Calendaring for RealConnect -
Microsoft Office 365 Skype for Business Deployments
(not AQUA)

REVISION HISTORY

Revision	Date	Author	Details
Release 1.0	August 11, 2016	christian.davis@polycom.com	First release
Release 1.1	October 03, 2016	christian.davis@polycom.com	Added need for skypeDomain attribute to be added to VMR settings of match rule
Release 1.2	March 01, 2017	christian.davis@polycom.com	Updated for Workflow Server release 1.6.1. Changes include: • Password no longer needs to be encoded as Base64 • Browser URL for management is https://localhost/admin. • New UI for agent configuration • Configuration requirements for enabling support for skype public and private meetings
Release 1.2	March 01, 2017	christian.davis@polycom.com	Updated to include support for Windows Server 2016

INFORMATION ELEMENTS

Polycom guides may contain the following icons to alert you to important information.

Name	Icon	Description
Note		The Note icon highlights information of interest or important information needed to be successful in accomplishing a procedure or to understand a concept.
User Tip		The User Tip icon highlights techniques, shortcuts, or productivity related tips for users.
Caution		The Caution icon highlights information you need to know to avoid a hazard that could potentially impact device performance, App functionality, or successful feature configuration.

Name	Icon	Description
Warning		The Warning icon highlights an action you must perform (or avoid) to prevent issues which may cause you to lose information or your configuration setup, and/or affect phone, video, or network performance.
Web Info		The Web Info icon highlights supplementary information available online such as documents or downloads on support.Polycom.com or other locations.
Troubleshooting		The Troubleshooting icon highlights information which may help you solve a relevant problem or to refer you to other relevant troubleshooting resources.
Settings/Decision Required		The Settings icon highlights settings you may need to choose for a specific behavior, to enable a specific feature, or to access customization options.
Polycom Best Practices		Polycom icon references recommendations for best practices.

BEFORE YOU BEGIN

This solution deployment guide details how to deploy Polycom One Touch Dial (OTD) Application in conjunction with Polycom® RealConnect™ functionality for Microsoft Office 365 Skype for Business Deployments.

With Polycom® RealConnect™, Microsoft Skype for Business enabled users do not have to change their workflow or learn a new process to participate in online meetings from video enabled meeting rooms. The meeting organizer simply schedules the online meeting via Microsoft Outlook and the integrated solution automatically sets up the call in the background.   H.323 or SIP compatible videoconferencing devices, including telepresence systems can be used in conjunction with those clients and devices natively supported by online meeting.

The solution enables PC users to maintain the familiar click-to-join user experience for joining calls from the Outlook meeting reminder or invitation. The OTD App extends the click-to-join functionality to compatible videoconferencing and telepresence devices.

The purpose of this guide is to explain the deployment models, architectures, and constraints, enabling unified communications architects to determine the optimum deployment model for a given environment.

The Polycom RealConnect solution for Microsoft is a suite of Polycom hardware or virtual appliances and software applications that enable integration of high-quality videoconferencing and telepresence devices across Microsoft Lync Server 2013 or Skype for Business.

REQUIRED SKILLS

Deploying Polycom RealConnect calendaring in a Microsoft Office 365 environment requires planning and knowledge of videoconferencing and Microsoft expertise. Note that this guide does not provide full administration or maintenance procedures for Microsoft Office 365 email and calendaring, for full administrative procedures, consult Microsoft documentation.
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 the Polycom UC solution:
- Microsoft Active Directory
- Microsoft Exchange Server
- Microsoft Domain accounts
- Domain Name Servers
- Skype for Business Servers

In particular those carrying out the implementation should be familiar with the Office 365 management shell.

HARDWARE AND SOFTWARE DEPENDENCIES

Deployment of Polycom RealConnect with calendaring solution requires the following components:
- Microsoft Skype for Business on premise deployment with edge services. Required to enable the Polycom solution to join the Office 365 hosted Skype for Business online meeting
- Microsoft Office 365 email/calendaring
- Microsoft Office 365 Skype-for-Business
- Polycom DMA version 6.4 or later
- Polycom RMX/RPCS version 8.7.1 or later
- Polycom OTD App 1.5.2 or later
- Windows Server 2012 R2 or Windows Server 2016 to host Polycom OTD App
- Compatible Polycom or Cisco videoconferencing/telepresence room devices
  - Polycom Group Series codec version 4.3.0 or later
  - Polycom HDX services codec version 3.0.4 or later
  - Polycom RealPresence Immersive Studio version 5.0.0 or later
  - Polycom RealPresence OTX Studio version 5.0.0 or later
  - Polycom RPX/OTX with HDX series hardware version 3.0.5 or later
  - Cisco C/SX/EX/Profile/MX200G1/MX300G1 Series codec version TC 5.0 or later
  - Cisco Telepresence System (CTS) version 1.7 or later
  - Cisco Telepresence Immersive eXperience (IX)
  - Cisco DX series codec

> ⚠️ *Polycom RealConnect functionality requires alignment of software versions between the Polycom products. Please consult the release notes for each product prior to deployment to avoid compatibility issues.*

Polycom RealConnect solution for Microsoft Office 365 Skype for Business requires the OTP App to create a VMR on the DMA. When one or more videoconferencing/telepresence devices click-to-join, the DMA creates the conference on an available RMX and instructs the RMX to dial the Skype-for-Business online Meeting. If the Office 365 Skype for Business tenant online meeting is enabled for dial-in conferencing, non-calendared videoconferencing/telepresence devices may also participate in the meeting by calling the Conference ID:

→ Join Skype Meeting
This is an online meeting for Skype for Business, the professional meetings and communications app formerly known as Lync.

Join by phone
1-800-555-0100 (USA)   English (United States)
Find a local number

Conference ID: 11127
Forgot your dial-in PIN? | Help

To join an online meeting from an H.323 or SIP compatible videoconferencing device dial <ConferenceID>@myrpp.net

> ⚠️ *At least one internal videoconferencing/telepresence room must be invited to the meeting, to invoke the creation of the DMA VMR by the OTD App. If dial-in conferencing is not enabled only click-to-join compatible devices may participate.*

CALENDARING FOR POLYCOM REALCONNECT SCHEDULING WORKFLOW

With Polycom® RealConnect for Microsoft Office 365, Skype for Business enabled users schedule meetings via the online meeting button added to the Microsoft Outlook mail new items and calendar ribbons by the Skype for Business client.
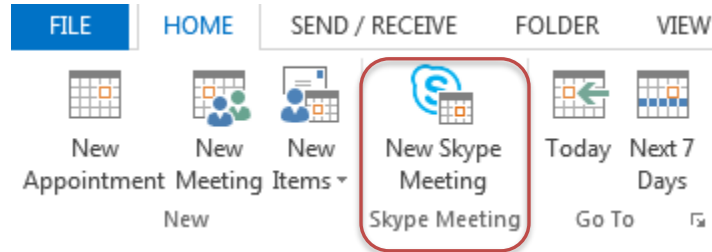

The online meeting button creates a new meeting invitation and automatically populates the comments section of the meeting invitation with join instructions.

The meeting organizer selects the desired date, time and duration and enters a subject for the meeting. The 'To…' button and field enables the organizer to invite attendees. The 'Rooms…' button or room finder App are used to add the rooms containing the videoconferencing or telepresence devices to the meeting invitation.
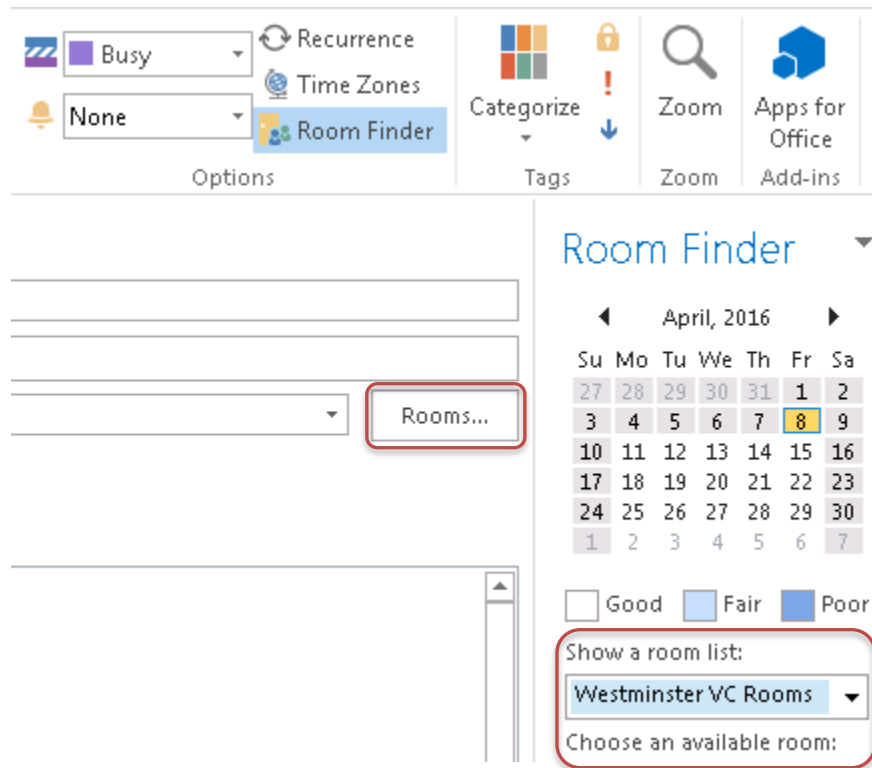
For organizations that schedule the room via other means, the videoconferencing or telepresence devices may be assigned equipment resource mailboxes to avoid confusing users and potential booking conflicts. Equipment resource mailboxes are added to the invitation using the 'To…'button and field.

The Outlook meeting ribbon includes a meeting options button.
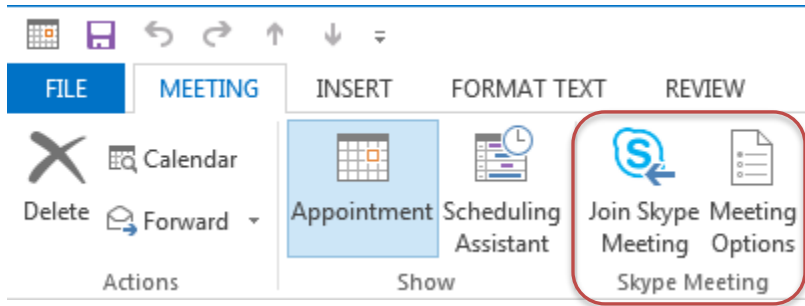
The button enables the meeting organizer to customize the meeting security settings. If the button is not selected the setting are assigned by the Lync/Skype for Business system administrator using the Set-CsMeetingConfiguration cmdlet.

