

Empowering the UC Environment with Polycom's UltimateHD

A Next Generation Architecture for Integrating High Definition Videoconferencing into Unified Communications Deployments

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Defining Unified Communications

Wainhouse Research (WR) defines a unified communications (UC) system as a collaborative communications environment that includes elements of presence, instant messaging, telephony, audio conferencing, web or data collaboration, unified messaging (a common message store for voicemail, email, and faxes), mobility, and video conferencing all accessible in an ad hoc, multimodal fashion through a single client interface or within an embedded application interface.

Before the emergence of unified communications, people often were required to decide in advance which communications modality they wished to use (voice, mobile phone, email, IM, web, or video) and separate communications channels for each were established. Typically, these could not be changed or augmented while a meeting was in progress. The new unified communications paradigm allows users to start with any communications modality they choose, and then add any or all other communication methods as needed, seamlessly. Unified communications capabilities can also be integrated into nearly any business process or situation where human interaction or intervention is required.

WR strongly believes that presence is a fundamental enabler for a unified communications system. Presence gives status information about any of the communications or workflow tools a person may use, along with the person's working context. For example, telephone status information (on-hook, in a call, in a conference call, etc.) adds significant information about how people are working, and it complements and enhances a user's presence information based on calendar information, location services, or computer keyboard state. By knowing both device status and an individual's context, people are able to reduce human latency and more effectively reach out and communicate with the other people in their particular value chain. WR expects that presence will become the dial tone of the 21st century because it allows people to know when someone is available as well as how to best contact them.

UC System Features / Functions

The chart below highlights the common features offered by Unified Communications systems:



Figure 1: Features / Elements of Unified Communications

Presence – In many ways, presence is the cornerstone of the unified communications (UC) environment. In the UC world, presence includes the following areas:

- **Rich Presence** – provides an indication – updated automatically in real time - of a person's availability (offline, online and available, online and busy / in use, etc.). More robust systems integrate with telephony systems to indicate desk phone and mobile phone off / on hook status, as well as with calendaring programs to provide a user's working context (in a meeting, at a customer location, etc.). Some are even beginning to show a person's location using IP networking heuristics and/or from cellular phone location data residing in the mobile handset.
- **Capability** – provides an indication of the communication methods (IM / chat, audio, video, etc.) available to a person at a given moment

Many UC systems provide the above information for multiple devices. For example, a system may show that a person is currently using their desk phone, but is available to receive instant messages on their PC or cell phone.

Instant Messaging (IM) – The ability to send text messages between user devices in real time. Depending upon the offering, UC systems either include their own instant messaging engine or integrate with an existing enterprise IM solution. Some systems allow IMs to be exchanged between PCs and mobile phones and between PCs and desktop phones with graphical displays.

Telephony – The transfer / exchange of information – typically audio / voice related – between two parties using the telephone or similar device. Enterprises today can choose from traditional phone systems (TDM / circuit switched) and IP (packet switched) phone systems, and these can be premise-based PBXs or hosted telephony services offered in the cloud. The telephony functions within a UC system are basically the same as those found in a stand-alone phone system, with one exception ... shared presence. UC allows users to see other users' telephony availability via the UC interface / client. In addition, UC allows users to escalate communication sessions (e.g. from IM / chat to voice to video, etc.) without the need to disconnect and re-establish the connection.

Unified Messaging (UM) – The centralization of different types of electronic messages (voice mail, fax transmissions, email messages, etc.) under a single user interface accessible from a variety of devices (PC, telephone, mobile phone, etc.). Key UM features include text to speech conversion allowing users to listen to email messages over the phone, PC-based inbound and outbound faxing, the ability to create new or send existing voice mail messages as email attachments, and the ability to append and combine messages.

Audio Conferencing – A communication session that includes three or more audio-only (typically telephone based) participants.

Web / Data Conferencing – A communication session in which two or more computer users share computer data, typically the on-screen view of a particular application or of a user's desktop, in real time.

Video Conferencing – A communication session that includes two or more participants, each sharing both video images (typically camera signals) and sound signals (typically microphone / speech audio).

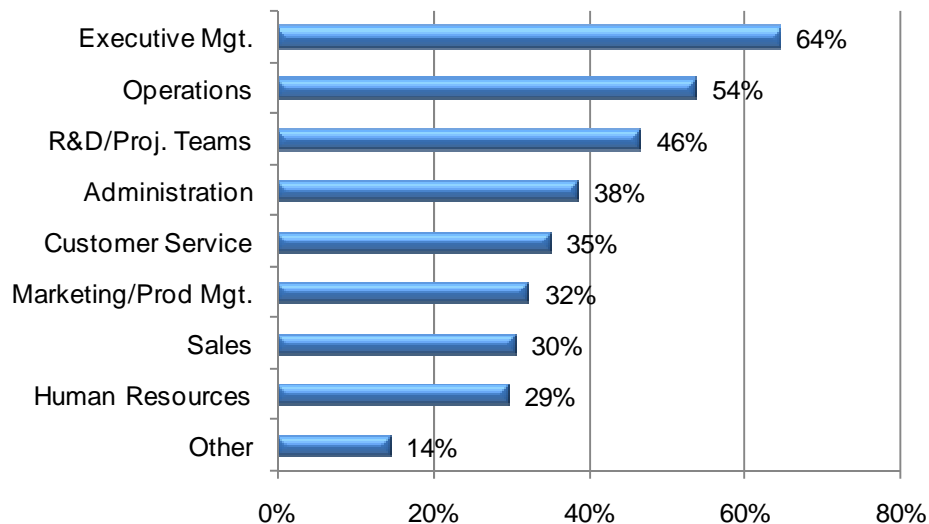
Mobility – Providing UC functionality (presence, IM, conferencing, etc.) to mobile workers, ensuring that these resources have access to the communication tools they depend on even while on the road (visiting other offices, clients, etc.) or working from home.

Many of the above elements have been available to and in use by enterprises for many years - either individually as a part of a multi-feature communications application (e.g. a conferencing system that includes audio, video, and web conferencing capabilities). Unified Communications, however, changes the story in four ways:

- 1) UC consolidates these typically discrete capabilities under a single user interface, maximizing both accessibility and usability.
- 2) UC enables the different features and applications to work together synergistically to provide greater value and utility. For example, UC allows the presence engine to automatically update a user's telephony availability status to "busy" when he picks up the phone.
- 3) UC can be embedded in line of business applications, giving people immediate access to any UC capability from within a known application, helping remove human latency from workflow processes and accelerating the business.
- 4) UC includes an integration of the back-end infrastructure, greatly simplifying global system management and administration and enabling high degrees of scalability.

