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Before You Begin

The purpose of this guide is to explain a number of deployment models, architectures, and limitations of the solution and assist administrators deploying Polycom products in a Microsoft environment. Where the Microsoft environment can include Skype for Business or Lync Server, this guide refers to Skype for Business except where a feature is not supported by Skype for Business or instructions apply only to Lync Server.

Audience and Required Skills

The primary audience for this guide is administrators who configure, customize, manage, and troubleshoot RealPresence Group Series systems with Skype for Business. Polycom expects the administrator to be a mid-level IT professional experienced in system administration.

Deploying RealPresence Group Series systems in a Microsoft environment requires planning and knowledge of SIP video conferencing and video conferencing. Note that this guide does not provide full administration or maintenance procedures for Skype for Business or Microsoft Lync Server 2013. For full administrative procedures, see Skype for Business Server 2015 on Microsoft TechNet.

This document assumes administrators have knowledge of the following systems, that these systems are already deployed, and that Microsoft administrators are available to assist administrators of RealPresence Group Series systems.

- Microsoft Active Directory
- Microsoft Exchange Server
- Domain name servers
- Microsoft Domain accounts
  - To participate in calls with Microsoft components, including Skype for Business clients and Skype for Business-hosted multipoint calls, your Polycom devices must have an account in a Windows domain accessible by the Skype for Business Server environment. You can create a new Skype for Business account for your Polycom device, or you can set up your Polycom device with an existing Skype for Business account. This Windows domain can be an Active Directory domain or a SIP domain. You need to configure the proper capabilities and settings at the account level, and at the domain level, with policies.

- Skype for Business or Lync Server
  - For help with Skype for Business 2015, see Skype for Business Server 2015.
  - For help with Lync Server 2013, see Microsoft Lync Server 2013.
- Skype for Business Server components. In particular, you should be familiar with Skype for Business Server 2015 Management Shell.
- Components of the Polycom UC solution you are using:
  - Polycom® RealPresence® Collaboration Server (RMX®) solution (RPCS)
Before You Begin

- Polycom® HDX® system
- Polycom® RealPresence® Group Series system
- Polycom® RealPresence® Distributed Media Application™ (DMA®) system
- Polycom® RealPresence® Resource Manager
- Polycom® RealConnect™ technology

You can access Polycom product documentation and software at Polycom Support.

Deploying in a Secure Federal Environment

If you are deploying this solution in a secure federal environment, refer to Deploying in Secure/Federal Environments.

Get Help

For more information about installing, configuring, and administrating Polycom products, refer to Documents and Downloads at Polycom Support.

For more information on Polycom solutions with Microsoft, see the following Microsoft resources:

- Skype for Business Server 2015 Management Shell
- Skype for Business 2015 documentation and Microsoft's Lync Server 2013 Planning Tool and on the Microsoft TechNet Library

Polycom Resources

All Polycom documentation for Microsoft solutions is available at Polycom Support.

Polycom provides support for Polycom solution components only. Additional services are available from Polycom Global Services. These services are intended to help customers successfully design, deploy, optimize, and manage Polycom visual communication within their third-party UC environments. If you want to deploy with Skype for Business Server, contact Polycom Services or contact your local Polycom representative for more information.

The Polycom Community

The Polycom Community gives you access to the latest developer and support information. Participate in discussion forums to share ideas and solve problems with your colleagues. To register with the Polycom Community, simply create a Polycom online account. When logged in, you can access Polycom support personnel and participate in developer and support forums to find the latest information on hardware, software, and solutions topics.

Customer Feedback

We are striving to improve our documentation quality and we appreciate your feedback. E-mail your opinions and comments to DocumentationFeedback@polycom.com.
Registration and Deployment

Microsoft Interoperability

RealPresence Group systems support interoperability with the following Microsoft software products. For supported server and client versions and any limitations for systems registered with Skype for Business, refer to the Polycom RealPresence Group Series Release Notes at Polycom Support.

Servers
- Microsoft Skype for Business Server 2015 (Feb. 2017)
- Microsoft Lync Server 2013
- Microsoft Exchange Server 2013
- Microsoft Skype for Business Online
- Microsoft Exchange Server Online

Clients
- Microsoft Skype for Business 2015
- Microsoft Lync Server 2013
- Windows client
- Mac client
- Polycom Trio (with video)
- Skype Room System v1 (Polycom CX8000)
- Polycom RealConnect Solution

Supported Skype for Business Online and On Premises Topologies

The following table lists Polycom support for each Skype for Business topology, which varies by environment.

<table>
<thead>
<tr>
<th>Topology</th>
<th>Active Directory</th>
<th>Skype for Business</th>
<th>Exchange</th>
<th>Polycom Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Premises</td>
<td>On Premises</td>
<td>On Premises</td>
<td>On Premises</td>
<td>Supported</td>
</tr>
<tr>
<td>Office 365 Multi-tenant (O365MT)</td>
<td>Online</td>
<td>Online</td>
<td>Online</td>
<td>Supported</td>
</tr>
</tbody>
</table>
Registration and Deployment

Support for Skype for Business Online

To enable Skype mode for RealPresence Group Series, you must provision an Office 365 room account and register the system with the room account. You can use a RealPresence Touch device or a RealPresence Group Series remote control to provision and register Skype for Business Online.

Previously, RealPresence Group Series systems with Skype for Business Online was supported as a beta feature. As of software version 6.1.1, Polycom provides mainstream support for this functionality.

Prerequisites

Before you can register Skype for Business Online, the following prerequisites must be met:

- Have a minimum Microsoft license for E1 with Skype Plan 2 for enabling RealPresence Group video endpoints. For information about the various plans, refer to this Technet article.
- To search the directory for contacts, you must have added contacts to your Skype for Business contact list.
- Register the RealPresence Group Series system with a room account instead of a user account for the following reasons:
  - Automatic processing and acceptance of meeting invites
  - Display of Skype for Business meeting prompts
  - Lobby enforcement, which prevents participants from automatically being admitted to a meeting

For step-by-step instructions on each required setting, refer to Configure RealPresence Group Systems for Registration with Skype for Business Online.

Deploying On Premises Servers with Skype for Business Online

When deploying Skype for Business Online, you must create a small On Premises Skype for Business Server 2015 or Microsoft Lync Server 2013 deployment. At minimum, you must deploy a single Front End Server and single Edge Server to provide SIP connectivity between the Polycom RealConnect technology and Skype for Business Online in Office 365. The required On Premises deployment can use your existing Front End and Edge servers or you can create a new On Premises deployment specifically for this integration.

In either case, you can use either the Hybrid (Split-Domain) or Federated models to provide the workflow for the Polycom RealConnect technology for any Skype for Business Online users homed in Office 365.

- A split-domain hybrid deployment uses the same SIP domain between the On Premises installation and the online tenancy.
- A federated deployment is an alternate On Premises installation leveraging a different SIP domain used only by the back-end components to communicate with the primary SIP domain that you configure solely within Skype for Business Online.

<table>
<thead>
<tr>
<th>Topology</th>
<th>Active Directory</th>
<th>Skype for Business</th>
<th>Exchange</th>
<th>Polycom Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid (Split domain)</td>
<td>On Premises</td>
<td>On Premises and Online</td>
<td>Online</td>
<td>Supported</td>
</tr>
<tr>
<td>Hybrid (CCE/OPCH)</td>
<td>On Premises</td>
<td>Online</td>
<td>Online</td>
<td>Not supported at this time</td>
</tr>
</tbody>
</table>

Support for Skype for Business Online
Configure RealPresence Group Systems for Registration with Skype for Business Online

You must perform some configuration steps before the RealPresence Group system is ready to interoperate with Skype for Business Online. The following registration and encryption tasks are required.

To register RealPresence Group Series with Skype for Business Online

1. Provision your Office 365 RealPresence Group Series room account. For information on creating room accounts, refer to Provisioning Skype Room System Accounts in Office 365 on the Microsoft Technet site.

2. Do one of the following:
   - Use the RealPresence Touch device. On the RealPresence Touch device, ensure that you are paired to a RealPresence Group system. In the paired system’s web interface, navigate to Admin Settings > General Settings > Pairing, select Enable Polycom Touch Device and select Save.
   - Use the RealPresence Group Series remote control to perform this registration process.

3. To verify that the system has a Skype for Business Interoperability License, navigate to Admin Settings > General Settings > Options.

4. To enable Skype Mode, navigate to Admin Settings > General Settings > Home Screen Settings, and click the checkbox Enable Skype Mode.

