Data Sheet

Cisco Unified Videoconferencing 3545 System

A flexible, high performance, modular system for connecting multiple video endpoints so that users can participate in IP-based videoconferences

Cisco® Unified Communications—a comprehensive system of powerful, enterprise-class solutions including IP telephony; video, audio, and Web conferencing, and customer contact solutions—helps organizations achieve business success by improving operation efficiency, increasing organizational productivity, and enhancing customer satisfaction. The Cisco Unified Videoconferencing 3545 System—an integral component of the Cisco Unified Communications system—facilitates face-to-face discussions among videoconference participants in different locations using a wide variety of video-enabled devices.

The Cisco Unified Videoconferencing 3545 System connects three or more H.323, Session Initiation Protocol (SIP), or Skinny Client Control Protocol (SCCP) videoconference endpoints in a single, multiparticipant meeting. When used with a Cisco Unified Videoconferencing Gateway product, older ISDN H.320 endpoints can also participate in the conference, providing investment protection for existing videoconferencing deployments.

HIGH-PERFORMANCE VIDEOCONFERENCING SOLUTION

The Cisco Unified Videoconferencing 3545 System represents a flexible solution for medium and large-sized organizations that want to deploy high-performance, feature-rich videoconferencing. Each system consists of a modular chassis that supports multipoint control unit (MCU), enhanced media processor (EMP), and ISDN gateway modules in any combination for a wide variety of videoconferencing features and capacities. These systems also work with the Cisco Unified Videoconferencing 3515 MCU, and the Cisco Unified Videoconferencing 3522 and 3527 Gateway appliances, which can be readily deployed at remote network sites to provide a distributed video environment, optimizing WAN bandwidth use for geographically dispersed organizations.

In a multipoint conference, the Cisco Unified Videoconferencing 3545 MCU modules mix the audio and the EMP modules mix the video, and the result is then distributed to the rest of the conference participants. The Cisco Unified Videoconferencing 3545 System offers two modes of video display: voice-activated video selection and continuous presence. In a voice-activated conference, participants see a full screen of the person who is actively speaking. As the speaker changes from one location to the next, the video follows to show the new speaker. In a continuous-presence conference, the display shows the video of 2 to 16 participants simultaneously, depending on the preferences of the conference moderator. When more participants are involved, one of the screen positions becomes voice-activated. This position will then switch among speakers as members from off-screen locations speak. In either mode, a conference moderator can manually control the display through an easy-to-use Web-based interface.

The Cisco Unified Videoconferencing 3545 System requires the presence of an H.323 gatekeeper in the video network to provide functions such as telephone-number-to-IP address resolution and zone bandwidth management for videoconferencing endpoints. The Cisco IOS® Gatekeeper product is based on Cisco IOS Software and runs on a wide variety of Cisco Integrated Services Routers. The Cisco IP-to-IP Gateway, also a Cisco IOS Software product, can enhance a videoconferencing deployment by providing session-border-control services, quality-of-service (QoS) functions, and enhanced security with firewall traversal capabilities, all of which allow customers to extend their videoconferencing capabilities beyond their network to partner and customer networks, or even to video endpoints using the public Internet.

KEY FEATURES AND BENEFITS

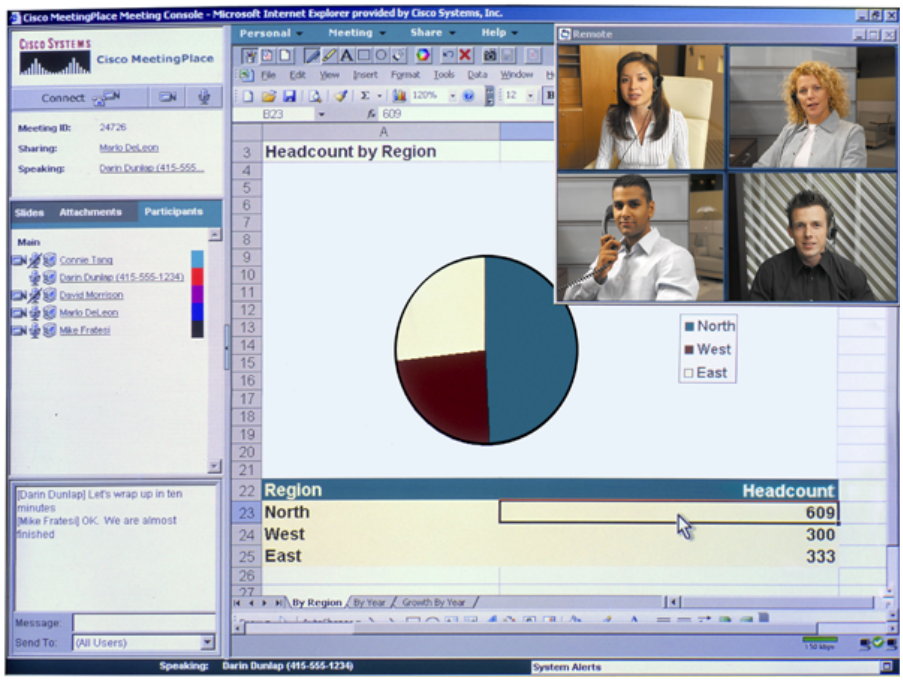
The Cisco Unified Videoconferencing 3545 System offers important features and benefits for videoconference users—and for your organization.