Using UC in the Real World

WR recently polled UC technology end users about which groups in their companies enjoy the greatest benefit from their UC deployment. These results are shown in the figure below.



Source: Wainhouse Research, July 2008

Figure 2: User Groups Benefiting from UC

Not surprisingly, executive management receives the most benefit from UC. However, after executive management, those expected to see the most benefit are organizations internal to the company including operations, project teams, and administration.

The following examples highlight the benefits a unified communications environment can deliver:

Example 1: Urgent Client Issue

A customer service representative receives a call from a client asking for assistance with a purchase.

The Non-UC Environment:

In order to resolve the situation, the rep needs guidance from his manager, so he puts the client on hold and attempts to reach his manager as follows:

Step 1 – He calls his manager’s office phone and after five rings reaches voice mail. Because the client is still on hold, the employee does not leave a message.

Step 2 – He calls his manager’s cell phone, and once again gets voice mail. Once again he doesn’t leave a message.

Having failed to reach his manager, the rep informs the client that he will research the issue and call back as soon as possible. The rep then sends an email and leaves a voice mail on his manager’s office phone asking for help. In the end, the client’s issue was not resolved and the rep lost valuable time. When the manager returns to his office, he will lose time reading the email and listening to the voice mail, only to find that an important issue that could have been resolved immediately is still open.

The UC Environment:

In the UC environment, the rep uses the UC interface to locate the manager. He immediately sees that although his manager is not available for phone calls or instant messages at his desk, he is listed as available for IM conversations to his cell phone. With the client still on hold, the rep sends the manager a short text message regarding the situation.

Upon receiving the IM, the manager responds that he’s in a meeting but will step out for two minutes to talk to the client. The rep then uses his UC client to conference-in his manager on his cell phone. Two minutes later the client’s issue has been resolved and the manager has returned to his meeting.

In this case, the UC advantages include:

- Timely Interaction – the rep was able to contact the he person needed immediately, thus providing his client with timely information.
- Revenue Generation – deals can be lost due to slow response; in this example, a manager was able to learn of a pending deal, take a few minutes to facilitate it, and then return to his meeting.
- Greater Customer Satisfaction – the UC solution allowed the customer to gain immediate access to the information needed to make a product or service decision. Providing rapid information the first time generates customer satisfaction and loyalty.

Example 2: The Ad-Hoc Team Meeting

Two colleagues are IM'ing about an important and sensitive topic. After a few minutes they realize that this topic is too critical to cover via text chat, and that additional people need to be included.

The Non-UC Environment:

To keep things simple and avoid delays, the only viable option is an audio-only meeting (which provides a limited level of "connectedness" as shown in the graphic below). To launch the session, the meeting host sends all invitees, either by IM or email, the dial-in information to her meet-me audio bridge. If the session will include content sharing, she also launches a web conference session and sends the login information to the participants. A few minutes later the meeting begins.

The UC Environment:

Ad-hoc meetings in the UC world are quite different. First of all, the meeting host can launch the call quickly and easy via a few mouse clicks on her UC client. Participants simply have to accept the incoming meeting request / call to join the meeting. In addition, the UC system is aware of each participant's rich media capabilities (audio, video conference, web conference) and automatically leverages these capabilities to maximize the user experience. For example, this meeting might include four video / web conferencing users, three audio only / web conferencing users, and two audio-only users (one using his cell phone and another using his soft-client on his notebook from an airport lounge).

In this case, the UC advantages include:

- Simplicity and Convenience – the UC meeting was launched by dialing out to all participants, regardless of their location.
- Time Savings – the UC meeting was launched immediately, without having to wait for the participants to receive the dial-in details and join the session.
- Greater Impact – the UC meeting allowed video-enabled users to enjoy a high impact, face-to-face meeting experience and a much higher level of connectedness during the session.
- Accessibility - people using different devices, each with different capabilities, were able to participate in the meeting at the highest level their equipment would support.

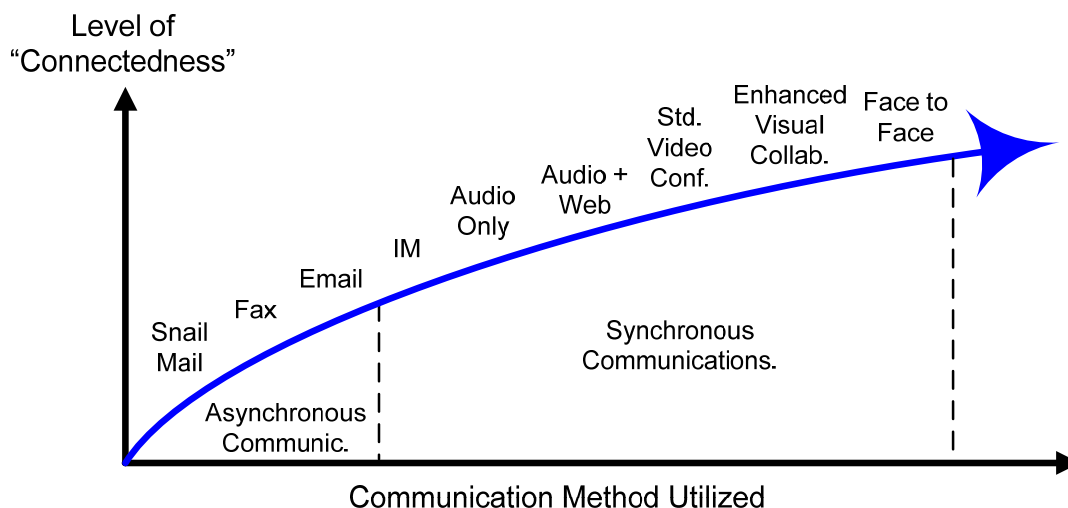
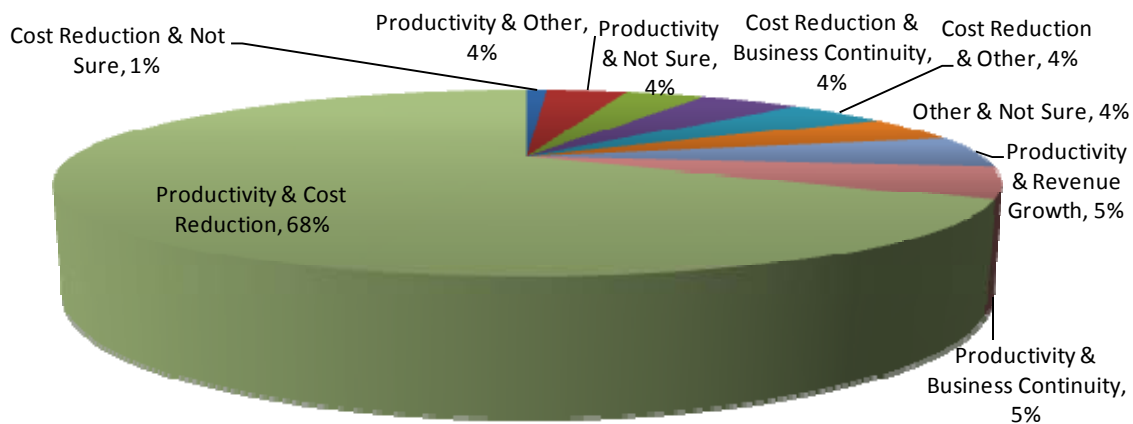


