CHAPTER 2

Prepare and Plan

Introduction to Prepare and Plan

In the Prepare and Plan phase, you evaluate Cisco technologies that address your business needs. Gather information about your business and technical environment that will feed into the high-level design. Create a business case for the contact center solution that provides the best return on your investment.

Before You Begin

Understand the features and functions of contact center applications. Start with the Contact Center Overview and the System Release Notes for Contact Center: Cisco Unified Communications, Release 6.1(1). Then review the business requirements, deployment models, and sites to understand the options that are available for your specific environment.

When You Are Done

You have defined and created the following:

- Your business and system requirements
- A list of components and applications that match the requirements
- A project plan based on those requirements including a proposed, high-level design

Major Concepts and Tasks in This Process

- Cisco Unified Communications Features and Benefits Overview
- Planning Concepts
- Planning Tasks
- Define Case Studies

Cisco Unified Communications Features and Benefits Overview

The Cisco Unified Communications 6.1(1) system securely integrates voice, video, and other collaborative data applications into intelligent network communications solutions. This system, which includes IP telephony, unified communications, rich-media conferencing, IP video broadcasting, and customer contact solutions, takes full advantage of the power, resiliency, and flexibility of an IP network. The elements of this system were designed, developed, documented, and tested as part of a comprehensive, end-to-end Unified Communications System.

The Cisco Unified Communications system reduces the cost and complexity associated with managing multiple and remote sites, meets stringent quality of service (QoS) requirements, and provides optimal availability and security when deployed as part of a converged network. In addition, the solution interoperates with existing time-division multiplexing (TDM)-based systems and enterprise business applications, allowing organizations to migrate to full-featured IP Communications while maintaining existing technology investments.

This topic provides an overview of the key features and benefits of Cisco Unified Communications. It includes these sections:

System Definition

The Cisco Unified Communications system is designed for a single, secure, converged network. Part of an integrated, comprehensive Cisco architecture, the communications applications reside “in” the network, not “on” the network, and can easily incorporate emerging business processes, applications, and new devices. Applications can be deployed in a single instance, rather than in multiple instances, and managed services offerings further increase deployment flexibility. Standards-based Cisco Unified Communications products let organizations migrate based on business needs, not technical limitations, to keep pace with new technology.

This release of the Cisco Unified Communications system introduces the Cisco Unified Communications Manager Business Edition and deployment models for the medium-sized business. The Cisco Unified Communications Manager Business Edition includes the features and capabilities of Cisco Unified Communications Manager, Cisco Unified Mobility, and Cisco Unity Connection co-resident on a single, low-cost Media Convergence Server. The Cisco Unified Communications Manager Business Edition is designed to support 150 to 500 endpoints in one main and up to five remote locations.

The Cisco Unified Communications System also includes a suite of network management applications that allow you to monitor, manage, and troubleshoot your system. It also includes tools that allow you to analyze the readiness of your infrastructure to support the Cisco Unified Communications system.

System Release Strategy

The Cisco Unified Communications system includes the following types of releases:

- Major release—Marks the beginning of a major new release version. This release type typically is based on a major release of at least one of these components: Cisco Unified Communications Manager, Cisco Unity, Cisco Unified MeetingPlace, or Cisco Customer Response Solutions.
- Minor release—Adds features and fixes to an existing major release. This release type can consist of revisions to existing components and new versions of components.
- Maintenance release—Contains bug fixes for one or more of the components. This release type is based on an existing major or minor release.

For example, in Cisco Unified Communications release 6.1(1), "6" indicates the major release, the first "1" indicates the minor release, and the second "1" indicates the maintenance release.

Service Offerings

Using the Cisco Lifecycle Services approach, Cisco Systems and its partners offer a broad portfolio of end-to-end services. These services are based on proven methodologies for deploying, operating, and optimizing Unified Communications solutions. Planning and design services, for example, can help you meet aggressive deployment schedules and minimize network disruption during implementation. Operate services reduce the risk of communications downtime with expert technical support. Optimize services enhance solution performance for operational excellence. Cisco and its partners offer a system-level service and support approach that can help you create and maintain a resilient, converged network that meets your business needs.

Service offerings include:

- Cisco Unified Communications Software Subscription—Allows you to purchase major software version upgrades of various Cisco Unified Communications products at a reduced cost through a one-, two-, or three-year subscription.
- Cisco Unified Communications Essential Operate Service—Provides 24-hour, 365-day-a-year access to Cisco Systems engineers and certified partners who are highly trained and have a deep understanding of Cisco Unified Communications products and technologies.
- Cisco Unified Communications Remote Management Service—Provides a proactive support solution that combines 24-hour, 365-day-a-year access to technical support representatives plus a simple-to-install monitoring solution designed for Cisco Unified Communications.
- Cisco Unified Communications Cisco SMB Network Operate & Optimize Service, a partner-led service offering—Enables the delivery of affordable, ongoing, high-availability network support designed specifically for the medium-sized businesses.