5. To configure the SIP registration for the room system, navigate to Admin Settings > Network > IP Network > SIP.
6 Click the Enable SIP checkbox, enter the SIP registration information, at Registrar Server Type, select Microsoft. Then ensure that the Registration Status changes to Registered.

In the example below, the sign-in address and the username for the room account is gsrm@plcmmslab03.onmicrosoft.com.

![SIP configuration settings](image)

**To configure encryption:**

Ensure encryption is enabled, as this is a requirement to establish an AV MCU conference.

1. In the system web interface, go to Admin Settings > Security > Global Security > Encryption.
2. In the Require AES Encryption for Calls list, select When Available.
3. Click Save.

**To configure the Directory Server:**

» In the system web interface, go to Admin Settings > Servers > Directory Servers, enter the Directory Server information, and ensure the Registration Status changes to Registered, as shown next.
To configure the Calendaring Service:

1. In the system web interface, go to Admin Settings > Servers > Calendaring Servers, enter the server information, and ensure the Registration Status changes to Registered, as shown in the figure below.

To validate the system status:

- In the system web interface, go to Diagnostics > System > System Status, and ensure the Microsoft Server, SIP Server Registrar Server, and Calendaring Service options all show a Green status, as shown next.
<table>
<thead>
<tr>
<th>System Status</th>
<th>Status</th>
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<td>![Status Icon]</td>
<td>More Info</td>
</tr>
<tr>
<td>Audio Devices</td>
<td>![Status Icon]</td>
<td>More Info</td>
</tr>
<tr>
<td>VisualBoard</td>
<td>![Status Icon]</td>
<td>More Info</td>
</tr>
<tr>
<td>Microsoft Server</td>
<td>![Status Icon]</td>
<td>More Info</td>
</tr>
<tr>
<td>Presence Service</td>
<td>![Status Icon]</td>
<td>More Info</td>
</tr>
<tr>
<td>IP Network</td>
<td>![Status Icon]</td>
<td>More Info</td>
</tr>
<tr>
<td>Gatekeeper</td>
<td>![Status Icon]</td>
<td>More Info</td>
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<tr>
<td>SIP Registrar Server</td>
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</tr>
<tr>
<td>Log Threshold</td>
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<td>More Info</td>
</tr>
<tr>
<td>Meeting Password</td>
<td>![Status Icon]</td>
<td>More Info</td>
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<td>Calendaring Service</td>
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<td>More Info</td>
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<td>Recording Service</td>
<td>![Status Icon]</td>
<td>More Info</td>
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</tbody>
</table>
RealPresence Group Series Systems with Skype for Business Server

This section provides an overview of the RealPresence Group Series solution for Skype for Business environments and includes information on available features.

Features of the Polycom Solution

Integrating Real Presence Group Series systems with Skype for Business Server 2015 enables the following:

- Support for Exchange Online (only on RealPresence Group Series systems) and Microsoft Skype for Business
- Native support for Microsoft Remote Desktop protocol
- Support for native Microsoft application and desktop sharing with the Skype for Business clients
- Easily join Skype for Business meetings from standards-based endpoints using ‘Click to Join’ functionality
- Point-to-point and multipoint calls involving RealPresence Group Series systems with Microsoft Skype for Business clients
- Real-time presence information between Polycom devices and Microsoft Skype for Business clients
- Support for remote and federated endpoints to participate in point-to-point calls and video conference calls
- High-quality video (720p for RTV and 1080p for SVC) between Skype for Business clients and Polycom endpoints
- Participation in Skype for Business-hosted multipoint conferences using Polycom endpoints
- Optional use of Microsoft Skype for Business clients to view the presence status of Polycom RealPresence meeting rooms and to start one-click conferences

Polycom ContentConnect Software

Polycom ContentConnect software is a content sharing solution for Microsoft Skype for Business clients and standard-based video endpoints. You can enable Polycom ContentConnect software in two modes: Add-on Mode and Gateway Mode. This guide focuses on Gateway Mode, which enables client-less bi-directional content sharing between Microsoft and standards-based video room systems.

Note: Gateway Mode is supported only with Polycom ContentConnect for Skype for Business and Microsoft Lync Server 2013.
Continuous Presence with RealPresence Group Series Systems

Polycom’s native support for Microsoft SVC technology means that you can use Skype for Business to host multipoint conferences with up to five active participants with continuous presence video. The new SVC layouts enable RealPresence Group Series systems to host up to five active speakers in a multipoint conference call using a single-screen or dual-screen layout that optimizes participant screen space. Two primary use cases are illustrated in the following figure.

You can use RealPresence Group Series systems to view content from Skype for Business desktop clients in active calls when the Skype for Business client initiates the content-sharing request. RealPresence Group Series can view the following content types from Skype for Business clients:

- **All Monitors**: Displays content from all monitors connected to the system with the Skype for Business client.
- **Primary Monitor**: Displays content from the primary monitor connected to the system with the Skype for Business client.
- **Secondary Monitor**: Displays content from the secondary monitor connected to the system with the Skype for Business client.
- **Program**: Displays content from a particular program connected to the system with the Skype for Business client.

Polycom RealConnect Technology for Skype for Business

RealPresence DMA system and RealPresence Collaboration Server (RMX) solution feature Polycom RealConnect technology for Skype for Business Online and On Premises environments. Polycom RealConnect technology enables you to send a Microsoft-compatible SVC stream from Polycom RealPresence platform products to an audio/video multipoint control unit (AVMCU) and receive up to five Skype for Business participants, as well as an additional panoramic layout that includes four standards-based endpoints.

Polycom RealConnect also enables you to join traditional standards-based video room systems to Skype for Business-hosted conferences without the need for additional plug-in applications. Note that Polycom RealConnect technology still enables you to join Microsoft UC desktop clients and traditional video endpoints to a VMR, and offers standards-based systems you can use to add non-Skype for Business-capable, H.323, or standard SIP-registered endpoints. For more information on configuring RealPresence DMA systems, refer to the *Polycom® Unified Communications for Microsoft® Environments Solution Guide* at Polycom Support.

Conferences held using RealPresence Collaboration Server (RMX) are bridged or use Polycom RealConnect technology automatically. Up to five of the active Skype for Business participants display as individual participants on the RealPresence Collaboration Server (RMX) layout. In addition, all participants are joined in a single virtual meeting room which displays video from participants using a standards-based endpoint.
Scheduled Conference Support for Microsoft Office 365

The RealPresence DMA system supports Meet Now and scheduled conferences for Microsoft Office 365 environments. The Office 365 solution requires the Polycom One Touch Dial application and enables video conferencing endpoints to join conferences through calendar invitations from Microsoft Outlook and Exchange.

The RealPresence DMA system also supports conference scheduling for Microsoft Office 365 environments without the use of the One Touch Dial application. RealPresence DMA system administrators can manually create VMRs with an associated focus URI.

Polycom One Touch Dial Application

The Polycom One Touch Dial is an optional application that enables easy 'Click to Join' calls held on Polycom RealConnect technology in Skype for Business On Premises deployments. With Polycom RealConnect technology and Skype for Business enabled, a meeting organizer can schedule an online meeting using Microsoft Outlook and the integrated solution automatically sets up the call in the background. Any H.323 or SIP compatible video conferencing system, including telepresence systems in conjunction with supported clients and devices, can use the Polycom One Touch Dial application to join conferences through calendar invitations.

The Polycom One Touch Dial application is required with Office 365 and is used to discover scheduled meetings and create a VMR that includes the conference focus URI and destination network (which are part of the Office 365 meeting invitation) to the RealPresence DMA system using the REST API. To use the Polycom One Touch Dial application with Office 365 and to create VMRs in Office 365, you must install or update to Polycom One Touch Dial version 1.5.2 or later.

Note: The Polycom One Touch Dial Application is available only from Polycom Professional Services.

The Polycom One Touch Dial application is required for and supports the following Office 365 and Skype for Business functionality:

- **Click to Join.** Endpoints display a list of scheduled meetings and users select a meeting to automatically dial into the conference.
- **Cloud Connector Edition (CCE) and Bring Your Own Device (BYOD).** Use a smart-phone application or web page to pair with an endpoint, view a list of meetings, click to join a meeting, and dial into the conference.
Microsoft Skype for Business AVMCU-to-MCU Affinity

When Skype for Business deployments are geographically distributed, you can start a Polycom RealConnect conference on Skype for Business AVMCUs deployed within the geography depending on the location of the Skype for Business Front End pool. You can configure the RealPresence DMA system to select a Polycom MCU near the Skype for Business AVMCU hosting the Polycom RealConnect conference to reduce call latency, network traffic and costs, and provide for redundancy.

