Introduction

Revised: March 1, 2018

Collaboration means working together to achieve a common goal. Not very long ago, the best way for people to collaborate was for them to be in the same location at the same time so that they were in direct contact with each other. In today's globalized economy with decentralized business resources, outsourced services, and increasing costs for office facilities and travel, bringing people together in the same physical location is not the most efficient or effective way to collaborate. But with Cisco Collaboration Solutions, workers can now collaborate with each other anytime, anywhere, with substantial savings in time and expenses.
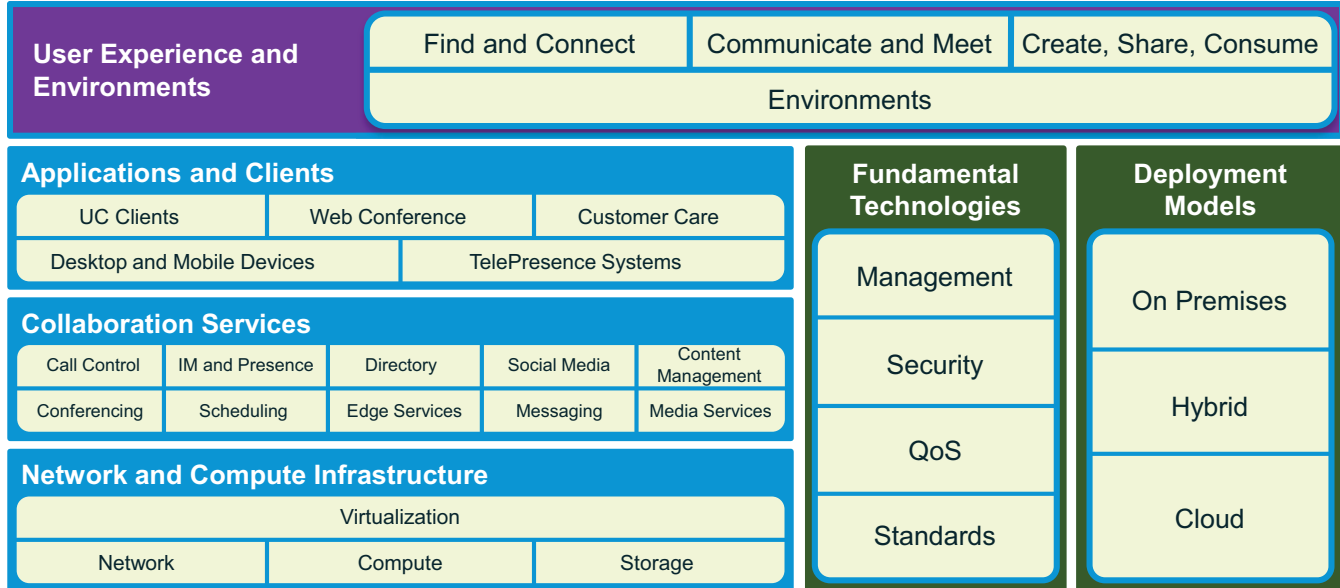
Cisco Collaboration Solutions support the full range of voice, video, and data communications, including the latest advances in mobile communications and social media. Cisco Collaboration Solutions also provide an extensive set of applications and services that can be deployed either on premises or in the cloud.

Cisco End-to-End Collaboration Solutions

Cisco Collaboration Technology comprises an array of products to build complete end-to-end collaboration solutions for virtually any size or type of enterprise. Cisco Collaboration Solutions consist of the following main elements, illustrated in conceptual form in Figure 1-1:

- Collaboration Infrastructure, page 1-2
- Collaboration Applications and Services, page 1-3
- The Collaboration User Experience, page 1-4

Figure 1-1   **Cisco Collaboration Architecture (Conceptual View)**

User Experience and Environments	Find and Connect	Communicate and Meet	Create, Share, Consume
	Environments		

Applications and Clients

UC Clients	Web Conference	Customer Care
Desktop and Mobile Devices		TelePresence Systems

Collaboration Services

Call Control	IM and Presence	Directory	Social Media	Content Management
Conferencing	Scheduling	Edge Services	Messaging	Media Services

Network and Compute Infrastructure

Virtualization		
Network	Compute	Storage

Fundamental Technologies

- Management
- Security
- QoS
- Standards

Deployment Models

- On Premises
- Hybrid
- Cloud

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Collaboration Infrastructure

Cisco has long been recognized as the world leader in routing and switching technology. This technology forms the core of the network infrastructure for Cisco Collaboration Solutions. The Quality of Service (QoS) mechanisms available on Cisco switches and routers ensure that the voice, video, and data communications will be of the highest quality throughout the network. In addition, Cisco gateways provide a number of methods for connecting your enterprise's internal network to an external wide area network (WAN) as well as to the public switched telephone network (PSTN) and to legacy systems such as a PBX. And Cisco Hosted Collaboration Solution (HCS) enables Cisco partners to offer customers cloud-based, hosted collaboration services that are secure, flexible, low-cost, scalable, and always current with the latest technology.