Career Certifications

The Cisco Certified Voice Professional (CCVP) certification and related certifications are designed for IT professionals who are responsible for integrating voice technology into underlying network architectures. Individuals who earn a CCVP certification can help create a telephony solution that is transparent, scalable, and manageable. Earning a CCVP certification validates a robust set of skills in implementing, operating, configuring, and troubleshooting a converged IP network. The certification content focuses on many components of the Cisco Unified Communications system, including Cisco Unified Communications Manager, quality of service (QoS), gateways, gatekeepers, IP phones, voice applications, and utilities on Cisco routers and Cisco Catalyst switches.

Solution Bundling

In addition to providing traditional solution ordering, where you choose the individual components and quantities that you require, the Cisco Unified Communications system provides flexible bundling options. A bundled solution simplifies the way in which you order applications and services and makes it easy to add options.

Cisco Unified Communications systems also offer a bundling option for medium-sized businesses. This option includes the Cisco Unified Communications Manager Business Edition, which is designed specifically to address the call processing and messaging needs of medium-sized businesses, as well as new network management tools.

Intelligent Information Network

The Cisco Intelligent Information Network facilitates the evolution of networking to systems. It allows the network to be used as a strategic asset and provides capabilities that include:

- Cisco Discovery Protocol (CDP)—A simple broadcast protocol that devices use to advertise their presence, it operates in the background and facilitates communication between a Cisco Unified IP Phone plugged into a network and the network switch.
- QoS—Cisco provides an end-to-end solution to ensure quality of service. QoS starts at the phone and LAN distribution layer, where packets are classified and marked as high priority traffic. Traffic markings originating from Cisco Unified IP Phones are automatically trusted by the Cisco switch infrastructure, which typically remarks traffic from nontrusted end user workstations. Configuration is made easier through Cisco AutoQoS, which automatically handles a range of tasks traditionally done manually, including classifying applications, generating policies, configuring the proper QoS configurations, monitoring and reporting to test QoS effectiveness, and enforcing service-level consistency.

  As traffic flows through the access layer, priority queuing and buffer management ensure that real-time traffic is prioritized over less time-critical data. Where bandwidth is most restricted, across the WAN, the Cisco solution provides RSVP for reserving the bandwidth needed for voice. Fragmentation and interleaving of large blocks of data ensure a steady stream of voice traffic, and voice packet header compression minimizes bandwidth consumed.
- VLAN—When a Cisco Unified IP Phone boots up on the IP network, it advertises its presence using CDP, and it requests an IP address lease from a DHCP server. The Cisco LAN switch learns of the new phones via CDP and automatically reconfigures to add that port to the VLAN used for voice.

  With this feature, the LAN infrastructure can distinguish a phone from a PC and does not require manual configuration every time a phone is added, moved, or removed.
- Wireless—Cisco wireless access points allow Cisco wireless phone users to roam a campus without losing voice connectivity. If a user roams to a different site, the system will discover the new physical location for emergency 911 information purposes.
- Power over Ethernet (POE)—Eliminates the need for local power connections for every phone. Cisco switches can be configured with redundant power supplies connected to uninterruptible power supplies in a data center to ensure that the power to the phone is preserved, even when local power for other equipment at the desk is lost. Most Cisco Unified IP Phone models support the industry-standard 802.3af power and the Cisco pre-standard inline power.
- Gigabit Ethernet (GigE)—Allows certain Cisco Unified IP Phone models to take advantage of the emerging Gigabit Ethernet LAN infrastructure.

Business Productivity Applications

The Cisco Unified Communications system provides a wide array of applications that enhance business and organizational productivity and efficiency. These applications offer capabilities that include:

- Rich-media conferencing—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.
- Messaging—Cisco Unity provides users with access to voice, e-mail, and fax messages from a Cisco Unified IP Phone or from a PC. These solutions combine unified messaging with personal productivity tools to help manage communications quickly and conveniently. For midsize organizations, Cisco Unified Connection provides voice messaging, speech recognition, call routing rules, and desktop PC message access in a system that is easy to manage and deploy. For small organizations, Cisco Unity Express offers a voice messaging solution that integrates with your router.
- Common interface—Cisco Unified Personal Communicator is a presence-based desktop application that provides a focal point for phone services, directory services, messaging, and conferencing.
- Cisco Unified Presence—The focal point of all status processing, including attributes and capabilities. It links the various knowledge within each application to provide a ubiquitous and broad view of a defined user within the Cisco Unified Communications system.

Customer Interaction Network

The Cisco Customer Interaction Network component provides a single, integrated platform for all contact center locations. It is a distributed, IP-based customer-service infrastructure that easily integrates with legacy contact center platforms and networks, providing multi-channel services and integration with customer relationship management applications.

