Planning Your System Installation

This chapter provides an overview of the installation processes for IP telephony components. It describes the types of installations, provides an overview of components that are included in the release sets, and describes various installation strategies.

This section contains the following topics:

- Cisco Unified Communications System Overview
- Scope of this Installation Documentation
- System Installation Overview
- System Installation Strategies
- Interoperability and Compatibility Portals

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.

Cisco Unified Communications System Overview

The Cisco Unified Communications System is a full-featured business communications system built into an intelligent IP network. It enables voice, data, and video communications for businesses of all sizes. The Cisco Unified Communications System in this document is defined around commonly deployed business topology models in North America and European and Emerging Markets (EUEM). The Cisco Unified Communications System testing process validates the interoperability of voice products to ensure that they work together as an integrated system.

Cisco Unified Communications System provides an integrated system to meet a wide variety of customer needs. Cisco Unified Communications refers to the entire range of specific Cisco IP Communications products including all call control, conferencing, voicemail and messaging, customer contact, IP phone, video telephony, video conferencing, rich media clients, and voice application products. These products and applications are designed, developed, tested, documented, sold, and supported as an integrated system. Cisco Unified Communications System for enterprise is built upon IP telephony products that centers around the core call processing component, Cisco Unified Communications Manager. Cisco Unified Communications System for midmarket is built upon IP telephony products that centers around the call processing component, Cisco Unified Communications Manager Business Edition.

Scope of this Installation Documentation

The installation procedures that are described in this document are intended to provide a high-level guide to installing the Cisco Unified Communications System. This document provides installation information from a system perspective and only for products that are part of Cisco Unified Communications System Release 8.5(1).

The Cisco Unified Communications IP telephony systems should meet the following basic characteristics and requirements:

- A deployment that is based on Cisco recommendations and guidelines for network design and architecture

- A new *greenfield* or a legacy system deployment

- An installation of Cisco Unified Communications System, not an upgrade from previous software versions. This topic only provides information related to installing components that are present in the Cisco Unified Communications System. See Release Set Versions in Chapter 2, "Preparing for Your System Installation" for more information.

> **Note** If you have a legacy system with PBXs and other products that need to interoperate with the Cisco Unified Communications system, see the Interoperability and Compatibility Portals section.

Due to the variety of options and complexity of procedures required to set up an IP telephony system completely, this document does not provide installation or configuration procedures for:

- Individual standalone components and features of the components

- Third-party coresident applications, such as antivirus, security, server management, and remote access

- Additional third-party off-board applications such as operator console, and billing and accounting

- Server replacement (hardware installation) for components. For information on how to replace a single server or an entire cluster for Cisco Unified Communications Manager Release 8.5(1), see:
  http://www.cisco.com/en/US/docs/voice_ip_comm/cucm/install/8_5_1/cluster/clstr851.html

  For information on supported Cisco 7800 Series Media Convergence Servers and Unified Computing System B-series servers, see:
  http://www.cisco.com/en/US/products/hw/voiceapp/ps378/prod_brochure_list.html

  Refer to product-specific installation documents to perform the installation and configuration of the IP telephony products.

- Cisco Unified Communications on the Cisco Unified Computing System Solution Overview:

  http://www.cisco.com/en/US/prod/collateral/voicesw/ps6790/ps5748/ps378/solution_overview_c22-597556.html

- Product-specific installation documentation for all Cisco voice products is available at:
  http://www.cisco.com/cisco/web/psa/default.html?mode=prod

- List of URLs for component-specific installation and configuration documents for all IP telephony components in Cisco Unified Communications System Release 8.5(1) are available at:
  http://www.cisco.com/cisco/web/docs/iam/unified/ipt851/Component_Installation_and_Configuration_Guides.html

- Links to configuration information for IP telephony components tested in the Cisco Unified Communications System Release 8.5(1) are available at:
  http://docwiki.cisco.com/wiki/Category:Unified_Communications_System_Implementation

  Also see the Related Documentation section in Chapter 3, "Performing Your System Installation."

System Installation Overview

This section includes the following topics:

- Installation Types
- Release Sets
- System Installation Roadmap
- Component Installation Overview
- Component Installation Overview for Unified Communications Manager Business Edition

Installation Types

When installing and creating an IP telephony environment, consider the following deployment types:

- Greenfield deployment—A completely new installation of Cisco Unified Communications System, using no existing equipment.
- Legacy deployment—A new installation of Cisco Unified Communications System combined with existing legacy equipment, such as TDM PBXs and third-party adjuncts, which may require long-term co-existence and integration or eventual migration to new installation.
- Installed base (*brownfield* deployment)—An existing Cisco Unified Communications System, which requires an upgrade and migration from a previous system release to current system release. For more information about upgrading an existing installed base, see the upgrade topics in this document.

