

How Cisco Deploys Video Telephony to Employee Desktops

Deployment of 30,000 video telephony cameras helps Cisco employees communicate more effectively.

Cisco IT Case Study / Video / Cisco Unified Video Advantage: Communicating with colleagues who are working in other locations is a daily activity for Cisco® employees. Although phone calls, e-mails, and instant messaging are used regularly, these methods cannot replicate the nuances of a face-to-face interaction. To improve the communication effectiveness, Cisco IT deployed Cisco Unified Video Advantage in the company's major offices. This solution improves employee productivity, provides a low-cost method for person-to-person videoconferencing, is easy to use, and requires minimal technical support. Cisco enterprise customers can draw on Cisco IT's real-world experience in this area to help support similar enterprise deployments.

“Cisco Unified Video Advantage is especially beneficial for employees who communicate regularly across different geographic areas because it builds stronger relationships than a voice call or e-mail alone.”

— Rob Gates, Project Manager, Cisco IT

BACKGROUND

In 2005, Cisco® IT conducted a pilot project to deploy Cisco Unified Video Advantage at selected company sites in Australia and New Zealand. The purpose of the pilot was to assess how this video telephony product would affect current network services and resources—primarily how it might affect WAN bandwidth and Cisco Unified CallManager resources, as well as the Cisco operational support organization.

Cisco IT was able to demonstrate that the company's network and support teams could support a global rollout of Cisco

Unified Video Advantage. As a result, Cisco IT is making video telephony available in all major Cisco offices worldwide as a communications option for employees.

CHALLENGE

The project to deploy Cisco Unified Video Advantage had two major objectives. The first was to deploy video telephony in all major Cisco sites that provided adequate infrastructure and network resources, and where there was sufficient user demand. Smaller sites would be eligible after their WAN links were upgraded to the bandwidth levels required to support video telephony.

The second objective was to integrate Cisco Unified Video Advantage with existing H.323 videoconferencing systems, including room-based options supported by Cisco IT. Integration included point-to-point video calls between a room-based videoconferencing system and an employee using Cisco Unified Video Advantage.

The deployment would also need to validate several business and technology assumptions about user adoption and network upgrades. The business assumptions included:

- Adding video to a phone call would improve the efficiency and effectiveness of the employee's communication.
- Video telephony would be accepted and adopted by employees for use in daily activities.
- Departmental managers would be willing to allocate budget funds for internal purchase of the required Cisco

Unified Video Advantage cameras.

- The technical assumptions included:
- The Cisco network infrastructure would support the increased bandwidth and quality of service (QoS) required by desktop video telephony.
- Cisco Unified CallManager resources would not be negatively affected by adding video to most enterprise voice calls.
- Internal support operations would be able to handle any increase in support cases caused by deploying Cisco Unified Video Advantage.

Additional Deployment Considerations

Cisco IT's network infrastructure for voice and video telephony is much more complex than is the case for most enterprises. For example, Cisco has deployed numerous Cisco Unified CallManager clusters for call handling worldwide. Given this complexity, Cisco IT considered several issues regarding the impact of video telephony traffic on the corporate network.

Processing video calls. Enabling video on Cisco Unified CallManager systems requires updates to both endpoint configuration and call-processing rules. Because Cisco uses multiple Cisco Unified CallManager clusters for handling calls, Cisco IT needed to help ensure that all video calls were routed on-net with the proper audio and video codec pairings. The associated tasks included updating Cisco Unified CallManager route patterns, regions, and device pools.

Call admission control (CAC). The project team evaluated each location to make certain that local CAC parameters matched the available bandwidth specified by the corporate standards for QoS across the WAN. Cisco IT also had to monitor and establish baselines for the Busy Hour Call Average (BHCA) across the WAN to provide adequate bandwidth availability for both voice and video calls.

Solution delivery and installation. With the deployment planned to serve almost 30,000 users worldwide, Cisco IT needed to resolve customs and shipping issues for the cameras, as well as leverage tools and communication that would simplify hardware and software installation for users.

