



# Design

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## Introduction to Design

Using the project plan that was developed in the Plan phase, develop a detailed design for each site and the entire network. At a minimum, the network design contains:

- Routing and switching component connectivity
- WAN connectivity intra- and intersites
- Software applications and configurations for routers and switches
- Power and environment
- Security
- Redundancy and failover
- Disaster recovery

Also, for each site, include phone circuitry, equipment racks with cabinet locations, and layouts. Encompasses your network call processing, conferencing, and messaging requirements in each site. Make the design scalable for future growth.

### Before You Begin

Review information about the [Cisco Validated Design and Preferred Architecture](#). Cisco Validated Designs consist of systems and solutions that are designed, tested, and documented to facilitate and improve customer deployments.

Review Solution Reference Network Design (SRND) documents and design tools. Gather requirements and data, which can include:

- Business and system requirements
- Service-level agreements (SLAs)
- Capacity (bandwidth) requirements
- Site survey and proposal from the project plan

### When You Are Done

The main deliverable of the Design phase is the detailed design, including:

- Deployment models that you can use at your site: see [Review Tested Deployment Models](#), on page 5)
- Network diagrams: see [Network Topology Diagrams](#) in the Resource Library for editable Microsoft Visio network drawings
- Routing strategy
- Redundancy
- Call flows
- Traffic flows
- Equipment flows
- Bill of materials

### Major Concepts and Tasks in This Process

- [Design Concepts](#), on page 2
- [Design Tasks](#), on page 4

## Design Concepts

Read the following conceptual, overview topics for the background knowledge to build an intelligent design.

- [Using SRND Documents](#), on page 2
- [Using Design Tools and Templates](#), on page 3

## Using SRND 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 Collaboration systems:

- [Cisco Collaboration Communications System SRND Based on Cisco Unified Communications Manager 10.x](#)
- [Cisco Unified Communications SRND Based on Cisco Unified Communications Manager 9.x](#)
- [Cisco Unified Communications SRND Based on Cisco Unified Communications Manager 8.x](#)

- [Cisco Unified Communications SRND Based on Cisco Unified Communications Manager 7.x](#)
- [Cisco Unified Contact Center Enterprise SRND Release 9.x](#)
- [Cisco Unified Contact Center Enterprise SRND Release 8.x](#)
- [Cisco Unified Contact Center Enterprise SRND Release 7.x](#)
- [Cisco Unified Contact Center Express SRND Release 9.0](#)
- [Cisco Unified Contact Center Express SRND Release 8.5\(1\)](#)
- [Cisco Unified Contact Center Express SRND Release 7.0](#)
- [Cisco Unified Customer Voice Portal \(CVP\) 9.x SRND](#)
- [Cisco Unified Customer Voice Portal \(CVP\) 8.5\(x\) SRND](#)
- [Cisco Unified Customer Voice Portal \(CVP\) 8.x SRND](#)
- [Solution Reference Network Design for Cisco MediaSense Release 8.5\(4\)](#)
- [Cisco Unified Intelligence Center Solution Reference Network Design \(SRND\)](#)
- [Enterprise QoS System Reference Network Design](#)

**Note**

Additional SRND resources are available at [http://www.cisco.com/c/en/us/solutions/enterprise/design-zone-medianet/landing\\_vid\\_medianet.html](http://www.cisco.com/c/en/us/solutions/enterprise/design-zone-medianet/landing_vid_medianet.html).

## Using Design Tools and Templates

Use these design tools to assist you in sizing your network.

- Tools such as the IPC Resource Calculators, are intended to simplify and automate the process of sizing contact center resources that are required for specific contact center business operations. The tools are also useful for verifying and troubleshooting existing installations. The output from these tools can also be used as input to the [Cisco Unified Contact Center Express Configuration and Ordering Tool](#).

- [Cisco Collaboration Sizing Tool](#)

A web-based tool that assists users with hardware sizing of large or complex Cisco Collaboration Systems solutions by calculating the call processing requirements for products that have a major impact on performance and scalability. With the Cisco Collaboration Sizing Tool, system engineers with Cisco Collaboration Systems solution experience or individuals with equivalent abilities can design and model solutions for existing and prospective customers. The tool requires various types of information to calculate the minimum size and type of devices required for a solution, such as the type and quantity of IP phones, gateways, and media resources. For most device types, the tool also requires the average number of call attempts per hour per device during the busy hour (known as busy hour call average or BHCA) and the average utilization time. The resulting calculations produced by the tool can be saved, copied, and sent to other users.

The output from the Cisco Collaboration Sizing Tool includes the count and size mix of Virtual Machines, which can be used with the Cisco Collaboration Virtual Machine Placement Tool.

