Polycom® RealPresence®
Management Platform
Multi-tenancy Deployment Guide
For Large Enterprise and Service Provider Environments
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About This Guide

This guide describes how to deploy and implement the Polycom® RealPresence® Platform multi-tenancy solution in enterprise and service provider environments.

Required Knowledge

Deploying and implementing this Polycom solution requires planning along with knowledge of networking, unified communications, and immersive telepresence administration.

Besides having general skills, you or someone on your team must also possess Polycom-specific knowledge and the third-party skills appropriate for your implementations. The following sections include knowledge your team must have:

• General Video Networking Knowledge
• Polycom Product Knowledge
• Third-Party Product Knowledge

General Video Networking Knowledge

Depending on the implementations you plan to support, you or someone on your team should have advanced knowledge of the following:

• Infrastructure router configurations
• Firewall configurations
• Present network architecture
• H.323 protocol
• SIP protocol

In addition, you need to have a full understanding of the current internal call control configuration for the following items:
• Directory name server (DNS)
• Data flow
• Security

Polycom Product Knowledge

Make sure you have sufficient knowledge of the Polycom products that you are using. The list of necessary courses and certifications may include any of the following:

• Polycom® Certified Video Conferencing Engineer (CVE) Course
• Polycom® Distributed Media Application™ (DMA™) Technical Operations Course
• Polycom® Endpoint Certification
• Polycom® HDX™ Technical Course
• Polycom® RealPresence (Infrastructure) Implementation Training
• Polycom® RealPresence Media Certification
• Polycom® RealPresence (Infrastructure) System Administration Training
• Polycom® RMX Technical Course
• Polycom® Overall Course
• Polycom® Virtual Border Proxy (VBP) Administration and Technical Course

Third-Party Product Knowledge

Depending on specifics of the unified communications (UC) implementation, you need a full understanding of, or certification on, third-party endpoints, infrastructures, and multipoint control units (MCUs). This list of possible third-parties is meant as a guideline and may not include each item in your implementation:

• Cisco®
• Red Hat® Linux®
• IBM®
• TANDBERG®
• Avaya™

For more information on Polycom training, go to www.polycom.com/services/learning_center/index.html.
• Juniper®
• Sonus®

This document assumes that the third-party systems used in the implementation model are already deployed.

Related Documentation

Refer to the appropriate product documentation for details on any Polycom product. You can find Polycom product documentation online at support.polycom.com.

Polycom Solution Support Services

Polycom Implementation and Maintenance services provide support for Polycom solution components only. Additional services for supported third-party Unified Communications (UC) environments integrated with Polycom solutions are available from Polycom Global Services, and its certified Partners, to help customers successfully design, deploy, optimize, and manage Polycom visual communication within their third-party UC environments.

UC Professional Services for Microsoft® Integration is mandatory for Polycom Conferencing for Microsoft Outlook and Microsoft Office Communications Server or Microsoft Lync™ Server integrations. UC Professional Services for IBM Integration provides seamless call routing between Lotus applications and Polycom immersive and room systems through integration with the IBM Sametime® server.

For additional information and details, please refer to www.polycom.com/services or contact your local Polycom representative.
The Polycom® RealPresence® Management Platform is the basis of the Polycom’s Cloud infrastructure, which is being developed to equip:

• Large enterprises with the infrastructure systems, endpoints, and services they need to decentralize their video network management services.

• Service providers with the infrastructure systems, endpoints, and services they need to support subscription-based Video as a Service (VaaS) offerings.

**Introduction to Cloud Computing, Multi-tenancy, and APIs**

To understand how the RealPresence Management Platform is the basis of the Polycom’s Cloud infrastructure, consider these three aspects of cloud computing.

• Cloud computing is the delivery of computing as a service provided over either a private (enterprise) or public (typically the Internet) network. Some of the advantages of cloud computing can be scalability, faster processing speeds, accessibility from multiple devices, better reliability, and often better system security.

• Multi-tenancy is an architecture in which a single instance of system serves multiple tenants—this may be different organizations in an enterprise or different customers of a service provider. Multi-tenancy is regarded as an essential attribute of cloud computing. But each tenant must have a secure and exclusive virtual computing environment.

