Contents

About This Guide  .................................................. 1
   Required Skills .................................................. 1
   Polycom Solution Support Services .......................... 1

1 Polycom Visual Communications  ............................. 3
   Polycom-enabled Unified Communications .................. 4
      End User Advantages ........................................ 4
      System Administrator Advantages ........................ 4
   Polycom Conferencing for Microsoft Outlook ............... 5
      End User Advantages ........................................ 5
      System Administrator Advantages ........................ 5

2 Polycom Conferencing for Outlook ......................... 7
   Architecture .................................................... 7
   Polycom Conferencing for Outlook Scenarios .............. 8
      Set up a Video Meeting with Polycom RMX but no Polycom DMA System ........................................ 8
      Set up a Video Meeting with a Polycom DMA System .... 10
      Join a Meeting Using Polycom HDX System as the First User with a Polycom DMA System .................. 10
         Join a Meeting Using Polycom CMA Desktop from Microsoft Outlook 2007 ................................. 11
         Join a Meeting through Microsoft Office Communicator 2007 from Microsoft Outlook 2007 ............... 11
         Join a Meeting Using a non-Polycom Conferencing for Outlook Endpoint .................................. 12
         User Dials in Using Audio-Only Endpoint ................. 12
   Calendaring vs. Scheduling .................................... 13
      Polycom Scheduling Plugin .................................. 13
      Polycom Conferencing for Outlook ........................ 13
   Polycom Products for Polycom Conferencing for Outlook .... 15
   Microsoft Products for Polycom Conferencing for Outlook .. 16
   Polycom Conferencing Add-in for Outlook .................. 17
      Deployment considerations: ................................ 17
      tel: vs sip: URI Links ....................................... 17
      Polycom RMX Systems ...................................... 19
      Virtual Meeting Rooms ..................................... 19
3 Polycom-enabled Unified Communications ........... 27

Polycom Products that Enable Unified Communications ........ 28
Architecture ............................................. 29
Communication Protocols ................................ 31
H.323 and SIP (Dual Stack Environment) .................... 31
SIP Only ................................................... 31
Supporting Remote Users .................................. 31
Supporting Remote H.323 Users ............................. 33
Design Considerations ..................................... 33
Polycom RMX System ..................................... 33
Dialing Conventions ...................................... 33
Deployment Considerations: ................................ 34
Polycom HDX System ...................................... 34
Deployment Considerations: ................................ 34
Microsoft Office Communications Server 2007 .............. 35
Office Communications Server Mediation Role ............... 35
Microsoft Office Communications Server 2007 Directors .... 35
Microsoft Office Communicator ............................ 35
About This Guide

This guide describes design and architecture details of the Polycom Visual Communications solution with Microsoft products.


Required Skills

Deploying Polycom Visual Communications requires planning and elementary knowledge of video conferencing and video conferencing administration. Also, Polycom Visual Communications requires knowledge of the following third-party products:

- An external domain name server
- An external Microsoft SQL database server
- An external Microsoft Active Directory server
- An external Microsoft Exchange Server
- An external Microsoft Office Communications Server

Polycom Solution Support Services

Polycom Implementation and Maintenance services provide support for Polycom solution components only. Additional services for supported third-party Unified Communications (UC) environments integrated with Polycom solutions are available from Polycom Global Services, and its certified Partners, to help customers successfully design, deploy, optimize and manage Polycom visual communication within their third-party UC environments. UC Professional Services for Microsoft Integration is mandatory for Polycom Conferencing for Microsoft Outlook and Microsoft Office Communications Server integrations.
Please see http://www.polycom.com/services/professional_services/index.html or contact your local Polycom representative for more information.
The Polycom® Visual Communications experience is enabled by an integrated suite of Polycom hardware devices and software applications that allow you to integrate high-quality video and audio conferencing across Microsoft® platforms.

Polycom Visual Communications includes the following integrations:

- **Polycom-enabled Unified Communications** which allows you to integrate the Microsoft Office Communications Server infrastructure for presence-based real-time instant messaging (IM), voice, video, and data communications.

- **Polycom Conferencing for Microsoft Outlook** offers an integrated and enhanced calendaring experience for both Polycom and Microsoft endpoints.
Polycom-enabled Unified Communications

Polycom-enabled unified communications allows you to integrate your Polycom video conferencing infrastructure and Polycom endpoints with Office Communications Server to provide seamless video conferencing functionality for Office Communicator users.

With Polycom-enabled unified communications, the Office Communications Server manages presence for each registered Polycom component and allows full-featured video calls between Office Communicator clients and Polycom components. This includes both point-to-point calls and video conferencing, high-quality video, and calling directly from a contact lists.

Polycom devices connect to Office Communications Server using session initiation protocol (SIP).

End User Advantages

For end-users, this solution makes it simple to:

- Launch video calls from Office Communicator clients by clicking links included in meeting invitations provided by the Polycom Conferencing for Outlook Add-in.
- Use a contact list in Microsoft Outlook or Sharepoint to initiate video calls to Polycom endpoints (Polycom components, the Exchange or Sharepoint server must have been provisioned with Office Communications Server).
- Integrate Office Communicator users into a Polycom HDX favorites list and call them directly from the list.
- Take advantage of the enhanced presence features of Office Communications Server in a Polycom infrastructure environment.
- Call a Microsoft Office Communicator user with a Companion Mode Polycom HDX system registered to the same Microsoft Office Communications Server account. The call rings at both devices (call forking), and the recipient can answer using either device.

