



## CHAPTER 4

# Design

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## Introduction to Design

Using the project plan that was developed in the Plan phase, your team should have enough information to develop a detailed design for each site and the entire network. The network design should contain, at a minimum:

- Routing and switching component connectivity
- Software applications and configurations for routers and switches
- Power and environment

For each site, in addition to the above, your design should include telephone circuitry, equipment racks with cabinet locations, and layouts. Each site should have a design that encompasses your network call processing, conferencing, and messaging requirements. The design should be scalable for future growth.

For specific deployment steps, see [Deployment Methodology](#) in the Cisco Unified Communications System Description for small and medium business.



**Tip**

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You can navigate to any topic on this tab by using the tab navigation pane at the left of the content pane. This navigation pane contains the table of contents (TOC) for the active tab.

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## Before You Begin

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

- Business and system requirements
- Service-level agreements
- 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:

- Network diagrams (see [Network Topology Resource](#) for editable Microsoft Visio network drawings)
- Routing strategy

- Redundancy
- Call flows
- Traffic flows
- Equipment list
- Bill of materials

## Major Concepts and Tasks in This Process

Go directly to the main design concepts and tasks:

- [Design Concepts](#)
- [Design Tasks for Small Business Systems](#)
- [Design Tasks for Medium Business Systems](#)
- [Network Topology Resource](#)

## Design Concepts

Read these conceptual, overview topics for the background knowledge you need to build an intelligent design.

- [Using SRND Documents](#)
- [Using Design Tools and Templates](#)

## 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 Unified Communications Systems for small and medium businesses:

- [Smart Business Communications System Design Guide](#) 
- [Smart Design: Unified Communications 2.0](#) 
- [Cisco Unified Communications Manager Express Solution Reference Network Design](#)
- [Cisco Unified Contact Center Express SRND Release 7.0](#)
- [Cisco Unity Express Solution Design](#)

**Note**

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Additional SRND resources are available at

[http://www.cisco.com/en/US/netsol/ns742/networking\\_solutions\\_program\\_category\\_home.html](http://www.cisco.com/en/US/netsol/ns742/networking_solutions_program_category_home.html).

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## Using Design Tools and Templates

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

- IPC Tools

<http://tools.cisco.com/partner/ipccal/index.htm>

The IPC Tools, such as the IPC Resource Calculators, are intended to simplify and automate the process of sizing IP resources that are required for specific business operations. They are also useful for verifying and troubleshooting existing installations.

- Solution Expert Tool

<http://apps.cisco.com/sx>

Solution Expert is a web-based tool that assists in the design, configuration, quoting, and ordering of 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. For an overview of how to use the tool, see the introductory PDF on the home page.

- SBCS Quick Pricing Tool

[http://www.cisco.com/web/partners/downloads/partner/sell/technology/ip/sbcs\\_quick\\_pricing\\_tool.xls](http://www.cisco.com/web/partners/downloads/partner/sell/technology/ip/sbcs_quick_pricing_tool.xls) 

This is SBCS partner offline pricing tool that provides quick price estimates. The price estimates includes key components of SBCS solution such as UC500, wireless, switching, etc. You can also enter the discount for partner and channel programs to arrive at the price estimates.

- Quote Builder Tool

<http://www.cisco.com/web/partners/quotebuilder/index.html> 

The Quote Builder tool is a complete commercial solutions quoting application that enables specialized partners and Cisco employees to build a system quote for Security, Wireless and Unified Communications.

With Quote Builder, users can build a system quote with design documents to aid in the implementation of the solution. Quote Builder also validates designs for common deployments. Quote Builder generates a bill of materials, a network diagram, and design guides for deployment.

- Cisco Unified Communications Sizing Tool 

The Cisco Unified Communications Sizing Tool is a web-based tool that assists users with hardware sizing of large or complex Cisco Unified Communications solutions by calculating the call processing requirements for products that have a major impact on performance and scalability.

With the Cisco Unified Communications Sizing Tool, system engineers with Cisco Unified Communications 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.

For additional information on design tools such as the Cisco Unified Communications Sizing Tool, as well as 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 for Small Business Systems

The following list is an overview of tasks for small business systems and is not meant to represent an ordered sequence of tasks.

- [Identify the Components That You Need](#)
- [Review Tested Site Models](#)
- [Review System Caveats](#)
- [Review System Test Results](#)

## Identify the Components That You Need

This topic provides links to descriptions of components, component documentation, and matrixes.

- [Small Business: Unified Communications 500 Series](#)—Describes the primary Cisco components in Unified Communications 500 system.
- [Review Release Matrix](#)—Identifies the components and their software versions that you need.
- [Cisco Unified Communications 500 Series Compatibility Information](#)—Provides compatibility information of software release versions for each product in the solution.
- [Cisco Interoperability Portal](#)—Provides information about configuring Cisco technologies with third-party products and lists features that interoperate between Cisco solutions and other vendors.

For an additional overview of primary components that can be installed and configured in the IPT environment, see [Small Business: Install and Configure System Components](#) and [Sample Configuration Information](#) in the Implement tab.