- Intelligent contact routing and multi-channel automatic call distribution (ACD)—Enables interaction with customers via phone (inbound or outbound), web, e-mail or chat. The application provides call handling tailored to different classes of customers and to individual customers, providing flexible contact center operational profiles based on varying business needs.
- Voice and web self-service—Extracts and parses web content and presents this data to customers through a telephony interface, allowing simple transactional requests to be handled by the interactive voice response (IVR) system instead of by agents. This application provides self-service automation with automatic speech recognition (ASR) and TTS. It also performs *prompt-and-collect* functions to obtain user data such as passwords or account identification that it can then pass to contact center agents, and it delivers proactive notification users through e-mail, fax, pager, and short message service (SMS).
- Agent and supervisor options—Provide full support for agent or supervisor interaction using chat capabilities. Instant messaging offers the capability to communicate with any or all the agents on a supervisor's team. Other options include:
  - Agent status monitoring
  - Silent monitoring
  - Barge-in
  - Intercept
  - Real-time and historical reporting

  - ACD

IP Communications

IP communications provides powerful and efficient voice, data, and video communications, and related capabilities. Key features include:

- Video telephony—Allows video calls to be placed and received over an IP telephony network using the familiar phone interface. Video endpoints support common call features such as forward, transfer, conference, and hold. Use of a single infrastructure also enables a unified dial plan and user directory for voice and video calls. This release of the Cisco Unified Communications system also includes Cisco Unified Conferencing for TelePresence, which is a new technology that combines rich audio, high-definition video, and interactive elements to deliver a unique in-person experience.
- Mobility—Provides for several forms of user mobility, including:
  - Extension Mobility—Allows users to access any phone within a single Cisco Unified Communications cluster as their own, by simply logging in to the phone. After log in, the phone assumes all of the user profile information, including line numbers, speed dials and service links.
  - Site/campus mobility—Allows users to access the Cisco Unified Communications network through the wireless Cisco Unified Wireless IP Phones 7920G and 7921G. In addition, this release includes enhanced mobile IP phone applications that allow users to:

    Dynamically manage how and when mobile calls take place

    Intelligently screen calls based on urgency, subject matter, and caller identity

    Identify which users are available to talk and which users choose not to be disturbed

    Increase accessibility of corporate calendar and contact information from mobile phones.
- Emergency caller response/safety and security—Enables emergency calls in an IP network to be directed to the appropriate Public Safety Answering Point (PSAP). In this way, emergency agencies can identify the location of 911 callers without a system administrator needing to keep location information current.

Security

The Cisco Unified Communications system takes a layered approach to protecting against various attacks, including denial of service (DOS), privacy, and toll fraud. Security features include:

- Encryption of signaling and media—Ensures that the signaling and the actual phone conversations are protected against unintended interception by third parties.
- Catalyst Integrated Security Features (CISF)—Includes private VLANs, port security, DHCP snooping, IPSource Guard, secure Address Resolution Protocol (ARP) detection, and dynamic ARP inspection. These features protect the network against attacks such as man-in-the-middle attacks and other spoofing.
- Integration with firewalls—Ensures that system platforms are accessible only by authorized devices. The firewall acts as a guardian between all IP devices and the Cisco Unified Communications system platforms, ensuring that only specific transactions are allowed.
- Secure platforms—Provides features, such as host-based intrusion detection, optional security scripts, and anti-virus software, that ensure that the platform is hardened against intruders and malicious code.

- Enhanced phone security features—Provides configurable levels of security. Options include configuring the phone to ignore Gratuitous Address Resolution Protocol (GARP) requests, disabling the PC port on the phone, disabling access to network configuration settings on a phone, and configuring a phone to accept only digitally signed firmware images.

Deployment and Migration

The Cisco Unified Communications system is designed to be deployed efficiently and effectively. The solution offers:

- Flexible deployment models—Cisco Unified Communications supports LAN and WAN connectivity and can be configured for single-site or multi-site networks. Headquarters, contact centers, branch offices, and telecommuter configurations can be interconnected without geographic constraints. Call processing and administration can be centralized or distributed.
- Integration with existing equipment and networks—Cisco Unified Communications provides gateway support to enable integration and interoperability with existing call processing equipment, phones, and TDM networks. This capability ensures compatibility with and migration from legacy systems, and supports:
  - Integration with PBXs through QSIG, Digital Private Network Signaling System (DPNSS), and PRI links
  - Integration with ACD platforms via CTI interface
  - Integration with legacy phones through gateways
  - Integration with TDM networks through gateways via T1, E1, and PRI links
- Open IP connectivity through SIP—Cisco Unified Communications provides enhanced support for SIP trunking and to a variety of SIP endpoints. An integrated Cisco Unified Presence provides user information and status and enables interconnection to popular messaging networks.
- High availability—Cisco Unified Communications networks can be built to meet high availability requirements as business needs dictate. Networks can be designed to ensure no single point of failure in either network topology or applications. Cisco Unified Survivable Remote Site Telephony (Unified SRST) allows remote branch offices to remain in service even when the WAN access link is lost.