System Administrator Advantages

For system administrators, this solution makes it easier to:

- Provide logistical support for large scale deployment of Polycom HDX systems in an Office Communications Server environment. The Polycom CMA system provisions the Office Communications Server integration and Polycom Conferencing for Outlook settings, while the Polycom DMA system provides scalable, fault-tolerant multipoint conferencing.
- Use Polycom’s SIP expertise to integrate Office Communicator clients with your Polycom video network and endpoints in a way that requires a minimum of network administration and maintenance.
Polycom Conferencing for Microsoft Outlook

Polycom Conferencing for Outlook is designed to leverage Microsoft Exchange Server 2007 and Microsoft Outlook 2007 client to make organizing and participating in a video meetings easier and more productive.

With Polycom Conferencing for Outlook, users can now organize video meetings within the same familiar workflow as is used to create meetings in Microsoft Outlook. The Polycom Conferencing for Outlook Add-in enables users to create video meetings, mark them for recording, and even password protect meetings with a few clicks.

End User Advantages

- Users can easily add video to meetings as well as ensure a meeting is recorded, without the direct help of IT or a video conferencing administrator. Joining video conferences is done with a single-click from an Outlook calendar entry.
- It allows meeting participants to track their video- and audio-enabled meetings on the same calendar that they track their other meetings.
- It also allows meeting participants to simply click a link in a calendar entry to join conferences on their associated video or audio endpoint system.
- Makes real-time calendar information available for Polycom HDX endpoints. Creates “smart rooms” that automatically display meeting details so users immediately know they are in the right video conference.
- Incorporates virtual meeting rooms (VMRs) that ensure a reliable experience for end users. End users connect to unique VMRs instead of re-usable video bridge numbers. With unique VMR numbers, end users End users with be in the right meeting at the right time and not be interrupted by overlapping meetings.

System Administrator Advantages

- Allows IT departments and video administrators/operators to offer users a simple, familiar procedure for scheduling video- and audio-enabled meetings, which requires less IT support.
- Maximizes the use of visual communication assets and their return on investment (ROI).
- Polycom Conferencing for Outlook allows IT to easily deploy a scalable video infrastructure into an existing Exchange environment.
Polycom Conferencing for Outlook

Polycom Conferencing for Outlook is designed to leverage Microsoft Exchange Server and Microsoft Outlook clients to make organizing and participating in a video meeting easier and more productive.

With Polycom Conferencing for Outlook, users can organize video meetings within the same familiar workflow as is used to create meetings in Microsoft Outlook. The Polycom Conferencing for Outlook Add-in enables users to create video meetings, mark them for recording, and even password protect meetings with a few clicks.

Architecture

Figure 2-1 presents the basic network architecture of Polycom Conferencing for Outlook. This reference architecture includes the supported Polycom components. Deployment and design details for each of these components are detailed in this chapter.

Your deployment can also include Polycom-enabled unified communications which provides an integration with Microsoft Office Communications Server, see Figure 3-2 on page 32.
Figure 2-1  Architectural Components of Polycom Conferencing for Outlook.

Polycom Conferencing for Outlook Scenarios

This section provides some example scenarios for Polycom Conferencing for Outlook.

Set up a Video Meeting with Polycom RMX but no Polycom DMA System

1. User opens the Polycom Conferencing Add-in for Outlook and creates a new meeting.
2. The Polycom Conferencing Add-in for Outlook generates a new random Virtual Meeting Room (VMR) identifier.
3. Polycom Conferencing Add-in for Outlook connects to Microsoft Exchange 2007 and sets up the meeting.
4. Microsoft Exchange 2007 sends meeting invites to users and room accounts that the creator selected. Exchange also sends an invite to the Polycom RMX.
5. Participants accept, reject, or ignore the meeting invitation.
The Polycom RMX system uses Exchange Web Services (EWS) to check the meeting request and compares the VMR to existing meetings. If the VMR is unique, it sends Exchange an accept message. If the meeting identifier is a duplicate it sends a reject message.
Set up a Video Meeting with a Polycom DMA System

This scenario assumes your deployment includes a Polycom DMA system.

To set up a video conference:

1. User opens the Polycom Conferencing Add-in for Outlook and creates a new meeting.
2. The Polycom Conferencing Add-in for Outlook generates a new random Virtual Meeting Room (VMR) identifier.
3. The Polycom Conferencing Add-in for Outlook connects to Microsoft Exchange and sets up the meeting.
4. Microsoft Exchange sends meeting invites to users and room accounts that the meeting organizer selected. Exchange also sends an invite to the Polycom DMA system.
5. The participants accept, reject, or ignore the meeting invitation.
6. The Polycom DMA system uses Exchange Web Services (EWS) to check the meeting request and compare the VMR to existing meetings. If the meeting is unique it sends Exchange an accept message. If the meeting is a duplicate it sends a reject message.

Join a Meeting Using Polycom HDX System as the First User with a Polycom DMA System

This scenario assumes your deployment includes all Polycom Visual Communications solution products.

To join a meeting using a Polycom HDX system (first participant):

1. The Polycom HDX system connects to Microsoft Exchange 2007 to check for changes to the user's calendar.
2. When the meeting is about to start a reminder popup alert is brought up on the Polycom HDX system screen.
3. The user can join the meeting from the reminder popup alert or from the Calendar screen on the Polycom HDX system.
4. When the user tells the Polycom HDX system to join the meeting, the Polycom HDX system contacts the Polycom DMA system.
5. The Polycom DMA system instructs a Polycom RMX system to start the calendared meeting and directs the connected endpoints to the Polycom RMX system.
6. The Polycom RMX system contacts Exchange to gather the meeting details.
7 If a Polycom RSS is available and the meeting creator set the meeting to record then the Polycom RMX system contacts the RSS to start recording. The RSS then joins the meeting.

8 The Polycom RMX system displays the Gathering Phase screen to all meeting participants after which the main meeting starts.