 A detailed explanation of meeting options is available via the Microsoft Office support website*.*

CALENDARING FOR POLYCOM REALCONNECT JOIN EXPERIENCE

The Polycom RealPresence OTD App in conjunction with Microsoft Office 365 room or equipment resource mailboxes provide a click-to-join experience for compatible videoconferencing and telepresence devices.

Polycom Group Series, RealPresence Immersive Studio and OTX Studio Join Experience

Polycom Group Series videoconferencing devices display the calendar for the assigned room or equipment mailbox across the top of the home screen.
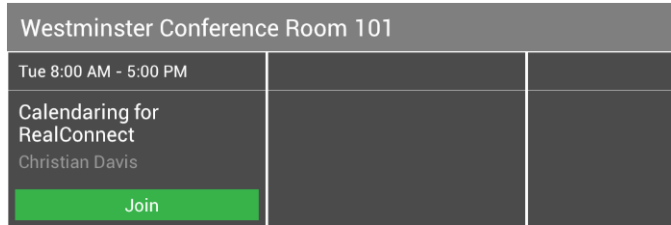
Users interact with the calendar using the Polycom Group Series remote control. To join the meeting the user highlights the meeting entry using the arrow buttons and initiates the join by pressing the select button.

A similar user interface is provided on Polycom Group Series, Immersive and OTX Studios equipped with a Polycom RealPresence Touch.
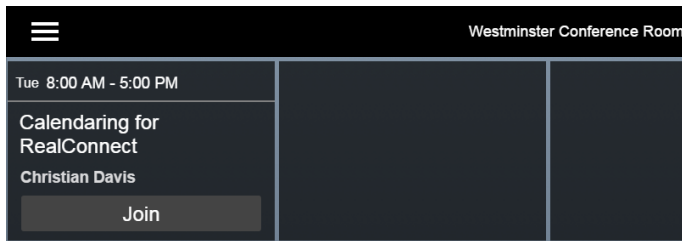
To join the meeting users select the join button beneath the calendar entry via the touch sensitive screen.

Polycom HDX/RPX/OTX Join Experience

Polycom HDX videoconferencing devices are typically configured to provide access to the calendar from the home screen.
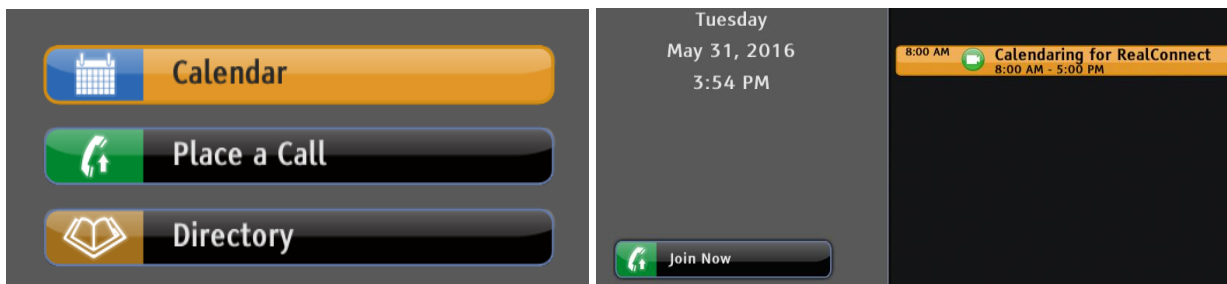

Users interact with the calendar using the Polycom HDX remote control. To join the meeting the user selects the calendar, highlights the meeting entry using the arrow buttons, and initiates the join by pressing the select button.

A similar user interface is provided on HDX, RPX or OTX devices equipped with a Polycom Touch Control (PTC).
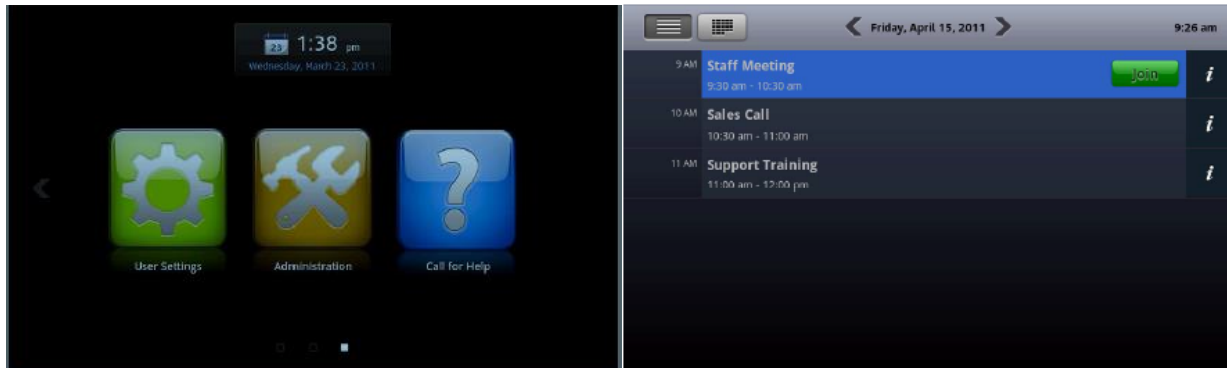
Users select the calendar icon top center on the home screen of the PTC, followed by the meeting entry and join button.

Also available from Polycom is the Polycom Touch for HDX App, a software application designed, developed and supported by the Polycom Professional Services Business Apps team. The Polycom Touch for HDX App provides the same user experience as the Polycom RealPresence Touch solution available for Polycom Group Series.
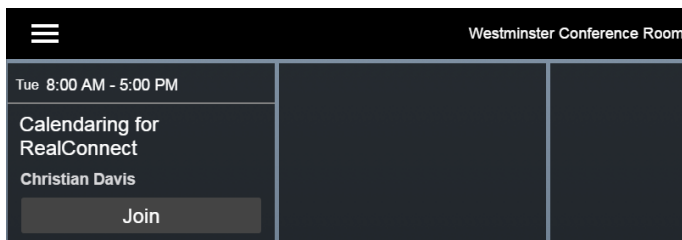

Polycom Touch for HDX App is an application that loads from a web service onto popular Android and Apple tablets (customer supplied). The app provides Touch for HDX, speed dialing, directory search, content sharing, layout options, camera views and other functions for HDX endpoints.

For further information on the Polycom Touch for HDX App please consult your Polycom sales representative.

Cisco Telepresence System (CTS) / Immersive eXperience (IX) Join Experience

Cisco videoconferencing devices display the calendar for the assigned room or equipment mailbox on the home screen.
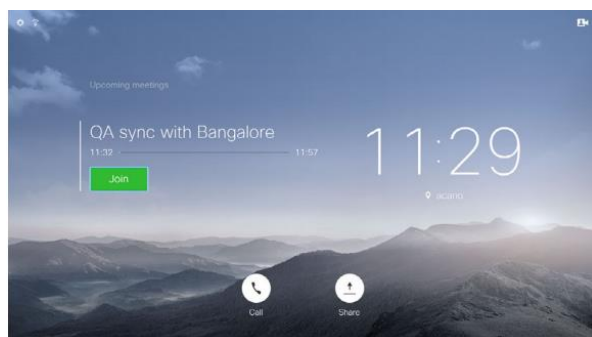

Users interact with the calendar using the remote control. To join the meeting the user highlights the meeting entry using the arrow buttons and initiates the joining the meeting by pressing select when the join option is illuminated.

A similar user interface is provided on devices equipped with a Cisco Touch. To view the calendar the user selects the meetings option.

To join the meeting the user select the meeting entry followed by the join meeting button.
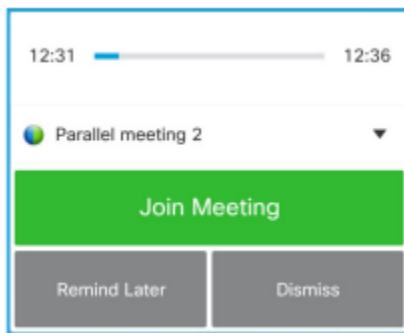
Cisco Telepresence System (CTS) / Immersive eXperience (IX) Join Experience

CTS devices are operated via either a Cisco Telepresence Touch or Cisco IP 7900 series phone.

To view the calendar the user selects the meetings option. To join the meeting the user select the join option next to the meeting entry.

Overview

Deployment example 3 supports the following deployment scenarios:

- Microsoft Office 365 room/equipment mailboxes with associated AD user object disabled for login

- Polycom HDX, Group Series, RealPresence Immersive Studio and OTX Studio devices dynamically managed by RealPresence Resource Manager (RPRM), assigned RPRM room and machine accounts

- Polycom RPX and OTX equipped with HDX codecs, manually configured to retrieve the calendar via the OTD App

- Cisco One Button to Push (OBTP) compatible devices

> ⚠️ *Polycom RPX and OTX devices equipped with Polycom HDX codecs do not support dynamic management, the calendaring settings must be entered manually on the primary/center codec.*