> **Note**   When performing upgrades, be aware of backward compatibility issues such as co-existence and interoperability with previous system release versions.

Release Sets

A release set is defined as the combination of products, components, and software versions that were tested to work together as an integrated Cisco Unified Communications System. A particular system release is also referred to as a release set.

Legacy Deployment and Installed Base Release Sets

If you are dealing with a legacy or brownfield deployment, be aware of interoperability issues between legacy and existing component versions and Cisco Unified Communications System Release 8.5(1) component versions.

You can verify a previous system release set by product release version in a summary matrix. Use the following links if you are unfamiliar with the versions of release sets deployed in IP telephony environments:

- Cisco Unified Communications System Release Summary Matrix for IP Telephony:

  http://www.cisco.com/en/US/docs/voice_ip_comm/uc_system/unified/communications/system/versions/IPTMtrix.html

- IP Communications System Test Release:

  http://www.cisco.com/en/US/docs/voice_ip_comm/uc_system/GB_resources/ipcmtrix.htm

You can also see the Interoperability and Compatibility Portals section for information about support for legacy products and third-party product interoperability with Cisco IP telephony products.

Greenfield Deployment Release Set

If you are dealing with a greenfield deployment, be aware that certain features, applications, and components are part of Cisco Unified Communications System Release 8.5(1) family of products and have been tested and verified for interoperability and compatibility.

Based on your specific network design, you may choose to install all or some of these features, applications, and components. For a list of components that apply to IP telephony environment, see the Component Installation Overview section.

For information about the Cisco Unified Communications System Release 8.5(1) IP telephony components and their software and firmware versions, see Release Set Versions in Chapter 2, "Preparing for Your System Installation."

System Installation Roadmap

Table 1-1 provides an overview of tasks that are performed during the installation of Cisco Unified Communications System.

Table 1-1   Overview of Installation Tasks

	Task	Remarks
Step 1	Perform preinstallation tasks.	See the Before You Begin section in Chapter 2, "Preparing for Your System Installation," and refer to the tasks that are described in the individual product installation documents.
Step 2	Install and configure network infrastructure.	Install and cable the hardware.
Step 3	Install and configure the software for the components to enable functionality between the installed components.	See Chapter 3, "Performing Your System Installation."
Step 4	Initialize installed components and ensure that components are functional.	• Applications at the system level (such as cold start, elapse time) • Each application at node level
Step 5	Perform verification and validation testing to ensure that installed components interoperate.	—

Table 1-1   Overview of Installation Tasks (continued)

	Task	Remarks
Step 6	Integrate Cisco and third-party or legacy components and ensure interoperability.	See the Before You Begin section in Chapter 2, "Preparing for Your System Installation," and refer to the tasks that are described in the individual product installation documents.
Step 7	Perform postinstallation tasks	See the Postinstallation Tasks section in Chapter 3, "Performing Your System Installation."

Component Installation Overview

The Cisco Unified Communications System IP Telephony environment consists of these primary software components:

- Call processing—Unified Communications Manager, Unified Communications Manager Express, Unified SRST

- Communications—Cisco Emergency Responder, Cisco Unified Contact Center Express

- Messaging—Cisco Unity, Cisco Unity Connection, Cisco Unity Express, Cisco Unified Messaging Gateway

- Instant Messaging and Presence—Cisco Unified Presence

- Conferencing—Cisco Unified MeetingPlace, Cisco Unified Videoconferencing

- System Management—Cisco Unified Operations Manager, Cisco Unified Service Monitor, Cisco Unified Service Statistics Manager, Cisco Unified Provisioning Manager, LAN Management Solution

- Virtualization—VMware vSphere, VMware ESXi, VMware vCenter Server, Cisco UCS 2104XP Fabric Extender, Cisco UCS 6100 Series Fabric Interconnect, Cisco UCS 5108 Blade Server Chassis, Cisco UCS C-Series servers

In addition, the following Cisco hardware and software products are required for a complete IPT deployment:

- Cisco Unified IP Phones, Cisco IP Communicator, Cisco Unified Personal Communicator

- Cisco gateways, gatekeepers, Cisco Unified Border Element

- Cisco LAN/WAN infrastructure and components

- Cisco security components

Table 1-2 provides an overview of primary components in Cisco Unified Communications System Release 8.5(1) product family that can be installed and configured in IP telephony environments.

Note Cisco Unified Communications System IP telephony components listed in Table 1-2 are for enterprise business models. Not all these components are required for midmarket business models. For the list of components for midmarket business model deployments, see Component Installation Overview for Unified Communications Manager Business Edition.