**Join a Meeting Using Polycom CMA Desktop from Microsoft Outlook 2007**

This scenario assumes your deployment includes a Polycom CMA system and CMA Desktop clients.

**To join a meeting using CMA Desktop:**

1 When the user clicks the **Join the meeting using Polycom CMA Desktop** link to join the meeting, the Polycom CMA Desktop client contacts the Polycom DMA system to join the meeting.

2 The Polycom DMA system directs the Polycom CMA Desktop client to the Polycom RMX system hosting the meeting.

3 The Polycom RMX system sends the current meeting view (either the Gathering Phase or the meeting in progress) to the Polycom CMA Desktop client which displays it to the user.

**Join a Meeting through Microsoft Office Communicator 2007 from Microsoft Outlook 2007**

This scenario assumes you are using Polycom-enabled Unified Communications with Office Communications Server, see “Polycom-enabled Unified Communications” on page 27.

**To join a video meeting through Office Communicator:**

1 When the user clicks the **Join the meeting using Microsoft Office Communicator** link to join the meeting, the Office Communicator client contacts the Polycom DMA system to join the meeting.

2 The Polycom DMA system directs Office Communicator to the Polycom RMX system hosting the meeting.

3 The Polycom RMX system sends the current meeting view (either the Gathering Phase or the meeting in progress) to the Office Communicator which displays it to the user.
Join a Meeting Using a non-Polycom Conferencing for Outlook Endpoint

This scenario assumes you are using a non-Polycom Conferencing for Outlook endpoint.

To join a meeting using a non-Polycom video endpoint:

1. The user views the meeting details listed in the meeting invitation. The meeting details include the meeting number and password (if required by the creator).
2. The user manually dials the meeting number on the endpoint which contacts the Polycom DMA system to join the meeting.
3. The Polycom DMA system directs the endpoint to the Polycom RMX system hosting the meeting.
4. The Polycom RMX system sends the current meeting view (either the Gathering Phase or the meeting in progress) to the endpoint which displays it to the user.

User Dials in Using Audio-Only Endpoint

To dial into a conference using an audio-only endpoint:

1. The user checks the meeting’s details that they received.
2. The user uses their endpoint to manually dial into the audio gateway.
3. The gateway sets up a connection with the Polycom DMA system to join the meeting.
4. The Polycom DMA system directs the gateway to the Polycom RMX system hosting the meeting.
5. The Polycom RMX system joins the gateway to the meeting and sends the audio to the gateway which sends the audio to the audio endpoint.
Calendaring vs. Scheduling

Polycom offers the Polycom Scheduling Plug-in for Microsoft Outlook and the Polycom Conferencing Add-in for Microsoft Outlook. Both applications allow Outlook users to create meeting invitations to Polycom conferences.

Polycom does not support using both the Polycom Scheduling Plug-in for Microsoft Outlook and the Polycom Conferencing Add-in for Microsoft Outlook on the same client system.

Polycom Scheduling Plugin

The Polycom Scheduling Plugin requires the Polycom CMA system and reserves conferencing resources through the Polycom CMA system. Scheduling involves allocating resources and guaranteeing they are available for a scheduled meeting. Scheduling has advantages and disadvantages.

Advantages:

• Tightly controlled resources. Once all available resources are allocated to meetings, no more meetings can be created for that resource.

• Users are guaranteed their resources are available.

Disadvantages:

• Scheduling delays can occur because few users are permitted to schedule video meetings and other users must contact a video scheduler in order to create a video meeting.

• Additional administration is required for both the video scheduler and IT.

• Users need to remember conference bridge numbers and generally require additional IT support which can make video conferencing intimidating and hurt utilization.

Polycom Conferencing for Outlook

The Polycom Conferencing Add-in for Outlook does not require the Polycom CMA system. It uses ad-hoc conferencing and does not reserve conferencing resources.

Advantages

• Users have the freedom to create video meetings ad-hoc, using a familiar workflow.

• Join the meeting by clicking a link within an Outlook meeting invitation, using either the Polycom CMA Desktop client or Microsoft Office Communicator (depending on your enterprise’s configuration).

• Click a link to view a recording of the meeting later or a stream of the meeting in real time (if recording and streaming are available).
• Meeting organizer is able to choose to record a video meeting.
• Video / audio dial-in information is automatically added to the meeting invitation.
• Meeting organizer is able to choose to protect a video meeting with a password, including a conference password and chairperson password.

Disadvantages
• Because resources are not reserved and allocated, it is possible to overcommit video resources.
## Polycom Products for Polycom Conferencing for Outlook

The following table describes the Polycom products that support or enhance Polycom Conferencing for Outlook.