Deployment Example Components

The deployment example shown comprises of the following components:
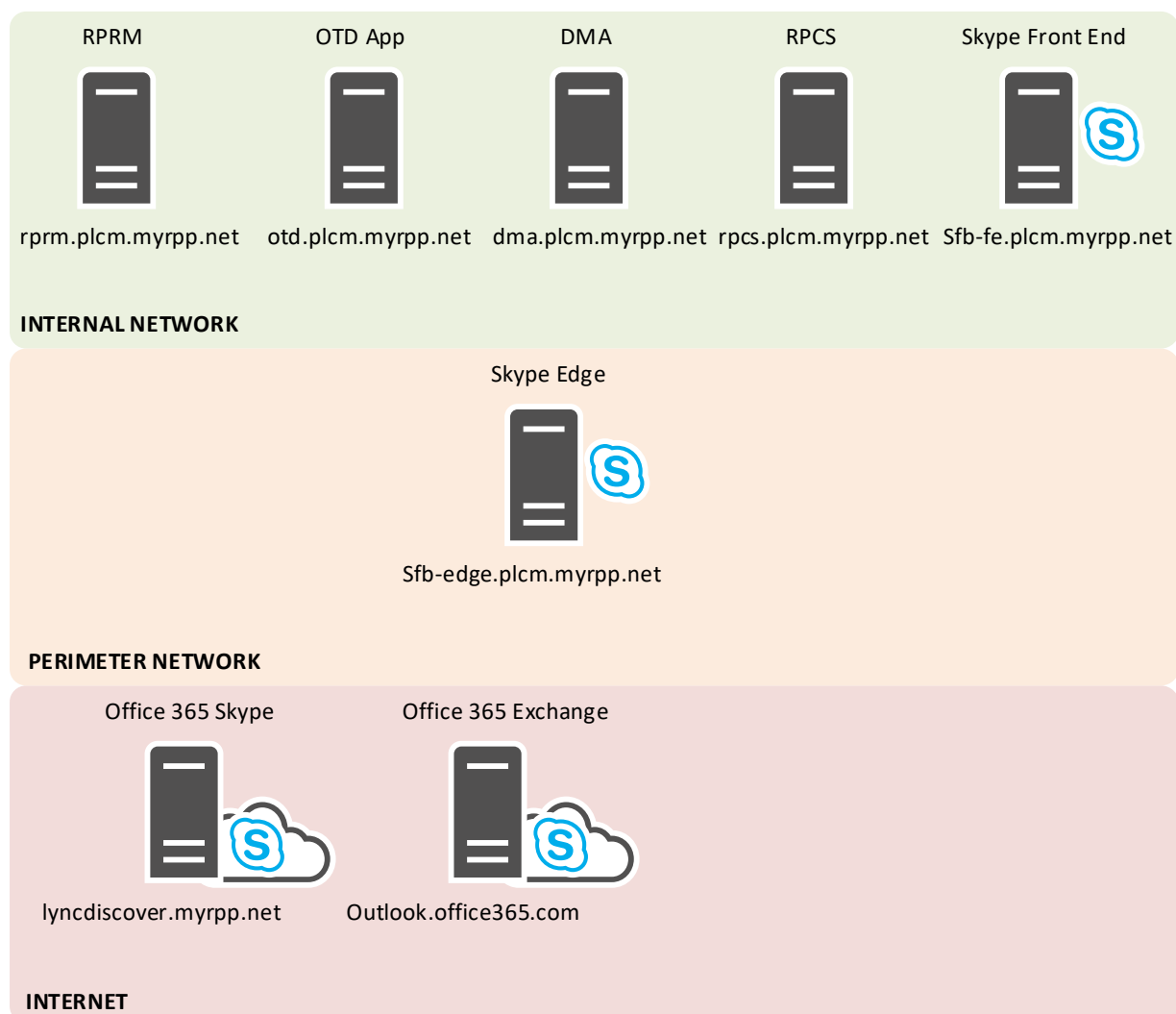
DNS Record	Host
rprm.plcm.myrpp.net	Polycom RPRM
otd.plcm.myrpp.net	Windows Server hosting OTD App
dma.plcm.myrpp.net	Polycom DMA
rpcs.plcm.myrpp.net	Polycom RMX or RealPresence Collaboration Server
sfb-fe.plcm.myrpp.net	Skype for Business on premise front end server
sfb-edge.plcm.myrpp.net	Skype for Business on premise edge server
outlook.office365.com	Office 365 email and calendaring service
Lyncdiscover.myrpp.net	Office 365 Skype for Business tenant

> *The example illustrates separate SIP domains for the on premise and Office 365 Skype for Business deployment. Hybrid deployments with the same SIP domain(s) are also supported.*

Office 365 Skype for Business Online Meeting Creation

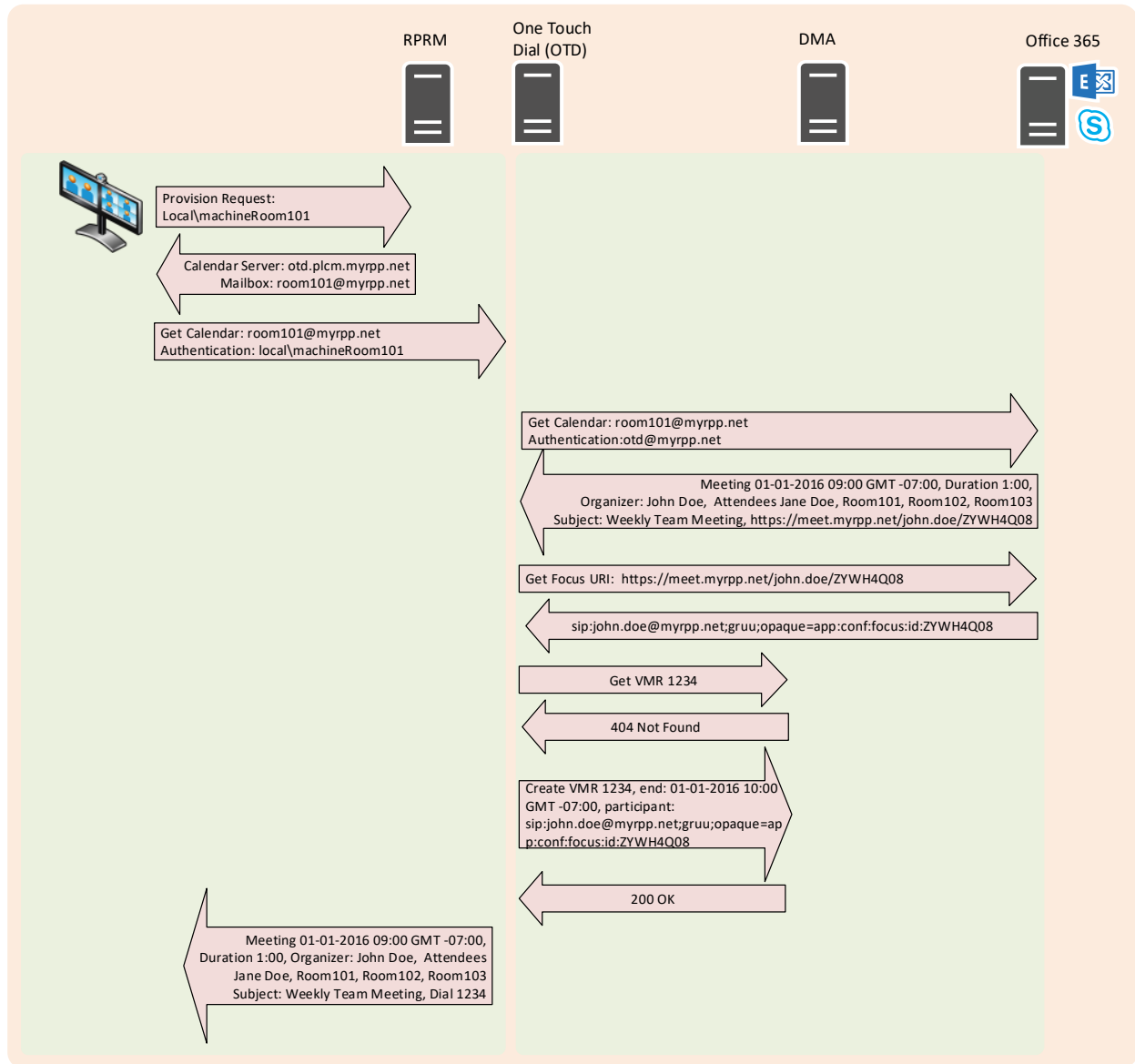Scheduling a Microsoft Office 365 Skype for Business online meeting with one or more internal videoconferencing/telepresence rooms invokes the creation of the Polycom DMA VMR:
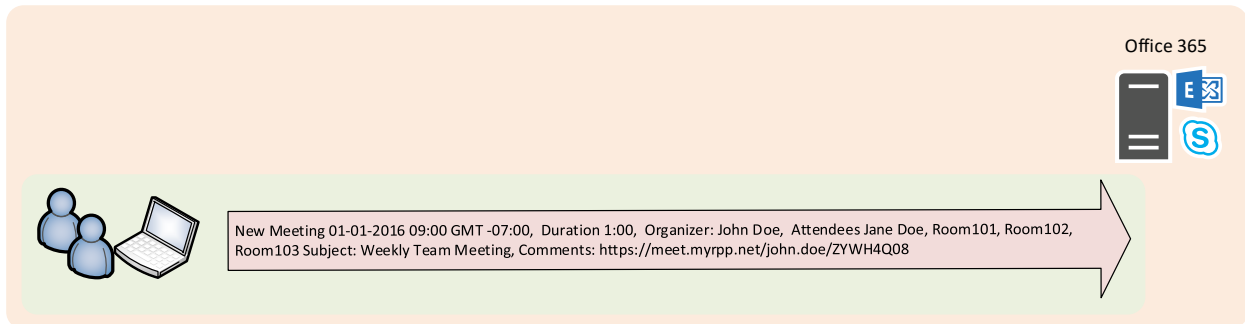
VMR Creation and Retrieval Polycom Videoconferencing/Telepresence Devices

The VMR creation process is as follows:

1. Polycom videoconferencing/telepresence device authenticates with RPRM using assigned RPRM machine account

2. RPRM provisions Polycom videoconferencing/telepresence device to enable calendaring feature, set the server FQDN as otd.plcm.myrpp.net and the mailbox address as room101@myrpp.net

3. Polycom videoconferencing/telepresence device authenticates with OTD App using assigned RPRM machine account and requests room calendar

4. OTD App authenticates with Office 365 using its service account and requests the room calendar on behalf of the videoconferencing/telepresence device

5. Office 365 returns the calendar entries

6. OTD App inspects the message header for the Skype for Business online meeting focus URI. The OTD App may also be configured to inspect the body of the invitation for Skype for Business online meeting invitations. This is typically required for Hybrid deployments or where rooms may be scheduled from outside the enterprise

7. The OTD App creates a DMA VMR with either the numerical alias of the dial-in conference ID if present, or by encoding the focus URI as an integer. The OTD App adds the focus URI as a dial out participant and sets the domain suffix for the from attribute of the SIP invite to match the SIP domain of the on premise Skype for business deployment

8. The OTD App returns the calendar entries to the videoconferencing/telepresence device, adding the instructions to invoke the click to join for the VMR

Dynamic management of Polycom RPX and OTX Studio HDX based telepresence devices is not supported. For these devices steps 1 and 2 two are replaced with manual configuration of the calendaring service as described later in the document.