• Cloud computing draws its strength from its connections to the outside world through application programming interfaces (APIs).
Like most cloud services, Video as a Service functionality is to a large extent deployed and configured through control, data, and application functionality APIs.

So in this release, the RealPresence Management Platform offers two essential cloud-capable features:

- Multi-tenancy
- Functional APIs.

The sections that follow describe how these features provide enterprises building a cloud-capable infrastructure and service providers deploying VaaS what they need to take advantage of the benefits, including economies of scale, that video conferencing in the cloud enable.

## Multi-Tenancy on a RealPresence Resource Manager System

With the introduction of its over arching *Areas* function, a RealPresence Resource Manager system (a follow on to the Polycom Converged Management Application™ system) can be virtually partitioned to support multiple client/tenant organizations. Each area provides the associated tenants with access to management capabilities for a collection of area-specific resources including users and their associated endpoints, bridging resources, and other network devices, etc.

*Figure 1-1* illustrates the difference between a single-tenant and multi-tenant RealPresence Resource Manager system and identifies the elements of the system that are managed at the area level.
The RealPresence Resource Manager system is a roles and permissions based system. In a multi-tenant environment, only users assigned one of the all-areas system roles (and associated permissions) can work with areas and tenants. Users assigned one of the area-specific roles do not have knowledge of other areas and tenants.

### RealPresence Management Platform APIs

The RealPresence Management Platform uses its newly developed Application Programming Interfaces (APIs) to integrate with the private (enterprise) or public (Internet) network cloud.

The RealPresence Resource Manager system provide functional APIs for:

- Scheduling
- Directory support
- User management
- Conference control and management

The DMA system provides functional APIs for:

- Scheduling by a third-party management
- Monitoring (including SNMP)
- Conference control and management
- Provisioning
- Resource Availability

The RealPresence Resource Manager and DMA systems also provide a billing interface that will allow the enterprise or service provider to detailed “per call” information downloadable from the RealPresence Resource Manager system as a CDR Report.

The RealPresence Platform API uses an XML encoding over HTTPS transport. The API adheres to a Representational State Transfer (REST) architecture. For more information, see the Polycom RealPresence Platform Application Programming Interface (API) Developer Guide.

### RealPresence Management Platform Deployment Models

Enterprises and service providers implementing the RealPresence Management Platform have two deployment models.

- Deploying the All Polycom RealPresence Management Platform Infrastructure
Deploying the Polycom RealPresence Management Platform with Other Components

Regardless of your deployment model, you can securely manage and monitor supported video endpoint models through a session border controller (SBC) or firewall.

**Deploying the All Polycom RealPresence Management Platform Infrastructure**

Figure 1-2 shows the deployment architecture for this model. The architecture features two of the Polycom management infrastructure products—the RealPresence Resource Manager management and scheduling system and the DMA 7000 video collaboration infrastructure system—as the cornerstone of the unified communications network.

*Figure 1-2  All Polycom RealPresence Management Platform Deployment Model*
Deploying the Polycom RealPresence Management Platform with Other Components

Figure 1-3 shows the deployment architecture for this model. In this model, RealPresence Resource Manager system is not required. Instead, you can use a management tool designed by your team or by a third party. It is important to ensure the application you select has a scheduling function.

**Figure 1-3** Modified Polycom RealPresence Management Platform Deployment Model
Comparing the Models

Because the video conferencing infrastructure systems are designed and configured to be fully integrated, the All Polycom deployment model provides an optimized solution to manage more aspects of your video conferencing system including provisioning, updating, scheduling, monitoring, and troubleshooting.

The second deployment model allows you to use your current scheduling solution along with the DMA system to provide the key aspects of this solution. You gain flexibility and interoperability with your multi-vendor environment. This architecture is implemented using the Polycom endpoint APIs.

Required Architectural Components

The following sections detail the role and requirements for each component in the architecture.

Conference Scheduling, Management, and Monitoring

Polycom RealPresence Resource Manager System or Other

In the All Polycom deployment model, the RealPresence Resource Manager system v7.0 enables multi-tenancy via the Areas feature, while it also provides:

- Endpoint management, including provisioning, updating, monitoring, and troubleshooting
- Conference, network device, and system monitoring and management including network solution by geography and visual alarm reporting
- Directory and user management including address books and presence
- Conference scheduling and monitoring
- XMPP service enabling chat and presence
- Reports on usage based on site, department, user and endpoint

When the Areas feature is enabled, most aspects of the RealPresence Resource Manager system become “area-aware,” which means management of the system and conferencing tasks may be segregated according to tenant area and tenant users and user roles.