<table>
<thead>
<tr>
<th>System</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polycom HDX systems</td>
<td>v2.6.1</td>
<td>Monitor the Microsoft Exchange calendar of the configured account and display on-screen notifications of meetings. Users can join meetings via these notifications.</td>
</tr>
<tr>
<td>Polycom RMX 2000 or 4000 systems</td>
<td>v7.0</td>
<td>Monitors the Exchange mailbox for the Polycom Conferencing service and hosts Polycom Conferencing for Outlook conferences. Displays meeting information at the start of a meeting.</td>
</tr>
<tr>
<td>Polycom Conferencing Add-in for Outlook</td>
<td>v1.0.2</td>
<td>Allows Outlook users to schedule meetings that include video, audio, and recording. Allows invitees to join a video-enabled meeting by clicking a link.</td>
</tr>
<tr>
<td>Polycom CMA 4000 or 5000 system</td>
<td>v5.0 with patch 500100610</td>
<td>Available on the Polycom CMA Technical Support site under Previous Polycom CMA Downloads and Documentation. Provisions Polycom HDX systems for Polycom Conferencing for Outlook functionality and routes H.323 calls to the appropriate Polycom RMX or DMA system.</td>
</tr>
<tr>
<td>Polycom CMA Desktop</td>
<td>v5.0</td>
<td>Allows users to join video-enabled meetings by clicking a link in a meeting invitation.</td>
</tr>
<tr>
<td>Polycom DMA 7000 system</td>
<td>v2.0.0 with SP3</td>
<td>Monitors the Exchange mailbox for the Polycom Conferencing service and determines the appropriate Polycom RMX system to host a given Polycom Conferencing for Outlook conference.</td>
</tr>
<tr>
<td>Polycom RSS 4000 system</td>
<td>v6.0</td>
<td>Via a connection from the Polycom RMX system, records Polycom Conferencing for Outlook conferences in H.323 format when selected in the Polycom Conferencing Add-in.</td>
</tr>
<tr>
<td>Polycom VBP-S/T system</td>
<td>v9.1.5.1</td>
<td>Enables H.323 Polycom HDX systems to support Polycom Conferencing for Outlook in a remote small office/home office (SOHO) network.</td>
</tr>
</tbody>
</table>
## Microsoft Products for Polycom Conferencing for Outlook

The following Microsoft product versions support Polycom Conferencing for Outlook in this release.

<table>
<thead>
<tr>
<th>System</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Active Directory</td>
<td>2003 or 2008</td>
<td>Enables account logins and integrates with Microsoft Exchange. Note that Polycom products currently support only a single-forest Active Directory deployment.</td>
</tr>
<tr>
<td>Microsoft Exchange</td>
<td>2007 with SP2 with Update Rollup 4</td>
<td>Hosts mailboxes and calendars. SP1 is required for the ‘Manage Full Access Permissions’ function. Exchange Web Services must be enabled.</td>
</tr>
<tr>
<td></td>
<td>2010 with Update Rollup 3</td>
<td></td>
</tr>
<tr>
<td>Microsoft Outlook</td>
<td>2007 with SP2</td>
<td>Provides login and instant message functionality for Microsoft Office Communicator clients.</td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td></td>
</tr>
<tr>
<td>Microsoft Office Communications Server</td>
<td>2007 R2</td>
<td></td>
</tr>
<tr>
<td>Microsoft Office Communicator client</td>
<td>2007</td>
<td>Can join video-enabled meetings by clicking a link in a meeting invitation.</td>
</tr>
<tr>
<td>DNS</td>
<td>N/A</td>
<td>Permits call routing to Polycom RMX and DMA systems and DMA subscription to Exchange for mail notifications.</td>
</tr>
<tr>
<td>Microsoft Office</td>
<td>2007</td>
<td>Microsoft Outlook and Microsoft Word® 2007 are required for sending Polycom Conferencing for Outlook invitations. Users of older versions of Microsoft Office can receive invitations.</td>
</tr>
</tbody>
</table>
Polycom Conferencing Add-in for Outlook

The Polycom Conferencing Add-in for Outlook provides a fully integrated video calendaring tool for Microsoft Outlook. Users can password-protect their meetings or add recording and streaming on a per meeting basis. When a user sends a video meeting request, the Polycom Conferencing Add-in for Outlook dynamically generates and automatically includes the information the meeting participants need to enter the conference, such as hyperlinks they can use to enter the conference and phone numbers for audio participants.

Deployment considerations:

• You can automatically deploy the Polycom Conferencing Add-in for Outlook by using an Active Directory Group Policy, scripting or some other software management infrastructure. You can also install it manually with a machine user account that has administrator rights.

• You can customize the types of callto: links in meeting invitations generated by the Polycom Conferencing Add-in for Outlook depending on your infrastructure, see “tel: vs sip: URI Links” on page 17.

tel: vs sip: URI Links

When you create a meeting using the Polycom Conferencing for Outlook Add-in, links are generated that allow users to join the meeting by clicking them. You can configure these links to be tel:, callto: or SIP: links. The type of link used varies depending on the signaling protocols used by endpoints in your environment.

Table 2-1  URI links used with Polycom Conferencing for Outlook.

<table>
<thead>
<tr>
<th>Supported Environment</th>
<th>Scheme</th>
<th>CMAD URI</th>
<th>Office Communicator URI</th>
<th>HDX Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.323 only</td>
<td>None/ Disabled</td>
<td>Callto:xxx</td>
<td>N/A</td>
<td>H.323-HDX dials E164 number (xxx). There are no SIP-HDXs present.</td>
</tr>
<tr>
<td>SIP only Office Communications Server</td>
<td>SIP</td>
<td>N/A</td>
<td>Callto:sip:<a href="mailto:xxx@sip-domain.com">xxx@sip-domain.com</a></td>
<td>SIP-HDX dials phone-context URI. There are no H.323-HDXs present.</td>
</tr>
</tbody>
</table>
### Table 2-1  **URI links used with Polycom Conferencing for Outlook.**

<table>
<thead>
<tr>
<th>Supported Environment</th>
<th>Scheme</th>
<th>CMAD URI</th>
<th>Office Communicator URI</th>
<th>HDX Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIP only with numeric dialing Office Communications Server</td>
<td>TEL</td>
<td>N/A</td>
<td>Callto:tel:xxx</td>
<td>H.323-HDX dials phone context URI. There are no SIP-HDXs present.</td>
</tr>
<tr>
<td>H.323 and SIP Office Communications Server</td>
<td>SIP</td>
<td>Callto:xxx</td>
<td>Callto:sip:<a href="mailto:xxx@sip-domain.com">xxx@sip-domain.com</a></td>
<td>SIP-HDX dials full SIP URI. H.323-HDX dials E164 number (xxx). If HDX has a preferred protocol it is used, otherwise the user is prompted for the dialing protocol.</td>
</tr>
<tr>
<td>H.323 and SIP with numeric dialing Office Communications Server</td>
<td>TEL</td>
<td>Callto:tel:xxx</td>
<td>Callto:tel:xxx</td>
<td>SIP-HDX dials phone context URI. H.323-HDX dials E164 number (xxx). If HDX has a preferred protocol it is used, otherwise the user is prompted for the dialing protocol. Templates only need one link for both CMAD and Office Communicator.</td>
</tr>
</tbody>
</table>
Polycom RMX Systems

The Polycom RMX system provides conferencing and bridge capabilities for the Visual Communications solution.