VMR Creation and Retrieval Cisco Videoconferencing/Telepresence Devices

The VMR creation process is as follows:

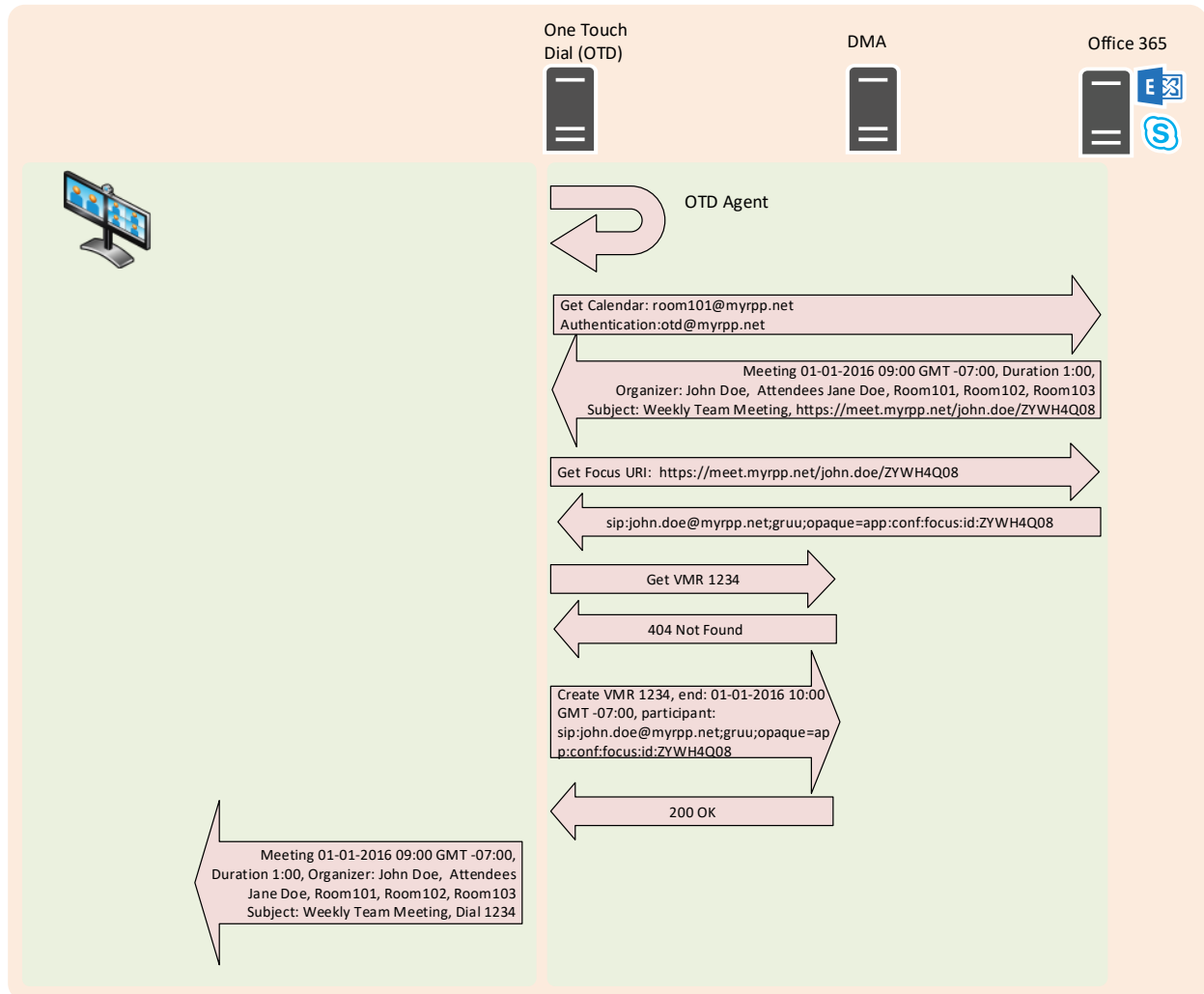1. An OTD Agent is created for each Cisco videoconferencing/telepresence device

2. The agent authenticates with OTD App using assigned account and requests the room calendar

3. OTD App authenticates with Office 365 using its service account and requests the room calendar on behalf of the videoconferencing/telepresence device

4. Office 365 returns the calendar entries

5. OTD App inspects the message header for the Skype for Business online meeting focus URI. The OTD App may also be configured to inspect the body of the invitation for Skype for Business online meeting invitations. This is typically required for Hybrid deployments or where rooms may be scheduled from outside the enterprise

6. The OTD App creates a DMA VMR with either the numerical alias of the dial-in conference ID if present, or by encoding the focus URI as an integer. The OTD App adds the focus URI as a dial out

participant and sets the domain suffix for the from attribute of the SIP invite to match the SIP domain of the on premise Skype for business deployment

7. The OTD App returns the calendar entries to the videoconferencing/telepresence device, adding the instructions to invoke the click to join for the VMR

RealConnect for Office 365 Skype for Business Online Meeting Call Flow
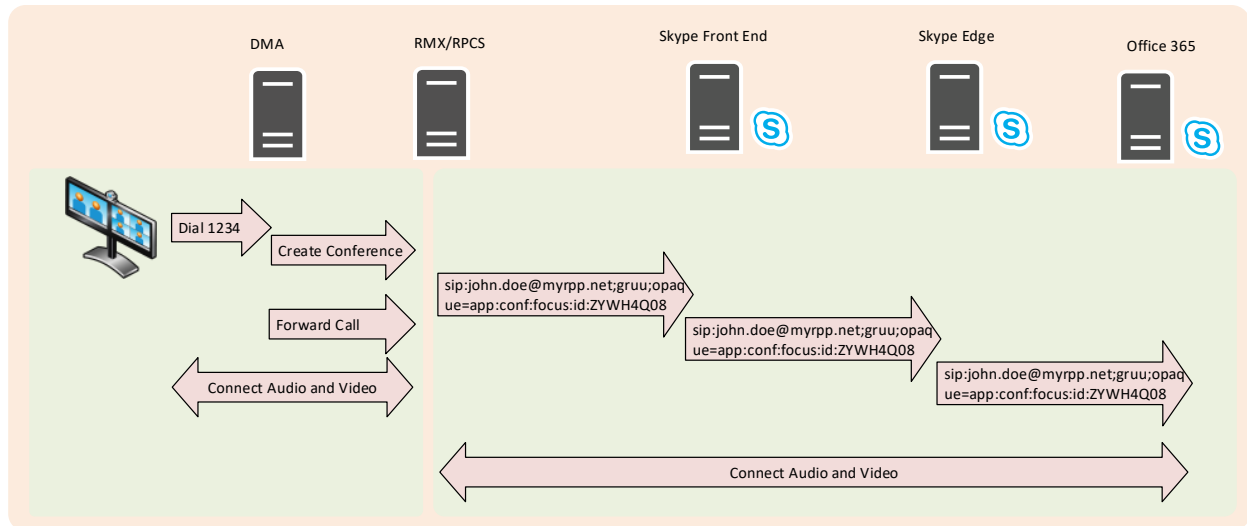
The VMR launch process is as follows:

1. A videoconferencing/telepresence device dials the assigned VMR ID

2. DMA creates a conference on the RMX/RPCS, routes the videoconferencing/telepresence device into the conference and instructs the RMX/RPCS to dial the skype for business online meeting focus URI

3. The RMX/RPCS dial the focus ID via its SIP registrar; the on premise Skype for Business front end pool.

4. The Skype for Business front end pool resolves the focus URI as an externally hosted meeting and routes the request to the edge pool

5. The Skype for Business edge pool routes the request to the Office 365 Skype for Business service

> *The conference initiation process detailed above has been simplified for the purpose of the illustration. Content has also been omitted.*

Office 365 Room/Equipment Resource Mailbox Requirements

A room resource mailbox is required for each meeting room containing a compatible Polycom or Cisco videoconferencing / telepresence device. Office 365 will create a disabled AD user object for each mailbox. The room resource mailbox is created using the PowerShell cmdlet:

```
New-Mailbox -UserPrincipalName room101@myrpp.net -Alias room101 -Name
"Meeting Room 101" -Room
```

> For deployments where meeting rooms are not scheduled via Office 365 an equipment resource mailbox will be used and users will be instructed to add the equipment to the meeting invitation. For these deployments replace the –Room switch shown above with –Equipment.

The room/equipment resource mailbox may also be used to educate users that the room is equipped with a videoconferencing/telepresence system that is able to participate in Skype for Business online meetings via the Exchange PowerShell cmdlet:

```
Set-Mailbox -Identity room101 -MailTip "This room is equipped with a
videoconferencing/telepresence device.  Please make this meeting a Skype
for Business online meeting request"
```
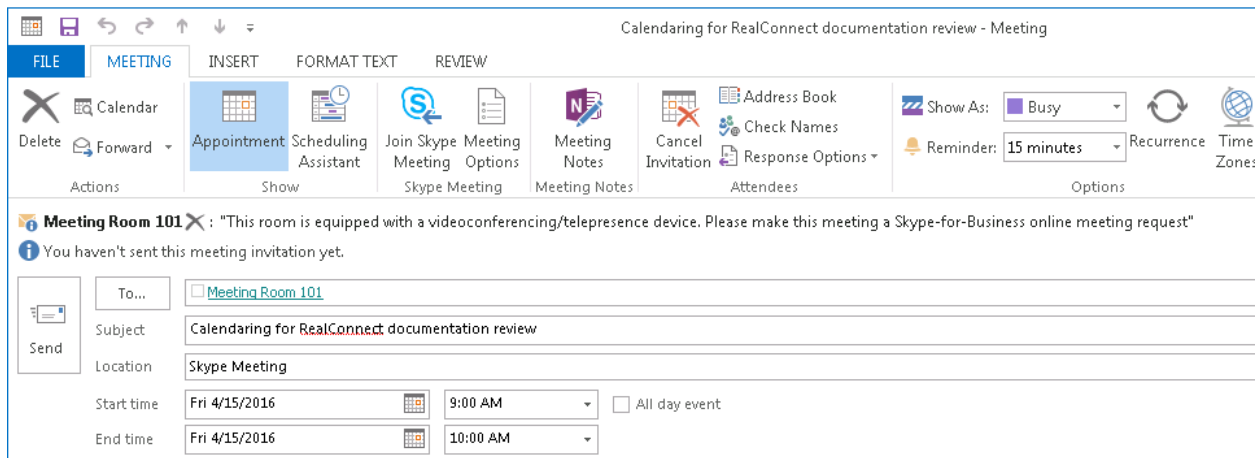

> A detailed explanation of mailbox creation and associated attributes is available via the Microsoft TechNet website.