In the second deployment model, a third-party off-the-shelf or internally developed tool can provide scheduling and limited management and monitoring capability.
Call Server and Conference Virtualization Manager
Polycom DMA 7000 Management System

The DMA 7000 system v5.0 is the system in these two deployment models that provides:

- Call server functionality including:
  - H.323 gatekeeper
  - SIP registrar and proxy
  - H.323/SIP and XMPP/SIP gateway
- Bandwidth management: limitation, prioritization, assurance
- Authentication for H.323 endpoints
- Dial plan and prefix services
- SNMP functionality

The DMA system is the defining component of these two deployment models.

MCUs
Polycom RMX System and Other

In both deployment models, the Polycom RMX multipoint conference platform v7.7.1 can provide:

- Collaboration and conferencing MCU platform
- H.323/PSTN gateway

In these deployment models, the Polycom DMA system supports the use of Cisco Codian 4200, 4500, and MSE 8000 series MCUs as part of the conferencing resource pool. However, not all integrated functionality is available.

For more information about these MCUs, read their product documentation. For more information about the DMA system's support of these MCUs see the Polycom DMA System Release Notes.

Endpoints
Polycom and Others

Of course, Polycom endpoints are managed and monitored in both deployment models; this includes Polycom immersive, room, desktop, social, and mobile endpoints.

Some models of LifeSize and Tandberg endpoints are also supported, but to a lesser extent. For more information on management support of these endpoints, see the Polycom RealPresence Resource Manager System Release Notes.
Firewalls

Enterprise and Tenant

In both deployment models, enterprise and tenant firewalls ensure remote endpoints and desktop users can reach the video network securely. Basic firewall functions include providing NAT/firewall traversal support for video networks such that calls coming from outside the network can reach the intended person/group – with no risk to the health of the network.

Recording

Polycom RSS 4000 System

The Polycom RSS 4000 system is the system in these two deployment architectures that provides video content recording, streaming, and archiving of multimedia conferences. The Polycom RSS system is the only system of this type with which the RMX system integrates.
Planning for Multi-Tenancy on the RealPresence Platform

Deploying multi-tenancy to best benefit your company or customers requires planning and preparation.

For an enterprise, it is likely that the areas you decide to implement will be based on some aspect of your organizational structure and your goals for multi-tenancy.

For example, you may be planning to separate out a specific set of users, like your executive team, and give them higher priority access to MCU resources. So, you would create an area for this purpose and assign it the appropriate resources.

Then, you may decide to assign a group of users scheduling permissions for this area; area schedulers who can arrange conferences on behalf of the executive team. Finally, you may decide to assign a specific conference room to this area and group, for example an immersive telepresence conference room.

This chapter details much of what you need to know to start that planning and preparation:

- Conference Services Planning
- Directory Management Planning
- System and Tenant User Management Planning
- Network Device Management Planning
- Endpoint Management Planning
- Security Planning
Conference Services Planning

Different components of the RealPresence Platform have different roles in conference services planning.

Conferencing resources are primarily managed by the DMA system, but this management must sometimes be coordinated with the RealPresence Resource Manager. Consider the following:

- Bandwidth is managed in part by the site topology definition. If there is a RealPresence Resource Manager system in the deployment, it maintains the site topology definition; otherwise the definition is maintained by the DMA system.

- Conference templates may have an implication in resource usage. Both the RealPresence Resource Manager and the DMA system employ conference templates to control the conferencing platforms (RMX system or others).

- MCU pool order (the assignment of priority to a pool of conferencing platforms) may have an implication in resource usage. The DMA system manages the MCU pool order, but on the RealPresence Resource Manager system you can identify what percentage capacity of a pool should be held for scheduled conferences.

The Polycom DMA system uses MCU pools and pool orders to select an MCU on which to host a conference. Ensure you understand how MCU pools and pool orders work and that you set them up in a way that uses the MCUs in your enterprise effectively as conferencing resources. For more information, see the Polycom DMA System Operations Guide.