In particular, the following design details assist in providing users a consistent experience.

Virtual Meeting Rooms

Virtual meeting rooms are created whenever a user creates a meeting using the Polycom Conferencing Add-in for Outlook. Virtual meeting rooms (VMRs) are randomly generated strings of characters that identify the Virtual Meeting Room (VMR) for video conference. These VMRs are valid from the time the Polycom infrastructure accepts them until midnight after the end of the meeting.

Virtual meeting rooms (VMRs) that ensure a reliable experience for end users. End users connect to unique VMRs instead of re-usable video bridge numbers. With unique VMR numbers, end users are less likely to be interrupted by overlapping meetings.

Deployment considerations:

• The Polycom RMX allows test calls within 24 hours of the meeting’s start. However, if your deployment includes a Polycom DMA, you can make test calls for the life of the VMR.

• Although highly unlikely, meetings can be rejected if the Polycom Conferencing Add-in for Outlook randomly generates and submits a VMR identifier that matches a valid, existing VMR. If this happens, the meeting organizer must then cancel the meeting and send a new invitation.

  For details on other scenarios that may cause the DMA or RMX products to reject meeting invitations, please see the Administrator Guides for those products.

Video Meeting Gathering Phase

The first few minutes of meetings hosted by a Polycom RMX system is called the Gathering Phase and displays the meeting organizer and duration as well as the names of currently connected users and connection information. This information is pulled from the meeting details in Microsoft Exchange.

Deployment consideration:

You can configure the duration of the gathering phase for your Polycom RMX, see the Polycom RMX documentation for details.
Polycom HDX Video Endpoints

Polycom HDX users view and join calendared meetings through the Polycom HDX calendar screen. Once connected, the HDX account's calendar can be displayed on the HDX calendar screen.

Deployment considerations:

- Polycom HDX systems access calendar information through Microsoft Exchange 2007's Client Access Server using Exchange Web Services (EWS).
- You can configure Polycom HDX systems for calendaring with the Polycom CMA system's dynamic management feature which can automatically provision Polycom HDX endpoints.
- Provisioning, configuration and maintenance of Polycom HDX endpoints will need to be done manually if there is no Polycom CMA system deployed.
- Polycom HDX endpoints can operate in H.323 mode or SIP mode. By default they operate in H.323 mode and should be registered to an H.323 gatekeeper, which can be either a Polycom CMA system or a third party gatekeeper.

If your deployment includes a Microsoft Office Communications Server:

- You can use Polycom HDX systems in SIP mode, see “Polycom-enabled Unified Communications” on page 27. In this configuration they do not use H.323 and thus do not require an H.323 gatekeeper.
- If your Polycom HDX is registered to a Office Communications Server, administrators cannot use Polycom CMA’s dynamic management feature to automatically provision and configure each Polycom HDX endpoint.

Polycom CMA Desktop

When deploying Polycom CMA Desktop to use with Polycom Conferencing for Outlook, you should ensure that it is configured to be the default handler for callto: links. If it is not the default handler, it is possible that other multimedia call programs can change become a default and the link from a Outlook user’s meeting invitation will not work.

Polycom CMA Desktop can be automatically deployed onto client machines via Active Directory Group Policy, scripting or some other software management infrastructure. It can also be installed manually using an account with administrator rights on the machine in question.

Note: In deployments that include Microsoft Office Communications Server 2007, it is assumed that Microsoft Office Communicator 2007 is used instead of the Polycom CMA Desktop.
Considerations for Remote Users

Polycom Conferencing for Outlook supports both H.323 clients (Polycom HDX systems) and Microsoft Office Communicator clients (see “Polycom-enabled Unified Communications” on page 27).

- Polycom HDX system H.323 calls are only supported if the remote user’s Polycom HDX system is registered to a Polycom VBP-S or VBP-S/T device which proxies the Polycom HDX system’s registration to a Polycom CMA system gatekeeper inside the enterprise network.

- Polycom HDX system SIP calls are supported only if the Polycom HDX is registered to Office Communications Server via an Office Communications Server Edge server, see “Polycom-enabled Unified Communications” on page 27.

- Polycom supports calendar access for remote users through Outlook Anywhere. In addition, Polycom HDX systems require access to Exchange Web Services. You need to ensure they have access the /ews/* paths provided by the Exchange Client Access Server role. If your organization has already enabled Outlook Anywhere then no additional configuration should be necessary. If not, please follow the Microsoft documentation to enable access to the /ews/* paths: http://technet.microsoft.com/en-us/library/aa998934(EXCHG.80).aspx.

Enabling Remote H.323 Users with Polycom VBP

If you want to support remote H.323 users, you need to use a Polycom VBP-E or Polycom VBP-ST.

A VBP-E has a number of functions. It can act as a federation endpoint as well as a H.323 and SIP aware firewall for allowing calls in from the outside.

A VBP-ST has one primary function: to act as a gateway for external users. They register to it and it then registers with an internal CMA on behalf of the external users. This allows external Polycom HDX and Polycom CMA Desktop endpoints to connect in without the need of a VPN. It should be noted that a VBP-ST is not designed to act as a federation endpoint or a data firewall.