For room and equipment resource mailboxes created using the PowerShell cmdlet, the Microsoft calendar attendant and resource booking attendant are enabled via PowerShell cmdlet. The default behavior is to delete the comments of accepted meetings, thereby removing the Skype for Business join instructions from the invite. Polycom recommend the delete comments feature be disabled using the PowerShell cmdlet:

```
Set-CalendarProcessing –identity room101 –AutomateProcessing AutoAccept
–DeleteComments $false
```

The calendar attendant by default replaces the meeting subject with the name of the meeting organizer. Though this does not impact operation of the solution, this behavior can be disabled using the PowerShell cmdlet:

```
Set-CalendarProcessing  –identity  room101  –DeleteSubject  $false  –
AddOrganizerToSubject $false
```

> *A detailed explanation of the Set-CalendarProcessing PowerShell cmdlet and associated attributes is available via the* [Microsoft TechNet website](#)*.*

Microsoft Outlook 2010 introduced room finder functionality enabling users to locate an available room within a given location through the association of room resource mailboxes with distribution groups. In this example Meeting Room 101 will be assigned to distribution group Westminster VC Rooms using the PowerShell cmdlet:

```
Add-DistributionGroupMember  –Identity  "Westminster  VC  Rooms"  –Member
room101
```

> *An overview of the room finder feature is available via the blog Get a Room! Enable Room Finder with Room List Distribution Groups posted on the* [Microsoft TechNet website](#)*.*

OTD Service Mailbox assigned Calendar Reviewer Requirement

The OTD environment will use an AD service account. The service account will be assigned an office 365 mailbox. The service account and mailbox are created using the PowerShell cmdlet:

```
New-Mailbox  -Alias  otd  -Name  "PLCM  OTD"  -FirstName  PLCM  -LastName  OTD  -
DisplayName "PLCM OTD" -UserPrincipalName otd@myrpp.net -Password (ConvertTo-
SecureString -String Polycom12#$ -AsPlainText -Force)
```

The service will be assigned reviewer rights for the room/equipment resource mailboxes calendars using the PowerShell cmdlet:
```
Add-MailboxFolderPermission  room101:\calendar  –user  otd  -accessRights
Reviewer
```

> *A detailed explanation of Add-MailboxFolderPermission PowerShell cmdlet and associated attributes is available via the* [Microsoft TechNet website](#)*.*

> *A shared service account is required for Office 365 deployments.*

As the OTD App is unable to automatically update the password of the service account it will be set to never expire using the AD PowerShell cmdlet:

```
Set-AdUser –Identity otd -PasswordNeverExpires $true
```

> *A detailed explanation of Microsoft Set-ADUser PowerShell cmdlet and associated attributes is available via the* [Microsoft TechNet website](#)*.*

DNS Requirements

The Polycom videoconferencing/telepresence devices attached to the internal network will derive the room/equipment resource calendar using the FQDN of OTD App environment. A DNS 'A' record must be created that resolves to the IPv4 address assigned to the Windows 2012 R2 server hosting the OTD App. In the examples shown the FQDN is otd.myrpp.net

The OTD App will proxy the calendaring request to the Office 365 mailbox/calendaring service and therefore must be able to resolve outlook.office365.com and the associated ADFS authentication services.

The OTD App will create VMR's on the DMA. The DMA may be defined by IPv4 address or FQDN.

Polycom RealPresence Resource Manager Room Accounts

Polycom RealPresence Resource Manager uses rooms to define device specific attributes to be provisioned to dynamically managed Polycom HDX, Group Series, RealPresence Immersive Studio and OTX Studio devices. A room account will be created for each device.

The General tab defines the room/equipment resource mailbox SMTP address

Edit Room	✕
General Info	Room Name: room101
Associated Endpoints	Description:
SIP Dial String Reservations	Site: NALA
H323 Dial String Reservations	E-mail: room101@myrpp.net

The SIP and H.323 dial string reservation tabs may be used to define the desired aliases

Edit Room	✕
SIP Dial String Reservations	✕
Device Type	All Devices (default)
SIP URI	room101@myrpp.nwt

Edit Room	×

H323 Dial String Reservations	×
Device Type	Group Series ▾
E164	441591
H323 ID	room101

	Do not attempt to associate a device with the room, RealPresence Resource Manager will automatically associate the device when it authenticates for the first time.
	Rooms are configured under the RealPresence Resource Manager user > room menu.

Polycom RealPresence Resource Manager Machine Accounts

Polycom RealPresence Resource Manager uses machine accounts to enable dynamically managed Polycom HDX, Group Series, RealPresence Immersive Studio and OTX Studio devices to authenticate for provisioning. The account is associated with a room account to enable RealPresence Resource Manager to provision the correct SMTP mailbox, H.323 and SIP aliases.

Edit Machine Account	×

☑ Enable Machine Account

☐ Unlock Machine Account

User ID	machineRoom101
Password	••••••••
Confirm Password	••••••••
Description	machineRoom101

Associate with an existing user or room:

Select	room101

	The password assigned to the machine account must match the OTD environment password (considered a shared secret).
	Machine account password expires after one year. After the expiration, the endpoint login will fail. After three failed login attempts, the system locks the machine account. You can reset the password and unlock the machine account by editing it and assigning a new password.

⚡	*The password assigned to the machine account must match the OTD environment password (considered a shared secret).*
⚙	Rooms are configured under the RealPresence Resource Manager user > room menu.

Polycom RealPresence Resource Manager Provisioning Profiles

The RealPresence Resource Manager Network provisioning profiles are used to provision regional settings to the dynamically managed Polycom HDX, Group Series, RealPresence Immersive Studio and OTX Studio devices. In the example shown the default network provisioning profile has been configured to provision the OTD App environment FQDN

Polycom	*Polycom recommends the devices be configured to derive time from a time server supporting NTP. Setting the time server as auto will configure the device to derive time from ntp.polycom.com. The time server is configured via the date and time settings tab.*

The RealPresence Resource Manager Admin configuration provisioning profiles are typically used to provision generic settings that apply to all dynamically managed Polycom HDX, Group Series, RealPresence Immersive Studio and OTX Studio devices, irrespective of location. The Default admin config provisioning profile is configured to enable calendaring:

- Calendaring enabled

- Display private meetings unchecked

- Meeting reminder 15 minutes

- Check for new meetings every 3 minutes

- Use endpoint provisioning credentials checked (use the machine account credentials to authenticate with the OTD App)

| The Provisioning Profiles are configured under the RealPresence Resource Manager endpoint > dynamic management > provisioning profiles menu. |

OTD App Installation

The Polycom OTD App is a feature of the Polycom Workflow Server. Polycom Workflow Server must be installed on a Windows Server 2102 R2 or Windows Server 2016 operating system. The Windows Server must be allocated the following resources or better:

- 2 vCPUs 4Ghz Reservation
- 8GB RAM allocation
- 40GB HDD

> ⚠️ *Caution. Windows Server Internet Information Services (IIS) role is not a requirement of Workflow Server. Installation of IIS may prevent the Workflow server from listening for HTTPS connections.*

Configuration of Workflow Server is performed via Google Chrome web browser, via the URL https://localhost/admin. Login with the default username and password ***admin***.

> ⚠️ *Caution. Configuration must be performed using Google Chrome web browser, installed locally on the Windows Server.*

OTD App Environment Configuration

Environments define the OTD proxy interactions between calendaring requests from videoconferencing / telepresence devices and the Microsoft Office 365 mailbox and calendaring environment.
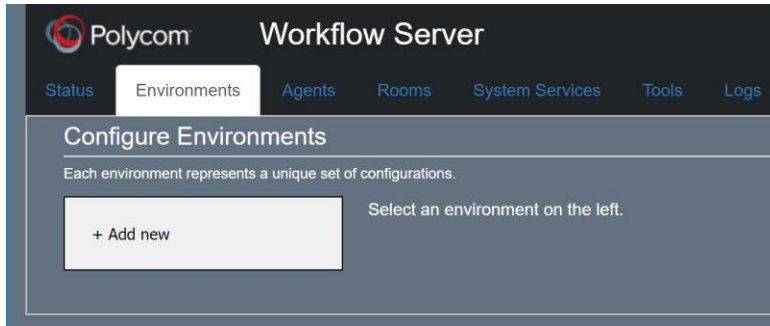

For Office 365 deployments, typically only a single environment is required.

The service fully qualified domain name field defines the name of the OTD environment.

The FQDN is the host defined with the HTTP header received from Polycom videoconferencing/telepresence devices and OTD Agents for Cisco devices.

The settings properties drop down menu is used to define the attributes to be configured within the OTD App environment.
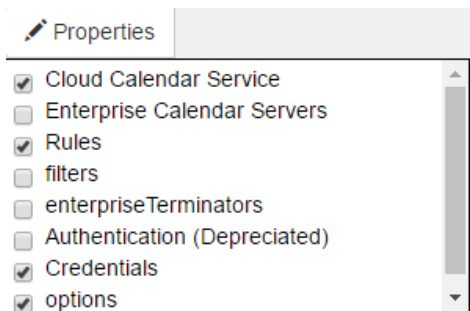
The Cloud Calendar Service, Rules, Credentials and options attributes are used within this configuration example. Having selected the desired attributes reselect properties to hide the menu and continue with the configuration.

The Cloud Calendar Service defaults to Office 365 (o365)
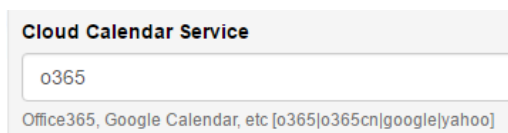
Rules instruct the OTD App how to parse calendar entries retrieved from Office 365.

At least one rule must be added with the match type set as Skype.

The match field is used to define the Skype for Business SIP domain suffix for online meeting requests. The dot/period domain separator(s) must be prefixed with backslash, the regular expression escape/literal indicator. In the example shown the match field is populated with myrpp\.net domain suffix. For environments with multiple Skype for Business SIP domain suffixes for online meeting requests the additional domains may be added using a pipe to represent the Boolean OR operand for example myrpp\.net|polycom\.com.

The protocol field may be used to instruct the OTD App to instruct the videoconferencing / telepresence devices to use H.323 or SIP. When left blank the device will attempt to call using the assigned default interface.

The Prefix and postfix options can be used to assign a prefix and/or domain suffix to the dial instruction sent to the videoconferencing/telepresence devices.

The vmrPrefix can be used to both assign a prefix and match a given DMA instance. This attribute is typically only used in service provider deployments.

VMR Settings are used to define the DMA MCU Pool Order, Conference Template and SIP domain suffix for assignment to the VMR. In the example shown the DMA factory default MCU Pool Order and conference template are used.