Use these tips to plan your conference services:

- Carefully assess your network capabilities and set up your site topology in the RealPresence Resource Manager system or DMA system to reflect these capabilities.

- Consider how you want to delegate territory duties on the DMA system and then implement those duties on the RealPresence Resource Manager system within the site topology settings.

- Be familiar with DMA topology requirements when setting up the RealPresence Resource Manager system site topology. Territories must meet the needs of the DMA. On the DMA system, each cluster within a supercluster is responsible for managing a territory or being a backup manager for a territory. So, you may need a territory for each DMA cluster. See the DMA documentation for more information.

- Assess the type (scheduled versus ad hoc) and frequency of your video conferencing traffic and define bandwidth usage, pool orders, conference templates, and scheduling capacity accordingly. Take this information into account when assigning resources to areas.
Directory Management Planning

While the RealPresence Resource Manager system is responsible for directory management, you must be aware of some important details of Microsoft Active Directory and RealPresence Resource Manager systems integration.

Integrating with Active Directory lets users have single sign-on and you can use Active Directory group policies to enforce some RealPresence Resource Manager system permissions.

Plan to use the Import Local Users feature to import users into each of the defined areas. For more information, see the Polycom RealPresence Resource Manager System Operations Guide.

When integrating Active Directory with RealPresence Resource Manager systems, there are separate guidelines for multi-tenant service providers and enterprises.

If you are a service provider, keep the following in mind:

- You cannot support multiple Active Directory integrations on one RealPresence Resource Manager system.
- You cannot have a multi-forest Active Directory environment (two entirely different Active Directory systems on the same server).

If you are an enterprise customer, note the following:

- If all of your users are in a single forest, you can use Active Directory.
- If you have a multi-forest Active Directory environment, manually import the users for each area using .csv files.
System and Tenant User Management Planning

Identify and define system and tenant roles for multi-tenancy using the RealPresence Resource Manager system.

There are two main types of user roles. You can assign users area roles, system roles, or both types of roles. Review the following for details:

- Area Roles
- System Roles
- System and User Considerations

Area Roles

*Area roles* are for RealPresence Resource Manager users that must manage the resources in one or more areas, but not all areas. A user must be assigned an area role in order to perform tasks in the area. In addition to being assigned a role, you must enable that user to manage his assigned area.

Area roles do not have the View and/or Modify All Areas permission, whereas system roles do have this permission. RealPresence Resource Manager users with area roles can only view and modify resources in the areas they manage.

The following table outlines the area roles.

<table>
<thead>
<tr>
<th>Role</th>
<th>Permissions</th>
</tr>
</thead>
</table>
| Area Administrator | Manage users and groups  
                     | Add network devices and endpoints  
                     | Monitor conferences  
                     | View-only scheduler  
                     | Directory setup  
                     | Provision devices using existing profiles  
                     | Update software on devices using existing software updates  
                     | add and edit users, groups, rooms, and other resources  
                     | View reports for the areas they manage  
                     | Monitor the system via the Admin Dashboard |
| Area Operator  | Conference operator  
                     | Reports  
                     | Troubleshooting  
                     | Schedule conferences (basic and advanced levels) |
| Area Scheduler | Schedule conferences (advanced level) |
System Roles

System roles are for users who perform RealPresence Resource Manager tasks for all areas. RealPresence Resource Manager users who have a system role can view and modify resources from all areas because their role includes the View and/or Modify All Areas permission.

The following table identifies the system roles.

<table>
<thead>
<tr>
<th>Role</th>
<th>Permissions</th>
</tr>
</thead>
</table>
| Administrator | Directory setup  
|             | Topology setup  
|             | Conferencing setup  
|             | System setup  
|             | Create areas  
|             | Associate areas  
|             | System maintenance  
|             | Troubleshooting  
|             | Provision profiles  
|             | Modify user roles  
|             | Note that this role allows the user most permissions, except scheduling/monitoring conferences and managing endpoints and network devices.  
|             | This role cannot be edited or deleted.                                      |
| AdvancedScheduler | Schedule conferences (advanced level)                                      |
| Auditor     | View and backup auditor logs                                                |
| Device Administrator | Add network devices  
|             | Manage endpoints                                                           |
| Operator    | Conference operator  
|             | Reports  
|             | Troubleshooting                                                           |
| Scheduler   | Schedule conferences (basic level)                                         |
| View-only Scheduler | View scheduled conferences                                                  |

System and User Considerations

As you consider multi-tenancy, think about the roles to assign to those who will manage the platform. While roles for managing certain resources are assigned using the RealPresence Resource Manager system, also consider other, more global roles.

