



# Cisco on Cisco Best Practices Cisco Global Video Conferencing

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Operational Best Practice

# Providing IP Video Conferencing that Fits the Cisco Collaborative Culture

**Best Practice: The technology and operational processes used by Cisco to evolve to a global video conferencing platform for 40,000 employees**

## Introduction

Cisco® employs more than 40,000 people in offices and locations around the world. Providing a variety of communications tools to facilitate the highly collaborative Cisco culture is core to the company's past and continued revenue growth. One of the tools deployed—IP-based video conferencing (IP/VC)—has proven to enable high-impact and cost-effective communications. Cisco IT has deployed approximately 800 IP/VC endpoints around the world with an average usage rate of 700,000 minutes per month. These endpoints currently consist of a mix of desktop units from various vendors such as Tandberg, as well as room-based systems.

This document provides the reader with Cisco IT best practices derived during the years of supporting internal deployment of H.323-based IP/VC. These solutions preceded Cisco's video conferencing product offering—the Cisco Unified Video Advantage application—which is currently being deployed by Cisco IT. Based on the Cisco Unified CallManager suite, Cisco Unified Video Advantage adds video capability to traditional audio calls. Gateways currently exist that provide connectivity between H.323 video conferencing systems and the Cisco Unified Video Advantage environment. Cisco's internal deployment of the Cisco Unified Video Advantage solution will be documented in a separate Cisco@Work case study.

The purpose of this best practice document is to help other organizations and enterprises currently planning large scale, H.323-based IP/VC deployments. By using these practices, companies can more quickly realize the return on investment (ROI) and other organization benefits possible with an implementation of IP/VC.

## Scope of IP/VC Deployment Within Cisco

The Cisco IP/VC deployment is used by Cisco employees for a variety of high-impact communications that would otherwise require face-to-face meetings.

### Executive Communications

One of Cisco's most powerful sales tools is bringing together Cisco executives with customers and other market influencers. Cisco IP/VC facilities include an executive presentation room, which allows executives to be more available without the scheduling and logistics obstacles posed when travel is required. Executives, customers, and industry and government leaders can come together in a high-quality and professional IP-based venue.

### Recruiting

Each year, Cisco human resources (HR) personnel carry out thousands of interviews with candidates for employment. IP/VC is commonly used to perform interviews in a timely manner and to minimize travel expenses. Interviewees are invited to a nearby Cisco location equipped with IP/VC capabilities and connected via IP/VC for a face-to-face interview with an HR representative.

### **Employee Performance Reviews**

A significant number of Cisco employees and their respective managers work at sites that are geographically separated. IP/VC is often used by these managers for employee reviews, providing a personal face-to-face setting and avoiding disruptions to team productivity.

### **Team and Project Meetings**

IP/VC is often used by team and project leaders to bring together geographically dispersed teams. Multiparty conferences allow all of the participants to see and hear each other, thus providing a natural setting for open and productive discussions among the entire team.

## Topics to Be Covered

This operational best practice document is divided into four sections:

- **Technology** – An overview of the technologies and products used within the Cisco IP/VC deployment.
- **Organization** – Detailed descriptions of the planning efforts and support organization required to support the worldwide Cisco IP/VC deployment.
- **Operations** – Descriptions of the preliminary and ongoing efforts required for the deployment.
- **Facilities** – To greatly enhance the quality and professionalism of the Cisco IP/VC solution, Cisco deployed and maintains an executive conference facility described in this section.

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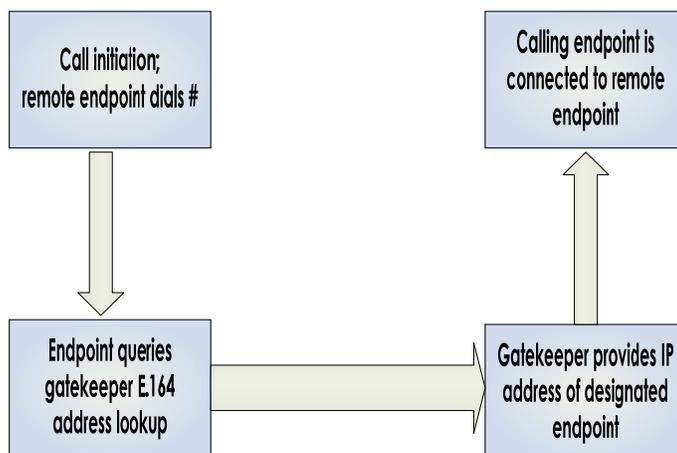
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## Section 1: Technology

A variety of IP/VC solutions are available in formats based on the different network connectivity protocols. Cisco's current IP/VC solution is IP-based and uses the popular H.323 protocol suite for audio-visual communication sessions across packet networks. Other protocol suites are available for IP/VC implementations. These protocol suites typically rely on gateway devices that serve as protocol translators. One of the other protocol suites used within Cisco is H.320, which provides support for ISDN-connected IP/VC endpoints. Cisco deploys H.320 gateways to provide connectivity between Cisco endpoints and IP/VC endpoints that are not on the Cisco intranet, such as customer, government, or industry analyst endpoints.

### IP/VC Operation

The end-user operation of an IP/VC device or endpoint is similar to the operation of a television with a remote control. Figure 1 provides a simple flow diagram for an endpoint-to-endpoint call. Table 1 includes expanded descriptions of the terms used in this explanation of IP/VC operation. Additional information on these and other Cisco devices can be found in the Products & Solutions section on <http://www.cisco.com>.

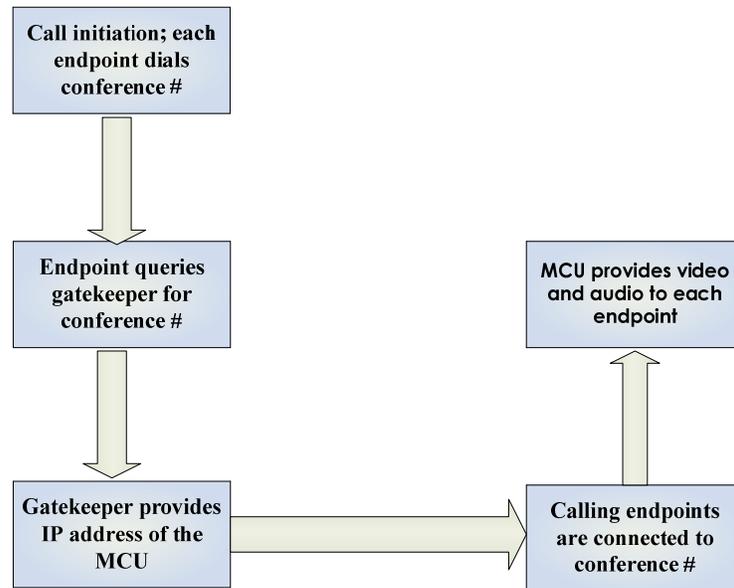


**Figure 1.** Establishing connection between two endpoints.

Each IP/VC endpoint is assigned a unique dial number. A special device known as an H.323 gatekeeper stores these numbers and matches the dial number to the IP address of the device that is dialed. When a number is dialed, the IP/VC endpoint requests access information from the gatekeeper. The gatekeeper looks up the appropriate IP address and sends that information back to the requesting endpoint. The requesting endpoint then initiates a session directly with the destination endpoint.