Contact Center Overview

The Cisco Unified Communications System for Contact Center is a complete contact center system that includes a rich suite of customer-relationship management (CRM) applications. The contact center functionality delivers intelligent call routing, network-to-desktop computer telephony integration (CTI), and multimedia contact management to contact center agents over an IP infrastructure.

The contact center system consists of four primary Cisco software components:

- IP communications infrastructure: Cisco Unified Communications Manager (Unified Communications Manager)
- Contact center routing and agent management: Cisco Unified Intelligent Contact Management (Unified ICM) software
- Queuing and self-service: Customer Response Solutions (Unified IP IVR) or Cisco Unified Customer Voice Portal (Unified CVP)

- Agent desktop software: Cisco Agent Desktop (CAD) or Computer Telephony Integration Object Server (CTI OS)

The following Cisco hardware products are required for a complete contact center deployment:

- Cisco IP Phones
- Cisco voice gateways
- Cisco LAN/WAN infrastructure
- Cisco security components
- Network management tools

By integrating automatic call distribution (ACD), IVR, and CTI functionality, the contact center enables companies to rapidly deploy a distributed contact center enterprise network.

The contact center software profiles each customer by using contact-related data such as dialed number and caller-entered digits (CEDs). The system also monitors the resources at the contact center to meet customer needs, including agent skills and availability, queue lengths, and expected delays. The combination of customer and contact center data is processed through routing scripts that graphically reflect a company's business rules, thus enabling the contact center software to route each contact to the optimum resource anywhere in the enterprise.

For more information on contact center features, go to System Features in This Release.

Contact Center Deployment Models

A Cisco Unified Communications contact center system supports the deployment models in Table 2-1.

Table 2-1 Deployment Models

Deployment Model	Description
Single-Site Model	This model is designed for autonomous offices in which most or all employees are IPC users. This model can support up to 30,000 users.
Multisite Centralized Call Processing Model	This model is designed for distributed operations with a large central or headquarters site and multiple remote or branch sites. This model can support up to a total of 30,000 phones distributed among up to a maximum of 1000 sites. Based upon the bandwidth available, each site can support any number of users up to the overall total of 30,000 phones.

Table 2-1 Deployment Models (continued)

Deployment Model	Description
Multisite Distributed Call Processing Model	This model is designed for organizations with large user populations or large numbers of geographically distributed sites resulting in the need for more than a single call processing entity. This model is suited for deployments that require multiple Cisco Unified Communications Manager clusters or Cisco Unified Communications Manager Express platforms. Each call processing entity in this model is configured as a Single-Site Model or Multisite Centralized Call Processing Model and each has a common dial plan and feature set.
Clustering Over IP WAN Call Processing Model	This model is designed for organizations with large user populations across multiple sites that are connected by an IP WAN with the QoS features enabled. It supports the Local Failover Deployment Model and the Remote Failover Deployment Model.

See also Deployment Methodology in the Cisco Unified Communications System Description.

System Features in This Release

The Cisco contact center system is a portion of the end-to-end system release for enterprise Cisco Unified Communications, which integrates telephony, conferencing, messaging, and contact center products for enterprise IP customers in a variety of deployment models using SIP and SCCP endpoints over IP networks. Cisco Unified Communications is centered on the latest Unified Communications Manager release.

For detailed contact center feature information, see the System Release Notes for Contact Center: Cisco Unified Communications System, Release 6.1(1).

Base Components and Applications

The contact center includes these software components:

- Cisco Unified Communications Manager—Provides scalable, distributable, and highly available enterprise IP telephony call-processing capabilities.
- Cisco Unified Intelligent Contact Management (Unified ICM)—Provides ACD functionality that includes monitoring and control of agent state, routing and queuing contacts, CTI capabilities, real-time data, and historical reporting.
- Cisco Agent Desktop (CAD)—Provides productivity tools for agents and supervisors. Allows supervisors to view agent states and call information and to send text messages to agents, record conversations, and provide advanced monitoring functions.
- Computer Telephony Integration Object Server (CTI OS)—Combines a powerful, feature-rich server and an object-oriented software development toolkit to enable rapid development and deployment of complex CTI applications.

The contact center offers two products that provide self-service call treatment capability:

- Customer Response Solutions (Unified IP IVR)—Automates access to account information or user-directed call routing by processing user commands through touch-tone input or speech-recognition technologies. Unified IP IVR helps customers who are calling the contact center use voice commands to retrieve the information that they require without ever speaking with an agent, or to quickly navigate to a customer service agent who can help them the first time.

  For a comprehensive view of the different components that are deployed in the Unified IP IVR test bed, see Snapshot of Unified IP IVR Sites Components.

- Cisco Unified Customer Voice Portal (Unified CVP)—Integrates time-division multiplexing (TDM) with IP-based contact centers to provide call management and call treatment functions. Unified CVP includes a self-service IVR option that can use information that is available to customers on the corporate web server. With support for automated speech recognition (ASR) and text-to-speech (TTS) capabilities, callers can obtain personalized answers to complex questions and conduct business without the cost of interacting with a live agent.