Please see the Polycom VBP system documentation for more information on remote systems.

For more information on the VBP devices, please the Polycom VBP documentation.

To support remote SIP users in an Office Communications environment, see “Polycom-enabled Unified Communications” on page 27.
Recording and Streaming

An optional component of the Polycom Conferencing for Outlook solution is recording and streaming. This is provided by a Polycom RSS recording and streaming server.

The Polycom RSS does not interface directly with any Microsoft product.

Polycom CMA System

Although Polycom HDX systems can make point-to-point calls without the aid of an H.323 gatekeeper, it is highly recommended to use one to manage bandwidth management, dialing rules and other advantages that gatekeepers provide. Polycom recommends using the Polycom CMA system’s gatekeeping capabilities.

Microsoft Interoperability Considerations

Multiple Microsoft products enable the Polycom Conferencing for Outlook experience.

Microsoft Active Directory Configuration

The Polycom Conferencing for Outlook solution requires Microsoft Active Directory for authentication and security of the Microsoft accounts that are used with Polycom Conferencing for Outlook components.

Supported Versions

- Microsoft Windows Server 2003
- Microsoft Windows Server 2003 R2
- Microsoft Windows Server 2008

Both Standard and Enterprise versions are supported, as are both 32-bit and 64-bit. Certain operating systems may need to be patched with service packs. Please see the release notes for which service pack levels are required for each version.

Group Scopes

Microsoft Active Directory provides two group types and four group scopes. The Polycom DMA system supports only security groups (not distribution groups) with universal or global scope.
In Microsoft Active Directory, a security group can be assigned permissions or rights to a resource. The other type of group, a distribution group, is only used to send mail to its members. However, a security group can be given an e-mail address which gives it the same capabilities as a distribution group. Mail sent to that security group’s e-mail address is then sent to its members. This means that you can use security groups and still provide the functionality of a distribution group should your Active Directory design require it.

**Accounts**

A number of Microsoft Active Directory user accounts are required. Microsoft Active Directory user accounts with Microsoft Exchange 2007 user mailboxes are required for each Polycom infrastructure device such as a Polycom RMX platform or a Polycom DMA platform.

Room based Polycom HDX endpoints require Microsoft Exchange room mailboxes. These are used to represent that room when a user attempts to create a meeting involving it. When a user wants to use a physical meeting room they include its account in the invitation list. If its calendar is clear during this time it will accept and book itself. Users can then view its calendar and see when it is in use without the need for manual management.

Lastly, individual users will enter in their existing Microsoft Active Directory credentials when using a personal Polycom HDX endpoint.

These user accounts must meet security requirements for Active Directory, including password length and complexity. It is recommended that it be an account with minimal privileges in the system and has its password set to never expire. If the password changes or expires, the new password will have to be changed in the Polycom HDX endpoint as well.

**Single Forest Required**

Polycom devices only read the root of a single LDAP directory at a time. For this reason, Active Directory must be configured as a single forest environment. There can be multiple individual trees in the same forest. A separate forest can be connected via federation but cannot be directly controlled by a single device or redundant cluster.

**Microsoft Exchange Configuration**

The Polycom Conferencing for Outlook solution requires Microsoft Exchange 2007 or Microsoft Exchange 2010. Both standard and enterprise versions are supported.

Exchange room mailbox accounts need to be attached to user accounts created for each Polycom HDX system. Its calendar will be stored in Exchange and accessible through the Calendar screen.
Polycom HDX and RMX systems connect to users’ calendars using Exchange Web Services which is a part of Exchange's Client Access server role. The Client Access server must be configured to proxy EWS connections for internal and external users.

If your deployment includes a Office Communications Server Edge server, a VBP is not necessary for remote HDX users that are registered to an Office Communications Server.

**User and Room account relationship in Microsoft Exchange**

Many organizations also have their Exchange Client Access Servers configured to provide Outlook Web Access (OWA) to allow users to access their mailboxes through a web client instead of Microsoft Outlook. Even though both services listen on TCP port 443, Exchange is able to distinguish between OWA and Outlook Anywhere traffic so the same Client Access Server can host both services.

**Microsoft Exchange Requirements Summary**

- **Room mailboxes**: Room based Polycom HDX system calendars in Exchange.
- **Exchange Client Access Server role with Exchange Web Services**: Allow local Polycom HDX systems to monitor their calendars in Exchange.
- **Outlook Anywhere**: Remote users to use Polycom Conferencing Add-in for Outlook to manage their video meetings without the use of a VPN.

**Microsoft Outlook Client Configuration**

**System Requirements**

The Polycom Conferencing Add-in for Outlook can be installed on the Microsoft Windows client operating systems listed below. Both the 32-bit and 64-bit versions of each operating system are supported. Some of these operating systems may require patches or service packs. See the release notes for details.

**Supported Operating Systems**

- Windows XP (any version)
- Windows Vista (any version)
- Windows 7 (any version)
Required Software

- Microsoft Outlook 2007 or 2010
- Microsoft Word 2007,
- Microsoft .NET Framework 3.5
- Microsoft Active Directory (Microsoft Windows Server 2003, Microsoft Windows Server 2003 R2, and Microsoft Windows Server 2008. Both Standard and Enterprise versions are supported, as are both 32-bit and 64-bit.)
Polycom-enabled unified communications allows you to integrate your Polycom video conferencing infrastructure and Polycom endpoints with Office Communications Server to provide seamless video conferencing functionality for Office Communicator users.

With Polycom-enabled unified communications, the Office Communications Server manages presence for each registered Polycom component and allows full-featured video calls between Office Communicator clients and Polycom components. This includes both point-to-point calls and video conferencing, high-quality video, and calling directly from a contact lists.