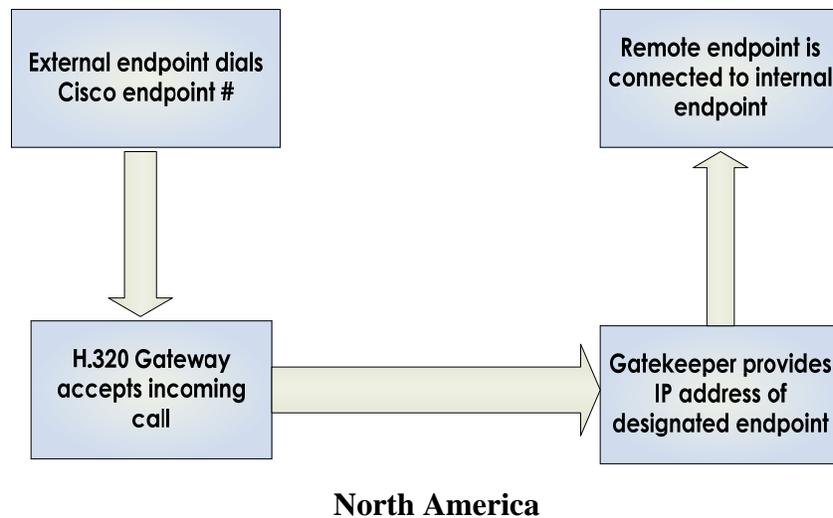
A multiparty IP/VC session is initiated in a manner that is similar to the initiation of a multiparty voice conference call (Figure 2).

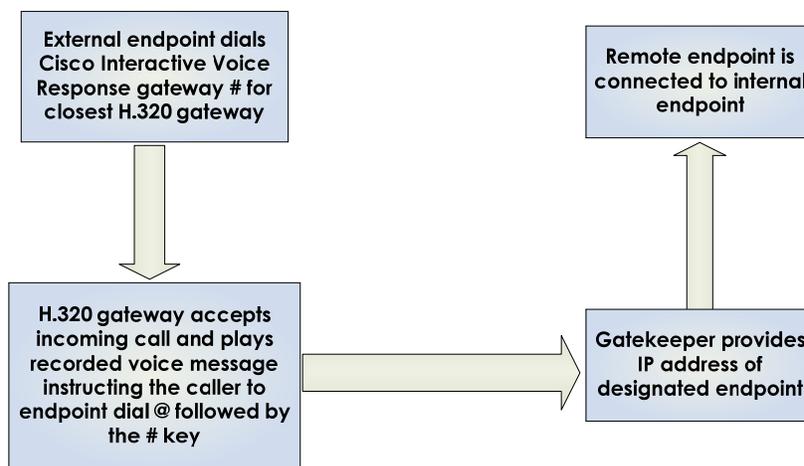
A unique conference number is scheduled and provided to all participants. Each participant dials this number from their IP/VC endpoint. The gatekeeper matches the number to the IP address of the multipoint control unit (MCU). All endpoint sessions are connected by the MCU.



**Figure 2.** Initiating a multiparty IP/VC session

A gateway device is used to connect calls to internal Cisco IP/VC endpoints from external IP/VC endpoints (Figure 3). For outgoing calls, from internal to external endpoints, a request must be made in advance to the IP/VC support team. In some cases, ISDN services may vary and troubleshooting by the IP/VC support team may be required for a successful connection.





### EMEA and AsiaPac

**Figure 3.** Two examples of an external IP/VC endpoint placing a call to an internal Cisco IP/VC endpoint

**Table 1.** Definitions

Device	Description
Endpoint or video terminal	IP/VC endpoints are available in many forms, ranging from standalone desktop units to room-based systems. Each unit includes a video display, camera, microphone, speakers, and onscreen menu system for configuration and placing calls. The desktop units have an all-in-one format. Room-based systems can be designed with multiple displays, cameras, and other components to suit the room size.
Gatekeeper	The gatekeeper performs all address resolution, bandwidth management, call admission control, zone management, and call routing. Gatekeepers are available as standalone devices. Many Cisco routers can be configured as an H.323 gatekeeper.
Gateway	A gateway provides interoperability between H.323 devices and H.320 devices.
Multipoint Control Unit (MCU)	An MCU enables three or more participants to join a video conference. The MCU manages call control functions, conference resources, and audio and video media streams.
Management and scheduling system	An option for many providers, a management and scheduling system provides the ability to schedule conference resources such as MCU conferences and provides usage reporting information.

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## Cisco Internal Deployment Architecture

The Cisco deployment of IP/VC is based on a globally distributed environment of gatekeepers, gateways, and MCUs. IP/VC endpoints register with a predefined gatekeeper. The gatekeeper is capable of defining multiple zones, so endpoints in Cisco's Asia Pacific (APAC) region can "home" to a gatekeeper in San Jose, California while providing the unique APAC video endpoint number to dial. Cisco IOS® Software-based gatekeepers can manage multiple IP/VC endpoints, MCUs, and gateways. Each gatekeeper maintains a database for all devices assigned to it.