Table 1-2   *System Installation Overview for Cisco Unified Communications System IP Telephony Components*

Component/Application/Feature	Purpose
Communications Infrastructure and Wireless Components	
Switches and routers	Cisco switches and routers provide switching and intelligent routing services that can deliver voice, video, data and Internet access, wireless, and other applications. They can also provide high-speed connectivity between users, applications, and communications systems.
Gateways and gatekeepers	Cisco gateways and gatekeepers are optimized for data, wireless, and IP communications. They support IP-to-IP connectivity between independent voice-over-IP (VoIP) networks and analog phone gateways using your existing phone equipment.
Firewall and security components	Security components include firewall and policy enforcement services, antivirus software, and domain and web server hardening.
	Firewall allows any port on the device to operate as a firewall port and integrates firewall security inside the network infrastructure.
	Policy enforcement services can protect networks from unauthorized access. These services combine with VPN services to enable businesses to securely extend their networks to business partners, remote sites, and mobile workers.
Wireless components	Wireless components provide for secure, scalable, cost-effective WLANs with real-time access to instant messaging, e-mail, and network resources.
System network management applications	These applications provide the means to monitor, manage, and troubleshoot the Cisco Unified Communications System.
	For example, Unified Operations Manager provides comprehensive monitoring and diagnostics for the entire system. It performs automatic discovery of the entire system and provides contextual diagnostics for rapid troubleshooting.
Cisco Unified Communications Manager and Call Processing Components	
Cisco Unified Communications Manager	Unified Communications Manager provides the call-processing functionality to Cisco Unified Communications IP telephony networks.
Cisco Unified Communications Manager Services	There are a variety of services on the publisher, subscribers, and TFTP servers that are essential for call processing in the Unified Communications Manager cluster.
Cisco Unified Communications Manager Express	Cisco Unified Communications Manager Express provides call-processing functionality for small sized businesses
Cisco Unified IP Phones (SCCP and SIP)	Use methods such as auto-registration and Bulk Administration Tool (BAT) to install and configure Unified IP Phones and to add them to Unified Communications Manager database.
Install and configure Cisco IP Communicator	Cisco IP Communicator is a software-based application that delivers enhanced telephony support through desktop. It is designed to meet diverse customer needs by serving as a supplemental telephone when traveling, a telecommuting device, or as a primary desktop telephone.
Conferencing applications	Cisco Unified MeetingPlace provides intuitive interfaces for setting up, attending and managing meetings. Extensive voice, video using Cisco Unified Videoconferencing and web conferencing capabilities enable a range of meeting applications, including highly collaborative meetings, training sessions, and presentations.

Table 1-2   System Installation Overview for Cisco Unified Communications System IP Telephony Components

Component/Application/Feature	Purpose
Cisco Unified Communications Manager cluster (integration with switches, routers, gateways, gatekeepers, and Cisco Unified Communications Manager Telephony client	Install the Unified Communications Manager Telephony client on the Cisco Unified Contact Center Express system to enable communication with Unified Communications Manager cluster.
Voice Mail and Unified Messaging components	These applications combine voice messaging, integrated messaging, speech recognition capabilities, and call-routing rules. The applications include Cisco Unity Connection, Cisco Unity, Cisco Unity Express, and Cisco Unified Messaging Gateway.
Presence application	Cisco Unified Presence links the various knowledge within each application to provide a ubiquitous and broad view of a defined user within the Cisco Unified Communications System.
Mobility components	Wireless and mobility components provide services that enable secure, scalable, methods to real-time access to instant messaging, e-mail, and network resources. Some examples of these components are Cisco Unified Mobility Advantage and Cisco Unified Mobile Communicator.
Cisco Unified Computing System	The Cisco Unified Computing System (UCS) is a data center platform that unites computing, networking, storage access, and virtualization into a cohesive system and integrates a low-latency, lossless 10 Gb Ethernet unified network fabric with enterprise-class, x86-architecture servers. It includes products such as blade servers, network adapters, blade server chassis, fabric interconnect and extenders and UCS Manager, which provides centralized management capabilities for the Cisco Unified Computing System.

Component Installation Overview for Unified Communications Manager Business Edition

The Cisco Unified Communications System IP telephony environment for midmarket consists of these primary software components:

- Call processing—Cisco Unified Communications Manager Business Edition, Unified SRST
- Communications—Cisco Unified Contact Center Express
- Messaging—Cisco Unity Connection
- Instant Messaging and Presence—Cisco Unified Presence

In addition, the following Cisco hardware and software products are required for a complete IP telephony deployment:

- Cisco Unified IP Phones, Cisco IP Communicator, Cisco Unified Personal Communicator
- Cisco gateways and gatekeepers
- Cisco LAN/WAN infrastructure and components
- Cisco security components

Table 1-3 provides a an overview of primary components in the Cisco Unified Communications System Release 8.5(1) product family that can be installed and configured in IP telephony midmarket environments.