- [Cisco Collaboration Virtual Machine Placement Tool](#)

A web-based tool that assists users to determine the placement of virtual machines and the hardware design for virtualized Collaboration solutions.

The tool requires the user to have sized the applications and know which and how many Virtual Machines to use. So use the Cisco Collaboration Sizing Tool before you use the Cisco Collaboration Virtual Machine Placement Tool.

For additional information on design tools such as the Cisco Collaboration Sizing Tool, and other system design topics, see the documentation wiki (DocWiki) at: [http://docwiki.cisco.com/wiki/Unified\\_Communications\\_System\\_Design](http://docwiki.cisco.com/wiki/Unified_Communications_System_Design)

## Design Tasks

The following list is an overview of the design process and is not meant to represent an ordered sequence of tasks:

- [Identify System Components](#)
- [Review Tested Deployment Models](#), on page 5
- [Review System Caveats](#), on page 5
- [Develop Traffic Engineering Specifications](#), on page 5
- [Define Security Policies](#), on page 6
- [Additional Sites and Services](#)

## Identify System Components

For links to product documentation of the contact center products tested as part of the Cisco Collaboration Systems Release 11.0(1), see the [Product Documentation](#) topic in the System Release Notes for Contact Center.

The [Compatibility Matrix](#) lists all the components and their versions for a particular release. It is the recommended set of components and specific software versions that have been tested and verified for interoperability within a specific system release. For compatibility information prior to Collaboration Systems Release 10.5(1), refer to the [Compatibility Tool](#).

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.
- [Hardware and System Software Specification \(Bill of Materials\) for Cisco Unified Intelligence Center](#)—Specifies the hardware and software that have been qualified by Cisco Quality Assurance for use with Cisco Unified Intelligence Center (Unified IC).

## Ordering Tools

- [Ordering guides](#) for most Cisco Collaboration Systems products for Cisco partners, Cisco sales staff, and service providers
- [Cisco Unified Contact Center Express Ordering tool](#)

## Review Tested Deployment Models

The tested deployment models reflect the business requirements that were introduced on the Prepare and Plan tabs that require a contact center system.

Each deployment model was installed, configured, and tested with hardware and software designed to work together seamlessly and to provide a complete and optimized contact center solution. The tested deployment models provide you with guidance for your design and implementation. Compare your design to these models to see if they have similar characteristics. Where your requirements are different, do a risk analysis. See [Design Documents](#) to help you with your design decisions.

Topic	Description
<a href="#">Unified CCE Test Bed Description</a> <a href="#">Unified CCX Test Bed Description</a>	Provides components, topologies, and site definitions for the Unified CCE and Unified CCX deployments that were tested.

## Review System Caveats

System caveats describe unexpected behavior, defects, and product limitations discovered during system-level testing of Cisco Collaboration Systems components. Check the [Limitations and Restrictions](#) section in the latest release notes to make sure that your design has taken all system caveats into consideration.

## Develop Traffic Engineering Specifications

- [Traffic Analysis for Voice over IP](#)—Provides background information on various traffic analysis concepts and features that are applicable to Voice over IP (VoIP). This document presents fundamental traffic theory, several statistical traffic models, application of traffic analysis to VoIP networks, and an end-to-end traffic analysis example.
- Bandwidth Calculators —The following tools are available to calculate bandwidth for contact center systems.
  - [Cisco Agent Desktop \(CAD\)](#)
  - [Cisco Unified Intelligence Suite and Intelligence Center Bandwidth Calculator](#)
  - [HDS WebView](#)

The output from these tools can also be used as input to the [Cisco Unified Contact Center Express Configuration and Ordering Tool](#).

- [Cisco Unified Contact Center Enterprise Sizing Tool](#)—This tool is available to Cisco partners and employees only, with proper sign in authentication. This tool helps size the Unified CCE resources required to meet the needs of a specific contact center. It also provides data that can be used as input for other capacity planning and sizing tools, such as the Cisco Unified Communications Manager Capacity Tool, and the Unified CVP and Cisco IP IVR sizing tools.

In addition, these third-party traffic engineering tools are provided for your reference:

- [VoIP Bandwidth Calculator](#)
- [Online Erlang traffic calculators](#)

The [Cisco Collaboration System 11.x Solution Reference Network Designs \(SRND\)](#) also includes information on sizing your contact center components.

## Define Security Policies

Refer to security policies in these guides:

- [Cisco Unified Communications Manager Security Guide](#)
- Specific component documentation is available in the [Component Resources Documentation for Contact Center](#) topic in the Resource Library.

More security information is included here for your reference:

- [Cisco Self-Defending Network](#)
- [Design Zone for Security](#)
- [Cisco Security Intelligence Operations](#)