  For a comprehensive view of the different components that are deployed in the Unified CVP test bed, see Snapshot of Unified CVP Sites Components.

Note In the Parent and Child test bed, Unified CVP provides call treatment and queuing for Unified CVP post-routed calls. CRS (Unified IP IVR) provides call treatment and queuing for Unified Communications Manager post-routed calls that are received directly by a child system.

For a comprehensive view of the different components that are deployed in the Parent and Child test bed, see Snapshot of Parent and Child Sites Components.

Planning Concepts

This topic presents planning concepts. It is assumed that your network will be a converged network that combines voice, data, and video and that you have decided on one of network types discussed in the Internetwork Design Guide.

The primary planning considerations that drive the planning stage are:

- Types of deployment, whether it involves installing new equipment or migrating existing equipment
- Application availability based on your networking needs for multimedia and voice, security, redundancy, and fault tolerance
- Costs associated with your needs

Your goal is to minimize costs while delivering service that does not compromise established availability and performance requirements. These issues are essentially at odds. Any increase in availability and performance must generally be reflected as an increase in cost. As a result, you must carefully weigh the relative importance of resource availability, performance constraints, variables, and overall cost.

Note The concepts discussed in this topic are meant to be a high-level overview of considerations and are not meant to be a definitive set of rules.

The concepts that you should review are as follows:

- Deployment Types
- Cost of Ownership
- Redundancy
- Capacity and QoS
- Security
- Define Case Studies
- Understand Your Call Flows

Deployment Types

The deployment types to consider are as follows:

- New installation
  - Greenfield—Completely new installation of the Cisco Unified Communications system, using no existing equipment.
  - Legacy—New installation of the 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 the new installation.
  - Brownfield—Existing Cisco Unified Communications system, which requires an upgrade and migration from a previous system release to the current system release.
- Single-Stage Upgrade
  - Using existing hardware—All components in the network start at the base release set and all components can be upgraded to the target release set within a single maintenance window.

  - Using new hardware (flash-cut or shrink-and-grow)—A parallel network should be built using new hardware and pre-staged with configuration to support the existing production network.
- Multistage System Upgrade
  - Using existing hardware (hybrid system)—The components in individual sites can be upgraded from the base release set to the target release set in stages, during separate maintenance windows.
- Multisite Migration with Independent Site Upgrade
  - Using a hybrid network with interworking release sets—Components are upgraded on a site-by-site basis during separate maintenance windows. At the completion of each maintenance window, a hybrid network exists within the multiple sites that have components operating on the base release set; or components that are operating on the target release set; or components that are a hybrid system as described in Multistage System Upgrade.

For more information about deployment types, see the System Installation and Upgrade for Contact Center: Cisco Unified Communications System.

Cost of Ownership

Information system budgets can run into millions of dollars. As large organizations increasingly rely on electronic data for managing business activities, the associated costs of computing resources continue to rise. With this in mind, your basic network plan should include the following:

- Environmental consideration—Include the location of hosts, servers, terminals, and other end nodes; the projected traffic for the environment; and the projected costs for delivering different service levels.
- Performance constraints—Consider network reliability, traffic throughput, and host and client computer speeds. For example, network interface cards and hard drive access speeds.
- Internetworking variables—Include the network topology, line capacities, packet flow assignments, redundancy and fault tolerance factors, backward compatibility (co-existence and interoperability), and security.

Redundancy

Redundancy is critical considering the number of vital business applications running on the network. If you have a distributed network with several access layers to remote offices, and you have a failure from the distribution layer to the core without redundancy, you have loss of network service for a large number of people. If you have redundancy in the distribution layer and the core, you can potentially lose one or more circuits without disturbing service to any particular group of users. Depending on the application, you may also need some redundancy from the access layer to the distribution layer.

Because of redundancy, if you drop a link at any one point in the network, every remote group or user still has a path to get back to the core. Even if you cut off the connection from one of the distribution switches back to the core, you still have access to the core for every user.

For more information on redundancy planning, see the Redundancy and Load Sharing Design Guide.

Capacity and QoS

Capacity and QoS are major considerations in a converged network and effect one another. QoS is needed to prevent applications from using more than a fair share of bandwidth and degrading the performance of other applications. At the WAN interface, QoS is needed to allocate expensive wide area capacity among applications.

Bandwidth and QoS requirements are easy to figure in a multilayered design because the traffic flow is fairly predictable. You can also have end-to-end QoS in a multilayered design. End-to-end QoS is critical when you have real-time applications, such as a voice conversation or video presentation, and you have non-real time applications that can interfere with the real-time applications. For example, if the real-time and non-real time applications arrive at the same layer at the same time, the network must pass the real-time packets first, as well as keep latency and jitter low. QoS end-to-end is the answer.