## Ordering Tools

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

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

- The Quote Builder tool is a solutions quoting application for Cisco Unified Communications products. Quote Builder is available to specialized partners and Cisco employees. With Quote Builder, users can build a system quote with design documents to aid in the implementation of the solution. Quote Builder also validates designs for common deployments. Quote Builder generates a bill of materials, a network diagram, and design guides for deployment. To access the Quote Builder tool, go to the following URL:

<http://www.cisco.com/web/partners/quotebuilder/index.html> 

## Review Tested Site Models

For this release, Cisco developed a variety of site models as standard architectures. These models were tested and optimized for maximum efficiency and performance. You can derive your network design by choosing the deployment model that most closely matches your business and then adding the specific features and applications that meet your business needs. Review the following information:

- [Small and Medium Business Tested Deployments and Site Models](#)
- [Purpose of Solution Tests](#)

## Review System Caveats

System caveats are system limitations and restrictions. Check the latest release notes to make sure that your design has taken all system caveats into consideration. System caveats are listed under the [Limitations and Restrictions](#) section of the release notes.

## Review System Test Results

System test results show the scope and extent of the testing conducted for Cisco Unified Communications Systems in a test environment that is modeled on real-world deployments.

Depending on the network you are designing and your specific environment, use the system test results as a guide and supplement for your own site test and turn-up plan.

For the results of testing for Cisco Unified Communications Release 7.0(1), see [System Test Results](#).

# Design Tasks for Medium Business Systems

The following list is an overview of tasks for medium business systems and is not meant to represent an ordered sequence of tasks.

- [Identify the Components That You Need](#)
- [Review Tested Site Models](#)
- [Review System Caveats](#)
- [Review System Test Results](#)

## Identify the Components That You Need

This topic provides links to descriptions of components, component documentation, and matrixes.

- [Unified Communications Manager Express Solution Overview](#)—Describes the primary Cisco components in Unified Communications Manager Express Solution.
- [Review Release Matrix](#)—Identifies the components and their software versions that you need.
- [Cisco Unified Communications Manager Express and Cisco IOS Software Version Compatibility Matrix](#)—Provides compatibility information of Cisco Unified Communications Manager Express and Cisco IOS Software.
- [Cisco Unified Communications Manager Express Compatibility Information](#)—Provides information about Cisco Unified Communications Manager Express supported firmware, platforms, memory, and voice products
- [Cisco Interoperability Portal](#)—Provides information about configuring Cisco technologies with third-party products and lists features that interoperate between Cisco solutions and other vendors.

For an additional overview of primary components that can be installed and configured in the IP telephony environment, see [Medium Business: Install and Configure System Components](#) and [Sample Configuration Information](#) in the Implement tab.

## Ordering Tools

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

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

- The Quote Builder tool is a solutions quoting application for Cisco Unified Communications products. Quote Builder is available to specialized partners and Cisco employees. With Quote Builder, users can build a system quote with design documents to aid in the implementation of the solution. Quote Builder also validates designs for common deployments. Quote Builder generates a bill of materials, a network diagram, and design guides for deployment. To access the Quote Builder tool, go to the following URL:

<http://www.cisco.com/web/partners/quotebuilder/index.html> 

## Review Tested Site Models

For this release, Cisco developed a variety of site models as standard architectures. These models were tested and optimized for maximum efficiency and performance. You can derive your network design by choosing the deployment model that most closely matches your business and then adding the specific features and applications that meet your business needs. Review the following information:

- [Small and Medium Business Tested Deployments and Site Models](#)
- [Purpose of Solution Tests](#)
- [Multisite Distributed Deployment Options](#)

## Review System Caveats

System caveats are system limitations and restrictions. Check the latest release notes to make sure that your design has taken all system caveats into consideration. System caveats are listed under the [Limitations and Restrictions](#) section of the release notes.

## Review System Test Results

System test results show the scope and extent of the testing conducted for Cisco Unified Communications Systems in a test environment that is modeled on real-world deployments.

Depending on the network you are designing and your specific environment, use the system test results as a guide and supplement for your own site test and turn-up plan.

For the results of testing for Cisco Unified Communications Release 7.0(1), see [System Test Results](#).

# Network Topology Resource

You can download zip files containing Visio drawings of the logical and physical topologies for IP telephony. Table 1 identifies the Visio drawings in each zip file.


**Note**

You need Microsoft Visio 2003 to open the files.

If you need to create new Visio drawings, you can use the Cisco Visio stencils located at the [Visio Stencils resource page](#).

**Table 4-1** *Microsoft Visio Topology Diagrams*

Description	Filename
Zip file includes the site model topology drawings listed below.	<a href="#">IPTSMB_UC701_SiteModels.zip</a> (right-click to download zip) <b>Note</b> If you click the link rather than right-click, the zip file may open in the secondary window but also replace the contents of this window. Use your Back button to return to this window.
Cisco Smart Business Communications System Single Site Model	single-site-UC500.vsd
Cisco Unified Communications 500 Series configured for T.37 Fax	UC500-fax.vsd
Inter-Cluster Calls Between Two Cisco Unified Communications 500 Series Systems Through IP-to-IP Gateway (Convington-Freddo and Robins-Freddo)	UC500-scenario.vsd
Cisco Unified Communications Manager Express Single Site Model	single-site-CMECUE.vsd
Cisco Unified Communications Manager Express Multisite Distributed Call Processing Model	multisite-CMECUE.vsd
IP-to-IP Gateway Deployment and Cisco Unified Communications Manager Express Sites	IPIPGW-deploy.vsd