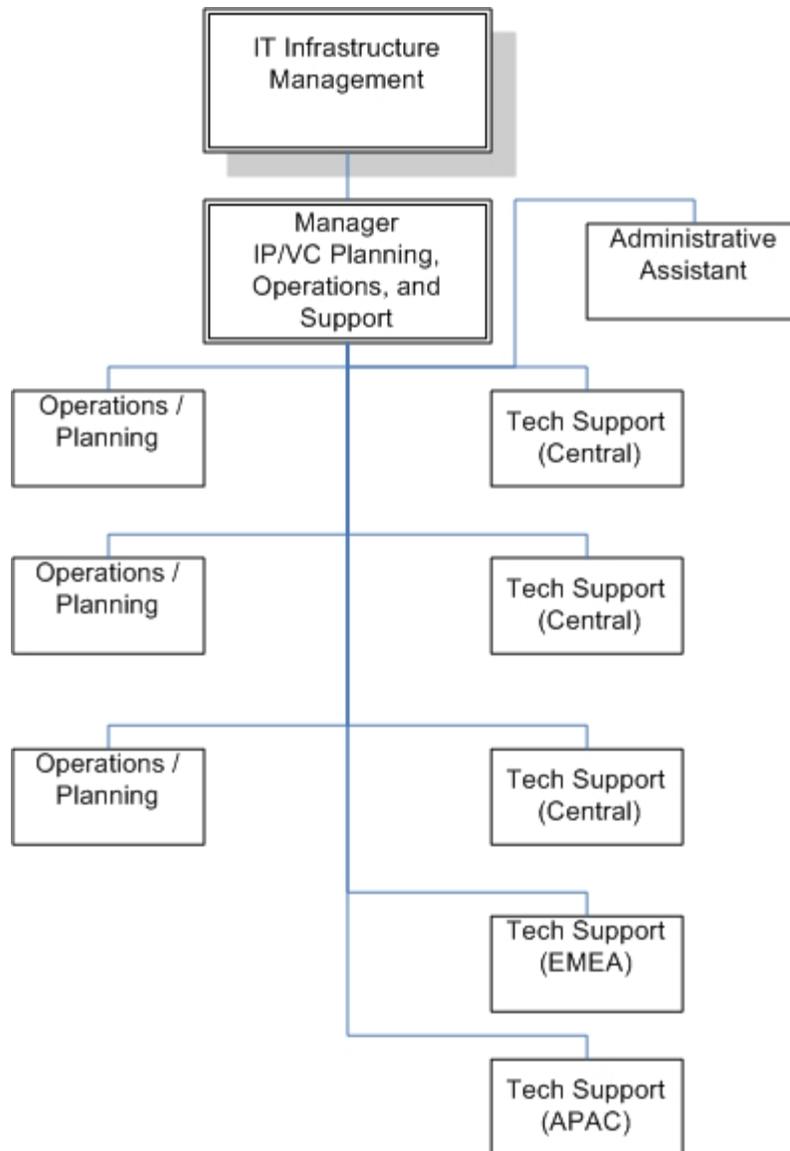
Care should be taken when placing MCUs. The main concerns should be total WAN bandwidth usage and latency, as opposed to geographic location. In testing MCU locations, Cisco first tried placing an MCU in Sydney. However, it was determined that calls from Hong Kong and Singapore to Sydney did not fare as well as calls from those locations to San Jose. After discovering that the WAN links from Hong Kong and Singapore to Sydney were not as robust as the links back to San Jose, it was decided that those APAC locations would use the San Jose MCU for video conferences.

H.320 gateways are dispersed globally to provide ISDN connectivity to Cisco IP/VC endpoints.

The current default bandwidth setting assigned to all IP/VC components is 384 Kbps. Quality of service (QoS v.2.0) is enabled for all WAN connections and is matched on application port IDs. Video conferencing traffic is prioritized a step below voice traffic and is carried across the general data VLAN.

## Section 2: Organization

A successful IP/VC deployment requires an organization that can be responsible for planning, deployment, operations, and support. This section describes a suggested structure (Figure 4) to cover these organizational responsibilities.



**Figure 4.** IP/VC deployment organizational requirements

The manager of the Cisco IP/VC group oversees all planning, organization, coordination, control, and support functions. This position is part of the overall Cisco IT organization and will continue to report to the IT infrastructure or the Cisco operations director. In addition to fundamental management functions, the manager of this group is also responsible for:

- Establishing the technical deployment and architecture planning for IP/VC throughout the organization.
- Planning and oversight of the budget for the core IP/VC components such as MCUs, gatekeepers, and gateways.
- Serving as primary liaison to various suppliers and vendors and other internal IT groups such as the IT telephony group.

The IP/VC group itself is organized by function (Table 2).

**Table 2.** Functional responsibilities for the Cisco IP/VC group

Group	Provides
Operations and planning	Responsible for deployment planning and developing operations procedures.
Technical support	Responds to and resolves end-user tech support issues.
Administrative	Manages order processes and provides usage reports.

## Operations and Planning

The Cisco IP/VC operations and planning team is responsible for deployment planning and the development and maintenance of operational procedures (Table 3).

**Table 3.** Operations and planning group's responsibilities

Function	Description
Architecture definition and design	Identify all the components required to support IP/VC services. Design the deployment of all required components to ensure maximum availability and best quality.
Dial plan	Work with the IP telephony group to design, implement, and maintain a dial plan that will include support for IP/VC endpoints.
Gatekeeper and gateway configuration	Properly provision and configure all required gatekeeper and gateway devices.
MCU configuration	Properly provision and configure all MCU devices.
Scheduling	Work with IT scheduling or calendaring group to develop and maintain a scheduling system to support room-based, system scheduling by end users.
Equipment evaluation and planning	Work with equipment providers to evaluate new equipment, plan and deploy upgrades to current systems, and plan long-term technology changes.
Liaison to IT infrastructure group	Ensure that sufficient bandwidth is available to room-based systems, IP/VC gateways and gatekeepers are properly configured, and QoS is deployed for IP/VC devices.
Tech support escalation	Provide escalation support for tech support group. Develop maintenance and troubleshooting procedures.
Support administrative processes	Review desktop and room-based system order requests. Collect management reporting information from scheduling system and/or gatekeeper units.

For an organization deploying an IP/VC system on a global scale with more than 500 endpoints and room-based systems, it is recommended that a staff of three operations and planning personnel be established to address these responsibilities.

Some of the staffing requirements and considerations for this team include:

- In-depth knowledge of IP/VC design theory and hands-on experience with IP/VC hardware and software operations.
- Strong interpersonal, written, and presentation communication skills.
- CCNA® certification level network knowledge and experience.
- Completion of Cisco Rich Media certification (available in late 2005), which includes courseware on Cisco IP/VC.

## Tech Support

The Cisco IP/VC tech support team is responsible for:

- Responding to and resolving end-user support requests that are typically created via a centrally managed, IT support system. Support requests from this central system are qualified centrally and IP/VC-specific requests are then passed on to the IP/VC tech support group.
- Providing pre-meeting support for room-based system meetings and executive events.
- Providing the operations and planning team with documented feedback relating to service/product enhancements that impact the IP/VC deployment.

For an organization deploying an IP/VC system on a global scale with more than 500 endpoints and room-based systems, it is recommended that a staff of one tech support person be hired for each multibuilding campus location (more than five buildings). It is highly recommended that an additional tech support person be located per geographic region (such as EMEA and Asia Pacific) to accommodate regional time zones. For locations with less than five buildings, support can be provided by tech support personnel located at a headquarters or central location.

Some of the staffing requirements and considerations for this group include:

- Operational experience or equivalent training with IP/VC software and hardware.
- Strong interpersonal skills and problem resolution skills. It is recommended that candidates have completed or will complete IT-focused, tech support training.
- Ability to provide remote support via telephone and IP/VC, and scheduled onsite support.
- Ability to set up and test IP/VC systems.
- Strong documentation skills to provide feedback and process recommendations to the operations and planning team.