You can also configure Skype for Business clients and non-Skype for Business endpoints to meet in the same conference. Skype for Business AVMCU-to-MCU Affinity enables the RealPresence DMA system to select a Polycom MCU near the On Premises Skype for Business Front End pool hosting the Polycom RealConnect conference. When you configure an MCU pool and MCU pool order to include Polycom MCUs near a Skype for Business deployment, the MCU you select builds a cascade link between the conference and the Skype for Business AVMCU.

You can deploy this feature only for Polycom RealConnect conferences and Skype for Business On Premises deployments. You cannot deploy this feature for Office 365 environments or in federated deployments such as a service provider environment.

Remote and Federated Users in Skype for Business Environments

You can support remote and federated users by including a Skype for Business 2015 Edge Server in your environment. Skype for Business 2015 Edge Server environments support calls to RealPresence Group Series systems.

- **Remote users** are users located outside of an organization's firewall. A remote user registered to an enterprise's Edge Server can make and receive calls to and from enterprise users without the use of a VPN or additional firewall traversal device.
- **Federation** is a trust relationship between two or more SIP domains that permits users in separate organizations to communicate in real-time across network boundaries as federated users. Federated users registered to a separate Skype for Business Server on a separate enterprise network are able to make and receive calls to endpoints and video infrastructure on an external network that is behind one or more firewalls.

Installing an Edge Server to your Skype for Business environment enables you to support the Interactive Connectivity Establishment (ICE) protocol. The ICE protocol enables devices outside an organization's network to call other devices that are also part of the Polycom-enabled unified communications solution. Remote and federated users are supported with Skype for Business Server 2015, Lync Server 2013, Polycom video infrastructure, and Polycom video systems.

The following figure illustrates a possible Edge Server deployment scenario. In this example scenario, enterprises A and B are federated, meaning that users in Enterprise A can communicate with users in Enterprise B, and vice versa. Enterprise B also contains a branch office, which in this example is a Polycom HDX system user behind more than one firewall. The user in the branch office can also place and receive calls to and from other enterprises and remote users.
Users in enterprise A and B can place calls to remote user A and B. The remote users can call each other as well as users in both enterprises.
Deploying Polycom RealPresence Group Series Systems

When deploying a Polycom RealPresence Group Series system for use with the solution, you must complete tasks in Skype for Business Server 2015 and the RealPresence Group Series system.

This section contains the following major tasks:

- Configuring Skype for Business Server for Use with a RealPresence Group Series System
- Hybrid Deployment for Office 365 Suite
- Configuring Polycom RealPresence Group Series System for Skype for Business Server
- Supporting Microsoft Real-Time Video (RTV) and H.264 SVC
- Microsoft Quality of Experience Monitoring Server Protocol

Configuring Skype for Business Server for Use with a RealPresence Group Series System

This section explains how to configure Skype for Business Server settings to use a Polycom RealPresence Group Series system within a Microsoft environment. Before completing tasks in this section, you must configure Skype for Business users in Microsoft Active Directory and enabled Skype for Business Server. Talk to your Microsoft Active Directory and administrators or visit Prepare Active Directory for Skype for Business Server 2015 on Microsoft TechNet.

Perform tasks in the following order:

1. Configuring Authentication in Skype for Business Server
2. Microsoft Call Admission Control
3. Enable RTV on the Skype for Business Server
4. Add Calendar and Scheduling Features to Polycom RealPresence Group Series Systems
5. Calendaring Service
6. Enable Conference Rooms for Skype for Business Server
7. Enabling Conference Room Access for Remote and Federated Users
8. Enable RDP Content Sharing
9. Enable Conference Room Accounts for Skype for Business Server
10. Adding Skype for Business Contacts to Conference Room Local Address Book
11. Using Skype for Business Mode in RealPresence Group Series
12. Enable Skype Mode for RealPresence Group Series
13. Disable Skype for Business Mode for RealPresence Group Series
Deploying Polycom RealPresence Group Series Systems

Configuring Authentication in Skype for Business Server

If you want to include a RealPresence Group Series system within your Microsoft environment, you must enable Windows NT LAN Manager (NTLM) on your Skype for Business Server. By default, NTLM is enabled in Skype for Business. If NTLM has been disabled for any reason, you need to enable it.

Polycom HDX systems and RealPresence Group Series systems support only NTLM authentication, and do not support Kerberos.

Microsoft Call Admission Control

Microsoft Call Admission Control (CAC) policies are supported and enforced when your RealPresence Group Series system is registered to a Skype for Business Server that includes an Edge Server.

When a Microsoft CAC policy is enforced in a Skype for Business environment, the following limitations apply:

- SIP calls between RealPresence Group Series systems are unable to support dual-stream Polycom® People+Content™.
- The maximum available bandwidth for SIP calls is 2 Mbps.

Enable RTV on the Skype for Business Server

If you want to support high-quality RTV, you need to change the default video settings on Skype for Business Server is by default enabled for full HD 1080p only on endpoints that support the Microsoft H.264 SVC codec. Polycom RealPresence Group Series and RealPresence Collaboration Server (RMX) support the Microsoft H.264 SVC codec; Polycom HDX systems do not.

To change the default video settings for your Skype for Business Server:

1. Access Microsoft PowerShell.
2. Change the video settings for your Skype for Business Server. For example,
   ```ps
   Set-CsMediaConfiguration -MaxVideoRateAllowed Hd720p15M
   ```
3. Restart the Skype for Business Server to apply your changes.

Add Calendar and Scheduling Features to Polycom RealPresence Group Series Systems

If you want to add a scheduling feature to your RealPresence Group Series system, you need to configure a conference room user account in Active Directory. To create a conference room user account, you can use a script, the Active Directory Users and Computers management console, or custom software. The following procedure shows you how to add a conference room user manually in the Active Directory Users and Computers management console.

If conference room users have an expiring password, system administrators need to keep track of the users and passwords and update the accounts as required. Polycom recommends setting the passwords to never
To add a conference room user to the Active Directory:

1. Go to Start > Run and open the Active Directory Users and Computers console by entering dsa.msc.
2. In the console tree, select Users > New > User.
3. In the New User wizard, enter the required conference room user information and click Next.
4. Set the user password. Polycom recommends that you also enable Password never expires.
5. Click Next and Finish.
6. Repeat for each conference room that has a Polycom RealPresence Group Series system.

Calendaring Service

RealPresence Group systems can connect to Microsoft Exchange Server 2013 or later to retrieve calendar information for a specific Microsoft Outlook or a Microsoft Office 365 individual or system account. The room system connects to Microsoft Exchange Server using the credentials you provide, or by automatically discovering the connection information based on an email address or SIP server address.

Connection to a calendaring service allows the room system to:

- Display the day's scheduled meetings, along with details about each
- Display a Join button on all scheduled meetings for the current day
- Let users join the meeting without knowing the connection details
- Hide or show details about meetings marked Private, depending on the configuration of the system
- Display a meeting reminder before each scheduled meeting, along with a reminder tone

Web Info: Professional Services for Microsoft integration is mandatory for Polycom Conferencing for Microsoft Outlook and Microsoft Office Communications Server integrations. For additional information and details, refer to Microsoft Integration Services on Polycom Collaboration Services.

Calendar Polling

When actively viewing the endpoint's calendar onscreen, the RealPresence Group Series system polls the Microsoft Exchange server for updates every 20 seconds. When viewing any other screen, or when the RealPresence Group Series system is in standby, polling occurs every five minutes.

Configure the Calendaring Service

Before users can view their scheduled meetings on the local interface, you must configure the Calendaring Service on the system web interface. RealPresence Group systems support the Calendaring service with Microsoft Exchange Server 2013 or later and Skype for Business 2015.