Use these tips to plan for system and tenant users:

• To set up multi-tenancy effectively, you must create one or more areas for each tenant.
After setting up areas, assign a user the Area Administrator role in each area. RealPresence Resource Manager system allows users assigned the Administrator role to manage users, groups, user roles, permissions, and areas (if applicable).

For system users to be fully functional, you must associate them with one or more roles to control their access to system functions and associate them with one or more endpoints. Alternatively, you can associate users with roles by associating them with local or enterprise groups. If you implemented the Areas feature, you can also associate enterprise users with areas for which you are an administrator.

System-wide administration tasks cannot be delegated to users with only area-specific roles. These tasks include managing site topology, conference templates, and network devices. To do these tasks, users must be assigned the Administrator role or Device Administrator role in addition to any area-specific role they have already been assigned.

You can assign a user (local or enterprise) roles both as an individual and as part of a group. In cases where a user has multiple roles, the permissions associated with those roles are cumulative; a user has all of the permissions assigned to all of his roles.

The RealPresence Resource Manager system allows you almost unlimited flexibility in defining and redefining roles, but for simplicity and clarity, we recommend keeping the default roles with their default permissions and responsibilities.

Network Device Management Planning

The RealPresence Resource Manager system is responsible for network device management for many of the devices key to your implementation. In general, this means the system presents status and alerts for these network devices.

Regarding deployment, the RealPresence Resource Manager system plays one main role in network device management. It can be used to provision the subscriber-side and provider-side IP addresses to the firewall or session border control (SBC) devices.

Use these tips to plan for network device management:

- Firewalls and VBPs (H.323 signaling only) or SBCs are recommended at each enterprise or tenant site, as well as between each site and the call control device. Identify the network devices that you plan to have in your deployment.
- While network constraints may mean you can’t manage all network devices, you can manage the firewall and SBC or VBP for the call control device.
• Place management applications and bridges in separate geographical areas for risk mitigation at the network level.

• Normally, you assign each network device to a specific area using the RealPresence Resource Manager system. However, if you want to share network devices between areas, leave them in the Common Pool.

• Regularly check Call Data Records (CDRs) to ensure bandwidth and MCU or bridge availability is sufficient.

• Use a naming convention to correlate sites to areas in the RealPresence Resource Manager system or DMA system. In doing that, make sure that site names are unique across the system. That is, two areas should not use the same site name. As a best practice, use a naming convention that identifies the area in the site name.

• Using the RealPresence Resource Manager system or the DMA system, ensure each site in the tenant area has a link to your service provider site. Make sure the purpose of each link is obvious from the site link name. For example, any site link being used to measure bandwidth for a specific tenant should be named in a way that makes this clear.

## Endpoint Management Planning

The RealPresence Resource Manager system and the DMA system have different roles in endpoint management planning.

• As the gatekeeper or gateway, the DMA system manages endpoint registrations and does the other standard gatekeeper functions like address translation, admissions control, bandwidth control, zone management, call control signaling, call authorization, and call management.

• For specified endpoint systems, the RealPresence Resource Manager system dynamically provisions and updates the endpoint software.

Any user with a role that can view profiles, regardless of assigned area, can view all automatically provisioned profiles.

Use these tips to plan for endpoint management:

• Assess the endpoints across the areas to be integrated.

• Plan to provision like endpoints in each area with the same information. Configuring endpoints in a similar way, when practical, simplifies management of them.

• Consider setting passwords on endpoints to prevent unauthorized configuration changes.

• Permanently register authorized remote endpoints to the network.
Security Planning

Security is always an important consideration when deploying and integrating a UC solution. Besides all of the normal IT security issues, take some time to carefully think about the security impact of each potential service, endpoint, and call.


Use these tips to plan your security:

• If you are an enterprise, add a firewall traversal solution such as the Polycom Video Border Proxy (VBP). The VBP system negotiates a connection between firewalls to enable H.323 media and signaling. The VBP system allows calls from partners, customers, and remote workers.