Cisco Collaboration Systems Release 12.*x* is deployed using virtualization with the VMware vSphere ESXi Hypervisor. The Cisco Collaboration application nodes are deployed as virtual machines that can run as single or multiple application nodes on a server. These virtualized applications can provide collaboration services for small and medium businesses, and they can scale up to handle large global enterprises such as Cisco.

In most cases you will want your collaboration sessions to be secure. That is why Cisco has developed a number of security mechanism to protect each level of the collaboration path, from the network core to the end-user devices.

Once your collaboration solution is implemented, you will want to monitor and manage it. Cisco has developed a wide variety of tools, applications, and products to assist system administrators in provisioning, operating, monitoring and maintaining their collaboration solutions. With these tools the system administrator can monitor the operational status of network components, gather and analyze statistics about the system, and generate custom reports.

Collaboration Applications and Services

Cisco Collaboration Solutions incorporate a number of advanced applications and services, including:

- **Instant messaging (IM) and presence** — The Cisco IM and Presence Service enables Cisco Jabber, Cisco Unified Communications Manager applications, and third-party applications to increase user productivity by determining the most effective form of communication to help connect collaborating partners more efficiently.

- **Collaborative rich media conferencing** — Cisco WebEx incorporates audio, high-definition (HD) video, and real-time content sharing in a platform that provides easy setup and administration of meetings, interactive participation in meetings, and the ability to join meetings from any type of device such as an IP phone, a tablet device, or a desktop computer. For on-premises conferencing, Cisco TelePresence Server in combination with Cisco TelePresence Conductor enables ad hoc, scheduled, and permanent audio and video conferencing along with content sharing for TelePresence video endpoints, video-enabled desk phones, and software-based mobile and desktop clients.

- **Cisco Spark** — Cisco Spark desktop and mobile clients enable persistent cloud-based virtual team rooms that facilitate 1-to-1 and team collaboration. The Cisco Spark desktop client runs on Windows and Mac computers. The Cisco Spark mobile client runs on Android and Apple iOS devices. Cisco Spark allows users to access collaboration services from the Cisco Collaboration Cloud, including secure and encrypted persistent messaging, voice and video calls over IP, and file sharing, all within virtual one-on-one or group collaboration rooms.

- **Telepresence** — Cisco TelePresence technology brings people together in real-time without the expense and delay of travel. The Cisco TelePresence portfolio of products includes an array of high-definition (HD) video endpoints ranging from individual desktop units to large multi-screen immersive video systems for conference rooms. And Cisco TelePresence products are designed to interoperate with other Cisco collaboration products such as Cisco WebEx and Cisco IP Phones with video capability.

- **Voice messaging** — Cisco products provide several voice messaging options for large and small collaboration systems, as well as the ability to integrate with third-party voicemail systems using standard protocols.

- **Customer contact** — Cisco Unified Contact Center products provide intelligent contact routing, call treatment, and multichannel contact management for customer contact centers. Cisco Unified Customer Voice Portal can be installed as a standalone interactive voice recognition (IVR) system, or it can integrate with the contact center to deliver personalized self-service for customers. In addition, Cisco SocialMiner is a powerful tool for engaging with customers through social media.

- **Call recording and monitoring** — Cisco Collaboration Solutions can employ a variety of technologies to record and monitor audio and/or video conferences as well as customer conversations with contact center personnel. The call recording and monitoring technologies include solutions based on Cisco Unified Communications Manager, Cisco Agent Desktop, Cisco TelePresence Content Server, and Switched Port Analyzer (SPAN) technology.

The Collaboration User Experience

Collaboration is all about the user experience. When users have a good experience with collaboration technology, they will use that technology more often and will achieve better results with it. That translates into a bigger return on investment (ROI) for the enterprise that has adopted the collaboration technology. And that is why Cisco has focused on making its collaboration technology easy, convenient, and beneficial to use, with particular emphasis on the following enhancements to the user experience:

- **Wide variety of collaboration endpoints** — Cisco produces a compete line of endpoint devices ranging from basic voice-only phones, to phones with video and Internet capability, and to high-resolution telepresence and immersive video devices. Cisco Collaboration Technology also provides the ability to integrated third-party endpoint devices into the collaboration solution.