Figure 3: The Curve of Connectedness

UC Business Drivers and Strategic Importance

When asked about the top two business drivers behind their unified communications deployment, end users chose productivity and cost reduction overwhelmingly, as illustrated in the figure below.



Source: Wainhouse Research, July 2008

Figure 4: Key Unified Communications Business Drivers.

The bulleted list below highlights a number of ancillary drivers that are motivating organizations toward unified communications.

- The need to compete in today's challenging, global marketplace
- The need to make general communication / transfer of knowledge and information more convenient, effective, and affordable
- The need to support business 24 hours a day, 7 days a week, around the world
- The need to expedite business decisions
- The need to include a greater number of people in business meetings and decisions
- The need to reduce / eliminate delays in business processing
- The need to help employees deal with information overload
- The need to allow employees to focus on core business initiatives
- The need to protect workers from unnecessary interruptions
- The need to stay connected and strengthen relationships with partners and peers around the world and in different time zones
- The need to make key resources / subject matter experts more accessible to more people in real time (for project or client-related issues, disaster recovery / emergency situations, etc.)
- The need to support different employee work styles, preferences, and methodologies
- The need to decrease internal support expenses

- The need to make productivity / time-saving business tools (e.g. videoconferencing) readily available to a greater number of people
- The need to empower remote workers (teleworkers, road warriors, workers in small offices / branches) with the same communication opportunities afforded those in main offices
- The need to maximize the contribution and value provided by every employee
- The need to help new employees contribute as quickly as possible
- The need to provide business tools that support employee productivity and quality of life (and thus enhance employee retention)

Unified Communications (UC) is about making people and work teams more productive and accessible – no matter where they're located.

Summarizing the above reveals that unified communications is not about a particular capability or feature. It's about helping employees process work more quickly, easily, and conveniently. It's about making people, and work teams, more productive and accessible – no matter where they're located. In a world of increasing competition and a razor-sharp focus on the bottom line, UC is about helping employees spend as much of their time as possible working and producing instead of dealing with the complexities of global communication.

Polycom's UltimateHD

Instead of re-inventing the capabilities (presence, IM, mobility, etc.) already resident in the leading UC platforms, Polycom's UC tools – referred to collectively as its UltimateHD offerings – are designed to augment the visual collaboration capabilities within these systems.

UltimateHD Devices

Polycom's UltimateHD platform includes the following devices:

Video Endpoints - Polycom's HDX video systems support HD-video sessions using either H.323 (the communications protocol commonly used for group / room-based videoconferencing) or SIP, which allows these endpoints to participate in SIP-based communication sessions with UC clients.

Video Bridges - Polycom's RMX 2000 and RMX 1000 media conferencing platforms / video bridges enable organizations to conduct multipoint video meetings including a combination of three (or more) desktop, room, and even telepresence participants or locations. Depending upon the UC platform, launching an RMX-hosted multipoint video session requires only a few mouse-clicks.

Conferencing Application Servers - Polycom's RAS 200 application servers act as the interface between the Polycom video architecture and Alcatel's unified communications solutions.

UltimateHD Capabilities

Polycom's UltimateHD platform adds the following capabilities to a UC solution:¹

- Ability to include group videoconferencing systems within the UC environment
- Ability to publish presence information / availability (free busy) for video endpoints
- Ability to include group video systems in UC client address books / buddy lists (for viewing or presence / click-to-call)
- Access to Polycom's desktop videoconferencing client (depending upon UC system in use)
- Ability to host multi-point (3 or more endpoint / location) video meetings including:
 - Protocol, speed, and video resolution transcoding
 - Advanced screen layouts (voice activated switching, continuous presence)
- Support for mixed rich-media collaboration sessions including:
 - UC clients (audio, desktop video, content)
 - Group videoconferencing clients (e.g. Polycom HDX and VSX endpoints, H.320 systems, and third-party IP systems)
 - Telepresence systems (e.g. Polycom RMX and TPX)
 - Audio-only (telephone – POTS and VoIP clients)
- Support for HD resolution and wide-band audio during UC video sessions

Polycom's UltimateHD can add high performance video conferencing to nearly any UC environment. In the next section of this document, we will discuss how UltimateHD integrates with several such solutions: Avaya Communication Manager, Microsoft Office Communications Server 2007 (OCS), and Nortel Networks Multimedia Communications Server (MCS) 5100.

¹ The exact capabilities provided depend upon the UC solution and the specific Polycom equipment installed.

Unifying Your UC Environment with UltimateHD Video

Video is a key component in a unified communications environment. While not all UC users require video capability, those who do will require the ability to interoperate with group video conferencing units and occasionally with telepresence solutions. Polycom has created a platform of solutions that bridge the gap between most UC environments and Polycom's UltimateHD video. This integration allows UC client users to call and be called by a variety of Polycom endpoints and to participate in multipoint conferences with SIP, H.323, and H.320 video devices.

Microsoft Office Communications Server 2007 Integration with Polycom UltimateHD

Numerous companies considering a UC environment are turning to Microsoft Office Communications Server (OCS) 2007 as a potential solution. OCS provides many of the elements of a complete unified communications system, including audio and video capabilities. Between OCS-based components, Microsoft OCS endpoints use Microsoft's proprietary RT Audio and RT Video codecs; however, when integrating with third-party products, the OCS SIP stack also supports H.263 and G.711.

Polycom has worked closely with Microsoft, creating a series of IP phones, video endpoints, and conferencing bridges that integrate natively into an Office Communications Server environment as illustrated in the figure below (items with red labels are Polycom products).

