
www.cisco.com/go/uc-virtualized
- Cisco Unified Communications System Release Summary Matrix for IPT:
http://www.cisco.com/en/US/docs/voice_ip_comm/uc_system/unified/communications/system/versions/IPTMtrix.html

Component Release Notes and Installation and Upgrade Documents

Table 3-4 lists provides references to release notes and installation and upgrade documents for components. These URLs link to web pages that list various release versions of these documents. Review the appropriate documents based on the release versions of the components in your base and target release sets.

Table 3-4 *Component-Specific Release Notes and Installation and Upgrade Documents*

Components	Release Notes	Installation and Upgrade Documents
Cisco Unified Communications Manager	http://www.cisco.com/en/US/products/sw/voicesw/ps556/prod_release_notes_list.html	http://www.cisco.com/en/US/products/sw/voicesw/ps556/prod_installation_guides_list.html
Cisco Unity	http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod_release_notes_list.html	http://www.cisco.com/en/US/products/sw/voicesw/ps2237/prod_installation_guides_list.html
Cisco Unity Express	http://www.cisco.com/en/US/products/sw/voicesw/ps5520/prod_release_notes_list.html	http://www.cisco.com/en/US/products/sw/voicesw/ps5520/prod_installation_guides_list.html
Cisco Unified MeetingPlace	http://www.cisco.com/en/US/products/sw/ps5664/ps5669/prod_release_notes_list.html	http://www.cisco.com/en/US/products/sw/ps5664/ps5669/prod_installation_guides_list.html
Cisco IP/VC 3500 Series Videoconferencing	http://www.cisco.com/en/US/products/hw/video/ps1870/prod_release_notes_list.html	http://www.cisco.com/en/US/products/hw/video/ps1870/prod_installation_guides_list.html
Cisco Unified Video Advantage	http://www.cisco.com/en/US/products/sw/voicesw/ps5662/prod_release_notes_list.html	http://www.cisco.com/en/US/products/sw/voicesw/ps5662/prod_installation_guides_list.html
Cisco Unity Connection	http://www.cisco.com/en/US/products/ps6509/prod_release_notes_list.html	http://www.cisco.com/en/US/products/ps6509/prod_installation_guides_list.html
Cisco Unified IP Phone 9900 Series	http://www.cisco.com/en/US/products/ps10453/prod_release_notes_list.html	http://www.cisco.com/en/US/products/ps10453/prod_installation_guides_list.html
Cisco Unified IP Phone 8900 Series	http://www.cisco.com/en/US/products/ps10451/prod_release_notes_list.html	http://www.cisco.com/en/US/products/ps10451/prod_installation_guides_list.html
Cisco Unified IP Phone 7900 Series	http://www.cisco.com/en/US/products/hw/phones/ps379/prod_release_notes_list.html	http://www.cisco.com/en/US/products/hw/switches/ps646/prod_installation_guides_list.html
Cisco Unified IP Phone 6900 Series	http://www.cisco.com/en/US/products/ps10326/prod_release_notes_list.html	—
Cisco Unified Operations Manager	http://www.cisco.com/en/US/products/ps6535/prod_release_notes_list.html	http://www.cisco.com/en/US/products/ps6535/prod_installation_guides_list.html
Cisco Unified Presence	http://www.cisco.com/en/US/products/ps6837/prod_release_notes_list.html	http://www.cisco.com/en/US/products/ps6837/tsd_products_support_install_and_upgrade.html

Table 3-4 Component-Specific Release Notes and Installation and Upgrade Documents (continued)

Components	Release Notes	Installation and Upgrade Documents
Cisco Unified Service Monitor	http://www.cisco.com/en/US/products/ps6536/prod_release_notes_list.html	http://www.cisco.com/en/US/products/ps6536/tsd_products_support_install_and_upgrade.html
Cisco IP Communicator	http://www.cisco.com/en/US/products/sw/voicew/ps5475/prod_release_notes_list.html	—
Cisco Unified Contact Center Express	http://www.cisco.com/en/US/products/sw/custcosw/ps1846/prod_release_notes_list.html	http://www.cisco.com/en/US/products/sw/custcosw/ps1846/prod_installation_guides_list.html
Cisco Emergency Responder	http://www.cisco.com/en/US/products/sw/voicew/ps842/prod_release_notes_list.html	—
Cisco Unified Survivable Remote Site Telephony	—	http://www.cisco.com/en/US/products/sw/voicew/ps2169/prod_installation_guides_list.html
Cisco Catalyst 3550 Series Access Switches	http://www.cisco.com/en/US/products/hw/switches/ps646/prod_release_notes_list.html	http://www.cisco.com/en/US/products/hw/switches/ps646/prod_installation_guides_list.html
Cisco Catalyst 6500 Series Switches	http://www.cisco.com/en/US/products/hw/switches/ps708/prod_release_notes_list.html	http://www.cisco.com/en/US/products/hw/switches/ps708/prod_installation_guides_list.html
Cisco IOS Software Releases 15.1	http://www.cisco.com/en/US/products/ps10592/prod_release_notes_list.html	—
Cisco 1861 Integrated Services Router	—	http://www.cisco.com/en/US/products/ps5853/prod_installation_guides_list.html
Cisco 3800 Series Voice Gateways	http://www.cisco.com/en/US/products/ps5855/prod_release_notes_list.html	http://www.cisco.com/en/US/products/ps5855/prod_installation_guides_list.html
Cisco 2800 Series Voice Gateways		http://www.cisco.com/en/US/products/ps5854/prod_installation_guides_list.html
Cisco 3900 Series Voice Gateways		http://www.cisco.com/en/US/products/ps10536/prod_installation_guides_list.html
Cisco 2900 Series Voice Gateways		http://www.cisco.com/en/US/products/ps10537/prod_installation_guides_list.html