Consider Call Admission Control (CAC) as an alternative to QoS. CAC limits the amount of traffic allowed onto the network at the ingress point. Because you know that the network will be congested at various times during the day, you can disallow additional traffic by using CAC. Also consider using traffic-shaping techniques using a traffic-shaping device. A combination of QoS, CAC and traffic shaping will provide optimal performance for applications on a converged network.

Managing link speed mismatches is the last element of traffic management. The mismatches, called chokepoints or bottlenecks, are a basic design issue whenever a large capacity link generates traffic destined for a low capacity link.To avoid the mismatches, carefully analyze the traffic and the device capabilities, then upgrade the interface (if needed) and apply a combination of CAC and QoS.

For more information on QoS, see the Enterprise QoS Solution Reference Network Design Guide.

Security

Cisco recommends multiple layers of security technologies to prevent a single configuration error from jeopardizing the security of the network. Cisco also recommends operational processes that ensure prompt application of software patches, timely installation of new security technologies, and performance of regular security audits and assessments.

As you begin to design your network, rank the importance of your network assets and services by considering these factors:

- What keeps you in business?
- How do you make money?
- Does loss of data or privacy equal lost money?
- What about regulatory compliance?
- How do you protect your critical data?
- Where does voice fit?

Then consider the potential threats to your business, which may include:

- Toll fraud
- Eavesdropping
- Address spoofing
- Fake caller identity
- Media tampering
- Denial of service

- SPAM, SPIT (SPAM over IP telephony), and SPIM (SPAM over Instant Messaging)

In addition to the operational processes, advanced security technologies should be reviewed and considered. Security technologies can be categorized as follows:

- Network security
  - Virtual LANs (VLANs)
  - Access control lists (ACLs)
  - Stateful firewalls with protocol aware inspection
  - Virtual Private Networks (VPNs)
  - QoS
  - Dynamic Address Resolution Protocol (ARP) inspection
  - Dynamic Host Configuration Protocol (DHCP) snooping
  - Port security
  - Network intrusion prevention
- Host security
  - Cisco Security Agent
  - Third-party anti-virus software
  - Host-based firewalls
  - Hardened operating systems
- User authentication, authorization, and accounting security
  - Phone image authentication
  - Multilevel administration privileges
  - Call detail reporting

For more information about Cisco end-to-end security designs, see the SAFE Blueprint. For more details about Cisco integrated network security solutions, see the following resources:

- Security Solutions and Products
- Enhanced Security for Unified Communications
- Networking Professionals Connection

Define Case Studies

System testing uses case studies to define and validate the interoperability and stability of components that comprise a complete and optimized Cisco Unified Communications system. The system test includes installing, configuring, and testing contact center hardware and software that are designed to work together in a predictable, effective, and reliable manner.

See Use Case Studies to Define Your Business Requirements for financial and retail business case studies.

Use Case Studies to Define Your Business Requirements

Cisco Systems has defined real-world business requirements in two case studies that utilize the contact center system. The business requirements for each case study were created in a test environment in order to validate the contact center solution for these business models.

The first case study is a financial firm with distributed call centers. The second case study is a large distribution and retail company. Both case studies define business requirements, agent profiles, and call flows that are typically used by these business models.

Review these case studies to understand how the contact center system meets real-world business needs.

Financial Business Case Study

This case study is a financial firm with distributed call centers, including outsourcer call centers. The case study overview includes:

- Business Requirements
- Sample Call Flows

For additional information on financial markets, see the following URL:

http://www.cisco.com/web/strategy/financial/index.html

Retail Business Case Study

This case study is a large retail and distribution company that supports "business to business" and consumer retail call center operations for its customers. The case study overview includes:

- Business Requirements
- Sample Call Flows

For additional information on retail call center operations, see the following URL:

http://www.cisco.com/web/strategy/retail/index.html

Call Flow Models

The call flows that are deployed by the sample businesses are as follows:

- Test Bed 1—Unified IP IVR (Unified Communications Manager Post-Routed calls) for the financial business model that is representative of the banking industry call center operations.
- Test Bed 2—Parent and Child calls for outsourced call center services.
- Test Bed 3—Unified CVP (CVP Post-Routed calls) for the retail business model that is representative of the retailing industry call center operations.

The case study methodology is continued for each PPDIOO process by using the deployment models and sites that were developed for testing.

- Review Tested Deployment Models is continued on the Design tab.
- Install and Configure System Components is continued on the Implement tab.
- Operating Contact Center Systems continues tested call flows on the Operate tab.
- Testing Failover and Redundancy is continued on the Optimize tab.

Understand Your Call Flows

Call flow analysis is an important part of determining your business requirements. Call flows show you how your calls are handled physically, which drives your equipment requirements. Call flows also help to determine the network routing plan. For sample call flows that are discussed in the context of case studies, see Test Case Studies.

Sample call flows were tested and verified in three separate test setups in the contact center environment: Test Bed 1, Test Bed 2, and Test Bed 3.