- High-quality audio and video—The Cisco Unified Videoconferencing 3545 System is designed using an encoder-per-port hardware architecture. This architecture allows the product to support a wide range of video and audio compression standards, codecs, continuous-presence features, and video resolutions at high performance levels and in any combination, without affecting the capacity of the product. This design offers organizations excellent videoconferencing video quality without sacrificing scalability or performance. The Cisco Unified Videoconferencing 3545 System automatically implements audio and video transcoding and connection speed transrating capabilities that allow each endpoint to use its preferred codec and connection speed and still connect to conferences with endpoints using different codecs and connection speeds. This approach helps ensure an optimal video and audio experience for each participant.
- Ease of use—The encoder-per-port hardware architecture of the Cisco Unified Videoconferencing 3545 System significantly reduces preconfiguration requirements by eliminating the need to limit the bit rates, video formats, and conference features that videoconferencing endpoints and conference participants can use. Because every port has dedicated audio and video encoders, any endpoint can connect to any conference, at any supported bit rate, with any supported audio or video codec, at any supported resolution, and with any screen layout. Everyone can connect, all the time, with no drop in product capacity or performance.
- Extensive conference management capabilities—Videoconference users often prefer to have direct control of the conference to manage the meeting flow. The Cisco Unified Videoconferencing 3545 System offers users and administrators a Web-based user interface, a dual tone multifrequency (DTMF) interface from video endpoints or standard phones, and the ability to use video endpoint remote controls to control various aspects of the meeting. For example, the administrator can move any conference participant to a specific screen layout location, as well as add, mute, or disconnect participants. In multiple-image continuous-presence conferences, the administrator can specify the screen position in which the locations appear and switch between a multiple-image and single-image display at the click of a mouse. Meeting effectiveness can be maximized through the use of the conference management tool, particularly in large videoconferences or educational environments.
- Unified communications interoperability and investment protection—The Cisco Unified Videoconferencing 3545 System, as with the rest of the Cisco Unified Videoconferencing products, is designed to protect customers' investment in videoconferencing technology through proven integrations that offer powerful videoconferencing technology for three types of solutions, whether deployed and used independently or together.
  - Rich-media conferencing—The Cisco Unified MeetingPlace® solution—also part of the Cisco Unified Communications system—is a complete rich-media conferencing solution that transparently integrates voice-, video-, and Web conferencing capabilities to make remote meetings as natural and effective as face-to-face meetings. The Cisco Unified Videoconferencing 3545 System, when combined with the Cisco Unified MeetingPlace Video Integration application, helps users set up, attend, and manage voice-, video-, and Web conferences. For easy setup and attendance of integrated rich-media conferences, Cisco Unified MeetingPlace conferencing offers a Web browser interface and advanced, proven integrations with the Microsoft Outlook and Lotus Notes calendaring environments. Meeting coordinators simply schedule the meeting, and the Cisco Unified MeetingPlace solution does the rest, reserving voice-, video-, and Web conferencing resources. Meeting invitees automatically receive notification by email or calendar invitation and can then attend rich-media conferences with a single click. Cisco Unified MeetingPlace conferencing also allows users to initiate rich-media conferences, including videoconferences, from common instant messaging clients such as America Online (AOL) Messenger, Lotus Sametime, MSN Messenger, and Yahoo Messenger.