• If you are a service provider and do not have an SBC (H.323 and SIP support), make sure to set one up as part of your integration.

• Set up automatic, periodic vulnerability scans of UC devices. In addition, run a vulnerability scan when adding a new device. Scan from both inside and outside the firewall to reveal potential security risks.

• Disable unnecessary communications services. For example, if you won’t be using SNMP, disable it.

• Think about the implications of the Auto Answer feature, which allows an endpoint to automatically answer incoming calls, and decide whether to disable it. Balance business needs with security considerations. For a detailed discussion of the issue, see the Polycom Recommended Best Security Practices for Unified Communications white paper.

• If you allow mobile devices to initiate and receive calls in your deployment, set up central management of both video configuration and endpoint security. This can avoid a mobile device being used as a staging point for a cyber attack.

• Regularly scan the CDRs to see if the system is being used by unknown remote devices or at unusual times.

• Set up VPN access for remote video endpoints, so that they appear to share the corporate or tenant firewall. This allows the endpoint to be managed the same like a local endpoint.
Deploying the Platform in an Enterprise Environment

This chapter helps you understand the steps you should take before beginning a deployment of the Polycom RealPresence Platform and what must happen at each stage of the deployment process. It contains these sections:

- Before Deploying in an Enterprise Environment
- Deploying and Integrating in an Enterprise Environment

Before Deploying in an Enterprise Environment

Use the following task list to determine how to plan for and implement multi-tenancy in your enterprise environment:

- Planning Task 1: Review your solution goals
- Planning Task 2: Review your current network and plan for network growth
- Planning Task 3: Review your infrastructure and design a solution architecture
- Planning Task 4: Review your endpoints
- Planning Task 5: Plan areas to meet organizational and administrative needs
- Planning Task 6: Review your meeting behaviors
- Planning Task 7: Assess your UC needs
- Planning Task 8: Examine your current directory implementation
- Planning Task 9: Evaluate your security needs
Planning Task 1: Review your solution goals

Goal: Determine the type of implementation you want to deploy.

Consider the advantages of areas. Then, determine how to best implement them so that your company gets the most benefit.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you will be implementing a cloud infrastructure, what are your reasons for doing so?</td>
<td></td>
</tr>
<tr>
<td>What are your goals for implementing multi-tenancy?</td>
<td></td>
</tr>
<tr>
<td>What problems are you working to resolve?</td>
<td></td>
</tr>
<tr>
<td>Review your business use cases and verify that they are enhanced by the architecture you want to implement.</td>
<td></td>
</tr>
</tbody>
</table>

Planning Task 2: Review your current network and plan for network growth

Goal: Assess your network and how it will work for the solution.

Create a diagram of your current network. If your network spans multiple sites, and you’re implementing multi-tenancy (areas) across those sites, make sure your diagram includes all of the gear on the site networks as well. Attempt to determine, in advance, what changes may be required.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the bandwidth capabilities of the existing network?</td>
<td></td>
</tr>
<tr>
<td>Is there a redundant network topology in place?</td>
<td></td>
</tr>
<tr>
<td>What are the existing performance characteristics of your LAN and WAN links?</td>
<td></td>
</tr>
</tbody>
</table>
**Planning Task 3: Review your infrastructure and design a solution architecture**

Goal: Have a UC capable infrastructure that can reach all endpoint users.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are any components of the solution infrastructure currently deployed (DMA, RMX, or CMA 5000 systems)?</td>
<td></td>
</tr>
<tr>
<td>Are there any migration requirements?</td>
<td></td>
</tr>
<tr>
<td>What are the integration points with your existing infrastructure and ecosystems?</td>
<td></td>
</tr>
<tr>
<td>What are the required third-party interfaces?</td>
<td></td>
</tr>
</tbody>
</table>

For deployments that use the RealPresence Resource Manager system, the DMA system must be the gatekeeper.

If you have a Polycom CMA 5000 system, it may be possible to migrated it to become a RealPresence Resource Manager system, as the hardware platform is the same. This migration requires a Polycom Professional Services engagement as the eligibility requirements for migration are stringent.

A Polycom CMA 4000 system cannot be migrated to become a RealPresence Resource Manager system.