Planning Tasks

The following overview shows the high-level tasks of the planning process:

- Determine Your Business Requirements
- Use Planning Tools and Templates
- Understand Your Deployment Options
- Identify System Components
- Review Release Matrix
- Collect and Analyze Data
- Create High-Level Design
- Plan and Prepare for Your System Installation
- Plan and Prepare for Your System Upgrade

Determine Your Business Requirements

Consider the following factors in your call center:

- Collect requirements
  - Assess user requirements
  - Identify functionality requirements
- Call center operations
  - Number of sites
  - Agents and types of services
  - Types of calls, call treatment, and call handling
  - Busy hour calls attempts (BHCA) rate
- Call flows
- Installation and upgrade requirements
  - Installation and configuration information
  - Upgrade and migration information

Collecting Requirements

The following are suggested methods to use in gathering information to plan your network:

- Assess User Requirements—Users want applications to be available on demand in the network. The chief components of application availability are response time, throughput, and reliability. You can assess user requirements as follows:
  - Develop community profiles of what different user groups require. Although many users have roughly the same requirements of an electronic mail system, engineering groups using Windows terminals and Sun workstations in an NFS environment have different needs from PC users sharing print servers in a finance department.
  - Build a baseline for implementing an internetwork by interviewing groups, forming focus groups, or using surveys. Some groups might require access to common servers, while others might want to allow external access to specific internal computing resources. Formal surveys can be used to get a statistically valid reading of user sentiment regarding a particular service level or proposed internetworking architecture.
  - Conduct a test involving representative users in a lab environment. This is most applicable when evaluating response time requirements. As an example, you might set up working systems and have users perform normal remote host activities from the lab network. By evaluating user reactions to variations in host responsiveness, you can create benchmark thresholds for acceptable performance.
- Identify Functionality Requirements—After you understand your internetworking requirements, you can select the specific functionality that fits your environment, such as the level of application availability and the implementation costs for that availability. Fault tolerance and redundancy should be considered also.

Call Center Operations

Review the business case studies in Test Case Studies for information on customer business requirements such as number of sites, agent profiles, types of calls, call handling and call treatment options, and sample call flows.

Call Flows

See the Understand Your Call Flows topic.

Planning a System Installation

See the Plan and Prepare for Your System Installation topic.

For installation and configuration checklists and documents, see the Installation and Configuration Checklists topic on the Implement tab.

For a list of installation and configuration documents for the software and hardware components that are part of the Cisco Unified Communications family of contact center products, see the Component Installation and Configuration Guides topic on the Implement tab.

Planning a System Upgrade

See the Plan and Prepare for Your System Upgrade topic.

Use Planning Tools and Templates

This topic includes planning tools and links to documents that provide guidelines for designing and configuring your contact center system. It also includes information on quoting and ordering Cisco Unified Communications products.

Solution Reference Network Design Documents

Solution Reference Network Design (SRND) documents provide guidelines, recommendations, and best practices for implementing enterprise networking solutions. The following SRNDs are recommended for designing Cisco Unified Communications systems:

- Cisco Unified Communications SRND Based on Cisco Unified Communications Manager 6.x
- Cisco Unified Communications SRND Based on Cisco Unified Communications Manager 5.x
- Cisco Unified Communications SRND Based on Cisco Unified CallManager 4.x
- Cisco Unified Contact Center Enterprise SRND Release 7.x
- Cisco Unified Contact Center Express SRND Release 6.0
- Cisco Unified Customer Voice Portal SRND Release 4.x
- Enterprise QoS Solution Reference Network Design

Note Additional SRND resources are available at http://www.cisco.com/go/srnd.

Solution Expert Tool

Solution Expert is a web-based tool that assists in the design, configuration, quoting, and ordering of Cisco Unified Communications products. Solution Expert is available for Cisco sales and partner systems engineers who have Unified Communications specializations.

With the Solution Expert tool, users can generate a recommended solution based on their requirements. Users can modify the recommended configuration if desired. Solution Expert validates any changes when it presents the new solution. Solution Expert also generates a bill of materials with list pricing, a Visio diagram, and other design documentation.

Ordering Guides

Ordering guides for most Cisco Unified Communications products are available for partners and Cisco employees. For information on ordering guides, go to the following URL:

http://www.cisco.com/web/partners/sell/technology/ipc/announcements/unified_communications_system_6_launch.html

Click the “What is available for Partners” tab to view a list of the ordering guides and other marketing collaterals.

Understand Your Deployment Options

Review the Deployment Models chapter in the Cisco Unified Communications System Description for a guide to site models and see Table 2-1 for a brief overview of each model.

See also the Define Case Studies topic.

Identify System Components

For a brief description of all the components that are available with Cisco Unified Communications, see the Cisco Unified Communications Component Overviews chapter in the Cisco Unified Communications System Description.

The Component Installation and Configuration Guides topic links to information that describes components that are specific to the contact center.

The Release Matrix (which includes the Software Version Matrix and the Firmware Version Matrix) lists all the components and their versions for a particular release. See Review Release Matrix.