# Section 3: Operations

## Reporting

Prior to implementing an IP/VC system, usage reporting requirements must be defined and the supplying components identified. Some of the most common usage metrics include:

- Call usage
  - Total number of unique calls
  - List of all calls by user name
  - Top callers
- Room utilization
  - What rooms are being used
  - How often
  - By whom

- MCU utilization
  - How often
  - By whom
- Gateway utilization
  - How many calls were made
  - How many calls were inbound
  - How many calls were outbound
  - Who made the outbound calls
- Productivity usage
  - Why do people use IP/VC
  - What types of tangible and intangible productivity gains have been realized

This information will most likely be collected from a variety of sources, including scheduling systems, device logs, and user surveys.

## Usage Marketing

To ensure that the business goals, productivity gains, and ROI envisioned with the deployment of IP/VC are realized, it is highly recommended that both an initial and ongoing marketing communications plan is developed and implemented (Table 4).

**Table 4.** Example: Initial Deployment Plan

Communication Type	Key Messages	Audience
Announcement poster 1	IP/VC is a real alternative to travel.	All buildings with IP/VC rooms.
Announcement poster 2	Highlight conference rooms with IP/VC onsite.	All buildings with IP/VC rooms.
Announcement poster 3	Informational – how to book an IP/VC call. Step by step.	IP/VC conference rooms.
IT e-mail 1	Distinguish between IT standardized and legacy IP/VC units.	Individual buildings with IP/VC rooms.
Executive e-mail 1	Travel alternative/availability. Aim to increase adoption.	Building aliases defined for specific regions and locations.
Executive voicemail 1	Optional/e-mail 1 content.	All buildings.
User presentation	Cisco Unified Telephony Advantage and IP/VC.	Team meetings.
IT update	Usage breakdown by region/site/unit and focus to increase adoption.	Regional owners and sponsors.
Executive e-mail 2	Adoption report by region. Introduce regional competition.	Building aliases defined for specific regions and sites.
Voicemail 2	Optional/e-mail 2 content.	All buildings with IP/VC rooms.
Executive e-mail 3 (closure)	Adoption update.	All buildings with IP/VC rooms.

## Poster Examples

Figure 5 and 6 show examples of some of the posters deployed within Cisco to promote IP/VC usage.



Figure 5. Example: IP/VC Deployment Poster



**IP Video Conferencing available here!**

 <Room Name>  
<Room Number>

**As easy as making a phone call!**

**Having a meeting? Think **video****

**V**ideo conferencing is ideal for team meetings

**I**nvide rooms and guests in a single outlook invitation

- 1) Search the Cisco Global Directory> Resource Search> Conference Room Advanced Search
- 2) Select Building and 'Y' for Video Conference to return a list of IT supported IPVC conference rooms.
- 3) Use a single Outlook Calendar meeting request to invite your guests and book IPVC conference rooms (as resources).

N.B IPVC conference rooms are easily identified with (VC) in your Outlook Calendar Conference Room list!

**D**ial using 8 digit or multi participant video bridge number

**E**asy as making a phone call

**O**ptimise your communications

**CISCO SYSTEMS**  


Figure 6. Example: IP/VC Deployment Poster

## Example Announcement E-Mails

Following are some of the IT and executive IP/VC announcement e-mails used to announce and promote the usage of IP/VC within Cisco, showing the links that were embedded to direct employees to the Website locations where they could find answers to their questions.

### IT Announcement E-Mail

**Subject: IP Video Conferencing supported in your office/ at your site**

There are currently x number of IT supported IP video conferencing units available for use at x site. The units are available in the following conference rooms:

Room X  
Room Y  
Room Z

Please note: These units are configured to new IT standards and are supported by Cisco IT. These units should not be confused with legacy units. IT will be standardising legacy units over the coming months to the latest IT standards.

**IT supported units:**

1. Support 8-digit dial
2. Secured as a permanent fixture in the meeting rooms
3. Accompanied by a wall-mounted user guide.
4. Listed in the Global Cisco Directory and Outlook Calendar (Room name-VC)
5. Support multiparticipant video calls

**How do I find** which buildings have VC capability?

**How do I find a room with a VC unit and schedule** a meeting between two or more locations?

**How do I learn more?**

### Executive Announcement E-Mail for Specific Site

**Subject: IP/VC: Open your eyes!**

I am pleased to announce that there are now IT-supported IP video conferencing (IP/VC) units available for use in conference rooms across Europe. This number is set to increase significantly in the coming months. Video is being enabled at 12 remote sites across the European and Emerging markets, with a focus on sites in the Central Eastern European region. These conference-room-based IP/VC units have an 8-digit-dial address system, making an IP/VC call as easy as any other voice over IP call!

IP video conferencing is a real alternative to travel with a potential travel saving of \$10 million per year in direct travel expense and time saved through travel avoidance. The increased accessibility to IP/VC units combined with improved quality of voice and video allows time to be used more efficiently. IP/VC breaks down geographical barriers, facilitating real-time, face-to-face meetings from your local office and giving you the opportunity to increase the impact of your communication.

The [Global Conference Room directory](#) has been updated to reflect IP/VC capability. Video-enabled rooms are easily identified and booked in Outlook Calendar (VC capability is indicated). Click [here](#) to check out IP video conferencing availability at your site.

I have committed to tripling the usage of IP/VC in my region over the next 2 quarters. Start using IP/VC now! Ensure your teams are aware of this opportunity to use these new IT

supported units and unlock the potential!

<sign-off>

How to... FAQs

[IP/VC Homepage & Learning](#)

### **Executive Announcement E-Mail to a Specific Region**

**Subject: Have you woken up to video? Or rushing off to the airport?**

#### **IP Video Conferencing Usage Update AND Call to Action!**

##### TRAILING REGION MESSAGE

Following my last e-mail, I'm pleased to announce that the reach of IP/VC has been extended across the theatre, with x sites now video-enabled.

The <region> has led the way with an increase of x% IP/VC usage. The competition is on to increase our usage above and beyond this, from x to x this quarter! We have some way to go before the potential of each IP/VC unit in this region is met and our target is reached. In this region, the X office is leading the way – Congratulations!

##### **OR**

##### WINNING REGION MESSAGE

Following my last e-mail, I'm pleased to announce that the reach of IP/VC has been extended across the theatre, with x sites now video-enabled.

Congratulations team, we have increased our usage by x%, the largest increase shown in any region across Europe! The X office is leading the charge in this region, with an n% usage.

Let's keep up the momentum. Be the first to set up your weekly team call as an IP video conference! Share your experiences with your colleagues and customers. IP video conferencing is as easy as an 8-digit-dial call; the Global Directory, alongside the Outlook Calendar, provide easy access to IP/VC room information for you to book in advance.

<sign-off>

[IP/VC Homepage Learning](#)

## Support, Maintenance, and Training

### Support Process

Cisco provides a centralized, tech support group and process (Figure 7) that is used by employees to request and receive support on all of the applications and systems used within Cisco, including IP/VC. Table 5 explains the steps involved the support process.