The Skype domain attribute defines the domain suffix of the VMR and is appended to the VMR number by the RMX when populating the 'from' attribute of the SIP invite sent to the on premise Skype for Business front end pool. In the example shown the on premise deployment has the SIP domain plcm.myrpp.net,

therefore the RMX must populate the 'from' attribute of the invite with this domain to be able to use the edge services to connect to the Office 365 tenant for the myrpp.net Skype for Business online meeting.

Credentials define how Polycom videoconferencing/telepresence devices and OTD Agents for Cisco devices will authenticate with the OTD App. Credentials also define the OTD App Office 365 Service Mailbox account used for retrieving the room resource mailbox calendars on behalf of the videoconferencing/telepresence devices.

At least one realm must be added to the configuration.

The realm field is configured to match the domain of the user credentials sent by the Polycom videoconferencing/telepresence devices or OTD Agents for Cisco devices. The Polycom devices are configured to authenticate with the OTD App using the RPRM machine account, therefore the realm is configured as local.

For deployments where the devices or OTD Agents authenticate using an AD username and password, the OTD environment server field may be configured. The field instructs the OTD App to use the LDAP services provided by a domain controller to validate the authentication request. Typically this feature is not used for Office 365 deployments as room resource mailboxes require Office 365 licenses only if the associated AD user object is enabled and therefore considered a managed mailbox.

> *When using the server option, the OTD App uses the domain controller to both validate the authentication request, retrieve the mail attribute of the AD user object and validate it matches the SMTP address of the requested calendar.*

The challenge user may be configured to match the user names sent by the Polycom devices or OTD Agents authenticating with the OTD environment. In the example shown each device will have a unique RPRM machine account, therefore the challenge user will be populated with asterisk, the regular expression wildcard indicator.

The challenge password is used to match the RPRM machine password sent by the Polycom devices or OTD Agents. For deployments using a domain controller to perform authentication the challenge password field is left blank.

> *The machine accounts must be configured with a common password. RealPresence Resource Manager machine account passwords expire after 365 days, therefore the password for all machine accounts and the OTD environment challenge password must be updated simultaneously.*

The username field is configured with the domain and username of the Office 365 service account used by the OTD App environment for retrieval of the room resource mailboxes. For Office 365 deployments the username is typically defined as a UPN. Populating the username as a UPN enables Office 365 to use the domain suffix of the username to determine the realm/customer environment and perform authentication using Microsoft Active Directory Federation Services (ADFS).

For environments where the UPN domain suffix differs from the email domain suffix, the organization attribute is used. The username field should be populated as domain\username, and the email domain suffix / realm entered in the organization added via the credentials properties.

The Advanced Options properties is used to configure many additional attributes as described within the appendix of this document.
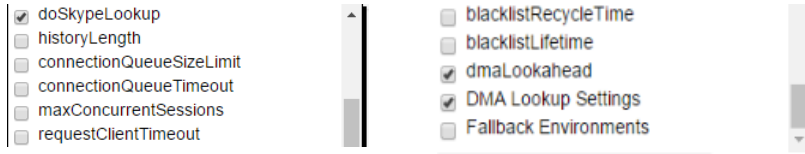
For the deployment example shown, the doSkypeLookup, dmaLookAhead and dmaLookup options are required.

Microsoft Outlook writes the Skype information (Skype Focus URI and where applicable numeric conference ID) within the body of meeting invites and within the extended properties of the meeting. The OTD App uses the extended properties for to retrieve and populate the DMA with the Skype Focus URI. When sending invitations inter company it is possible the extended properties may get removed during transport. Should you encounter this issue the doSkypeLookup attribute may be enabled instructing the OTD App to check within the body of the meeting invitation for the Skype 'Meet' simple URL between the two rows of dots and use it to perform retrieval of the focus URI.

The dmaLookAhead defines the number of hours to look ahead from current time for creation of meetings

as DMA scheduled VMR's. The default value is 12 hours, meaning any meeting scheduled to start in the next 12 hours will be created.
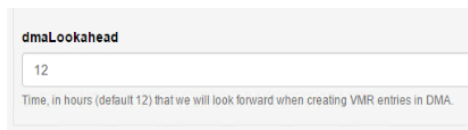
The DMA properties defines the DMA attributes to be used for VMR creation. Select prefix, server, username, password, API version, VMR type, early join and late finish options.
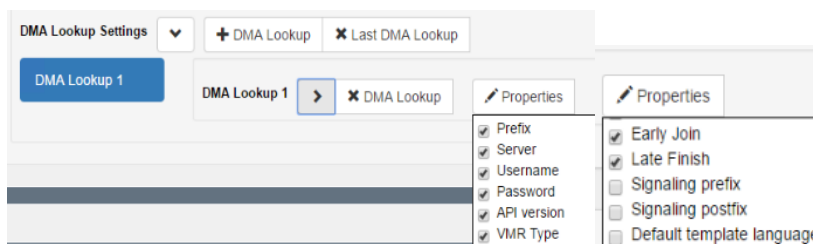
The first part of the DMA attributes define DMA connectivity and are configured as follows:

Prefix may be used to match a given OTD App match rule. This attribute is typically only used in service provider deployments, therefore an asterisk is entered, the regular expression wildcard/match all attribute.

The server field is populated with the protocol, address and port number for accessing the DMA API. Typically this is configured as

https://x.x.x.x:8443 or https://FQDN:8443.

The username field is populated with the user for accessing the DMA API domain\user. The domain must be entered in UPPERCASE. The DMA user account must be assigned DMA provisioner user role.

The password field is populated with the DMA user password.

The API version instructs Workflow Server as to the DMA API version; 3.4.0 corresponds to DMA software releases 6.4.0, and 2.6.0 to DMA 6.2.0.

> *Note. DMA does not require an API license for management by the OTD App.*

The second part of the DMA attributes define the DMA scheduled VMR creation and are defined as follows:

The early join attribute defines whether a buffer should be applied to scheduled start time. For example when set to 15 a meeting scheduled for 9am – 10am would be created on DMA as 8.45am – 10am, enabling users to join a few minutes before the meeting.

The late finish attribute defines whether a buffer should be applied to the scheduled end time. For example when set to 15 a meeting scheduled for 9am – 10am would be created on DMA as 9am – 10.15am, enabling the first user dialing into a conference, invoking the creation to join up to 15 minutes after the scheduled end time.

> *Note. The DMA end time defines the latest time the first participant may join to invoke the creation of the meeting. The conference is not ended until all participants choose to disconnect. Whilst a conference is active participants can continue to join after the scheduled end time.*

The VMR type defines whether the Skype deployment forces use of a unique URL / conference ID for each meeting the organizer schedules (random), or whether the organizer may use the same URL / conference ID for all meetings (static).
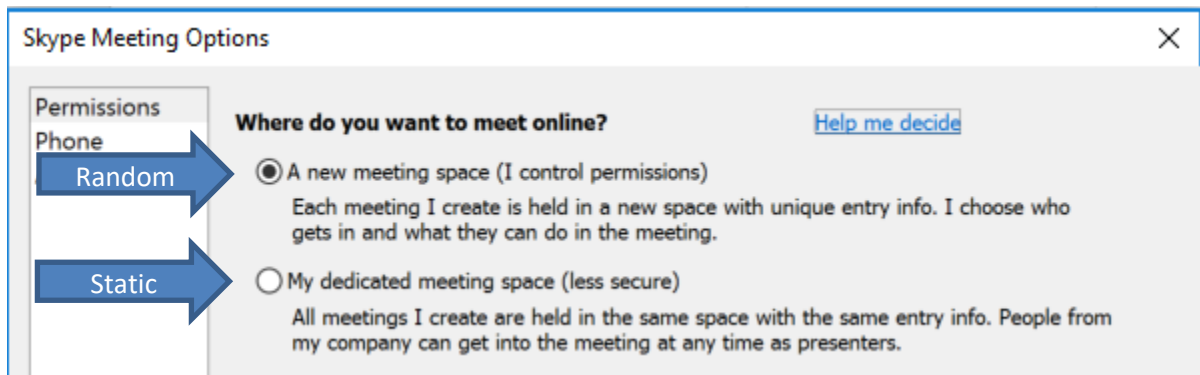

For deployments where the organizers are unable to select to use the same URL / Conference ID, the VMR type should be set as 'random'. If the user is enable for dial-in conferencing the VMR number will be the same as the Skype conference ID.

For deployments where the organizers are unable to select to use the same URL / Conference ID, the VMR type should be set as random. If the user is enable for dial-in conferencing the VMR number will be the same as the Skype conference ID.

OTD App Agent Configuration for Cisco Devices

An OTD App agent is required for each Cisco videoconferencing/telepresence device.
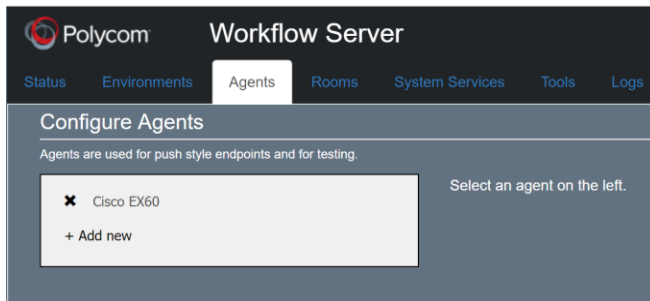
Cisco's One Button to Push (OBTP) functionality comprises of Cisco Telepresence Management Solution (TMS) and compatible Cisco videoconferencing/telepresence devices. TMS periodically pushes the room calendar to the device. The OTD App emulates this behavior through the creation and assignment of an agent for each Cisco videoconferencing / telepresence device. The agent periodically polls the OTA App environment on behalf of the Cisco device and pushes the results to device.

The settings properties drop down menu is used to define the attributes to be configured within the OTD App agent.
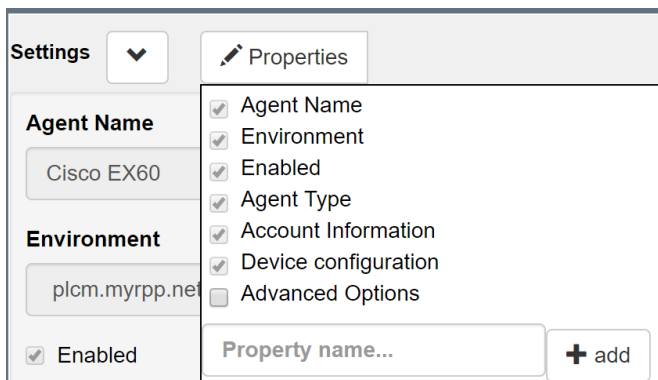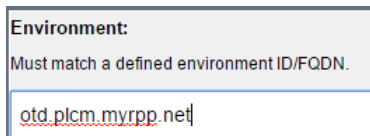

The agent name, environment, enabled, agent type, account information and device configuration attributes are used within this configuration example. Having selected the desired attributes reselect properties to hide the menu and continue with the configuration.

