



Introduction

This document provides an overview of the Cisco Unified Communication System. It describes the Cisco Unified Communications system-level approach, lists main features of the Cisco Unified Communications components, and illustrates the various Cisco Unified Communications deployment models.

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Overview

The Cisco Unified Communication 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.

The Cisco Unified Communications System provides support for the transmission of voice, video, and data over a single, IP-based network, which enables companies to consolidate and streamline communications. The Cisco Unified Communications System is a key part of the Cisco Unified Communications Solution, which also includes network infrastructure, security, and network management products, wireless connectivity, third-party communications applications, and a lifecycle services approach for preparing, planning, designing, implementing, operating and optimizing (PPDIOO) the system.

The Cisco Unified Communications System leverages an existing IP infrastructure (built on the Open System Interconnection [OSI] reference model) and adds support for voice and video-related devices, features, and applications. Support for major signaling protocols, such as the Session Initiation Protocol (SIP), the Media Gateway Control Protocol (MGCP), and H.323 is provided, as is the ability to integrate with legacy voice and video networks.

The following table shows the relationship between the OSI reference model and the voice and video protocols and functions of the Cisco Unified Communications System.

Table 1: Voice and Video Over IP in the OSI Reference Model

OSI Layer Number	OSI Layer Name	Voice	Video
7	Application	Unified IP Phone, Unified Personal Communicator, etc.	Video endpoint, Unified Video Advantage, etc.
6	Presentation	G.711, G.722, G.723, G.729	H.261, H.263, H.264
5	Session	H.323/MGCP/SIP/SCCP	H.323/SIP/SCCP
4	Transport	RTP/UDP, TCP	
3	Network	IP	
2	Data Link	Frame Relay, ATM, Ethernet, PPP, MLP, and more	

Following this model:

- **Layer 6**—Digital signal processors (DSPs) compress/encode (decompress/decode) the voice or video signal using the chosen codec. The DSP then segments the compressed/encoded signal into frames and stores them into packets.
- **Layer 5**—The packets are transported in compliance with a signaling protocol, such as Skinny Client Control Protocol (SCCP), H.323, MGCP, or SIP.
- **Layer 4**—Signaling traffic (call setup and teardown) uses TCP as its transport medium. Media streams use Real-time Transport Protocol (RTP) over UDP for the transport protocol. RTP is used because it inserts timestamps and sequence numbers in each packet to enable synchronization at the receiving end. UDP is used because TCP would introduce delays (due to acknowledgments) that are not easily tolerated by real-time traffic.
- **Layer 3**—The IP layer provides routing and network-level addressing.
- **Layer 2**—The data-link layer protocols control and direct the transmission of the information over the physical medium.

**Note**

Cisco Hosted Collaboration Solution (Cisco HCS) is a hosted solution that includes various Cisco Collaboration Systems release components. For more information about Cisco HCS see: [Cisco Hosted Collaboration Solution](#) and [Cisco HCS Product Support](#).