By dramatically simplifying the process for scheduling and attending conferences, Cisco Unified MeetingPlace conferencing promotes significant productivity gains. Integrating Cisco Unified Videoconferencing into the Cisco Unified MeetingPlace solution also combines formerly disparate conferencing investments and maximizes use of conferencing resources, providing increased user satisfaction and productivity.

Figure 1 shows the Cisco Unified MeetingPlace meeting console.

Figure 1. Cisco Unified MeetingPlace Rich-media Conferencing: Integrated Voice-, Video-, and Web conferencing



- Cisco Video Telephony—Cisco Unified Video Telephony is a capability of Cisco Unified CallManager that extends video to desktop communications. Video calls are now as easy to place as telephone calls (Figure 2) and have familiar phone features such as hold, transfer, and call forward; integrated dial plans; common call detail records (CDRs); and administration capability. The Cisco Unified Videoconferencing 3545 System provides video telephony endpoint support for multiparty conferences, providing a simple user experience that is as easy as pressing the conference button on the Cisco Unified IP Phone.

  Cisco Video Telephony extends the benefits of video communications from the conference room to the end-user's desktop and dramatically simplifies the user interface. Video telephony personalizes communications, and the Cisco Unified Videoconferencing infrastructure can be used across both traditional room-based videoconferencing and desktop video telephony environments, maximizing investment.

Figure 2. Cisco Video Telphony: Video Calls Are as Easy to Place as Telephone Calls

- Traditional IP videoconferencing—In addition to newer video telephony and rich-media conferencing environments, the Cisco Unified Videoconferencing 3545 System offers the flexibility, scalability, and performance of traditional conference-room-based videoconferencing with a wide variety of supported video endpoints, including H.320, H.323, SCCP, and SIP devices.

PRODUCT INFORMATION

Table 1 lists the Cisco Unified Videoconferencing 3545 System module options by part number, Table 2 describes the system features, and Table 3 lists the physical specifications of the system.

Table 1. Cisco Unified Videoconferencing 3545 System Options

Part Number	Description	Features
IPVC-3545-CHAS (=)	The product chassis contains four slots, which can be populated with any combination of Cisco Unified Videoconferencing 3545 System modules.	• Provides dual redundant power supplies and feeds • Is rack-mountable • Provides power and heat dissipation for modules
IPVC-3545-MCU (=)	The MCU module is responsible for actually connecting all videoconference participants to the same conference.	• Provides all audio processing capabilities • Provides 96 fully processed and transcoded audio ports per module • Manages up to four EMP modules in one or more chassis on the network
IPVC-3545-EMP (=)	The EMP module is responsible for all video processing for conferences hosted on the MCU module.	• Provides 24 fully processed video ports per module • Up to four EMP modules can be managed by a single MCU module in the same or different chassis
IPVC-3545-GW2P (=)	The dual Primary Rate Interface (PRI) ISDN gateway module provides connectivity and translation services for older ISDN H.320 videoconferencing endpoints so that they can join the same conferences as IP-based H.323, SIP, and SCCP endpoints.	• Provides dual PRI T1/E1 interfaces • Provides full built-in audio transcoding
IPVC-3545-GW4S (=)	The quad serial interface ISDN gateway module provides connectivity and translation services for older ISDN H.320 videoconferencing endpoints so that they can join the same conferences as IP-based H.323, SIP, and SCCP endpoints.	• Provides four serial interfaces • Provides full built-in audio transcoding