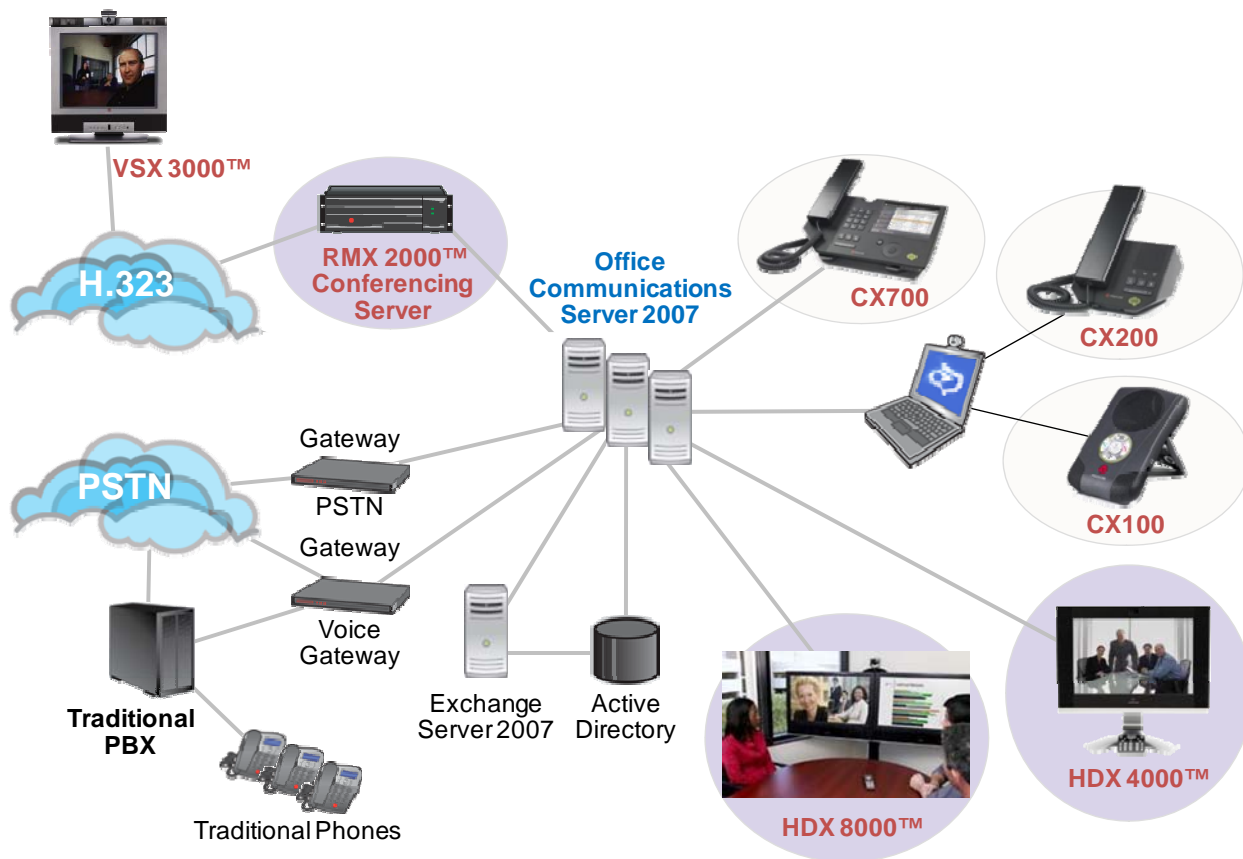


Figure 5: Polycom's Telephony and Video Integration with Office Communications Server 2007.

Telephony Integration

Polycom manufactures three telephony devices for use with Office Communications Server. The first of these is the CX 700, a desktop phone that runs a version of Microsoft Office Communicator (MOC) designed for a telephone handset. CX 700 users log into and authenticate with OCS using the same credentials they would use when logging in using the PC version of Office Communicator. The color display on this phone shows the same contact list one would see if using a PC, along with the current presence status of each individual. The CX 700 also supports Microsoft's wideband RT Audio codec, giving users of this phone full access to the high quality voice capabilities OCS provides.



In addition to the CX 700, Polycom has made two USB telephony devices for MOC clients. The first is the CX 200, a USB phone designed to replace a PC's headset and speakers. This USB phone has been tuned to provide Polycom's world class echo cancellation and noise suppression capabilities to Office Communicator users. It also gives people running the MOC client on their PC a handset to use when communicating using OCS, providing them with the familiar look and feel of a desk phone. Unlike the CX 700, the CX 200 must be plugged into the USB port on a PC, whereas the CX 700 operates independently with no reliance on the Office Communicator client running on a PC.



The third telephony device Polycom has made for OCS audio communications is the CX 100, a second USB audio device that runs in conjunction with the MOC client. The difference between this device and the CX 200 is that the CX 100 is like a portable personal speaker phone. Like its CX 200 cousin, the CX 100 has also provides echo cancellation and noise suppression capabilities.



Polycom UltimateHD Video Integration

Polycom's latest HDX video endpoint series and its line of RMX video bridges, integrate natively with Office Communications Server. This integration gives Microsoft Office Communicator (MOC) users two key capabilities they do not have with OCS out of the box:

1. MOC clients can call and be called by HDX video endpoints. This is important because it allows MOC clients to interact with group video conferencing units. HDX endpoints can register directly with Office Communications Server, and they can appear on the MOC buddy list as illustrated in the figure below. Initially, MOC-HDX communications will use H.263 video and G.711 audio. In a future release, HDX endpoints will be able to communicate with MOC clients using Microsoft's RT Audio and RT Video.
2. MOC clients can also participate in multipoint video meetings, including SIP and H.323 video users and telephone users, hosted on the RMX bridge. A key advantage is that in a Meet-Me meeting on the RMX, MOC clients receive a continuous presence (Hollywood Squares) video layout whereas in an OCS-only multipoint video conference the video is a full screen view of the last person / location to speak (a.k.a. voice activated switched mode).