Polycom devices connect to Office Communications Server using session initiation protocol (SIP).
# Polycom Products that Enable Unified Communications

The following table describes the products that support or enhance the Polycom integration with Microsoft Office Communications Server 2007 R2.

<table>
<thead>
<tr>
<th>Product</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polycom RMX 2000 or 4000 system</td>
<td>v7.0</td>
<td>Provides MCU conferencing resources for Polycom-enabled Unified Communications.</td>
</tr>
<tr>
<td></td>
<td>MPM+ card required for Edge Server support and media encryption. 1 GB controller board required for Edge Server support.</td>
<td></td>
</tr>
<tr>
<td>Polycom DMA 7000 system</td>
<td>v2.0.0 with SP3 v2.2</td>
<td>Virtualizes MCU conferencing resources for Polycom-enabled Unified Communications. Highly recommended for deployments that include two or more Polycom RMX systems.</td>
</tr>
<tr>
<td>Polycom CMA 4000 or 5000 system</td>
<td>v5.0 with patch 500100610</td>
<td>Enables automatic provisioning of Polycom HDX endpoint systems. Recommended for remote management of endpoints.</td>
</tr>
<tr>
<td></td>
<td>This release is available on the Polycom CMA Technical Support site under Previous Polycom CMA Downloads and Documentation.</td>
<td></td>
</tr>
<tr>
<td><strong>Endpoints</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polycom HDX system</td>
<td>v2.6.1</td>
<td>Video endpoint systems that can be fully integrated into a Microsoft Communications Server 2007 environment.</td>
</tr>
<tr>
<td>Polycom CX 100, 200, 300, 700, and 5000</td>
<td>All</td>
<td>Voice endpoint systems that can be fully integrated into a Microsoft Communications Server 2007 environment.</td>
</tr>
</tbody>
</table>
The basic deployment of Polycom-unified communications for a corporate LAN-only environment is shown in Figure 3-1.

With the components included in Figure 3-1, Polycom-unified communications provides the following features:

• Use a contact list in Microsoft Outlook or Sharepoint to initiate video calls to Polycom endpoints (Polycom components, the Exchange or Sharepoint server must have been provisioned with Office Communications Server).

• Integrate Office Communicator users into a Polycom HDX favorites list and call them directly from the list.

• Take advantage of the enhanced presence features of Office Communications Server in a Polycom infrastructure environment.

• Call a Microsoft Office Communicator user with a Companion Mode Polycom HDX system registered to the same Microsoft Office Communications Server account. The call rings at both devices (call forking), and the recipient can answer using either device.

• Support dual stack environment (Polycom endpoints can accept both SIP and H.323 calls).

• Account management and LDAP services with Microsoft Active Directory.

• Scalable conferencing with Polycom infrastructure (Polycom DMA system and Polycom RMX systems.)
Figure 3-1 Architectural Components of Polycom-unified communications.
Communication Protocols

Within Polycom-enabled unified communications environment the following protocols are used.

H.323 and SIP (Dual Stack Environment)

With the Polycom visual communications solution, Polycom infrastructure and endpoints can be configured to use both SIP and H.323.

Polycom HDX endpoints and infrastructure devices use SIP to interface with Office Communications Server and H.323 to interface with H.323 only devices.

Microsoft Office Communications Server 2007 uses a modified version of the Session Initiation Protocol (SIP) called Session Initiation Protocol Extensions that adds proprietary Microsoft extensions to the protocol. Polycom HDX devices and certain Polycom infrastructure understand Session Initiation Protocol Extensions and are able to interface fully with Microsoft Office Communications Server 2007.

SIP Only

In situations where SIP is a requirement but H.323 only devices are not deployed then Polycom devices can be configured to use only SIP as the signaling protocol.

Office Communications Server can be configured to allow full numeric dialing, see “Dialing Conventions” on page 33.

Supporting Remote Users

Remote users (users not on the corporate network) are supported through a Microsoft Office Communications Server Edge Server.

Polycom-enabled unified communications supports remote SIP endpoints when they are registered with an Office Communications Server Edge server. The Office Communications Server with an edge server role supports the Interactive Connectivity Establishment (ICE) protocol which allows devices outside an organization’s network to call other devices that are also registered to the same Office Communication Server environment.

Note

Within a Microsoft Office Communications Server environment, it is assumed that all Polycom endpoints are configured for SIP and registered to an Office Communications Server or an Office Communications Server edge server.
For example, an external Polycom HDX system, such as a Polycom HDX system in a home office, can call other external Polycom HDX systems and Office Communicator users, as well as endpoints behind the organization’s firewall.

In order for this configuration to work, your environment must meet the following requirements:

- An Office Communications Server Edge server must be present.
- Polycom HDX systems must be registered with the Office Communications Server and configured to use SIP.

**Figure 3-2** illustrates a possible Edge Server deployment scenario: Enterprises A and B are federated, meaning that users in Federation A can communicate with users in Federation B, and vice versa. Enterprise B also contains a branch office, which in this example is a Polycom HDX user who is behind more than one firewall. The user in the Branch Office can also place and receive calls from other enterprises and remote users.

If you want to support remote H.323 users, you need to use a Polycom VBP-E or Polycom VBP-ST, see “Enabling Remote H.323 Users with Polycom VBP” on page 21.

**Figure 3-2** *Office Communications Server environment with an Office Communications Server Edge Server (for simplicity, only endpoints are shown).*

Users in both enterprises A and B can place calls to remote users (Remote User C and Remote User D). A remote user is a user that is not behind the organization’s firewall. The remote users can call each other and users in both enterprises.