**Planning Task 4: Review your endpoints**

Goal: Increase your ability to schedule, monitor, and manage (provision and update) endpoints without the need for additional resources.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many Polycom endpoints, including legacy, mobile, and ITP, do you have? What are the endpoint capabilities? How much do you expect to grow this base?</td>
<td></td>
</tr>
<tr>
<td>How many non-Polycom endpoints do you have? What are the endpoint capabilities? How much do you expect to grow this base?</td>
<td></td>
</tr>
<tr>
<td>Will your solution have sufficient bridge and network capacity for the projected number of endpoints?</td>
<td></td>
</tr>
</tbody>
</table>
Planning Task 5: Plan areas to meet organizational and administrative needs

Goal: Implement areas in a way that meets your business goal and is easily managed and administered.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who will administer the solution?</td>
<td></td>
</tr>
<tr>
<td>How many areas will you create and based on what criteria?</td>
<td></td>
</tr>
<tr>
<td>Who will administer each of the areas?</td>
<td></td>
</tr>
<tr>
<td>What type of IT management capability do you have today?</td>
<td></td>
</tr>
<tr>
<td>What management practices need to be put in place to support the required level of availability?</td>
<td></td>
</tr>
</tbody>
</table>

Planning Task 6: Review your meeting behaviors

Goal: Determine how you use conferencing now, so that you can understand and plan the required changes. This ensures you are ready for improvements and growth.

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<tr>
<td>Do you currently have audio conferencing capability?</td>
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<tr>
<td>Do you currently have video conferencing capability? What signaling standards do you plan to implement (H.323 and/or SIP)?</td>
<td></td>
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<tr>
<td>How are meetings organized and scheduled today? Are they primarily scheduled or ad hoc? Are they mainly point-to-point or multi-point?</td>
<td></td>
</tr>
<tr>
<td>What are your ITP needs? What are your mobile needs?</td>
<td></td>
</tr>
<tr>
<td>What is your current web content sharing platform?</td>
<td></td>
</tr>
<tr>
<td>What level of availability do you require?</td>
<td></td>
</tr>
<tr>
<td>Going forward, who will schedule conferences in each of the tenant areas?</td>
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</tbody>
</table>
Planning Task 7: Assess your UC needs

Goal: To determine the level of integration between the different communication methods your business uses.

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<td>What are your email and messaging platforms?</td>
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<td>What components of UC have you deployed?</td>
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<td>What are you planning to deploy?</td>
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</table>

Planning Task 8: Examine your current directory implementation

Goal: Understand what is required to integrate the solution with your current directory and user population.

<table>
<thead>
<tr>
<th>Considerations</th>
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<td>What is the corporate directory?</td>
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<td>How many users are in the directory?</td>
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<tr>
<td>What is the geographic distribution of your users?</td>
<td></td>
</tr>
<tr>
<td>What are your mobile and telecommuting strategies?</td>
<td></td>
</tr>
</tbody>
</table>

Planning Task 9: Evaluate your security needs

Goal: Ensure secure and universal access to the video network for both remote and local endpoints users.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the security mechanisms in place today (access controls, authentication, encryption, audit capacity)? Are these adequate?</td>
<td></td>
</tr>
</tbody>
</table>
Deploying and Integrating in an Enterprise Environment

Before you begin, make sure you have the network configured and IP addresses for various systems, as well as applicable DNS information. In addition, ensure all applicable ports are available for the model you deploy. See the individual product documentation for details on specific port requirements.

Step through the following tasks, as needed, to deploy and integrate the RealPresence Platform:

- Task 1: MCU or RMX system initial setup
- Task 2: RealPresence Resource Manager system initial setup
- Task 3: Additional RealPresence Resource Manager system setup
- Task 4: DMA system initial setup
- Task 5: RealPresence Resource Manager system integration with DMA system
- Task 6: Additional DMA system setup
- Task 7: Endpoint setup
- Task 8: RSS system initial setup

**Task 1: MCU or RMX system initial setup**

If your implementation includes an MCU system, configure it as needed. If your implementation includes a Polycom RMX system, do the following:

1. Complete a first time setup of the RMX system. For more information, see the *Polycom RMX System Getting Started Guide*.