To configure the Calendaring Service:

1. In the system web interface, go to Admin Settings > Servers > Calendaring Service.
2. Configure these settings as needed.
## Calendaring Service Settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable Calendaring Service</td>
<td>Enables the room video system to connect to a calendaring service and retrieve meeting information.</td>
</tr>
<tr>
<td>Email</td>
<td>Specifies the mailbox account this system should monitor for calendar information. This should match the Primary SMTP Address for the account on Microsoft Exchange or Skype for Business Server, which displays as the value of the mail attribute in the account properties.</td>
</tr>
<tr>
<td>Domain</td>
<td>Specifies the domain for registering to the Microsoft Exchange or Skype for Business Server, in either NETBIOS or DNS notation, for example, either company.local or COMPANY. If you are using the Auto Discover Using setting, do not provide a value in this field.</td>
</tr>
<tr>
<td>User Name</td>
<td>Specifies the user name to register to Microsoft Exchange or Skype for Business Server, with no domain information included. You can use the system name or an individual's name. If you want the Calendaring Service to use the calendar associated with a Microsoft Office 365 account, enter the user name for that account in this field.</td>
</tr>
<tr>
<td>Password</td>
<td>Specifies the system password to register with Microsoft Exchange or Skype for Business Server. You can use the system password or an individual's password. If you want the Calendaring Service to use the calendar associated with a Microsoft Office 365 account, enter the password for that account in this field.</td>
</tr>
</tbody>
</table>
## Calendaring Service Settings (continued)

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auto Discover Using</strong></td>
<td>Specifies how the system obtains the Microsoft Exchange or Skype for Business Server address. If you select Email Address, the system uses the value provided in the Email field. If you select SIP Server, the system uses the registered SIP server domain name configured for the RealPresence Group system. When using this feature, you must provide values in the Email, User Name, and Password fields that correspond to the Microsoft Outlook or Microsoft Office 365 individual or system account you want the RealPresence Group system to use for the Calendaring Service. The system may prompt you to confirm the password. If after configuring the Calendaring Service a message displays that the system was unable to discover the service, ensure the information you provided is correct. For example, make sure the email address is in a valid <a href="mailto:username@domain">username@domain</a> format. You can also use an API command to automatically discover the Microsoft Exchange Server address. For more information, refer to the Polycom RealPresence Group Series Integrator Reference Guide.</td>
</tr>
<tr>
<td><strong>Microsoft Exchange Server</strong></td>
<td>Specifies the Fully Qualified Domain Name (FQDN) of the Microsoft Exchange Client Access Server/Skype for Business 2015. If your organization has multiple servers behind a network load balancer, this is the FQDN of the server’s Virtual IP Address. If required, an IP address can be used instead of an FQDN, but Polycom recommends using the same FQDN that is used for Outlook clients. Provide a value in this field only if you want to manually provide connection information to Microsoft Exchange or Skype for Business Server. Otherwise, use the Auto Discover Using setting that allows the system to automatically determine the connection information for Microsoft Exchange or Skype for Business Server and populate this field.</td>
</tr>
<tr>
<td><strong>Secure Connection Protocol</strong></td>
<td>Specifies the connection protocol to use to connect to the server. Select Automatic or TLS 1.0.</td>
</tr>
<tr>
<td><strong>Meeting Reminder Time in Minutes</strong></td>
<td>Specifies the number of minutes before the meeting that a reminder will display on the system.</td>
</tr>
<tr>
<td><strong>Play Reminder Tone When Not in a Call</strong></td>
<td>Specifies whether to play a sound along with the text reminder when the system is not in a call.</td>
</tr>
<tr>
<td><strong>Show Information for Meetings Set to Private</strong></td>
<td>Specifies whether to display details about meetings marked private.</td>
</tr>
</tbody>
</table>
Enable Conference Rooms for Skype for Business Server

After adding the conference room user accounts to Active Directory, you must enable and configure them for use with Skype for Business.

Polycom recommends using Microsoft PowerShell to do this. For more information, see Windows PowerShell and Skype for Business 2015 management Tools.

To enable a conference room user for the Skype for Business Server:

1. Access Microsoft PowerShell.
2. Enable a conference room user for Skype for Business. For example,
   ```powershell
   Enable-CsUser -Identity Ken Myer -RegistrarPool pool.corp.local -SipAddressType FirstNameLastName -SipDomain sipdomain.com
   ```

Enabling Conference Room Access for Remote and Federated Users

If you are supporting remote users and federated users, you need to configure the following on the Edge Server:

- Enable support for external users for your organization.
- Configure and assign one or more policies to support external user access.

After you have configured the Edge Server, you can enable Skype for Business to support remote and federated user access to a conference room. To enable remote and federated user access to a conference room, see Microsoft Configuring Support for External User Access for detailed instructions.

Enable RDP Content Sharing

You can use Remote Desktop Protocol (RDP) to send content to a RealPresence Group system. Use the system web interface to enable the VisualBoard/RDP setting.

To enable RDP content sharing:

1. In the system web interface, go to Admin Settings > General Settings > System Settings > VisualBoard/RDP.
2. Select Enable > Save.

Enable Conference Room Accounts for Skype for Business Server

RealPresence Group Series system 5.0 enables you to use Remote Desktop Protocol (RDP) with Skype for Business 2015 clients. Using RDP with Microsoft clients enables both application and desktop sharing without additional infrastructure.

To maximize the benefits of RDP content sharing, Polycom recommends deploying a Skype Room System or CsMeetingRoom account to allow sharing from in-room clients. When you use this approach, the Skype Room System prompts content presenters to mute the microphone and speaker to avoid audio feedback.

To create a Skype Room System account, complete the following procedure and update your account name and server details on your Exchange Server Management Shell.
To create a Skype Room System account:

1. Within your Exchange Management Shell, set the following:
   ```powershell
   New-Mailbox -Name 'Group Series01' -Alias 'Group.Series01'
   -UserPrincipalName 'Group.Series01@domain.com' -SamAccountName
   'Group.Series01' -FirstName 'Group' -Initials '' -LastName 'Series01' -Room
   ```
2. Set-CalendarProcessing -Identity Group.Series01 -AutomateProcessing
   AutoAccept -AddOrganizerToSubject $false -RemovePrivateProperty $false
   -DeleteSubject $false
3. Set-Mailbox -Identity Group.Series01@domain.com -MailTip "This room is equipped with a Polycom Group Series, please make it a Skype Meeting to take advantage of the enhanced meeting experience from Group Series"
4. Set-ADAccountPassword -Identity Group.Series01
5. Enable-ADAccount -Identity Group.Series01
6. Within your Skype for Business Management Shell, set:
   ```powershell
   Enable-CsMeetingRoom -SipAddress "sip:Group.Series01@domain"
   -domaincontroller dc.domain.local -RegistrarPool pool01.domain.local
   -Identity Group.Series01
   ```

Adding Skype for Business Contacts to Conference Room Local Address Book

To add Skype for Business contacts to your Polycom system local address book, use the Polycom system user account and password to log on to a Skype for Business client. You can then use the Skype for Business client to add contacts to the Polycom system account.

Polycom recommends that you configure the Skype for Business Server to allow no more than 200 contacts per user. Though the Skype for Business default setting is 250, the RealPresence Group Series system displays a maximum of 200 contacts per user.

After adding contacts through the Skype for Business client, contacts display on the RealPresence Group Series system the next time you log on.

Using Skype for Business Mode in RealPresence Group Series

RealPresence Group Series system supports some of the functionalities mentioned below when integrated with Microsoft:

- During active calls, the Skype for Business application and desktop sharing lets Skype clients share content with RealPresence Group Series systems
- AES encryption automatically encrypts calls to other systems that have AES encryption enabled
- Real-time video (RTV) in Skype-hosted calls provides higher resolutions during video calls when your system is integrated with Skype for Business Server 2015. This feature requires enabling the Skype for Business Interoperability License key enabled on your system.
- Skype for Business 2015 media encryption in calls with systems that have encryption enabled
- Start video as an audio-only participant during point-to-point and conference calls
- Add additional contacts as audio-only participants to a meeting
- Accept or decline a video stream request
● Accept or decline incoming calls forwarded from a contact
● Restart a RealPresence Group Series system from a RealPresence Touch device
● Restart the RealPresence Touch device

For more information on these Microsoft features, refer to the Polycom Unified Communications for
Microsoft Environments Solution Deployment Guide at Polycom Support.

For information on limitations of this feature, see the Polycom RealPresence Group Series Release Notes
for your software version at Polycom Support.

Enable Skype Mode for RealPresence Group Series

After the RealPresence Group Series system is registered with the Skype for Business Server online or
on-premises, you can enable Skype mode for the system to provide a consistent environment for all Office
365 products in your deployment. When the system is signed into Skype for Business Online, Skype mode
is required and enabled automatically, and users can control the system only with the RealPresence Touch
device. You cannot disable Skype Mode in Skype for Business Online deployments. In Skype mode, the
system local interface has limited operations; refer to the Polycom RealPresence Group Series Release
Notes for a limitations list.

To enable Skype for Business mode, do the following:

1. In the system web interface, go to Admin Settings > General Settings > Home Screen Settings >
   Skype Mode.
2. Select Enable Skype mode.
3. Click Save.

For information on using the Skype Mode user interface, refer to the Polycom RealPresence Touch in Skype
Mode Quick Tips or the Polycom RealPresence Group Series User Guide at support.polycom.com.