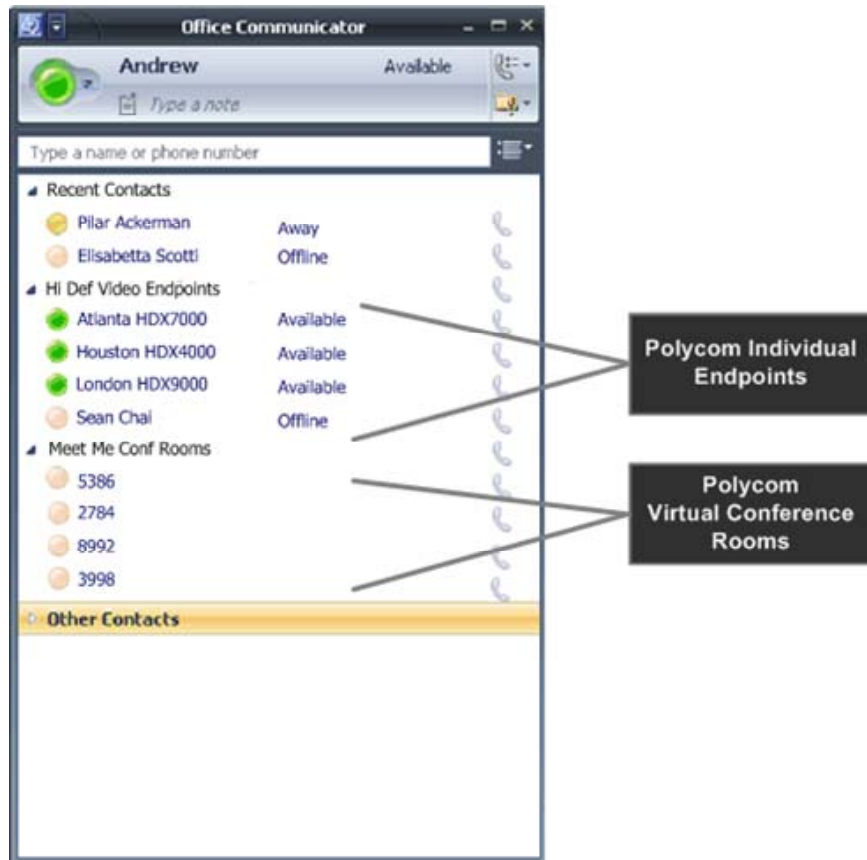


Figure 6: The OCS contact list showing HDX Video Units and RMX meet-me conference rooms

Enterprises should understand a few additional key points when integrating OCS 2007 with Polycom UltimateHD video. The first and possibly most important consideration, from an integration cost standpoint, is that HDX endpoints and RMX video bridges can integrate with OCS without requiring any additional licensing or software from either Microsoft or Polycom. Thus, if an enterprise rolls out OCS, it can immediately integrate with the Polycom UltimateHD system.

Second, a very useful capability for users with HDX 4000 executive video units (personal video appliances in a PC-display form factor) is that when the HDX user logs in to OCS using the same credentials used when launching the MOC client, simultaneous ringing is automatically enabled. This means that when HDX 4000 users are called, either by audio or video, both the MOC client and the HDX video unit ring, giving users a choice as to which device they can answer.

Polycom's video endpoints and RMX video bridges integrate natively via SIP and at no additional cost with Microsoft OCS.

One minor limitation is that point-to-point calls between MOC clients and HDX units cannot be escalated to multipoint calls automatically. For multipoint calling, users should dial out to a Meet-Me conference on the RMX bridge.

Nortel MCS 5100 Integration with Polycom UltimateHD

Integration between Polycom UltimateHD and Nortel's Multimedia Communications Server (MCS) 5100 is much different from the integrations with other UC solutions. In a Nortel / Polycom solution, connecting a video call is as easy as dialing a phone number, because it truly is just a phone call. The elegance of this integration stems from the fact that each Polycom video endpoint registers with the Nortel MCS 5100 SIP Server, making the endpoints operate just like any other phone or device within the UC environment. Consequently, Polycom video units support most of the mid-call controls (transfer, mute, forward, hold, etc.) that one would expect when using a telephone.

Nortel's MCS 5100 was one of the first UC environments developed, and it has evolved into a very robust unified communications platform. It provides a full suite of unified communications capabilities including presence (also phone presence), IM, audio, web, and SIP-based desktop video conferencing. It also integrates with Nortel's unified messaging system and it has full video softphone functionality. The MCS 5100 is PBX independent, but in practice it is usually integrated with one of Nortel's CS 1000, CS 2100, or BCM PBXs for telephony call control.

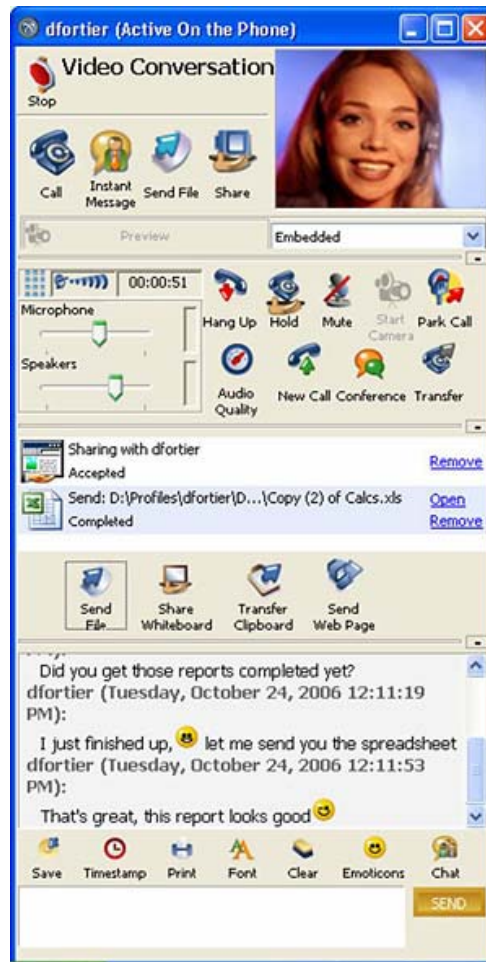


Figure 7: Nortel's MCS 5100 UC client interface.

Integrating a Polycom HDX video unit with the MCS 5100 unified communications environment is simple and straightforward. Nortel's MCS 5100 is SIP-based, and Nortel's PBXs are SIP-based call control servers. Since Polycom's HDX units also support SIP, these endpoints register directly with the MCS 5100, are assigned a telephone number, and can immediately participate in either voice or video calls with any Nortel phone, the MCS 5100 UC client, or any other registered SIP device.

Polycom RMX video bridges also register with the Nortel MCS 5100 to enable multipoint calling. Meet-Me video conferences, hosted on the bridge, are assigned phone numbers, and users dial into a video conference just like they would into an audio conference.