- **Cisco BYOD Smart Solution** — With the Cisco Bring Your Own Device (BYOD) Smart Solution, users can work from their favorite personal device, be it a smartphone, tablet, or PC. In addition to enhancing the work experience, the Cisco BYOD Smart Solution ensures greater network security and simplifies network management by providing a single policy for wired and Wi-Fi access across your organization.

- **Mobile collaboration** — Cisco mobile collaboration solutions provide mobile workers with persistent reachability and improved productivity as they move between, and work at, a variety of locations. Cisco mobility solutions include features and capabilities such as: Extension Mobility to enable users to log onto any phone in the system and have that phone assume the user's default phone settings; Cisco Jabber and Cisco Spark to provide core collaboration capabilities for voice, video, and instant messaging to users of third-party mobile devices such as smartphones and tablets; and Single Number Reach to provide a single enterprise phone number that rings simultaneously on an individual user's desk phone and mobile phone.

- **Applications and services** — As mentioned previously, Cisco has developed many advanced applications and services to enrich the collaboration experience for end users (see Collaboration Applications and Services, page 1-3). Whenever possible, Cisco strives to adhere to widely accepted industry standards in developing its collaboration technology so that you can easily integrate third-party applications and services into your collaboration solutions. In addition, the application programming interfaces available with many Cisco collaboration products enable you to develop your own custom applications.

About this Document

This document is a Solution Reference Network Design (SRND) guide for Cisco Collaboration Solutions. It presents system-level requirements, recommendations, guidelines, and best practices for designing a collaboration solution to fit your business needs.

This document has evolved from a long line of SRNDs produced by Cisco over more than a decade. As Cisco's voice, video, and data communications technologies have developed and grown over time, the SRND has been revised and updated to document those technology advancements. Early versions of the SRND focused exclusively on Cisco's Voice over IP (VoIP) technology. Subsequent versions documented Cisco Unified Communications and added information on new technologies for mobile voice communications, conferencing, instant messaging (IM), presence, and video telephony. This latest version of the SRND now includes Cisco's full spectrum of collaboration technologies such as Cisco Spark, TelePresence, and support for all types of end-user devices (Bring Your Own Device, or BYOD). As Cisco continues to develop and enhance collaboration technologies, this SRND will continue to evolve and be updated to provide the latest guidelines, recommendations, and best practices for designing collaboration solutions.

How this Document is Organized

This document is organized into four main parts:

- **Collaboration System Components and Architecture**

  The chapters in this part of the document describe the main components of Cisco Collaboration Technology and explain how those components work together to form a complete end-to-end collaboration solution. The main components include the network infrastructure, security, gateways, trunks, media resources, endpoints, call processing agents, deployment models, and rich media conferencing. For more information, see the Overview of Cisco Collaboration System Components and Architecture, page 2-1.

- **Call Control and Routing**

  The chapters in this part of the document explain how voice and video calls are established, routed, and managed in the collaboration system. The topics covered in this part include bandwidth management, dial plan, emergency services, and directory integration and identity management. For more information, see the Overview of Call Control and Routing, page 12-1.

- **Collaboration Applications and Services**

  The chapters in this part of the document describe the collaboration clients, applications, and services that can be incorporated into your collaboration solution. The topics covered in this part include Cisco Unified Communications Manager embedded applications, voice messaging, IM and presence, mobile collaboration, contact centers, and call recording. For more information, see the Overview of Collaboration Applications and Services, page 17-1.

- **Collaboration System Provisioning and Management**

  The chapters in this part of the document explain how to size the components of your collaboration solution, how to migrate to that solution, and how to manage it. The topics covered in this part include sizing considerations, migration options, and network management. For more information, see the Overview of Collaboration System Provisioning and Management, page 24-1.

Where to Find Additional Information

Because this document covers a wide spectrum of Cisco Collaboration products and possible solution designs, it cannot provide all the details of individual products, features, or configurations. For that type of detailed information, refer to the specific product documentation available at

https://www.cisco.com

This document provides general guidance on how to design your own collaboration solutions using Cisco Collaboration technology. Cisco has also developed, tested, and documented specific Preferred Architectures for collaboration, voice, and video deployments. The Preferred Architectures (PAs) provide prescriptive solution designs that are based on engineering best practices, and they are documented at

https://www.cisco.com/go/pa

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Cisco Collaboration System 12.x SRND

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