Disable Skype for Business Mode for RealPresence Group Series

You can disable Skype mode in the RealPresence Group Series system web interface. You cannot disable
Skype Mode in Skype for Business Online deployments.

Optionally, use a prerequisite.

To disable Skype for Business mode, do the following:

1. In the RealPresence Group system web interface, go to Admin Settings > General Settings >
   Home Screen Settings > Skype Mode.
2. Select Disable Skype mode.
3. Click Save.

Hybrid Deployment for Office 365 Suite

When deploying RealPresence Group Series systems with the Office 365 Suite, you can choose to set up
your Office 365 services online, or choose a hybrid of online and on-premise services.

See Office 365 integration with On Premises environments and Create a hybrid deployment with the Hybrid
Configuration wizard on Microsoft TechNet for additional information.

The following table shows the Office 365 environments Polycom supports.
Configuring Polycom RealPresence Group Series System for Skype for Business Server

Before you begin configuring your Polycom RealPresence Group Series system for a Microsoft environment, you should ensure that the RealPresence Group Series system is installed according to standard installation procedures. To identify the installation required for your RealPresence Group Series system, see the Polycom RealPresence Group Series Administrator Guide for your model at Group Series on Polycom Support. You must complete the following tasks to configure your RealPresence Group Series system for a Microsoft environment:

- Installing the Skype for Business Interoperability License on your RealPresence Group Series System
- Register a Polycom RealPresence Group Series System with Skype for Business
- Understanding SIP Settings
- Configure the Polycom RealPresence Group Series System LAN Properties
- Configure the Skype for Business Directory Server
- Configure Encryption Settings for Skype for Business 2015
- Upload Logs to the Skype for Business Server
- Enable Microsoft® Skype Mode
- Supporting Skype for Business-Hosted Video Conferencing
- Supporting Microsoft Real-Time Video (RTV) and H.264 SVC

### Office 365 Hybrid Environments

<table>
<thead>
<tr>
<th>Topologies</th>
<th>Office 365 Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Active Directory</td>
</tr>
<tr>
<td>Office 365 Multi-Tenant</td>
<td></td>
</tr>
<tr>
<td>Option 1</td>
<td>On Premises with Password Sync</td>
</tr>
<tr>
<td>Option 2</td>
<td>On Premises with Active Directory Federation Services (ADFS)</td>
</tr>
<tr>
<td>Option 3</td>
<td>Online</td>
</tr>
<tr>
<td>Option 4</td>
<td>On Premises</td>
</tr>
<tr>
<td><strong>On Premises</strong></td>
<td>On Premises</td>
</tr>
</tbody>
</table>
Installing the Skype for Business Interoperability License on your RealPresence Group Series System

When using Skype for Business 2015, support for RTV and H.264 SVC is mandatory for point-to-point and multiparty calls and you must install the Skype for Business Interoperability License.

RTV and H.264 SVC video and Skype for Business-hosted conferencing are supported only when you directly register Polycom endpoints to Skype for Business Server.

For instructions on installing the interoperability license, see the *Polycom RealPresence Group Series - Administrator Guide* on Polycom Support.

Register a Polycom RealPresence Group Series System with Skype for Business

When you register a RealPresence Group Series system with a Skype for Business Server, the Polycom RealPresence Group Series system user can see a list of Skype for Business 2015 contacts and whether contacts are online or offline. Contacts display in the directory and users can choose to display up to five contacts on the home screen or call a contact. You can find descriptions of all SIP settings shown in this procedure in the section *Understanding SIP Settings*.

Note: The H.263 codec has been deprecated and a Skype for Business Interoperability License is required for integration with Skype for Business Server.

To register a RealPresence Group Series system with Skype for Business Server:

1. Open a browser window and in the Address field enter the Polycom system IP address or host name.
2. Go to Admin Settings > Network > IP Network and select SIP.
3. Configure the settings in the SIP Settings section of the IP Network screen shown in the section *Understanding SIP Settings*.
4. Click Save.

After the RealPresence Group Series system registers with Skype for Business Server, continue to the section *Configure the Polycom RealPresence Group Series System LAN Properties*.
Deploying Polycom RealPresence Group Series Systems

Understanding SIP Settings
This section provides an overview of the SIP settings available on the RealPresence Group Series system shown in the following figure.

**RealPresence Group Series system SIP settings**

![SIP settings diagram]

The following list describes all SIP settings on the **IP Network** screen:

- **Enable SIP**: Select to enable the RealPresence Group Series system to make and receive SIP calls.

- **SIP Server Configuration**: Select **Auto** if your Skype for Business Server configuration is set up for automatic discovery, which requires you to correctly configure Skype for Business SRV records. If the Skype for Business Server is not configured for automatic discover, select **Specify**.

- **Registrar Server**: If you selected **Specify** in the **SIP Server Configuration** field, you need to specify the DNS name of the SIP Registrar Server.
  - In a Skype for Business environment, specify the DNS name of the Front End Pool or Director. The default port is 5061.
  - If registering a remote RealPresence Group Series system with an Edge Server, use the fully qualified domain name of the Access Edge Server. The port for the Edge Server role is usually 443 and must be entered explicitly.

  Polycom recommends using the DNS name. The format for entering the address and port is the following: `<DNS_NAME>:<TCP_Port>:<TLS_Port>`

  **Syntax Examples:**
  - To use the default port for the protocol you have selected: `pool.corp.local`
  - To specify a different Transport Layer Security (TLS) port and use the default Transmission Control Protocol (TCP) port: `pool.corp.local:443`

- **Proxy Server**: Specify the DNS name or IP address of the SIP Proxy Server. If you leave this field blank, the Registrar Server is used. Note that in a Microsoft environment, the Proxy server and the Registrar server are always the same server, so only one server address field is required. If you selected Auto for your SIP Server Configuration and leave the Proxy Server field blank, no Proxy Server is used.

  By default for TCP, the SIP signaling is sent to port 5060 on the proxy server. By default for TLS, the SIP signaling is sent to port 5061 on the proxy server.

  The syntax used for this field is the same as for the Registrar Server field.
Deploying Polycom RealPresence Group Series Systems

- **Transport Protocol**: The SIP network infrastructure in which your Polycom RealPresence Group Series system is operating determines which protocol is required.
  - **Auto** enables an automatic negotiation of protocols in the following order: TLS, TCP, and User Datagram Protocol (UDP). This is the recommended setting for Microsoft environments.
  - **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. TLS is required when connecting to Skype for Business.
  - **TCP** provides transport through TCP for SIP signaling and is not applicable for Skype for Business. Signaling encryption is mandatory.
  - **UDP** provides transport through UDP for SIP signaling.

- **Sign-in Address**: Specify the system's SIP name. This is the SIP URI or Skype for Business sign-in address. Specify the address for the conference room or user account created for the Polycom system.

- **User Name**: Specifies the name and Windows Domain to use for authentication when registering with a SIP Registrar Server, for example, `<user@windowsdomain.local>`. Polycom RealPresence Group Series systems supports the User Principal Name format `<username@domain.com>` as well as the legacy Microsoft DOMAIN\username format. If the SIP server requires authentication, this field and the password cannot be blank.

- **Password**: When enabled, allows you to specify and confirm a new password that authenticates the system to the SIP Server.

- **Registrar Server Type**: For Skype for Business Server this must be set to Microsoft.

Web Info: For more information on default user names and passwords, see the Polycom RealPresence Group Series System Administrator Guide for your model at Group Series on Polycom Support.

Configure the Polycom RealPresence Group Series System LAN Properties

To register with Skype for Business, the RealPresence Group Series system must be able to access a DNS server and the name for the Skype for Business Pool or Edge Server must have a valid domain name resolution.

To configure the Polycom system LAN properties:

1. Open a browser window and in the **Address** field enter the Polycom system IP address or host name.
2. Go to **Admin Settings > Network > LAN Properties**.
3. If needed, enter the **Domain Name** for the domain to which the Polycom system belongs.
4. In the **DNS Servers** field, verify that the correct DNS server addresses are populated if you are using DHCP to assign addresses. If the DNS server addresses are not correctly populated, enter the IP addresses for DNS servers that share DNS zone information with the Skype for Business Server. If you are registering a remote Polycom system, use a public DNS server that shares DNS zone information with the Edge Server.
5. Click **Update**.
Configure the Skype for Business Directory Server

You can configure the RealPresence Group Series system to use Skype for Business Server when the RealPresence Group Series system is automatically provisioned by a RealPresence Resource Manager system or in standard operating mode.