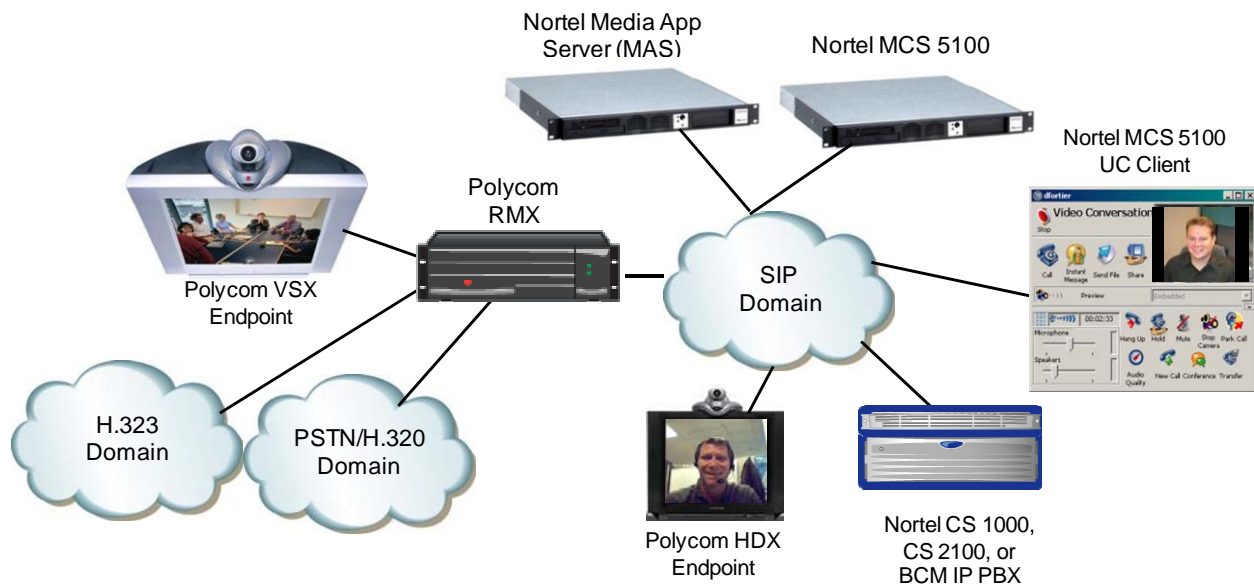


Figure 8: Components in a Polycom / Nortel MCS 5100 integrated video solution.

Enterprises should understand a few additional key points when integrating Nortel's MCS 5100 with Polycom UltimateHD video. The first is that the integration does not require additional software from either Polycom or Nortel: the HDX endpoints and RMX bridge support SIP, the Nortel components utilize SIP, and they are certified fully interoperable.

Second, anytime an HDX endpoint is involved in a multipoint call, bridging is handled by the Polycom RMX video bridge, and multiple parties, either HDX or MCS 5100 video clients, can easily be added. One use case caveat, however, is that the Nortel MCS 5100 also includes its own video bridge (labeled the Nortel Media App Server or MAS in the figure above). If three or more MCS 5100 desktop video clients join together in a multipoint call, the Nortel MAS bridge automatically handles the call. Once a call is anchored on the MAS, it cannot be rerouted to the RMX bridge, which means that the HDX user could not participate. Thus, the key in mixed HDX / MCS 5100 multipoint meetings is to have each user dial into a Meet-Me conference on the RMX.

Third, the Polycom / Nortel integrated solution lets telephone-only users join a call seamlessly. Since the PBX controls the call and media flow, telephone audio is sent to the RMX and mixed with the voice streams coming from the video participants.

Polycom's Ultimate HD integration with the Nortel MCS 5100 UC environment is elegant and simple to implement.

Polycom's UltimateHD integration with the Nortel MCS 5100 unified communications environment is elegant and simple to implement. MCS 5100 desktop video users can call HDX endpoints, and HDX endpoints can call MCS 5100 users just by dialing a phone number. Multipoint video is available through Meet-Me conferencing on the RMX bridge. Nortel's extensive call control and management capabilities are available to Polycom HDX video endpoints in this solution.

Avaya Communication Manager Integration with Polycom UltimateHD

Avaya is the poster child when it comes to integration with Polycom UltimateHD Video. The unique feature of this integration is that the Polycom video endpoints and multipoint bridges integrate natively with Avaya's PBX, known as Avaya Communication Manager. This works because Polycom VSX and HDX endpoints include a special H.323 stack built specifically for Avaya compatibility. Licenses for activating this special integration capability are available from Avaya or Avaya partners.

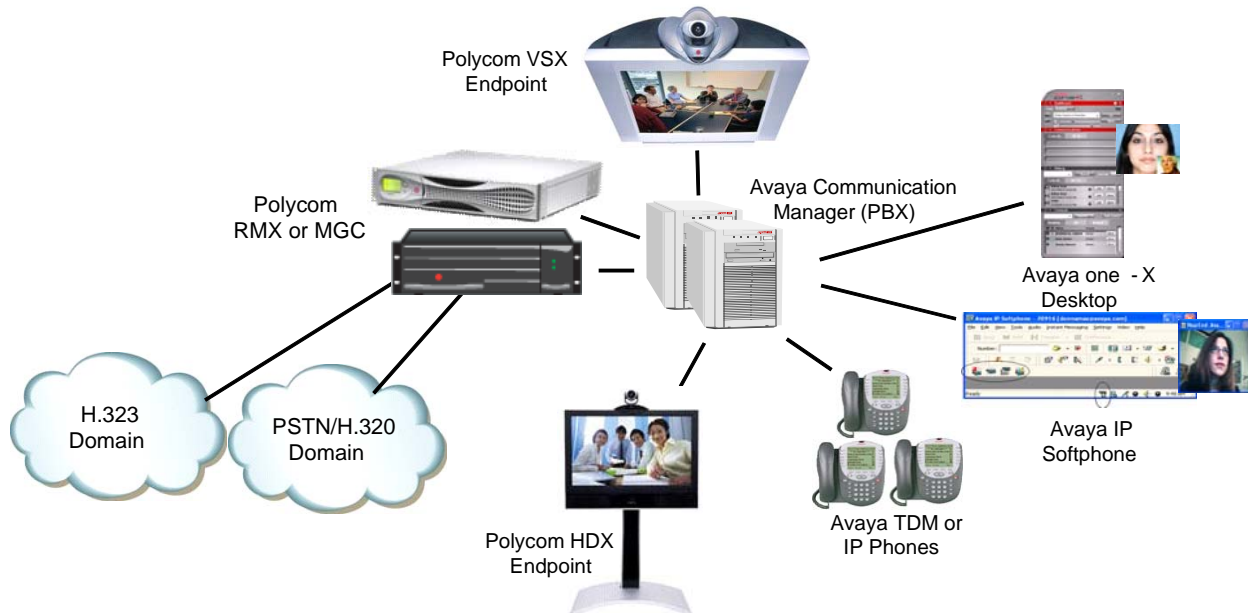


Figure 9: Polycom UltimateHD / Avaya Communication Manager integration architecture.