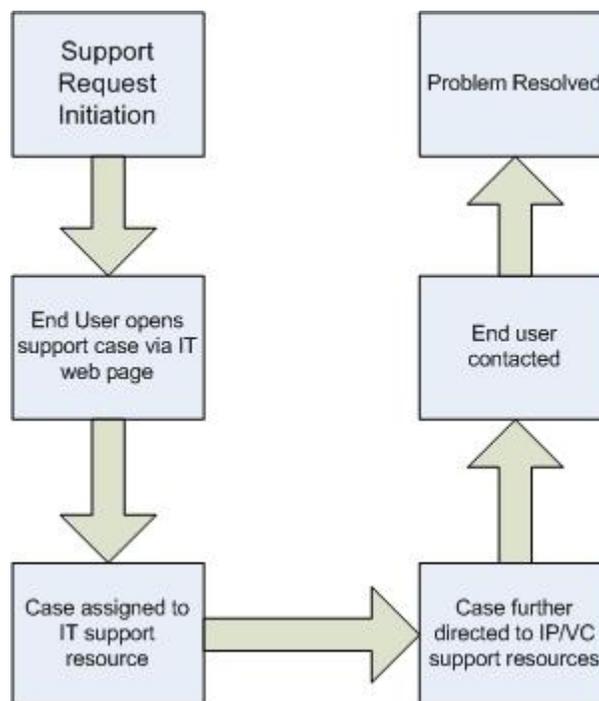


Figure 7. Problem reporting and case handling flow.

Table 5. The Technical Support Process

Function	Description
Initial case is opened by end user	A central tech support Website is maintained by Cisco IT. The site is used by Cisco employees to request IT support on most applications and systems used internally within Cisco, including IP/VC. The end user completes a support request form that includes contact information and a problem description field.
Case reviewed by IT central support	The support case is reviewed by IT support technicians.
Case directed to IP/VC support	The support case is categorized and assigned to available IP/VC support technicians.
End-user contacted by IP/VC support	The support requestor is contacted by phone or e-mail by the IP/VC support technician; the problem is diagnosed.
Problem resolution	The problem is resolved either by the technician providing instructions to the requestor, such as plugging the correct cables, or by the support technician remotely accessing the affecting systems and correcting

	configurations, manually placing calls, etc.
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In addition to the above process, IP/VC support technicians should also be available for the emergency and pre-meeting support.

- Emergency – End users should be able to contact the central support group directly by telephone and request immediate support for executive-level meetings. The central support group then contacts available IP/VC support personnel by pager or telephone.
- Pre-meeting – IP/VC support resources should be available to provide pre-meeting support for executive and large group meetings. This type of support ensures that all IP/VC resources are available, tested, and operational before the meeting starts. The normal tech support request process can be used to schedule these resources.

### Common Support Questions

In addition to providing a tech support Website, it is also recommended that a list of frequently asked questions (FAQs) and answers be distributed and posted on the employee Website. Table 6 lists categories and sample questions for the FAQ list.

**Table 6.** FAQ Categories and Examples

Request Category	Common Questions
Ordering equipment and service	<p>What type of video conference system do I need?</p> <p>How do I order a video conference unit?</p> <p>How much does a video conference unit cost to purchase?</p> <p>Whom do I call with ordering questions/concerns?</p> <p>How long does it take to get my new system up and running?</p> <p>Do I need a maintenance contract on my equipment?</p>
Basic functions and operations	<p>When should I use video conferencing?</p> <p>I am planning a meeting with a large group, is video conferencing a suitable choice?</p> <p>Where are video conference rooms located?</p> <p>How do I schedule a video conference room?</p> <p>What do I need to do to hold a video conference?</p> <p>How do I reserve a video bridge for a multipoint IP conference?</p> <p>What if I have a problem during my video conference?</p> <p>Can I get a video camera for my computer?</p> <p>How do I move my equipment from one location to another?</p>

### Common Problems

Table 7 lists some of the common problems encountered when supporting an IP/VC system. It is recommended that a checklist with common problems and end-user resolution steps be developed and available at each IP/VC endpoint location.

**Table 7.** Common Problems

Symptom	Resolution
No audio.	<p>What is the volume level on the receiving unit? Is it turned down?</p> <p>Is the MUTE selection on the sending unit microphone turned on?</p> <p>Are the cables attaching the microphone to the IP/VC unit connected?</p> <p>Is the power turned on to the in-room speaker system?</p>
No video.	<p>Is the power turned on at the receiving video display?</p> <p>Are the cables connected to the receiving video display?</p> <p>Is the power turned on at the sending camera?</p> <p>Are the cables attached between the sending camera and the IP/VC unit?</p>
Video quality is bad.	Have the default video quality or bandwidth settings been changed on the sending and receiving unit?
Unable to connect to another unit.	Check the dial number of the target IP/VC endpoint. Is the target IP/VC unit turned on? Are the Ethernet cables connected?
IP/VC unit not operational.	Is power available to the unit? Are the network connections up for the unit?
Rogue systems.	Rogue systems are IP/VC endpoints that were purchased and installed without the knowledge of the IP/VC support group. Users of these systems often are unable to receive calls except via their IP address, because no dial number was assigned to them. These units also often suffer other connection issues -- the initial configuration usually does not match the standards established by the IP/VC support group.

## Hardware Maintenance

The required hardware maintenance needs of IP/VC components are minimal. The following critical components should be stocked centrally and preconfigured:

- MCU – Provides multipoint conferencing services for multiple IP/VC endpoints.
- Videoconferencing gateway – Provides connectivity to ISDN-based (H.320) video conferencing endpoints.
- Endpoint replacement units, including extra remote controllers, microphones, and cables.

## Procurement

The development and operation of a centrally provisioned procurement process is considered to be a key to successfully operating and supporting an IP/VC system. A variety of environmental considerations and functions (Table 8) need to exist to ensure a successful implementation and experience.

**Table 8.** Environmental Considerations and Functions

Function	Centrally Provisioned Benefit
Supported list of desktop, IP/VC systems	Ensure that a list of centrally managed, supported desktop systems is available to end users so the unit is supported and functional immediately upon delivery.  Upgrades are planned and support performed remotely.
Universal dial plan	Each new unit is assigned a unique dial number, and a central address directory entry is created and maintained.
IT-provided configurations	Each new unit (desktop and room-based) is configured and tested by the IT staff prior to operation.
Utilization of available resources	Desktop systems not currently in use can be warehoused and re-deployed to new requestors.
Properly designed, integrated, room-based systems	Removes the frustration of experiencing poor audio quality, bad lighting, missing cables, and inoperable systems. All room-based systems are installed after rooms have been renovated for best acoustic and visual quality. All systems are integrated into the infrastructure of the room so that cables and controls cannot be disconnected or lost.
Bandwidth planned and provisioned	Prior to installation, the IT group ensures that proper connectivity is available at the installation location. This ensures the best end-user experience by making sure that QoS and sufficient bandwidth is available.