To configure the Skype for Business Server 2015 directory settings:

1. In the system web interface, go to Admin Settings > Network > IP Network > SIP.
2. Configure the SIP settings as shown in Understanding SIP Settings.
3. In the system web interface, go to Admin Settings > Servers > Directory Servers and select the Microsoft Service Type.
4. Configure the following settings on the Directory Servers screen.

Directory Servers Settings

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration Status</td>
<td>Specifies whether the system is successfully registered with the Skype for Business Server 2015.</td>
</tr>
<tr>
<td>Domain Name</td>
<td>Specifies the Domain Name entered on the SIP Settings screen.</td>
</tr>
<tr>
<td>Domain User Name</td>
<td>Specifies the Domain User Name entered on the SIP Settings screen.</td>
</tr>
<tr>
<td>User Name</td>
<td>Specifies the User Name entered on the SIP Settings screen.</td>
</tr>
</tbody>
</table>

Display Options for the RealPresence Group Series System Contact List

You can configure display options for your Microsoft contacts in your RealPresence Group Series system contact list. If you do not complete the Directory Services configuration, the Skype for Business Directory search, personal favorites, and contacts list do not display in the Contacts menu.

To configure display options for the contact list:

1. Open a browser window and in the Address field enter the Polycom RealPresence Group Series system IP address or host name.
2. Go to Admin Settings > Servers > Directory Servers.
3. In the Skype for Business Server section of the Directory Servers page, configure these settings:
   - **Server Type**: Specifies whether the SIP Registrar Server is a Skype for Business Server. Enabling this setting activates integration features such as the Microsoft global directory and Skype for Business contact sharing with presence.
   - **Registration Status**: Upon successful authentication this field displays as Registered, as shown in the next figure.
   - **Domain Name**: Specifies the Windows Domain to use for Directory lookup, for example, windowsdomain.local.
     Polycom RealPresence Group Series systems supports the User Principal Name format <windowsdomain.local> as well as the legacy Microsoft NETBIOS domain format.
4. Click Save.
Configure Encryption Settings for Skype for Business 2015

Polycom RealPresence Group systems support media encryption in calls with Skype for Business 2015 and Microsoft Lync 2013 Server pool. You must configure encryption settings before using the Polycom RealPresence Group system for video conferences with Skype for Business 2015. If components have encryption turned off, calls connect without encryption. If one component is set to require encryption and the other is not, calls fail to connect.

Each codec within Polycom systems must have the same settings.

- If both Skype for Business and Polycom endpoints have encryption turned off, calls connect without encryption.
- If a Skype for Business or a Polycom endpoint is set to require encryption and the other is not, calls fail to connect.

Your system encryption settings must be compatible with your Skype for Business Server settings. If you need to update encryption settings on Skype for Business Server, refer to the topic “Update Encryption Settings in the Polycom® Unified Communications for Microsoft® Environments Solution Guide at Polycom Support.”

To enable encryption for Skype for Business 2015:

2. On the Skype for Business Server go to Get-CsMediaConfiguration and change the encryption setting to:
   ```
   Set-CsMediaConfiguration -EncryptionLevel supportencryption
   (The default setting is: Set-CsMediaConfiguration -EncryptionLevel requireencryption)
   ```

Upload Logs to the Skype for Business Server

You can upload diagnostic logs to the Skype for Business Server to provide the Skype for Business administrator access to RealPresence Group Series device logs that can help the administrator troubleshooting issues. The Skype for Business administrator can enable or disable support for this option from the Skype for Business Server.

To upload logs to the Skype for Business Server:

1. Navigate to Diagnostics > System > Logs.
2. Click Upload system log.
Enable Microsoft® Skype Mode

After the RealPresence Group Series system is registered with the Skype for Business Server online or On Premises, you can enable Skype mode for the RealPresence Group Series system to provide a consistent environment for all Office 365 products in your deployment. When the RealPresence Group Series system is signed into Skype for Business Online, Skype mode is required and enabled automatically, and users can control the RealPresence Group Series system only with the RealPresence Touch device. You cannot disable Skype Mode in Skype for Business Online deployments.

The following limitations apply to RealPresence Group Series systems when Skype mode is enabled:

- Users cannot use the remote control, Polycom Touch Control, the touch interface, or keyboard and mouse to control the RealPresence Group Series system.
  Users can still use the Polycom® SoundStation® IP 7000 to control the system.
- You cannot configure the left and right elements of the address bar.
- You cannot configure the user login for system access.
- You cannot enable Speed Dials, and favorites do not display on the home screen.

To enable Skype mode:

1. In the RealPresence Group system web interface, go to Admin Settings > General Settings > Home Screen Settings > Skype Mode.
2. Select Enable Skype mode.
3. Click Save.

Supporting Skype for Business-Hosted Video Conferencing

Skype for Business-hosted conferencing is supported only when Polycom endpoints are registered to Skype for Business. To participate in Skype for Business-hosted video conferences using a RealPresence Group Series system or to register the system to Skype for Business, you must install the Skype for Business Interoperability License on the Polycom RealPresence Group Series system. If you want to use the call management features, you need to pair your RealPresence Group Series system with a Polycom® Touch Control or Polycom® RealPresence Touch™.

When using Skype for Business-hosted video conferencing, keep the following points in mind:

- When in a Skype for Business-hosted call, the RealPresence Group Series system displays a Busy presence state and rejects any incoming calls.
- When in a Skype for Business-hosted call, other multipoint calling methods, such as internal multipoint hosting, RealPresence Collaboration Server (RMX) or RealPresence DMA hosted conferencing, and Conference on Demand, are disabled.
- You need to install the Skype for Business Interoperability License on your RealPresence Group Series system to support Skype for Business-hosted conference calls and to use up to 1080p high-definition video between a RealPresence Group Series system and Skype for Business client.
- You need the Skype for Business Interoperability License to enable support for Skype for Business.
- In SVC multipoint calls hosted on Skype for Business Server, you can view multiple far-end sites in layouts. Note that when using RealPresence Group Series systems, layouts vary by model. On RealPresence Group Series 300, 500, and 700 systems you can view a maximum of five far-end sites, as shown in the figure.
In Skype for Business-hosted conferences, RealPresence Group Series systems require a Polycom Touch Control or RealPresence Touch to:

- View conference participants
- Add participants to the conference
- Organize and initiate conferences with RealPresence Group Series and Skype for Business clients and groups

**Understanding Roles in Skype for Business-hosted Calls**

Participants in a Skype for Business-hosted call can have one of three roles depending on the level of user rights granted within the call. The privileges associated with each role are shown in the tables Managing Participants in a Skype for Business-hosted Call and Managing a Skype for Business-Hosted Call. You set up these roles on the Skype for Business Server, but if you are the conference organizer, you can change the roles of other participants using the Skype for Business client.

The organizer of a Skype for Business-hosted conference can choose to leave the conference by touching Hang Up. The other participants can continue with the call.

### Managing Participants in a Skype for Business-hosted Call

<table>
<thead>
<tr>
<th>Role</th>
<th>Add a Participant</th>
<th>View Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizer</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Presenter</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Attendee</td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>

### Managing a Skype for Business-Hosted Call

<table>
<thead>
<tr>
<th>Role</th>
<th>Remove a Participant</th>
<th>End a Conference</th>
<th>Leave a Conference</th>
<th>Mute a Participant</th>
<th>Mute a Conference</th>
<th>Mute Self</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizer</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Presenter</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Attendee</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Supporting Microsoft Real-Time Video (RTV) and H.264 SVC**

The Skype for Business 2015 clients use both the RTV protocol and H.264 SVC. Polycom supports the RTV protocol for both Lync 2013 and Skype for Business 2015, and includes support for the Microsoft H.264 SVC codec for RealPresence Group Series and Polycom Collaboration Server (Rmx) solution. You must install the Skype for Business Interoperability License to enable the RTV and H.264 SVC protocols for RealPresence Group Series and to register endpoints with Skype for Business.

The following Polycom systems support the Microsoft RTV and H.264 SVC protocols:

- Polycom RealPresence Group Series systems with the Skype for Business Interoperability License
Polycom Collaboration Server (RMX) solutions with the MPMx or MPMRx cards

Software-based Polycom Collaboration Server 800s and RealPresence One

Call Quality Scenarios for RTV Video

The quality of video used depends on the capabilities of the endpoint you are using.