Because the Polycom endpoints integrate so tightly with Avaya's call control mechanism, video endpoints and multipoint conferences become extensions off the PBX. Hence, calling between video units is just like dialing between telephones. Furthermore, phones can dial video units, and video units can dial phones. Because all of these systems use the H.323 protocol, they interoperate seamlessly with one another. Video users may access mid-call controls – hold, transfer, forward, conference, mute, voice messaging, etc. – just like they would when using the telephone.

The Avaya Communication Manager can scale to one million endpoints, and its management tools enable video to scale right along with the phones. When integrated with an Avaya solution, Polycom video endpoints automatically utilize Avaya Communication Manager's bandwidth management capabilities. Consequently, LAN and WAN links can have bandwidth allocated to voice, video, and data, and Avaya Communication manager will assure that voice and video calls do not consume more than their specified share of the bandwidth. If a person tries to launch a video call when there is insufficient bandwidth, the person will receive a busy signal rather than degrading the voice and video quality for everyone using that particular WAN link. This is a significant benefit of a mixed Avaya / Polycom UC environment.

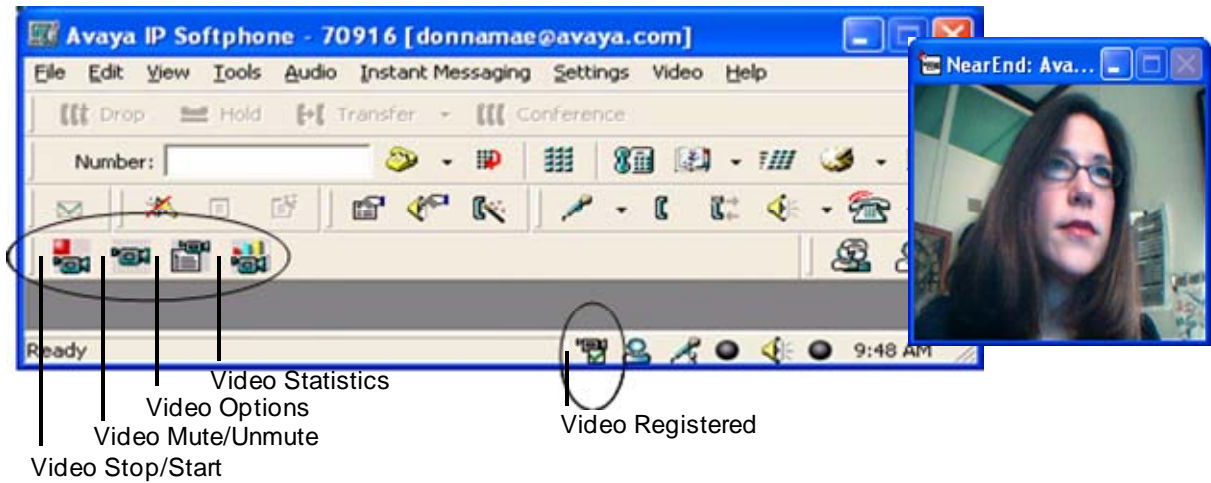


Figure 10: An Avaya IP Softphone with video powered by Polycom.

Avaya has two PC clients, the Avaya IP Softphone and the newer Avaya one-X Communicator desktop client, both have been programmed using the core video technology found in Polycom's PVX and CMA desktop video solutions. One of the nice features Avaya has built into these desktop clients is that a voice call can be launched first and then escalated to video. Avaya's Communication Manager automatically detects whether both parties are video enabled, and if so, a "video enabled" indicator is lit, which when clicked on launches the video call.



Figure 11: Avaya's one-X Communicator client supporting SIP, H.323, and Polycom-powered video.

Avaya has made multipoint video conferencing easy. Users simply add additional parties to any point-to-point audio or video call by pressing the conference button to put the first call on hold, dialing the additional party, and pressing the conference button again to join the calls together in a conference. The initial point-to-point video call is automatically transferred to a Polycom RMX video bridge where the multipoint call is established and bridged. Alternatively, multiple desktop clients and/or VSX or HDX video units can dial into a Meet-Me conference on the multipoint bridge. Audio-only callers participate in the multipoint sessions in exactly the same manner.

The Polycom endpoints integrate so tightly with Avaya's ... PBX, calling between video units is just like dialing between telephones.

Several other features make the Polycom / Avaya integration unique and useful. Since Polycom video endpoints behave just like phones, an executive's administrative assistant can answer an inbound call using the telephone. When the executive is ready to receive the call, it can be transferred to that executive's voice phone, a personal video system, or one of the video-enabled PC clients. If the executive needs to leave the office, he/she can seamlessly transfer the call to a mobile phone.

Another interesting aspect of this integration is the reality of a video-enabled contact center. Avaya's Communication Manager supports its contact center application; consequently, call centers can easily become video call centers. While this capability is not in huge demand today, video call centers have become a real niche market in certain areas of Asia and Europe.

Avaya/Polycom Integration with Microsoft OCS and IBM Lotus Sametime

Avaya's desktop clients, IP Softphone and one-X Communicator, can be easily and transparently integrated into the desktop solutions provided by IBM Lotus Sametime and Microsoft Office Communications Server.