Use Bill of Materials (BOM) for hardware and software specifications that are compatible with contact center components:

- Hardware and System Software Specification (Bill of Materials) for Cisco Unified ICM/Unified CC Enterprise & Hosted Editions—Specifies the hardware and system software compatible with and required for Cisco Unified ICM and Cisco Unified Contact Center.
- Hardware and System Software Specification for Cisco Unified Customer Voice Portal—Provides platform hardware specifications and compatible third-party software version requirements across the major components of the Cisco Unified CVP solution.

Review Release Matrix

The Release Matrix (which includes the Software Version Matrix and the Firmware Version Matrix) lists all the components and their versions for a particular release. This is the recommended set of components and specific software versions that have been tested and verified for interoperability within a specific system release.

Collect and Analyze Data

Using available tools, collect data on the network to assess network readiness.

Tasks for data collection and analysis:

- Perform an infrastructure analysis—Obtain floor plans and campus maps, including utilities and conduit systems, to identify deficiencies in infrastructure.
- Perform a software gap analysis—Do a software gap analysis to address network management tools for the IP network.
- Perform an initial traffic analysis—Collect data on all potential converged infrastructure traffic flows. Use station message detail recording (SMDR) and billing records to determine legacy call volumes and use network management tools to collect key statistics on your IP data network.

Create High-Level Design

Once data is collected and analyzed, record the results in the site survey and high-level design documents.

The Understand Your Call Flows topic shows you how to use call flow data for your design.

Plan and Prepare for Your System Installation

This topic provides the system-level information required to install contact center components in Cisco Unified Communications System Release 6.1(1).

- Planning Your System Installation
- Preparing for Your System Installation

Planning Your System Installation

This topic provides an overview of the primary components typically deployed in a contact center environment and the installation processes for contact center components. It also describes the types of installations and various installation strategies.

This topic contains the following sections:

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

When you have reviewed preinstallation planning, installation approach, and dependencies, go to Preparing for Your System Installation.

For information about the installation order and process for contact center components, see Performing Your System Installation.

Preparing for Your System Installation

This topic provides information that you should review before the actual installation process such as the general installation approach, release set software and firmware versions of the contact center components being installed, and dependencies impacting system installation.

This topic contains the following sections:

- Before You Begin
- System Installation Approach
- Release Set Versions
- System Installation Dependencies

When your installation plans are in place and you are ready to install components, go to Performing Your System Installation.

Plan and Prepare for Your System Upgrade

This topic provides the system-level information required to upgrade contact center components from previous Unified Communications releases to Release 6.1(1).

- Planning Your System Upgrade
- Preparing for Your System Upgrade

Planning Your System Upgrade

This topic provides an overview of the upgrade process for contact center components, the software releases that are involved in the upgrade process, and the different upgrade strategies that can be used based on the size of the customer network.

Note There may be more than one upgrade path based on the software deployed in your specific environment. For more information, see System Upgrade Paths.

This topic contains the following sections:

- Cisco Unified Communications System Overview
- Release Sets
- Upgrade Roadmap
- Upgrade Overview
- System Upgrade Paths
- System Upgrade Strategies

To ensure that you have completed upgrade prerequisites for additional approach and dependencies, see Preparing for Your System Upgrade.

For information about the upgrade order and process for contact center components, go to Performing Your System Upgrade.

Preparing for Your System Upgrade

This topic discusses information to be aware of before the actual upgrade process such as the general upgrade approach for the different contact center components, upgrade release versions of components involved in the upgrade, and release version compatibility.

This topic contains the following sections:

- System Upgrade Approach
- System Upgrade Dependencies
- Upgrade Release Versions

When your upgrade plan is in place and you are ready to upgrade, go to Performing Your System Upgrade on the Optimize tab.

Additional Sites and Services

Steps to Success is a Cisco methodology that outlines the tasks required to complete a successful customer engagement. Registered users can visit the Steps to Success resource site for Cisco Unified Communications process flows.

Cisco Unified Communications Services is a Cisco service offering that provides engineering expertise and best practices.

- Registered users can visit the Cisco Unified Communications Services partner site.
- Nonregistered users can visit the Cisco Unified Communications Services site.

Cisco Unified Communications System Demo

The capabilities of a Cisco Unified Communications solution can be demonstrated using the Demo Remote [**Internal**] tool. Demo Remote is a mobile, web-based demonstration platform that allows sales personnel to demonstrate a wide variety of Cisco solutions in Cisco offices or at customer sites using the Cisco VPN Client or a small mobile endpoint kit. Demonstrations are scripted, easy to use, and allow full administrative access during the demonstration session.

The Cisco Unified Communications Demonstration highlights key components and features of the Cisco Unified Communications solution. The demo offers a full set of business telephony features and a complete IP-based applications portfolio including voice, unified communications, mobility, presence, conferencing services and video. The demo is intended for medium to large customers with a need for integrated voice, video, and unified communications.