The agent name is used to provide a descriptive name for the agent.
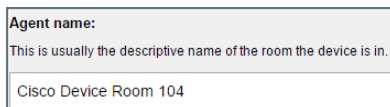
The named entered is listed on the agent configuration page and therefore typically includes building and room to enable the system administrator to easily identify the correct agent for a given device.

The environment field contains the FQDN of the OTD App environment to be used by the agent.

The agent is enabled/disabled by checking the enabled option.

Agent type is configured to emulate Cisco TMS

Account information defines how the agent interacts with the OTD App environment for retrieval of calendar entries.

Email address defines the Exchange room/equipment resource mailbox to be requested by the agent.

Username defines the OTD App environment realm\challengeUser value. For this configuration example the realm is defined as local and any value may be used for the username

Password defines the OTD App environment local realm challengePassword.

Polling interval is an optional parameter for defining in minutes the frequency which the agent will poll the OTD App environment for calendar updates. If not defined the default value of 5 minutes will be used.

Look ahead is an optional parameter for defining in minutes the cut off for calendar entries to be returned ahead of the current time. In the example shown the agent is populated with 1440 minutes, instructing OTD to retrieve calendar entries for the next 24 hours. If not defined the default value of 480 will be used to retrieve calendar entries for the next eight hours.

The target field defines how the agent interacts with the cisco videoconferencing/telepresence device.

Type defines the Cisco API to be used for communicating with the device. Select Tandberg for Cisco C / SX / EX / Profile / MX200G1 / MX300G1 device, or CTS for Cisco IX and CTS telepresence devices.

Address defines the protocol and IPv4 of the Cisco codec.

TCP Port defines the HTTP/HTTPS TCP port of the Cisco API. Note the Cisco IX and CTS devices API listens on port 8081 (http) and 9501 (https).

Username defines the username to be sent to the Cisco device for authenticating with the API.

Password defines the password to be sent to the Cisco device Cisco device for authenticating with the API.
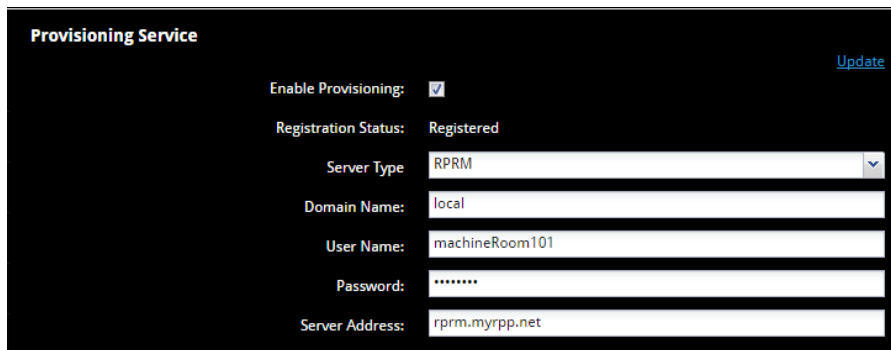
Call rate defines the call bit rate to be sent to the Cisco device. If the bit rate is set higher than the devices maximum call bit rate, the device will use the defined maximum bit rate.

Start time buffer defines the number of seconds prior to the scheduled start time to display a meeting reminder and enable the join button. The setting is only applicable for Cisco C / SX / EX / Profile / MX200G1 / MX300G1 devices. Cisco IX and CTS devices display the join button and reminder 5 minutes before the meeting start time.

Provisioned Polycom Group Series, RealPresence Immersive Studio and OTX Studio Configuration

The Polycom Group Series, RealPresence Immersive Studio and OTX Studio master Group Series codec are configured to register with the RealPresence Resource Manager provisioning service using a RealPresence Resource Manager machine account.

- Enable provisioning: checked

- Server type: RPRM

- Domain name: local

- User Name: RPRM machine account

- Password: RPRM machine account password

- Server address: FQDN of the OTD App environment

Group Series provisioning service is configured via the web interface of the device admin settings > servers > provisioning service menu.

Upon successful registration the Group Series is provisioned to derive the room/equipment resource mailbox calendar from the OTD App using the RealPresence Resource Manager machine account.

Group Series calendaring service is configured via the web interface of the device admin settings > servers > calendaring service menu.

The Polycom Group Series, RealPresence Immersive Studio and OTX Studio time zone/GMT offset is an attribute that may be optionally provisioned by the RealPresence Resource Manager network provisioning profile. For many deployments the time zone is not provisioned to limit the number of network provisioning profiles and associated provisioning rules required. The time zone/GMT offset must be set in order to ensure the calendar displayed on the device is correct.

Group Series time zone/GMT offset is configured via the web interface of the device admin settings > general settings > date and time menu.

Provisioned Polycom HDX Configuration

The Polycom Group Series, RealPresence Immersive Studio and OTX Studio master Group Series codec are configured to register with the RealPresence Resource Manager provisioning service using a RealPresence Resource Manager machine account.

- Domain: local

- User Name: RPRM Machine account

- Password: RPRM Machine account password

- Server address: FQDN or RealPresence Resource Manager server or HA pair

If provisioning is successful the HDX will apply the settings and restart.

HDX provisioning service is configured via the admin settings > global services > provisioning service menu.

Upon successful registration the HDX is provisioned to derive the room/equipment resource mailbox calendar from the OTD App using the RealPresence Resource Manager machine account.

HDX calendaring service is configured via the admin settings > global services > calendaring service menu.

The HDX calendar is accessible by selecting the option button on the remote controller followed by the calendar option from the subsequent on screen menu.
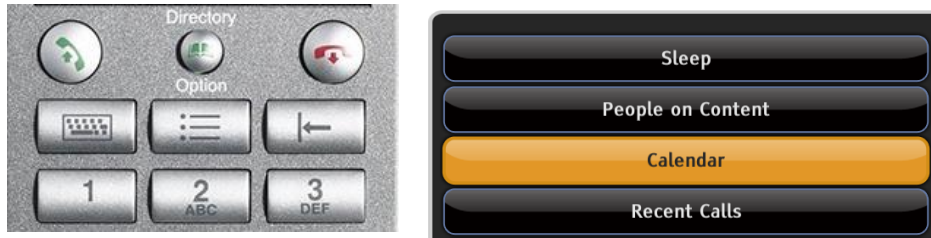
The home screen of the HDX may also be configured to provide a short cut for accessing the calendar.
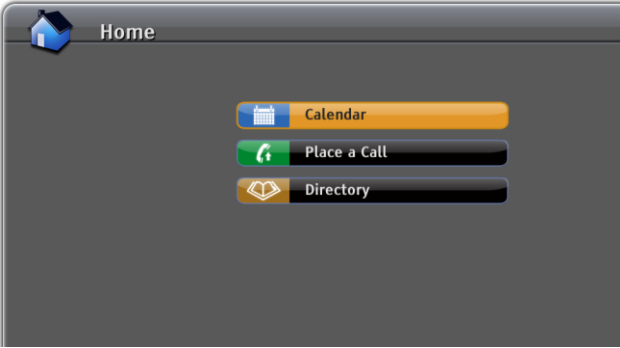
HDX home screen is configured via the admin settings > general settings > home screen settings menu.

The HDX time zone/GMT offset is an attribute that may be optionally provisioned by the RealPresence Resource Manager network provisioning profile. For many deployments the time zone is not provisioned to limit the number of network provisioning profiles and associated provisioning rules required. The time zone/GMT offset must be set in order to ensure the calendar displayed on the device is correct.

HDX time zone/GMT offset is configured via the web interface of the device admin settings > general settings > date and time menu.

RPX / OTX (equipped with HDX codecs) Configuration

Provisioning of RPX's and OTX's equipped with HDX codecs by RealPresence Resource Manager is not supported therefore the calendaring service must be manually configured.

The primary/center HDX is configured to derive the room/equipment resource mailbox calendar from the OTD App environment using the realm local and challenge password.

- Enable Calendaring service: Checked

- Microsoft Exchange server address: OTD App environment FQDN

- Domain: local

- User Name: anything

- Password: OTD environment challengePassword

- Mailbox: SMTP address of the room/equipment resource mailbox

- Meeting reminder time: none

- Play meeting reminder tone: unchecked

- Show private meetings: checked

Calendaring Service	Update	
Enable Calendaring Service:	☑ ✔	
Microsoft Exchange Server Address:	otd-nala.myrpp.net	
Domain:	local	
User Name:	anyUsername	
Password	☐	
Mailbox: (Primary SMTP)	room103@myrpp.net	
Reminder Time in Minutes:	None ▾	
Play Reminder Tone:	☐	
Show Private Meeting Information:	☑	

HDX calendaring service is configured via the admin settings > global services > calendaring service menu.

The HDX time zone/GMT offset must be set in order to ensure the calendar displayed on the device is correct.

|	
⚙	*HDX time zone/GMT offset is configured via the web interface of the device admin settings > general settings > date and time menu.*
Polycom	Polycom recommends the devices be configured to derive time from a time server supporting NTP. Setting the time server as auto will configure the device to derive time from ntp.polycom.com.

TROUBLESHOOTING OTD APP DEPLOYMENTS

Validate Mailbox Configuration

Microsoft Office 365 Outlook Web App (OWA) provides a convenient tool for validating correct configuration of room resource mailboxes and associated OTD App service accounts assigned reviewer rights for the calendar. Prior to carrying out the test below create an online meeting request, add a subject and invite the room/equipment resource mailbox.

From a PC or the Windows 2012 R2 server hosting the OTD App open a browser and enter https://outlook.office365.com
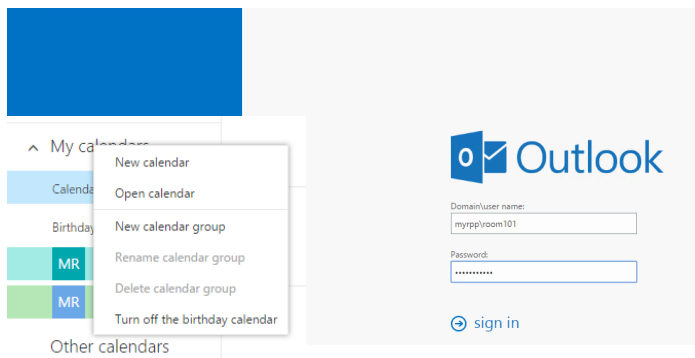
Login with the OTD App service account and select to view the calendar for the mailbox.