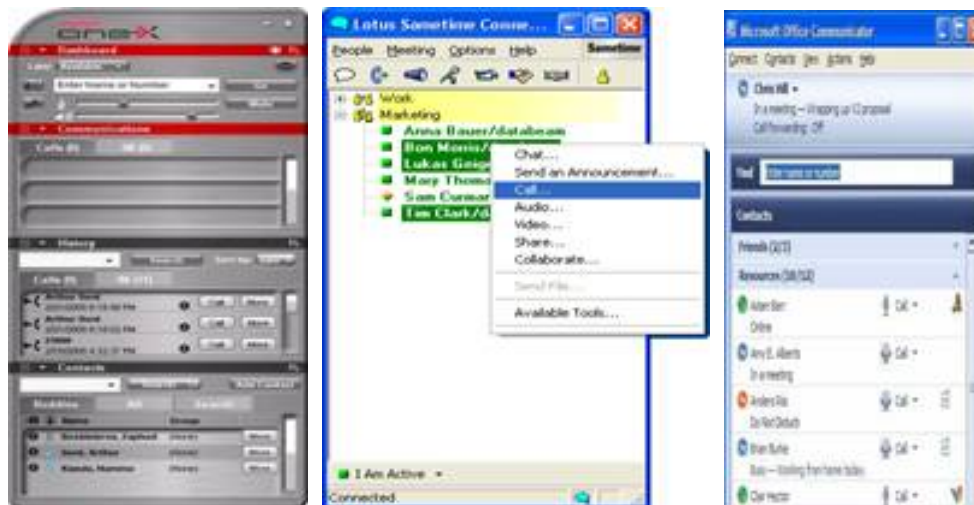


Figure 12: Avaya/Polycom video calls can be made from Sametime or OCS.

Using Avaya developed plug-ins for Sametime and OCS, Polycom's core PVX and CMA desktop video capabilities become immediately available to Sametime and OCS users. Because the voice and video traffic are still controlled by Avaya Communication Manager, video calls are still easy to make and all of the mid-call control functions remain accessible.

Microsoft and IBM users can elevate IM sessions to Avaya video calls by simply following the click-to-call interface of Microsoft Office Communicator or IBM Sametime. Users can take advantage of the robust ability of the Avaya/Polycom video solutions and still easily locate and contact people using corporate directories, Outlook contacts, and smart tags or buddy lists. In addition, they can tag key contacts so they know when they become available for an IM session or audio / video call.

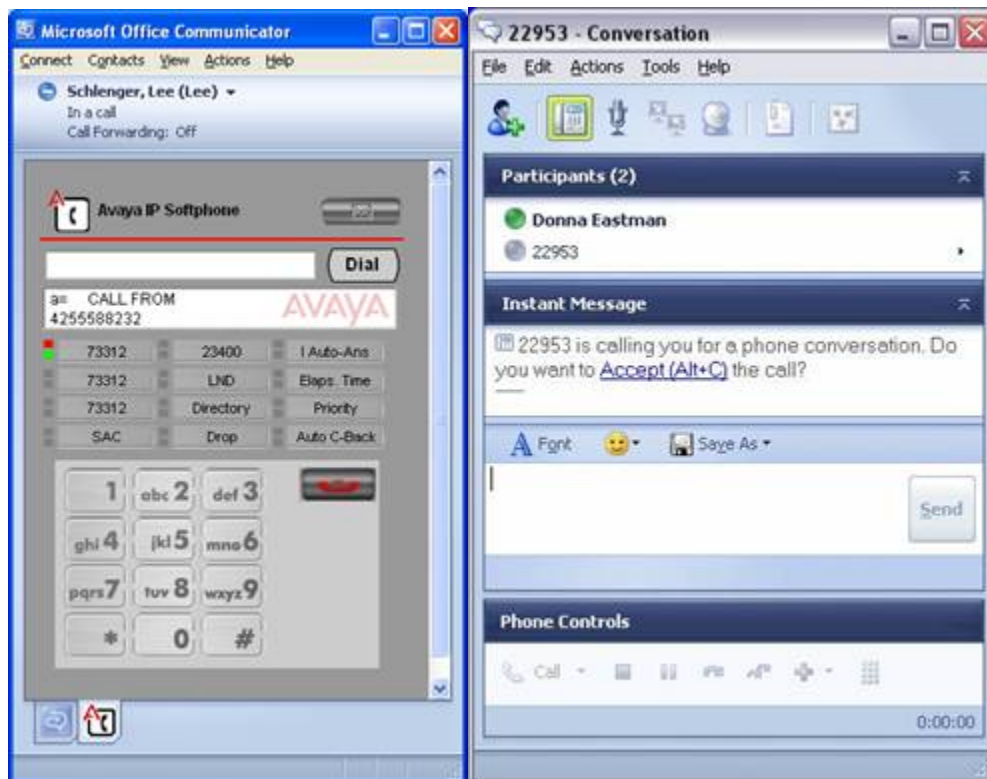


Figure 13: Avaya's OCS and Sametime integration enables Polycom video via click-to-call

Summary / Conclusion

Unified communications provides information workers with the communications tools, applications, and capabilities they need within a single user interface. Key features of a typical UC system include presence, IM / chat, telephony, web conferencing, unified messaging, and desktop videoconferencing. However, most currently available UC solutions offer only limited visual collaboration capabilities.

Polycom, a leader in the conferencing and collaboration space and the sponsor of this white paper, has designed its UltimateHD product line to integrate with and improve the video conferencing capabilities of leading UC platforms. This allows each communication component to do what it does best: the base UC platform provides an easy to use and highly scalable capability for presence, IM, click-to-call, etc., and the Polycom UltimateHD video technology provides high-quality (including HD resolution support) visual communications including internal (UC) users, group video systems, and external participants.

For organizations seeking to provide their global workforce with a complete UC solution that includes easy, convenient access to high quality videoconferencing, Polycom's Ultimate HD is worthy of serious consideration.

About Wainhouse Research

Wainhouse Research (www.wainhouse.com) is an independent market research firm that focuses on critical issues in rich media communications and conferencing. The company conducts multi-client and custom research studies, consults with end users on key implementation issues, publishes white papers and market statistics, and delivers public and private seminars as well as speaker presentations at industry group meetings. Wainhouse Research publishes Conferencing Markets & Strategies, a three-volume study that details the current market trends and major vendor strategies in the multimedia networking infrastructure, endpoints, and services markets, as well as a variety of segment reports, the free newsletter The Wainhouse Research Bulletin, and the PLATINUM (www.wrplatinum.com) content website.

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About Polycom

(Copy provided by Polycom)

Polycom, Inc. is the worldwide leader in unified collaborative communications (UCC) that maximize the efficiency and productivity of people and organizations by integrating the broadest array of high definition video, wired and wireless voice, and content solutions to deliver the ultimate collaborative experience. Polycom's high quality, standards-based conferencing and collaboration solutions are easy to deploy and manage, as well as intuitive to use. Supported by an open architecture, they integrate seamlessly with leading telephony, workplace wireless telephony, and presence-based networks. With its market-driving technologies, best-in-class products, alliance partnerships, and world-class service, Polycom is the smart choice for organizations seeking proven solutions and a competitive advantage from on-demand communications and collaboration. For additional information, call 800-POLYCOM or visit the Polycom web site at www.polycom.com.

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