- RTV and H.264 SVC video require a minimum call rate of 128 kbps. Calls below this rate connect with audio only.
- Multipoint calls initiated by a Microsoft Skype for Business client are hosted on the Microsoft AVMCU. You must install the Skype for Business Interoperability License to connect RealPresence Group Series systems. Multipoint calls initiated by a RealPresence Group Series system with the Skype for Business Interoperability License installed are also hosted on the Microsoft AVMCU.
- Multipoint calls initiated by a RealPresence Group Series system that does not have the Skype for Business Interoperability License are hosted on the RealPresence Group Series system's internal multipoint control unit (MCU) and do not use RTV or H.264 SVC. If a Skype for Business client joins the call, the entire call will be conducted on H.263/CIF.
- On point-to-point calls with Microsoft clients, the RealPresence Group Series system uses RTV or H.264 SVC with Skype for Business when the Skype for Business Interoperability License is installed. You must install the Skype for Business Interoperability License to make point-to-point calls and multi-point calls with Skype for Business.
- When you call into a RealPresence Collaboration Server conference that includes participants using a RealPresence Group Series system, Polycom HDX system, or Polycom ITP system, Polycom systems can use H.264 while Skype for Business uses either RTV or H.264 SVC.
- Polycom ITP systems only use RTV on point-to-point calls with a Skype for Business client and connect only with the primary codec.
- When calling from RealPresence Group Series and RealPresence Collaboration Server to Skype for Business, H.264 SVC is prioritized higher than RTV. H.264 SVC also delivers higher resolution video 1080p vs a maximum of 720p (for point-to-point) with RTV it also reduces the need for Skype for Business clients to send additional video streams comprised of RTV.

Microsoft Quality of Experience Monitoring Server Protocol

Using Microsoft’s Quality of Experience Monitoring Server Protocol (QoE), you can monitor the audio quality and troubleshoot audio related issues in your deployment. When Skype for Business monitoring is available, the RealPresence Group Series systems publish QoE metrics for each SIP session hosted on the Skype for Business Server. QoE reports contain audio-only metrics and do not contain video or content sharing metrics.

QoE is compatible with Skype for Business Server, and Skype for Business Online, and Lync Server 2013. For more information on QoE, see Quality of Experience Monitoring Server Protocol on Microsoft Developer Network.

The following table includes the QoE metrics published to the Skype for Business Server for RealPresence Group Series systems.
## Supported QoE Metrics for RealPresence Group Series

<table>
<thead>
<tr>
<th>Parent Element</th>
<th>Child Element/Attributes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VQReportEvent</td>
<td>VQSessionReport</td>
<td>Quality report for a session (SIP dialog).</td>
</tr>
<tr>
<td></td>
<td>VQSessionIntervalReport</td>
<td>Mid call Quality report</td>
</tr>
<tr>
<td>VQSessionReport and VQSessionIntervalReport</td>
<td>Endpoint</td>
<td>Information about the endpoint that created the report.</td>
</tr>
<tr>
<td></td>
<td>DialogInfo</td>
<td>Information regarding the SIP dialog.</td>
</tr>
<tr>
<td></td>
<td>MediaLine</td>
<td>A media line is the logical equivalent to an m-line in Session Description Protocol (SDP).</td>
</tr>
<tr>
<td>Endpoint</td>
<td>Name</td>
<td>Computer name of the device that created the report. If the maximum string length is exceeded, the report is rejected.</td>
</tr>
<tr>
<td></td>
<td>v2:OS</td>
<td>The operating system used for the reporting endpoint.</td>
</tr>
<tr>
<td></td>
<td>v2:VirtualizationFlag</td>
<td>Flag indicating the type of virtualization environment:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• '0x00' – None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• '0x01' - HyperV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• '0x02' - VMWare</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• '0x04' - Virtual PC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• '0x08' - Xen PC</td>
</tr>
<tr>
<td>DialogInfo</td>
<td>DialogCategory</td>
<td>Information about the QoE Report leg type, which is either a UC or Mediation Server-GW trunk.</td>
</tr>
<tr>
<td></td>
<td>FromURI</td>
<td>SIP URI in the SIP From header that the reporting endpoint uses if it makes a SIP transaction using the reported SIP dialog.</td>
</tr>
<tr>
<td></td>
<td>ToURI</td>
<td>SIP URI in the SIP To header that the reporting endpoint uses if it makes a SIP transaction using the reported SIP dialog.</td>
</tr>
<tr>
<td></td>
<td>Caller</td>
<td>True if the reporter was the caller of the SIP dialog. False if the reporter was not the caller of the SIP dialog.</td>
</tr>
<tr>
<td></td>
<td>LocalContactURI</td>
<td>SIP URI in the SIP Contact header of the reported SIP dialog that was sent from the reporting endpoint.</td>
</tr>
<tr>
<td></td>
<td>RemoteContactURI</td>
<td>SIP URI in the Contact header of the reported SIP dialog that was sent from the remote endpoint.</td>
</tr>
</tbody>
</table>
### Supported QoE Metrics for RealPresence Group Series (continued)

<table>
<thead>
<tr>
<th>Parent Element</th>
<th>Child Element/Attributes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LocalUserAgent</td>
<td></td>
<td>SIP User-Agent or Server header content of the reported SIP dialog that was sent from the reporting endpoint.</td>
</tr>
<tr>
<td>RemoteUserAgent</td>
<td></td>
<td>SIP User-Agent or Server header content of the reported SIP dialog that was sent from the remote endpoint.</td>
</tr>
<tr>
<td>LocalPAI</td>
<td></td>
<td>SIP URI in the SIP p-asserted-identity (PAI) header of the reported dialog that was sent from the reporting endpoint.</td>
</tr>
<tr>
<td>RemotePAI</td>
<td></td>
<td>The SIP URI in the SIP p-asserted-identity (PAI) header of the reported dialog that was sent from the remote endpoint.</td>
</tr>
<tr>
<td>ConfURI</td>
<td></td>
<td>The SIP URI of a conference bridge that hosted a conference and terminated this dialog. This URI is unique to each conference and common to all the dialogs that participated in the same conference. ConfURI is available for conferences only.</td>
</tr>
<tr>
<td>v2:CallPriority</td>
<td></td>
<td>The SIP Priority header that indicates the priority selected for the call.</td>
</tr>
<tr>
<td>v2:MediationServerBypassFlag</td>
<td></td>
<td>True if the reporting endpoint selected the bypass SDP.</td>
</tr>
<tr>
<td>v2:TrunkingPeer</td>
<td></td>
<td>The SIP ms-trunking-peer header that reports the fully qualified domain name (FQDN) of the public switched telephone network (PSTN) gateway.</td>
</tr>
<tr>
<td>v2:RegisteredInside</td>
<td></td>
<td>True if the listening address is registered within the enterprise. This replaces the Inside element in AddrType.</td>
</tr>
<tr>
<td>CallId</td>
<td></td>
<td>SIP Call-ID of the dialog. If the maximum string length is exceeded, the report is rejected.</td>
</tr>
<tr>
<td>FromTag</td>
<td></td>
<td>SIP From tag of the dialog.</td>
</tr>
<tr>
<td>ToTag</td>
<td></td>
<td>SIP To tag of the dialog.</td>
</tr>
<tr>
<td>Start</td>
<td></td>
<td>Start time of the dialog.</td>
</tr>
<tr>
<td>End</td>
<td></td>
<td>End time of the dialog.</td>
</tr>
<tr>
<td>MediaLine</td>
<td>Description</td>
<td>Media Line context information</td>
</tr>
<tr>
<td>InboundStream</td>
<td></td>
<td>Information regarding the inbound media stream.</td>
</tr>
</tbody>
</table>
## Supported QoE Metrics for RealPresence Group Series (continued)