Right click the 'my calendars' option, choose open mailbox and enter the SMTP address of the desired room/ resource mailbox. If the calendar is displayed the service account has been configured with reviewer access.

Note it will only be possible to login if the company/organization does not use multi-factor authentication. Note even if mutli-factor authentication has been implemented for OWA, it is typically not enabled for the Exchange Web Services (EWS) API as used by the Polycom Workflow Server.

Select the appropriate time and date and open the online meeting invitation.
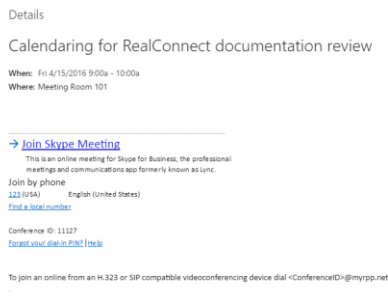
Verify the comments section of the meeting invitation includes the online meeting join instructions. If the instructions are missing the calendar processing deleteComments attribute has not been changed to false. Verify whether the subject is the original subject or has been replaced with the meeting organizers name. The behavior can be set as desired via the calendar processing deleteSubject and addSenderToSubject attributes.

Validate Codecs Retrieve/Receive the Calendar

Polycom HDX, Group Series, RPX, OTX, RealPresence Immersive Studio and OTX Studio devices are configured to retrieve their assigned room/equipment resource mailbox calendar from Resource Manager

or the OTD App. To validate the configuration browse to the web interface of the device and select admin settings > global services > calendaring service or admin settings > servers > calendaring service, validate the credentials are correct and the device shows as registered.
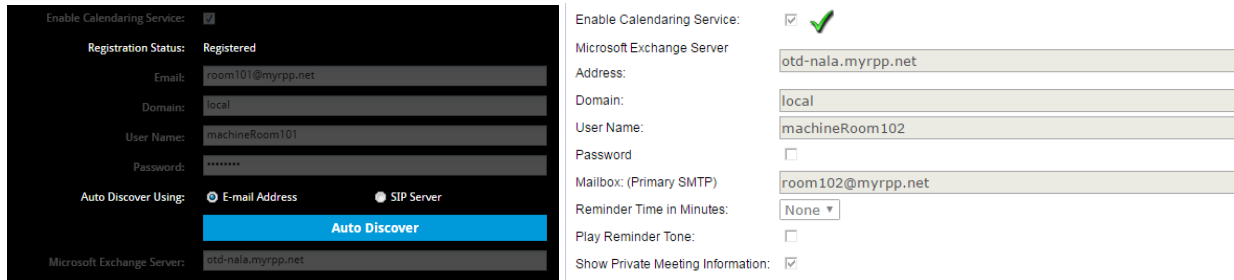
To validate the device successfully retrieves the calendar, establish an SSH session to the device and enter the command: `calendarmeetings list "today"`

The device will display a list of meetings for the day, for each listing date, time, subject and Polycom data that enables the join function.

For Cisco C/SX/EX/Profile/MX200G1/MX300G1 devices the OTD App pushes the calendar to the device. To validate the device receives the calendar, establish an SSH session to the device and enter the command: `xcommand bookings list`

For CTS devices the OTD App pushes the calendar to the device. To validate the device receives the calendar, establish a SSH session to port 22 of the device and enter the commands:

`show status calendar summary`

`show meetings summary`

Validate the OTD App Service Is Running

The OTD App runs as a service on the Windows Server 2012 R2. Remote desktop to the server and validate the service is running.

To validate the OTD App configuration browse https://localhost/admin from the Windows server hosting the App

The web UI of the OTD App is only accessible from the server hosting the App.

To validate the server is accessible via the network establish a telnet session on port 443 from a host to the OTD App environment FQDN:

If successful the cursor will appear as shown above. If you receive a connection refused message check the Windows Server firewall configuration is either disabled or has an exception for TCP port 443.

Environment Settings

- Service Fully Qualified Domain Name - The FQDN assigned to the environment
- Settings
    - Calendar Server Hostname – The FQDN of the Micrsoft Exchange or OFFICE 365 EWS
    - Rules
        - Match Type
            - Lync/Skype – Instructs OTD to search the message header and body of meeting invites for Lync Online meeting focus ID or dial-in conferencing dialing instructions. Used in conjunction with match field
            - Subject - Instructs OTD to search the subject field of meeting invites. Used in conjunction with match field for non-RealConnect deployments
            - Location - Instructs OTD to search the location field of meeting invites. Used in conjunction with match field for non-RealConnect deployments
            - Body - Instructs OTD to search the body of meeting invites. Used in conjunction with match field for non-RealConnect deployments
            - AttendeeName - Instructs OTD to search the attendee list of meeting invites parsing the names in conjunction with match field for non-RealConnect deployments
            - AttendeeAddress - Instructs OTD to search the attendee list of meeting invites parsing the email addresses in conjunction with match field for non-RealConnect deployments
            - OrganizerPhone –

        - match – Regex scripting used in conjunction with matchType attribute to instruct OTD upon the match condition. In RealConnect deployments identifies the SIP domain for example myrpp\.net
        - protocol
            - tel – Defines the join/call interface type as auto instructing devices to attempt call using H.323, SIP and telephone interfaces in order of priority
            - sip - Defines the join/call interface type as SIP instructing devices to attempt SIP call
            - h323 - Defines the join/call interface type as SIP instructing devices to attempt H.323 call
        - prefix – Defines prefix to be inserted by OTD on dial string
        - Postfix – Defines prefix to be inserted by OTD on dial string
        - vmrPrefix –
        - ConferenceRoomTemplate –
            - mcuPoolOrder -
            - conferenceTemplateName -

- continue – The continue options enables the administrator to use compounded rules to manipulate the meeting invitation. The OTD App parses meeting invitations using the rules in order. Upon matching the meeting to a given rule match condition the OTD will not parse with later rules unless the continue option is checked
  - o Credentials
    - Realm – Defines the domain sent by Polycom devices authenticating with the OTD App or domain portion of OTD agent username. In the shared/service account configuration example shown the domain is set as local to enable Polycom devices to authenticate with Resource Manager using a local machine account. Not required for pass through authentication
    - Server – Defines an LDAP server to enable devices authenticating with OTD using AD service accounts to be authenticated against a domain controller. For example: `ldap://dc1.myrpp.net/DC=myrpp,DC=net`
    - users
      - challengeUser – Defines the username string to match when OTD or a domain controller performs authentication of a Polycom device or OTD agent. For most deployments an asterisk is used indicating all usernames result in a match
      - challengePassword – Defines the password string to match when OTD performs authentication of a Polycom device or OTD agent. For the example shown the shared password of Resource Manager machine accounts is used. For deployments using a domain controller for authentication, the password field is left blank
      - credential
        - o username - Defines the shared/service account AD domain\username or UPN string to be used by OTD for authenticating with Exchange or OFFICE 365
        - o password - Defines the password to be OTD for authenticating with Exchange or OFFICE 365.
        - o organization – Defines the domain suffix for the organization for OFFICE 365 deployments. For example myrpp\.net
    - options
      - debug – Enables debugging logs to be generated by the OTD App
      - debugVerbose – Enables more detailed logging
      - historyLength – The number of transactions to be kept in the history. Used only for diagnostics. The default value is 0
      - connectorQueueSizeLimit - This is the number of requests that can be queued by the OTD App. The default value is 200
      - connectorQueueTimeout – How long a request will be held in the queue. The default value is 60 seconds

- maxConcurrentSessions – Defines the number of concurrent connections allowed by the OTD App to Exchange or OFFICE 365. For shared account deployments this should be configured to align with the exchange throttling policy. The default value is 10
- requestClientTimeout – How long an outbound connection to the Exchange / Office 365 environment is kept alive (in seconds) when not being used. The default value is 120
- forceDisconnect - Force disconnection of a client calendaring request after it has been serviced. Used for diagnostic purposes. Default value is disabled
- sessionLifetime - Time an authentication request will be kept alive (in minutes) when not being used. Default value is 5
- cacheLifetime – Time a calendar entry will stay in the OTD cache (in minutes). The default value is 180
  - filters
    - filterType -
    - match -

Agent Settings

- Agent name - The agent name is used to provide a descriptive name for the agent. The named entered is listed on the agent configuration page and therefore typically includes building and room to enable the system administrator to easily identify the correct agent for a given device
- Environment - The environment field contains the FQDN of the OTD App environment to be used by the agent. The agent periodically polls the OTA App environment on behalf of the Cisco device and pushes the results to device.
- Enabled – Enables/disables the agent
- Agent Type
  - o Cisco TMS / CTS-Man emulator – Invokes the OTD agent calendar push functionality for Cisco devices
  - o Generic calendar Interface -
- Account attributes define the following:
  - o "emailAddress": defines the Exchange room/equipment resource mailbox to be requested by the agent
  - o "username": defines the OTD App environment realm\challengeUser value. For this configuration example the realm is defined as local and any value may be used for the username
  - o "password": defines the OTD App environment local realm challengePassword.
  - o "lookAhead": is an optional parameter that defines in minutes the cut off for calendar entries to be returned ahead of the current time. In the example shown the agent is populated with the default value 480 and will send to the Cisco videoconferencing/ telepresence device meeting entries for the next eight hours

- o "pollFrequency": is an optional parameter that defines in minutes the frequency the agent will poll the OTD App environment for new meetings. If not defined the default value is 5 minutes
- Target - The target field defines how the agent interacts with the cisco videoconferencing/telepresence device. The attributes define the following:
  - o "timeSyncOffset": enables the agent to apply a time offset in minutes. Can you be used to correct misconfiguration of time on a Cisco telepresence room device. Typically set as zero
  - o "address": defines the IPv4 address of the Cisco videoconferencing/telepresence device for pushing of calendar information by the agent
  - o "type": for Cisco C/SX/EX/Profile/MX200G1/MX300G1 and IX devices the type is set as "tandberg", for CTS devices the type is set as "cts"
  - o "port": the agent interacts with the Cisco device web interface. The web interface may be configured to accept HTTP and/or HTTPS connections. For Cisco C/SX/EX/Profile/MX200G1/MX300G1 and IX devices the port will be set as 80 for HTTP or 443 for HTTPS. For CTS devices the port will be set as 8081 for HTTP or 9501 for HTTPS
  - o "username": defines the username to be sent to the Cisco device for login to the web UI
  - o "password": defines the password to be sent to the Cisco device for login to the web UI.