IP/VC endpoints are available in two different systems:

- Desktop – Desktop IP/VC units are usually placed on an end-user desk. These standalone units typically have a screen that is approximately 8-inch by 8-inch in size with a built-in camera and microphone. A dial pad or remote control accompanies each unit. The unit usually requires an Ethernet connection and does not require a PC for connectivity or operation.
- Room-based systems – Room-based systems are often installed in existing conference rooms. These systems are implemented either as a portable cart-based system (a camera, microphone, and monitor mounted on a rolling cart), or as an integrated room system placed in a room specially designed for video conferencing operations. Cisco IT recommends that integrated room-based systems be implemented wherever possible. These types of systems, although more expensive, offer a much better quality experience and lower support costs. The rooms can be provisioned with the proper lighting and audio controls for a better hearing and viewing experience. The system components are often integrated into the room walls, thus hiding all the various cables and ensuring higher availability and lower support requirements.

Two suggested procurement processes can be implemented by an organization to support a central procurement environment for IP/VC endpoints. The first process is intended to support the procurement of desktop IP/VC endpoints (Figure 8 and Table 9).

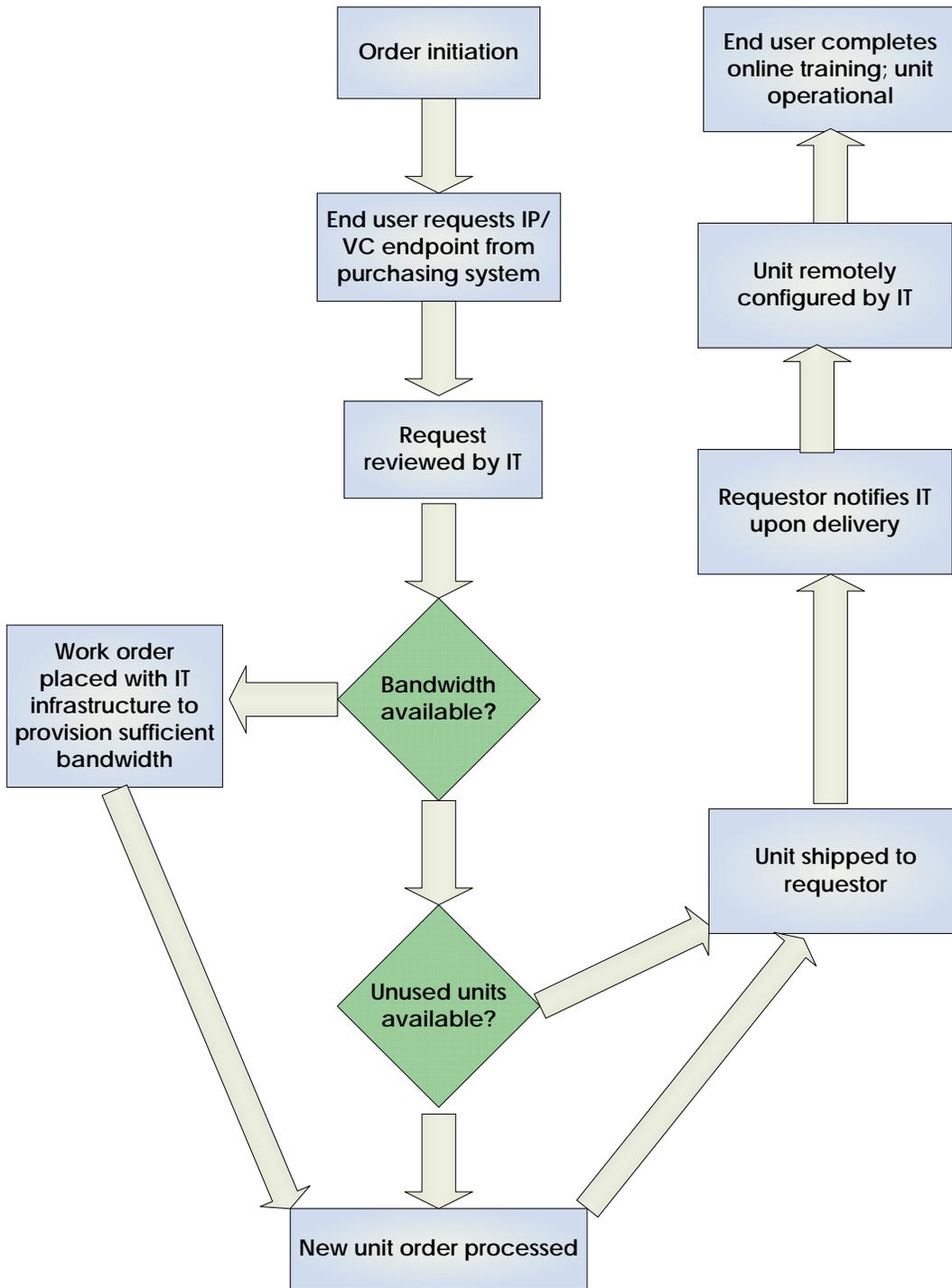


Figure 8. Procurement of desktop IP/VC endpoints

**Table 9.** Procurement Functions for Desktop IP/VC Endpoints

<b>Function</b>	<b>Description</b>
Initial request	End user makes the initial request for an IP/VC desktop system via the organization procurement tools. The user chooses from a list of endpoints supported by the IP/VC IT team.
Request reviewed by IP/VC IT group	The purchase request is automatically forwarded to the IP/VC IT group for review.
Bandwidth/network provisioning analysis	The IP/VC IT group checks the requestor's physical location to ensure availability of the minimum amount of bandwidth as well as other required network resources. If there are insufficient resources, a work order is created and forwarded to the infrastructure IT group and the order is held until the required work is completed.
Available IP/VC endpoints	The IP/VC IT group reviews the request and compares the request to available, unused equipment. If unused equipment is available, these units are installed at the new location instead of ordering new systems.
New unit order processed	If unused equipment is not available, the new equipment order is approved and processed by the organization purchasing department.
Unit shipped to requestor	The new unit is shipped directly to the requestor's location.
Requestor provides delivery notification	The requestor informs the IP/VC IT group when the new equipment arrives.
IP/VC endpoint remotely configured	The IP/VC IT group directs the requestor to plug the unit into the assigned Ethernet connection. The unit is then remotely accessed, configured, and tested by the IP/VC IT group.
End user completes orientation training	The end user is directed to and completes orientation training and begins using the new unit.

The following suggested procurement process (Figure 9 and Table 10) is intended to support the procurement of room-based IP/VC systems.