SOLUTION

Nearly 30,000 Cisco Unified Video Advantage cameras were deployed to users in 50 major Cisco offices worldwide, encompassing approximately two-thirds of all Cisco employees. Video telephony was enabled on 13 internal Cisco Unified CallManager clusters globally.. (Figure 1)

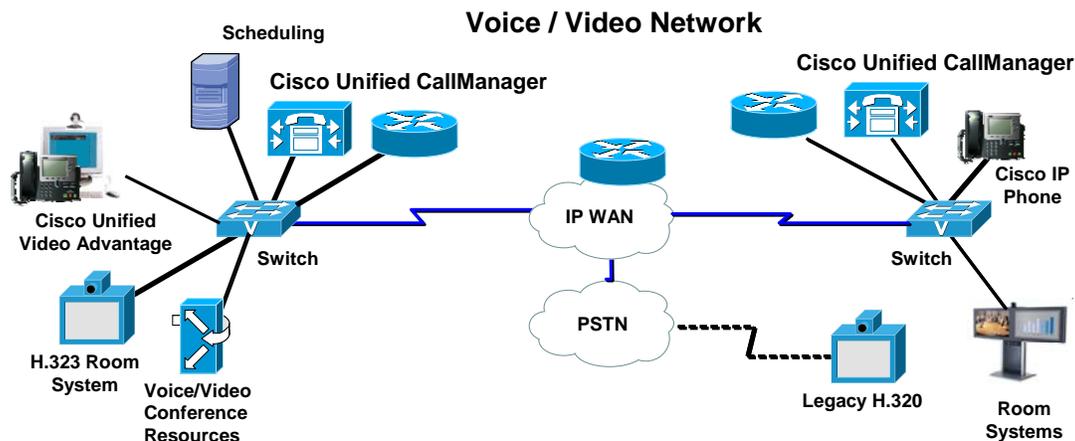
"Cisco Unified Video Advantage is especially beneficial for employees who communicate regularly across different geographic areas because it builds stronger relationships than a voice call or email alone," said Rob Gates, the project manager for Cisco IT.

Cisco Unified Video Advantage (formerly called Cisco VT Advantage) provides video telephony functionality to Cisco 7900 Series Unified IP phones. For users, this solution makes video telephony as simple as placing a voice phone call, because the video calls are processed by the same Cisco Unified CallManager system. (Figure 1)

The solution includes the Cisco Unified Video Advantage software and a Cisco VT Camera II, which is a USB camera specially designed for video telephony. With Cisco Unified Video Advantage, users make and receive point-to-point video calls, hearing the audio through a phone while the video stream is displayed on the PC. Administrators provision this solution as they would any other Cisco Unified IP phone.

After receiving the video camera, users simply connected it to a USB port on the PC and followed a simple procedure for installing the Cisco Unified Video Advantage software.

Figure 1. Cisco Unified CallManager processes all video calls, whether from a room-based videoconferencing system or an employee's desktop, with Cisco Unified Video Advantage.



WAN Bandwidth Requirements

To deliver video calls with acceptable quality, the WAN bandwidth must be adequate at each site. While the main Cisco campuses and other large sites had adequate bandwidth, most of the smaller field offices would require additional bandwidth for both the primary and secondary WAN circuits. The business decision to incur the expense of additional bandwidth was based on offering video telephony, telepresence support, and other capabilities at each site.

The required bandwidth was calculated using two factors:

- Adoption of video telephony by 100 percent of the local users.
- A first-call completion rate of 99 percent for video calls placed with Cisco Unified Video Advantage. This rate is significantly higher than the best-case scenario of ISDN-based conferencing, which typically has a call completion rate of 89 percent. Based on user feedback during the pilot project, the Cisco IT team learned that unless the call completion rate is at a consistently high level, user frustration would lead to lower adoption rates, reducing the benefits from the video telephony deployment.
- The WAN upgrade proved to be more complicated than simply adding bandwidth; it involved the following considerations:
 - If a WAN link is upgraded to support Cisco Unified Video Advantage, all additional capacity should be available for use by video calls.
 - The primary and secondary WAN links must have identical bandwidth to minimize service impact if one link fails.
 - Network planning must consider the variances in latency at each site. Video should experience one-way transit delay of less than 150 ms.
 - Other applications also place high-bandwidth traffic on the WAN, which makes it important to help ensure that neither voice nor video oversubscribe their allocated bandwidth.
 - Integration with Existing Systems and Dial Plans

Video telephony is unique because it offers call hold, call transfer, and other features that are not typically available in traditional H.323 video-conferencing systems. However, because users see it as another video device, they expect desktop video telephony to be compatible and interoperable with existing H.323 systems.

This compatibility requires integration of the telephony dial plan and the H.323 video-conferencing dial plan to allow dialing between Cisco Unified Video Advantage and H.323 video endpoints. Over the long term, the dial plan should

also enable a video bridge between Cisco Unified Video Advantage endpoints and Cisco Unified MeetingPlace systems for rich-media conferences.