In a Microsoft Office Communications Server environment, ICE calls are supported to the following endpoints, if the endpoints are deployed in the same Microsoft Office Communications Server environment:

- Polycom HDX systems
- Microsoft Office Communicator clients
- Polycom RMX® systems
Supporting Remote H.323 Users

In order to support remote H.323 users, you need to use a Polycom VBP-E or Polycom VBP-ST.

A VBP-E has a number of functions. It can act as a federation endpoint as well as a H.323 and SIP aware firewall for allowing calls in from the outside.

A VBP-ST has one primary function: to act as a gateway for external users. They register to it and it then registers with an internal CMA on behalf of the external users. This allows external Polycom HDX and Polycom CMA Desktop endpoints to connect in without the need of a VPN. It should be noted that a VBP-ST is not designed to act as a federation endpoint or a data firewall. 

Please see the Polycom VBP system documentation for more information on remote systems.

For more information on the VBP devices, please see the Polycom VBP documentation.

To support remote SIP users in an Office Communications environment, see “Polycom-enabled Unified Communications” on page 27.

Design Considerations

Polycom RMX System

The Polycom RMX system enables multipoint calls in Office Communications Server environment.

Dialing Conventions

You can simultaneously set up an RMX for both numerical and matched URI dialing. You can configure the Polycom RMX as a voice gateway in the Office Communications Server to enable dialing into meeting rooms using numbers instead of or in addition to SIP URI addresses.

Numeric dialing has the following advantages:

- HDX or Office Communicator users can dial a number rather than a full SIP URI, simplifying the dialing, which is especially beneficial with the HDX remote control.
- It also enables a common dialing plan for virtual meeting rooms across Office Communications Server and H.323 infrastructures.
- When using Polycom Conferencing for Outlook, a single number can be inserted into a calendar invitation and it will be valid for Office Communications Server endpoints and H.323 endpoints in a mixed SIP and H.323 environment.
Deployment Considerations:

- You must configure the Polycom RMX system to be a Trusted Host within the Office Communication Server. Define the IP address of the Polycom RMX signalling host to be the trusted host.

- In order to support matched URI dialing, you need to set static routes in the Office Communications Server to enable SIP entities and user agents to connect to conferences without explicit registration of conferences with the Office Communications Server. Static routes alleviate the need to create a user account in the Office Communications Server for each Meeting Room and Entry Queue. This also allows users to join ongoing conferences hosted on the RMX without registering all these conferences with Office Communications Server.

- Optionally, you can use RMX entry queues can also be used for ad-hoc conferencing and enable Office Communicator clients to dial to the Entry Queue and create a new ongoing conferences using DTMF codes to enter the target conference ID. In such a case, other Office Communicator users use that ID to join the newly created conference.

- Both Polycom HDX systems and Polycom RMX systems support secure SIP signalling with Office Communications Server using Transport Layer Security (TLS).

  TLS provides secure communication of the SIP signaling. TLS is available only when the system is registered with a SIP server that supports TLS. When you choose this setting, the system ignores TCP/UDP port 5060.

Polycom HDX System

When integrated with a Office Communications Server environment, the Polycom HDX system is registered with the Office Communications Server and supports SIP calls.

Deployment Considerations:

- Calls from a Polycom HDX system to a Polycom RMX system using Microsoft Office Communications Server require that the Polycom HDX system have encryption set to Off.

  Polycom RMX systems do not support AES encryption (media encryption) when using SIP signaling and thus cannot encrypt with Office Communications Server or its registered endpoints. This includes Polycom HDX systems that are registered to Office Communications Server and exclusively use SIP.

- Both Polycom HDX systems and Polycom RMX systems support secure SIP signalling with Office Communications Server using Transport Layer Security (TLS).
TLS provides secure communication of the SIP signaling. TLS is available only when the system is registered with a SIP server that supports TLS. When you choose this setting, the system ignores TCP/UDP port 5060.

**Microsoft Office Communications Server 2007**

**Office Communications Server Mediation Role**

An Office Communications Server environment usually requires an Office Communications Server running the Mediation Server role. However, Polycom RMX systems and Polycom DMA systems can interface directly with Office Communications Server front end servers without the use of a Mediation Server.

**Microsoft Office Communications Server 2007 Directors**

Some organizations may use an Office Communications Server Director to direct clients to the correct Office Communications Server front end server. The Office Communications Server Director role provides a single SRV DNS record that handles Office Communication Server registrations.

Polycom HDX systems cannot be redirected and must be configured to register to their own Office Communications Server and not to an Office Communications Server Director.

For example, a SRV DNS lookup in an environment using a Office Communications Server Director would return ocs-director.polycom.com. However, clients that register to this server will be re-directed to ocs-pool1.polycom.com. A Polycom HDX endpoint must be configured to register with the actual front end server ocs-pool1.polycom.com, not the Office Communications Server Director ocs-director.polycom.com.

If you move an Office Communications Server account from one pool to another, you need to update to any Polycom HDX endpoints using the moved account.

**Microsoft Office Communicator**

Microsoft Office Communicator users can participate in scheduled or ad hoc video meetings using a Polycom DMA or Polycom RMX system.

**Deployment considerations:**

Office Communicator can be automatically deployed onto client machines via Active Directory Group Policy, scripting or some other software management infrastructure. It can also be installed manually using an account with administrator rights on the machine in question. See Microsoft's deployment guide for Office Communicator for details.
It should be noted that the link that users click in the Outlook invitation is a `callto:` link. Installing or running other multimedia call programs such as the Polycom CMA Desktop will change the operating system's priority list for `callto:` commands. This may interfere with the one-click dial functionality of Office Communicator. When some of these programs are run they take control of `callto:` commands. If this occurs users can still manually dial in to the conference ID or launch Office Communicator which will retake `callto:` priority for itself.