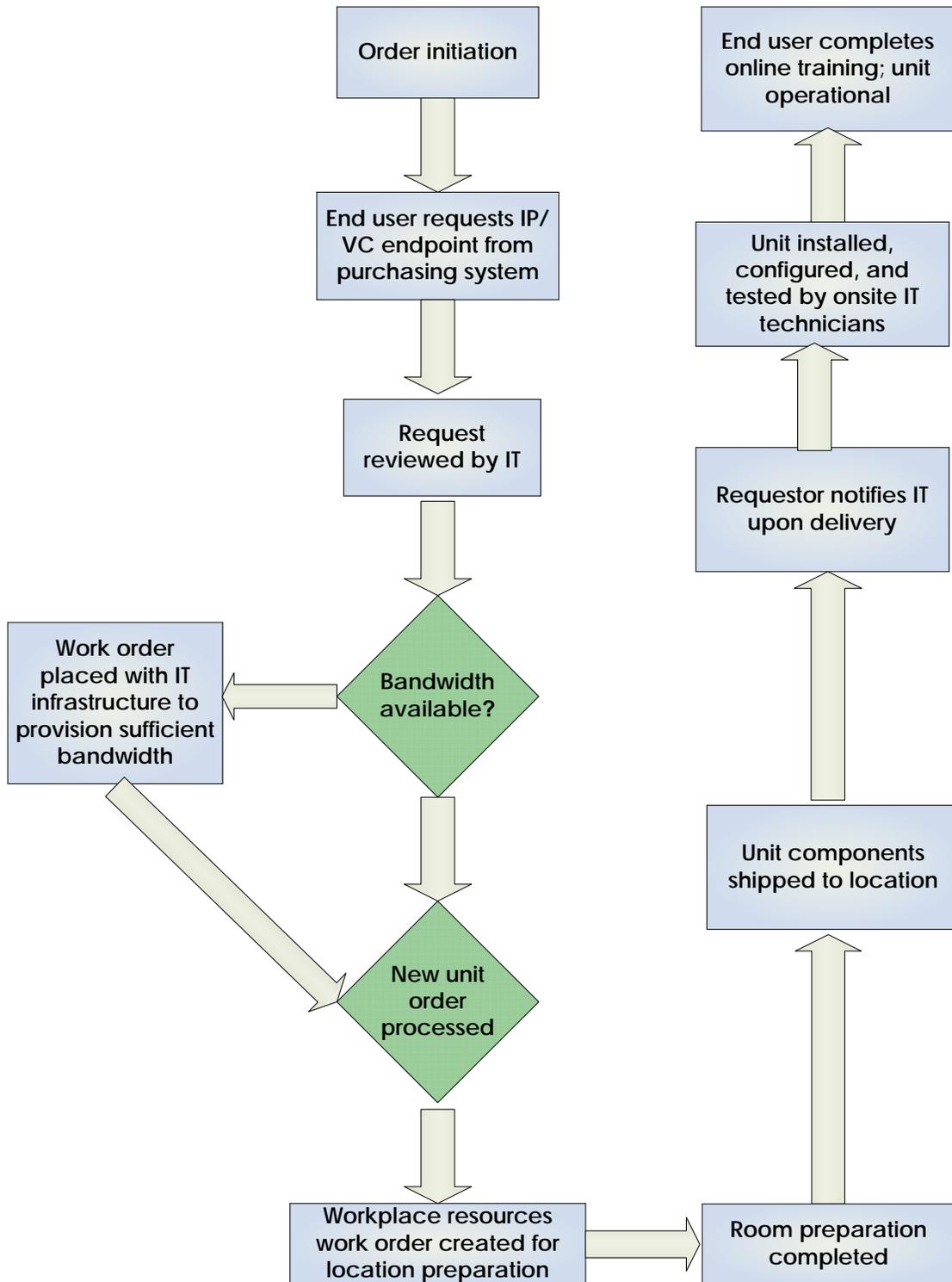


Figure 9. Procurement of room-based IP/VC systems

**Table 10.** Procurement Process for Room-Based IP/VC Systems

<b>Function</b>	<b>Description</b>
Initial request	End user makes the initial request for an IP/VC desktop system via the organization procurement tools. The user chooses from a list of systems supported by the IP/VC IT team.
Request reviewed by IP/VC IT group	The purchase request is automatically forwarded to the IP/VC IT group for review.
Bandwidth/network provisioning analysis	The IP/VC IT group checks the requestor's physical location to ensure availability of required bandwidth as well as other required network resources. If there are insufficient resources, a work order is created and forwarded to the infrastructure IT group and the order is held until the work is completed.
New unit order processed	The new equipment order is approved and processed by the organization purchasing department.
Workplace resource work order prepared	A work order to prepare the new location of the room-based system is prepared by the IP/VC IT group and forwarded to the facilities group. This work order provides details on the requirements for modifying the location for the best acoustical and visual experience as well as required modifications to support the built-in IP/VC components.
Room preparation completed	An onsite IT technician reviews the room preparation with a facilities representative to assure all requirements have been implemented.
Unit components shipped	The room-based components are shipped to the designated, onsite IT technician.
Room-based system installed, configured, and tested	The designated IT technician installs, configures, and tests all components based on the procedures provided by and with support from the IP/VC IT group.
Overview and usage training completed	The onsite IT technician provides an overview and usage tutorial to designated end users such as administrative assistants, who will be providing local support for day-to-day usage.

## Section 4: Facilities

A variety of IP/VC-equipped facilities are used throughout Cisco. With specially equipped carts that contain a monitor, speakers, and an IP/VC camera, almost any conference room can be used for IP/VC. In addition to portable or mobile resources, there are several permanent and specially designed IP/VC facilities within Cisco. These facilities are currently used mostly for executive communications. However, a deployment plan is currently underway to establish 20 additional IP/VC facilities throughout Cisco before the end of 2006. These facilities will be available for general employee use. This section includes details on the executive IP/VC facilities, which form a model for Cisco's follow-on facilities.

Executive communications is one of the primary and most compelling uses for video conferencing. The ability to conference face-to-face with another CEO, VP, or government official generates trust, confidence, and identity that goes far beyond what can be done with a phone call.

As technology (and network bandwidth) advances, the look and feel of IP/VC meetings approaches that of face-to-face meetings. Already, the immediacy and costs savings fully justify the use of this technology and the configuration of a special IP/VC facility to support virtual executive meetings.