Table 2. Cisco Unified Videoconferencing 3545 System Features

Feature	Description	
Audio and video capacity	• Single Cisco Unified Videoconferencing 3545 chassis: ◦ 1 MCU + 3 EMPs = 96 audio + 72 video ports All ports are fully processed, allowing them to offer any supported connection speed, any supported video and audio codecs, and any supported video resolutions without any decrease in port capacities or in the number of simultaneous conferences supported.	• Two Cisco Unified Videoconferencing System 3545 chassis (either of the following): ◦ 2 MCUs + 6 EMPs = 192 audio + 144 video ports ◦ 8 MCUs = 768 audio ports All ports are fully processed, allowing them to offer any supported connection speed, any supported video and audio codecs, and any supported video resolutions without any decrease in port capacities or in the number of simultaneous conferences supported.
Video capabilities	• Video codecs: H.261, H.263, and H.264 • Live video resolutions: Quarter Common Intermediate Format (QCIF), Common Intermediate Format (CIF), Standard Input Format (SIF), and 4CIF • Presentation video resolutions: Video Graphics Array (VGA), Super Video Graphics Array (SVGA), and Extended Graphics Array (XGA) • Video bandwidth: Up to 2 Mbps per port with no decrease in port capacity • Full transcoding and transrating for all video codecs and speeds on all ports • 4CIF resolution on all ports for all layout combinations [1] • H.264 codec on all ports for all layout combinations • QualiVision for highly improved, standard-based video quality in networks with packet loss • QoS support with Differentiated Services (DiffServe), type of service (ToS), and IP Precedence • Per-user (rather than per-conference) video processing, allowing unique and optimal video settings for each user	
Audio capabilities	• Audio codecs: G.711, G.722, G.722.1, G.723.1, G.728, and G.729A • DTMF tone detection (in-band, H.245 tones, and RFC 2833) [2] • Entry and exit sound played when conference participants join or leave a conference • Ability to record and upload custom messages • Full transcoding and mixing on all audio ports	
Signaling protocols	• H.323 • SCCP • SIP • H.320 with gateway modules	
Conferencing and video display features	• Unlimited number of simultaneous conferences • Continuous-presence conferences displaying up to 16 participants at one time • More than 26 screen layout options • Auto layout selection depending on the number of participants • Administrative control of layouts and conference views • Web interface that gives a conference moderator full control of participant location in the screen layout • Self-see window in the screen layout that can be turned off, providing a unique and optimized view for each participant (without the participant in the layout) • Text overlay	
Scalability	• Creation of larger conferences by cascading multiple Cisco Unified Videoconferencing 3545 MCU modules and Cisco Unified Videoconferencing 3515 MCUs together • Cascaded conferences, which can be centralized in the data center or geographically distributed to more efficiently use WAN bandwidth	

<table>
<tr><td>Conference management</td><td colspan="3">

Easy-to-use Web interface that allows a conference moderator to perform a variety of conference monitoring and management functions
Real-time conference management and monitoring, allowing moderators to:

View conference list and number of participants
View conference type and participant information including name, number, IP address, video and audio codecs in use, and time joined the conference
Create a new conference and assign a conference password
Terminate a videoconference

Powerful conference control for management of active conferences, allowing moderators to:

Add or drop participants in a conference
Lock the video on a location to be viewed by all participants in a conference
Lock the video and specify image position during a continuous-presence conference
Switch between voice-activated and continuous-presence views during a conference
Mute audio from a selected participant
Terminate a videoconference

H.243 and DTMF conference control from the endpoint

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<tr><td>On-demand or scheduled conferences</td><td colspan="3">

Easy user initiation of unscheduled conferences
Conference scheduling through the Cisco Unified MeetingPlace solution or compatible third-party scheduling applications

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<tr><td>Security</td><td colspan="3">

H.235 Advanced Encryption Standard (AES) and Data Encryption Standard (DES) encryption, up to 128-bit keys, for secure audiovisual conferencing [3]
Password-protected Web GUI user access with multiple levels: Administrator, Operator, and User
PIN-protected conferences to help ensure privacy

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<tr><td>Data sharing and collaboration</td><td colspan="3">

H.239 and Tandberg DuoVideo for presentation sharing
Integration with the Cisco Unified MeetingPlace solution for rich-media conferencing and Web collaboration

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<tr><td rowspan="2">ISDN gateway module capacities</td><td colspan="2">Dual PRI Gateway Module</td><td>Quad Serial Gateway Module</td></tr>
<tr><td>T1 interface

Forty-six voice calls
Twenty-three video calls at 128 kbps
Seven video calls at 384 kbps
Three video calls at 768 kbps
Two video calls at full T1
</td><td>E1 interface

Sixty voice calls
Thirty video calls at 128 kbps
Ten video calls at 384 kbps
Four video calls at 768 kbps
Two video calls at full E1
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Four serial ports at up to 2 Mbps each
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<tr><td>ISDN gateway features</td><td colspan="3">

Video, audio, and data support:

Signaling protocols—H.323 and H.320
Video—H.261, H.263, H.263+, H.263++, and H.264
Resolutions—QCIF, CIF, 4CIF, and 16CIF
Audio—G.711, G.722, G.722.1, G.723.1, and G.728
Data—T.120, T.281 (FECC), DuoVideo, and H.239
H.243 conference control

Built-in audio transcoding and line echo cancellation:

Transcoding between G.728 and G.711
Transcoding between G.711 and G.723.1
Line echo cancellation on Dual PRI Gateway module (part number IPVC-3545-GW2P), allowing connection of standard telephones

Call routing:

Built-in interactive voice response (IVR)
Direct inward dialing (DID)—IP connectivity according to the ISDN number dialed
Terminal Control Session 4 (TCS4)—Supplies the IP endpoint number as part of the ISDN dial string
Default extension—Connects all calls to a specific location (for example, an MCU)

Call bonding on Dual PRI Gateway module (IPVC-3545G-W2P):

ISDN call bonding for up to 2 Mbps (E1) or 1.5 Mbps (T1)
Automatic downspeeding on ISDN channel failure

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<tr><td>Gatekeeper support</td><td colspan="3">Cisco IOS Gatekeeper or equivalent</td></tr>
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Diagnostics	• Power-on self-test for CPU, interfaces, and memory when the unit is turned on • Front-panel error indicators • Telnet and serial port monitoring capabilities

[1] 4CIF supported using H.263 at 15 frames per second.
[2] When using in-band DTMF detection, MCU audio capacity drops to 72 ports and H.235 encryption must be disabled.
[3] When using H.235 encryption, MCU audio capacity drops to 72 ports. If H.235 encryption is used on video calls over 768 kbps, EMP port capacity drops to 12 ports each.

Table 3. Cisco Unified Videoconferencing 3545 System Specifications

Feature	Specification
LAN interface	One 10/100 Ethernet port, IEEE 802.3, 8-pin RJ-45 on each module
Serial port	EIA-232, 9-pin D-type
Dimensions	3.50 x 17.25 x 10.0 in. (8.89 x 43.815 x 25.4 cm)
Weight	17.6 lb (8 kg) for empty chassis (with two power supplies)
Power	• 100–240 VAC auto-sense, 50–60 Hz, 202W maximum • Dual redundant power supplies • U.S. power cable included • Other power cables available
Environment	• Operating temperature 32 to122°F (0 to 50°C) • Storage temperature –13 to 158°F (25 to 70°C) • Humidity 5 to 90% non-condensing
Agency compliance	• Safety: ◦ UL 60950: 2000 ◦ CSA CS22.2 No. 60950-00 ◦ GS Approval (EN 60950: 2000) ◦ EN 60950: 2000 ◦ ACA: TS002-1997 ◦ AS/NZS 3260: 1993, A4: 1997 ◦ AS/NZS 60950: 2000 ◦ IEC 60950: 1999 (CB test report) • EMI: ◦ FCC Part 15 Subpart B, Class A, ◦ EN 55022: 1998, Class A ◦ ICES 003 ◦ EN 55024: 1998 ◦ EN 61000-3-2: 1995, Amendment A14: 2000 ◦ EN 61000-3-3 ◦ EN 61000-4-2: 1995 ◦ EN 61000-4-3: 1995 ◦ EN 61000-4-4: 1995 ◦ EN 61000-4-5: 1995 ◦ EN 61000-4-6: 1996 ◦ EN 61000-4-8: 1993 ◦ EN 61000-4-11: 1994 ◦ AS/NZS 3548: 1995 Class A, Amendment 1: 1997, Amendment 2: 1997 ◦ VCCI: 1999

CISCO UNIFIED COMMUNICATIONS SERVICES AND SUPPORT

Cisco Unified Communications services and support reduce the cost, time, and complexity associated with implementing a converged network. Cisco Systems® and its partners have designed and deployed some of today's largest and most complex Unified Communications networks, meaning that they understand how to integrate a unified communications solution into your network.

Cisco design tools and best practices help ensure that the solution fits your business needs from the start, eliminating costly redesigns and downtime. The company's proven methods help ensure a sound implementation that will deliver the functions and features that you expect—on time. Support services include remote network operations, network management tools to administer the converged application and network infrastructure, and technical support services.

Through these services, your organization benefits from the experience gained by Cisco and its partners. Relying on this valuable experience, you can create and maintain a resilient converged network that will meet your business needs today and in the future.

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