<table>
<thead>
<tr>
<th>Parent Element</th>
<th>Child Element/Attributes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OutboundStream</td>
<td></td>
<td>Information regarding the outbound media stream (2).</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td></td>
<td>Interactive Connectivity Establishment (ICE) connectivity information.</td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td>The security profile in use. Supported values are “SRTP” and “None”.</td>
</tr>
<tr>
<td>Transport</td>
<td></td>
<td>The type of transport in use. Supported values are “TCP” and “UDP”.</td>
</tr>
<tr>
<td>LocalAddr</td>
<td></td>
<td>IP address related information for the reporting endpoint.</td>
</tr>
<tr>
<td>RemoteAddr</td>
<td></td>
<td>IP address related information for the remote endpoint.</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td></td>
<td>Information about the media path, such as direct or relayed. For more information, see the enumeration types in Connectivity Element.</td>
</tr>
<tr>
<td>IceWarningFlags</td>
<td></td>
<td>Information about ICE process described in bits flags.</td>
</tr>
<tr>
<td>RelayAddress</td>
<td></td>
<td>IP address related information of the Audio/Video Edge Server (A/V Edge Server).</td>
</tr>
<tr>
<td><strong>InboundStream and OutboundStream</strong></td>
<td></td>
<td>Network-based metrics.</td>
</tr>
<tr>
<td>Network</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Payload</td>
<td></td>
<td>Payload-based metrics.</td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jitter</td>
<td></td>
<td>Jitter related metrics.</td>
</tr>
<tr>
<td>PacketLoss</td>
<td></td>
<td>Packet loss related metrics.</td>
</tr>
<tr>
<td>BurstGapLoss</td>
<td></td>
<td>Burst related metrics.</td>
</tr>
<tr>
<td>Delay</td>
<td></td>
<td>Delay related metrics.</td>
</tr>
<tr>
<td>Utilization</td>
<td></td>
<td>Utilization related metrics.</td>
</tr>
<tr>
<td><strong>Jitter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>InterArrival</td>
<td></td>
<td>The average inter-arrival jitter, as specified in [RFC3550] section 6.4.1.</td>
</tr>
<tr>
<td>InterArrivalSD</td>
<td></td>
<td>The standard deviation of inter-arrival jitter, as specified in RFC 3550.</td>
</tr>
<tr>
<td><strong>PacketLoss</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LossRate</td>
<td></td>
<td>The average fraction lost, as specified in RFC 3550, computed over the duration of the session.</td>
</tr>
<tr>
<td>LossRateMax</td>
<td></td>
<td>The maximum fraction lost, as specified in RFC 3550, computed over the duration of the session.</td>
</tr>
</tbody>
</table>
## Supported QoE Metrics for RealPresence Group Series (continued)

<table>
<thead>
<tr>
<th>Parent Element</th>
<th>Child Element/Attributes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BurstGapLoss</td>
<td>BurstDensity</td>
<td>The average burst density, as specified in RFC 3611, computed with a Gmin=16 for the RTP packets received.</td>
</tr>
<tr>
<td></td>
<td>BurstDuration</td>
<td>The average burst duration, as specified in RFC 3611, computed with a Gmin=16 for the RTP packets received.</td>
</tr>
<tr>
<td></td>
<td>GapDensity</td>
<td>The average gap density, as specified in RFC 3611, computed with a Gmin=16 for the RTP packets received.</td>
</tr>
<tr>
<td></td>
<td>GapDuration</td>
<td>The average gap duration, as specified in RFC 3611, computed with a Gmin=16 for the RTP packets received.</td>
</tr>
<tr>
<td>Delay</td>
<td>RoundTrip</td>
<td>The average network propagation round-trip time computed as specified in RFC 3550.</td>
</tr>
<tr>
<td></td>
<td>RoundTripMax</td>
<td>The maximum network propagation round-trip time computed as specified RFC 3550.</td>
</tr>
<tr>
<td>Utilization</td>
<td>Packets</td>
<td>Number of Real-Time Transport Protocol (RTP) packets sent in the session.</td>
</tr>
<tr>
<td>Payload</td>
<td>Audio</td>
<td>Audio-based payload metrics.</td>
</tr>
<tr>
<td>Payload.Audio</td>
<td>PayloadType</td>
<td>Payload number used for the codec, as specified in MS-RTP.</td>
</tr>
<tr>
<td></td>
<td>PayloadDescription</td>
<td>Codec name, as specified in MS-SDPEXT or RFC 3551.</td>
</tr>
<tr>
<td></td>
<td>SampleRate</td>
<td>Audio sample rate.</td>
</tr>
<tr>
<td></td>
<td>v4:JitterBufferSizeAvg</td>
<td>Average size of jitter buffer during session.</td>
</tr>
<tr>
<td></td>
<td>v4:JitterBufferSizeMax</td>
<td>Maximum size of jitter buffer during session.</td>
</tr>
<tr>
<td></td>
<td>v4:JitterBufferSizeMin</td>
<td>Minimum size of jitter buffer during session.</td>
</tr>
<tr>
<td></td>
<td>v4:NetworkJitterAvg</td>
<td>Average of network jitter computed over 20 second windows during the session.</td>
</tr>
<tr>
<td></td>
<td>v4:NetworkJitterMax</td>
<td>Maximum of network jitter computed over 20 second windows during the session.</td>
</tr>
<tr>
<td>Signal</td>
<td>InitialSignalLevelRMS</td>
<td>The root-mean-square of the received signal for the first 30 seconds of the call.</td>
</tr>
<tr>
<td></td>
<td>Echoeventcauses</td>
<td>It is important to report 0x04; skip 0x01 and skip 0x10.</td>
</tr>
</tbody>
</table>
### Supported QoE Metrics for RealPresence Group Series (continued)

<table>
<thead>
<tr>
<th>Parent Element</th>
<th>Child Element/Attributes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Echopercentsend</td>
<td></td>
<td>Percentage of time when echo is detected in the audio from the capture or microphone device after echo cancellation.</td>
</tr>
<tr>
<td>RecvSignalLevels</td>
<td></td>
<td>If there is no support for Stereo, use only Ch1.</td>
</tr>
<tr>
<td>RecvNoiseLevels</td>
<td></td>
<td>If there is no support for Stereo, use only Ch1.</td>
</tr>
<tr>
<td>SendSignalLevels</td>
<td></td>
<td>This is the post AGC signal level reported in dBFs.</td>
</tr>
<tr>
<td>RenderSignalLevel</td>
<td></td>
<td>Average render speech level after dynamic range compression or analog gain control is applied.</td>
</tr>
<tr>
<td>RenderNoiseLevel</td>
<td></td>
<td>Average render noise level after dynamic range compression or analog gain control is applied.</td>
</tr>
<tr>
<td>RenderLoopbackSignalLevel</td>
<td></td>
<td>Average level of speaker loopback signal (after any device offload effects have been applied).</td>
</tr>
<tr>
<td>QualityEstimates.Audio</td>
<td></td>
<td>In the QoE / VQ structure, the inbound and outbound blocks contain a &quot;Network&quot; section which has a DSCP field. These fields should be used to indicate what DSCP value was applied to the RTP stream packets outgoing as well as received with incoming packets. This would be valuable information for ensuring the end-to-end network is dealing appropriately with media streams. See <a href="#">QualityEstimates.Audio Element</a>.</td>
</tr>
<tr>
<td>RecvListenMOS</td>
<td></td>
<td>The MOS-LQO wideband for decoded audio received by the reporting entity during the session.</td>
</tr>
<tr>
<td>RecvListenMOSMin</td>
<td></td>
<td>Minimum of the RecvListenMOS for the stream during the session.</td>
</tr>
<tr>
<td>NetworkMOS</td>
<td></td>
<td>Predictive metrics based on network factors alone.</td>
</tr>
<tr>
<td>OverallAvg</td>
<td></td>
<td>The average of MOS-LQO wideband based on the audio codec used and the observed packet loss and inter-arrival packet jitter.</td>
</tr>
<tr>
<td>NetworkMOS</td>
<td>OverallMin</td>
<td>The minimum of MOS-LQO wideband based on the audio codec used and the observed packet loss and inter-arrival packet jitter.</td>
</tr>
</tbody>
</table>
Deploying in Secure/Federal Environments

Use this appendix as a reference to this Solution Deployment Guide when deploying the Polycom Microsoft solution in a secure environment. This appendix points to:

- Restrictions and limitations of the solution in a secure environment
- Product-specific configurations
- Additional steps to complete and steps in this Solution Deployment Guide to ignore

Additional Skills and Resources for Secure Environments

Administrators require the following additional background, skills and resources when deploying this solution in a secure federal environment:

- Knowledge of local security policies enforced in the secure environment
- UCR and applicable Security Technical Implementation Guide (STIG) requirements
- Applicable Polycom documentation for each Polycom product you are installing and deploying in a secure environment. You can locate Polycom supporting documentation at Documents & Downloads on Polycom Support or contact your Polycom representative.

RealPresence Group Series Systems

Complete the initial installation of RealPresence Group Series systems as outlined in the Polycom RealPresence Group Series for Maximum Security Environments - Deployment Guide.

The following lists exceptions in this Polycom for Microsoft Solution Deployment Guide when deploying RealPresence Group Series systems:

- Do not configure Calendaring Services (no Click-to-Join) for RealPresence Group Series systems
- Do not enable connection with remote/federated users
- Polycom® Touch Control is not supported
- Do not enable conference room access for remote and federated users for RealPresence Groups Series systems.