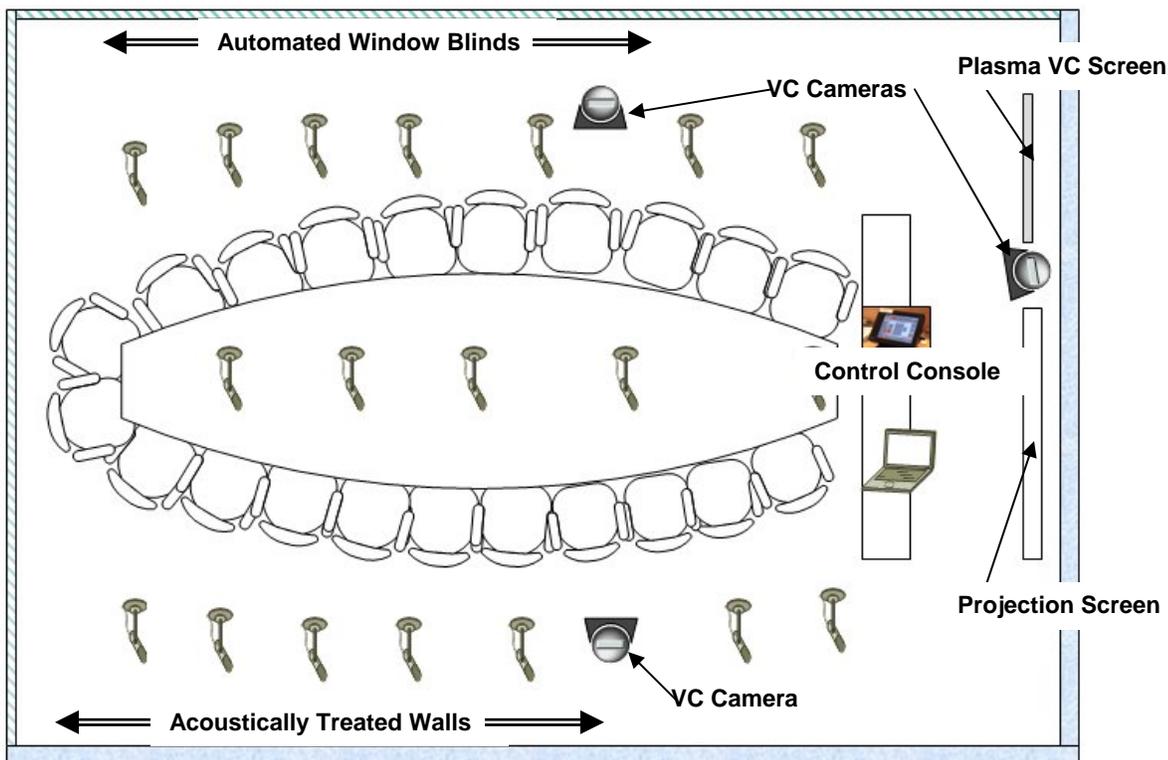


Figure 10. IP/VC Room Layout Diagram

### Room Layout

The Cisco Executive IP/VC facility uses a layout that is typical for executive-level meetings (Figure 10). The room-based IP/VC system is configured to enhance and support both video and audio quality. Additional lighting (Figure 11), acoustic enhancements, and AV support enhance the video conferencing experience at all locations in the room.

### Acoustics

The walls of the room are lined with an absorbent material that deadens the sound reflection qualities of the room.

### Automated Window Blinds

The overall room lighting can be further adjusted using remote-controlled vertical window blinds, shutting out natural outdoor light and reducing glare on the presentation screens when necessary. In addition, the adjustable blinds are lined with acoustical padding to further dampen noise. These blinds are controlled from the presenter's podium using a touch-screen panel (Figure 12).

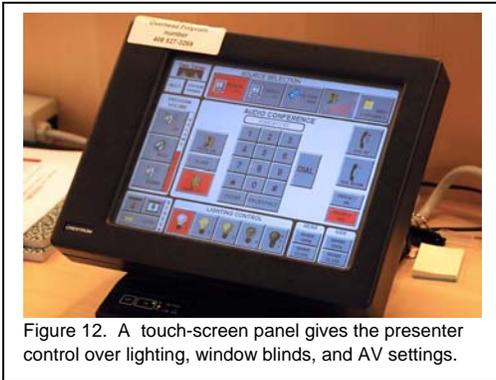


Figure 12. A touch-screen panel gives the presenter control over lighting, window blinds, and AV settings.



Figure 11. Special indirect color-balanced fluorescent lighting fixtures replace the standard fixtures for softer shadow-less light and enhanced video viewing.

### Audio

Microphones are hung in the ceiling and are pre-directed to provide audio coverage for every area of the room. A video conference call is initiated by dialing the designated MCU number or remote IP/VC-equipped conference room from the touch pad of the control console.

### Remote-Controlled VC Cameras

A total of three cameras are installed in the ceiling and front wall, and can be controlled from the presentation podium to capture video from any area of the room (Figure 13).

Normally the cameras will be programmed (pre-set pan, tilt, and zoom) before a meeting to show specific areas of the room to support that particular meeting. The camera shots can vary depending on the number of meeting participants in the room, and the communications requirements for the meeting.



Figure 13. Video conference cameras capture video of the participants and presentations.



## Video Conference

A large, plasma screen (Figure 14) mounted on the front wall enables everyone in the room to see the participants at the distant end of the conference, and/or to monitor the video being transmitted to the distant end.

## Presentation Projection Screen

PowerPoint slides and other presentation media are projected onto a large screen on the front wall. The video from this screen is also transmitted to the distant end of the video conference.

## Control Console

All the media and in-room controls (lighting, audio, window blinds, cameras, etc.) are combined into a single control point at the presentation podium. This touch-screen interface provides complete control of the conference at this end by the main speaker or presenter (Figure 15).

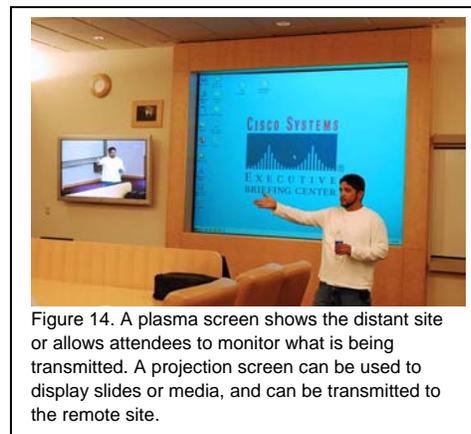


Figure 14. A plasma screen shows the distant site or allows attendees to monitor what is being transmitted. A projection screen can be used to display slides or media, and can be transmitted to the remote site.

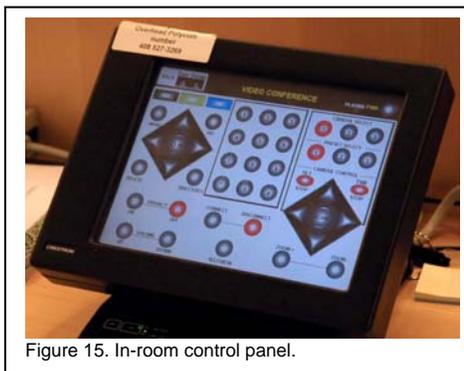


Figure 15. In-room control panel.

## Support Process

### Meeting Scheduling

Scheduling for the facility is handled by the Cisco Executive Briefing Center. Only specified types of meetings can be scheduled for this facility and only a limited number of people can schedule it.

### Meeting Support

Whenever the briefing center receives a valid request to schedule a video conference meeting, VC IT support is notified and a technician is scheduled for setup and testing of the equipment prior to the meeting, as well as monitoring the technical aspects during the actual meeting.

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