Table 1-3   System Installation Overview for Cisco Unified Communications System IP Telephony Components for Midmarket Businesses

Component/Application/Feature	Purpose
Communications Infrastructure and Wireless Components	
Switches and routers	Cisco switches and routers provide switching and intelligent routing services that can deliver voice, video, data and Internet access, wireless, and other applications. They can also provide high-speed connectivity between users, applications, and communications systems.
Gateways and gatekeepers	Cisco gateways and gatekeepers are optimized for data, wireless, and IP communications. They support IP-to-IP connectivity between independent voice-over-IP (VoIP) networks and analog phone gateways using your existing phone equipment.
Firewall	Allows any port on the device to operate as a firewall port and integrates firewall security inside the network infrastructure.
Cisco Unified Communications Manager Business Edition and Call Processing Devices	
Cisco Unified Communications Manager, Business Edition	Cisco Unified Communications Manager, Business Edition (includes Cisco Unified Communications Manager and Cisco Unity Connection) provides call-processing functionality for midmarket businesses. It integrates call-processing, conferencing, mobility, and messaging on a single platform and eliminates the need for multiple servers to run each application.
Cisco Unified IP Phones (SCCP and SIP)	Use methods such as auto-registration and Bulk Administration Tool (BAT) to install and configure Unified IP Phones and to add them to Unified Communications Manager database.
Conferencing applications	Cisco Unified MeetingPlace provides intuitive interfaces for setting up, attending and managing meetings. Extensive voice, video using Cisco Unified Videoconferencing and web conferencing capabilities enable a range of meeting applications, including highly collaborative meetings, training sessions, and presentations.
Cisco Unity Connection	These applications combine voice messaging, integrated messaging, speech recognition capabilities, and call-routing rules. Cisco Unified Communications Manager Business Edition includes Cisco Unity Connection.
Presence application	Cisco Unified Presence links the various knowledge within each application to provide a ubiquitous and broad view of a defined user within Cisco Unified Communications System.
Cisco Unified Business Attendant Console	The Cisco Unified Business Attendant Console uses a powerful queuing engine to direct the calls to the operator and provides the operator several monitoring features to help ensure that incoming calls are handled efficiently.

For installation information on Cisco Unified Communications System Release 8.5(1) for contact center components, see the following:

- System Installation and Upgrade for Contact Center:
  http://www.cisco.com/en/US/docs/voice_ip_comm/uc_system/UC8.5.1/cc_system_inst_upg/siumc851.pdf

System Installation Strategies

This section describes the installation strategies that can be used for an IP telephony deployment. Details of individual components installations are not described unless additional information or clarification is required.

Installation of new networks in Cisco Unified Communications IP telephony environments (using new hardware) is supported via a *flash-cut* or a *shrink-and-grow* approach.

Single-Stage installation Using New Hardware (for Greenfield Deployments)

A completely new network is built using the components and software versions in the current Cisco Unified Communications System release set. The new system becomes operational when it is turned on after the required software is installed and initial configuration is completed.

Single-Stage installation Using New Hardware (for Legacy Deployments)

A new network using components and software versions in the current Cisco Unified Communications System release set is built alongside the legacy network. The new network is staged and configured to support the production environment.

All users should be migrated from the existing legacy network to the new network in a single installation window using a flash-cut installation process. Because interoperability with the legacy system is not required, components of the legacy system do not need to be upgraded. After all users are moved to the newly installed system, the legacy system is decommissioned.

Multistage Installation using New Hardware (for Legacy Deployments)

A new network using components and software versions in the current Cisco Unified Communications System release set is built alongside the legacy network. The new network is staged and configured to support the production environment.

This strategy uses either a flash-cut or shrink-and-grow installation process or a combination of both to:

- Deploy all the applications in one installation window (flash-cut) or in several installation windows (shrink-and-grow).
- Migrate all the users in one installation window (flash-cut) or in multiple installation windows (shrink-and-grow).

After all users have been moved to the newly installed system, the legacy system is decommissioned.

Multisite Phased Installation

For large enterprises with many sites, you can install one site at a time in multiple phases. Depending on whether it is a greenfield or legacy deployment, within each site, you can either employ the single-stage or multistage installation strategies described in this chapter.

Interoperability and Compatibility Portals

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

For detailed information about the compatibility with Unified Communications Manager and Cisco Unified Contact Center Express, see the following sites:

- Cisco Unified Communications Compatibility Tool:
  http://tools.cisco.com/ITDIT/vtgsca

- Cisco Unified Communications Manager Compatibility Information:
  http://www.cisco.com/en/US/products/sw/voicesw/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: CTI Compatibility Matrix:
  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/voicesw/ps6790/ps5748/ps378/prod_brochure0900aecd8062a4f9.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