The Cisco IT team determined that the dial-plan integration could be accomplished relatively quickly by updating the zone configuration on both the gatekeepers used by the video endpoints and the voice gatekeepers (i.e., the Cisco Unified CallManager clusters). Additionally, the team verified that a compatible G.711 audio codec could be negotiated whenever a call traversed the voice/video boundary.

Security Requirements

An analysis conducted by Cisco IT indicated that video telephony presented very little additional risk to the existing IP telephony infrastructure. In fact, several security enhancements would be realized by upgrading to a version of Cisco Unified CallManager that supported video telephony, including:

- Disabling gratuitous Address Resolution Protocol (ARP) to reduce the vulnerability of gateway spoofing.
- Disabling the PC port and network configuration screen on IP phones in public locations.
- Separating the video stream on a data virtual LAN (VLAN) and the audio stream on a voice VLAN.

Training and User Communications

A variety of communications strategies were applied to reach users with information about the Cisco Unified Video Advantage solution and the deployment plans. They included a series of e-mail and voicemail messages, articles in an internal Cisco IT newsletter, and information published on the Cisco IT Website.

Users received a printed, one-page reference card with their cameras. Web-based training was developed to help employees learn how to install the camera and Cisco Unified Video Advantage software, as well as place a video call and use other system features. Instructor-led training was offered to employees identified as “power” users. In addition to frequently placing video telephony calls, these individuals were highly visible and promoted the solution to other employees.

RESULTS

The Cisco Unified Advantage deployment yielded both near- and long-term results for Cisco.

- The investment in video telephony leveraged the existing Cisco IP telephony network and H.323 videoconferencing systems.
- Cisco employees gained a convenient, low-cost means for videoconferencing, which improves productivity and builds rapport through face-to-face communications.
- Video telephony enhanced internal communications for remote teams, as well as managers and their employees who work in different offices.

A significant result of the deployment project was the low number of technical support requests from users. The number of support cases opened per week during the initial deployment was less than half the number expected, and represented less than 1 percent of users. Most of these cases involved installation issues and were resolved by Tier 1 and Tier 2 support resources; fewer than 5 percent of the cases required escalation to the expert-level Tier 3. “The impact of video telephony on our support resources was very low compared to other technologies, especially considering the 30,000 units deployed,” says Rob Gates, Cisco IT project manager..

LESSONS LEARNED

Cisco IT offers the following lessons for other enterprises that are considering deploying desktop video solutions:

- Sites that support video traffic must define proper QoS for video-signaling bearer traffic in conjunction with CAC. Helping ensure that CAC and QoS policies are aligned is necessary for delivering video telephony

without adversely affecting the network or existing voice and data applications. This alignment is especially critical at smaller sites, which have less WAN bandwidth to allocate among all applications.

- To determine the appropriate WAN bandwidth, it is necessary to identify the BHCA for existing voice calls and then multiply that BHCA by the target adoption rate. However, this calculation should not consider the expected call completion rate for video calls as an attempt to reduce the projected bandwidth. Doing so will calculate inadequate bandwidth, which can negatively affect the user experience and lead to reduced user adoption levels.
- The legal and regulatory issues for video telephony should be identified in each country where the solution will be deployed. For example, some countries might not allow video calls to be transmitted internationally over an IP network.
- If multiple Cisco Unified CallManager systems are installed in different countries, changes to call routing to accommodate video telephony should be examined in each region to help ensure adherence to on-net vs. off-net national policies for calls.
- A quick reference card in multiple languages can encourage global user adoption.

NEXT STEPS

In 2007, Cisco IT expects to expand the Cisco Unified Video Advantage deployment with the following capabilities:

- Multipoint videoconferences in major sites, using Cisco MeetingPlace systems to connect multiple Cisco Unified Video Advantage users.
- Support for Cisco Unified Video Advantage in employees' homes with video enabled on the Cisco Enterprise Class Teleworker solution, which gives employees secure access to the Cisco VPN..
- Ability to use Cisco Unified Video Advantage with the Cisco IP Communicator softphone application, which is installed on employee laptops.

For more information about Cisco Unified Video Advantage solutions, visit:

www.cisco.com/en/US/products/sw/voicesw/ps5662/index.html. A detailed case study about the Cisco Unified Video Advantage pilot project is available at

http://www.cisco.com/web/about/ciscoatatwork/unified_comm/ip_videoconferencing_collaboration.html

FOR MORE INFORMATION

To read the entire case study or for additional Cisco IT case studies on a variety of business solutions, visit Cisco on Cisco: Inside Cisco IT www.cisco.com/go/ciscoit

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