2. Configure the advanced RMX system features. Do not enable maximum security mode.

For more information on RMX advanced configuration options, see the *Polycom RMX System Administration Guide*.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>What additional security capabilities do you need to deploy with your solution?</td>
<td></td>
</tr>
<tr>
<td>Where are your firewalls? Are they sufficient?</td>
<td></td>
</tr>
<tr>
<td>Do you have session border controllers (SBCs) in place?</td>
<td></td>
</tr>
</tbody>
</table>
Task 2: RealPresence Resource Manager system initial setup

If your implementation includes a Polycom RealPresence Resource Manager system, complete its first time setup. Do **not** either of the following options, as they are not compatible with either multi-tenancy deployment model:

- Integrate with Enterprise Directory Server
- Allow Delegated Authentication to Enterprise Directory Server

For more information, see the *Polycom RealPresence Resource Manager System Getting Started Guide*.

Task 3: Additional RealPresence Resource Manager system setup

We recommend that you configure, as needed, the following advanced RealPresence Resource Manager system features:

- Create and manage areas.
  - Enable the Areas feature.
  - Add the areas that you want to use. Create an area for each tenant or department, as needed. If you want to use the same RealPresence Resource Manager system as your tenants, create an area for yourself.
  - Assign rooms, conference templates, and network devices to an area.

- Import and manage users.
  - Import users.
  - Add users to areas.
  - Assign roles to area users. By default, area users all have the Area Scheduler role. You need to determine which, if any, of the area users will be given the Area Administrator or Area Operator roles.

- Set up RealPresence Resource Manager system redundancy for higher reliability and greater call success.

- Manage site topology. (If you are not using a RealPresence Resource Manager system, set up site topology on the DMA system.)

- Manage certificates.

- Set up address books for tenants.

For more information on these and other configuration options, see the *Polycom RealPresence Resource Manager System Operations Guide*.

Task 4: DMA system initial setup

Complete first time setup of the DMA system. Make sure you do not enable maximum security mode on the DMA system.
Perform the following DMA system setup, as needed:

- Ensure that the DMA system can communicate with your RealPresence Resource Manager system, or other management system, on the same DNS.
- Configure clustering. Set up super nodes or a supercluster for failover.
- Set up site topology or, if you set up site topology on a RealPresence Resource Manager system, verify that the site topology from that system now appears within the DMA system.

When the DMA system is integrated with a RealPresence Resource Manager system, the RealPresence Resource Manager system owns and manages the site topology. At the time of integration, any DMA site topology data will be overwritten by the site topology data from the RealPresence Resource Manager system.

- Add MCUs.
  - Create MCU pools.
  - Create MCU pool orders.
- Integrate the DMA system with RMX systems or other MCUs.

Both a DMA system and a RealPresence Resource Manager system cannot both point to the same RMX platform. Only one system or the other can be integrated with each RMX platform.

For more information on basic setup, see the Polycom DMA System Getting Started Guide.

**Task 5: RealPresence Resource Manager system integration with DMA system**

If your implementation includes a RealPresence Resource Manager system and DMA system, enable integration on both systems:

1. On the DMA system, select the **Join Resource Manager** option and provide the information required. For more information, see the *Polycom DMA 7000 System Operations Guide*.

2. Verify that the pool orders you created on the DMA system have been imported to the RealPresence Resource Manager system.

3. Add pool orders to areas.

For more information, see the *Polycom RealPresence Resource Manager System Operations Guide*.
Task 6: Additional DMA system setup

Perform the following additional DMA system setup, as needed:

- Configure clustering. Set up super nodes or a supercluster for failover.
- If the DMA system has more than one cluster, indicate the domain name (FQDN) for the specific cluster to use.
- Verify the site topology that you set up on the RealPresence Resource Manager system now appears on the DMA system.
  
  When the DMA system is integrated with the RealPresence Resource Manager system, the RealPresence Resource Manager system owns and manages the site topology. The DMA site topology becomes read-only.

- Set up signaling by enabling the call protocols to support, and then opening the appropriate ports:
  - SIP (You can, optionally, create DNS records and add external SIP peer proxies.)
  - H.323
  - XMPP

- Add MCUs.
  - Create MCU pools.
  - Create MCU pool orders.

- Add an external SBC and integrate it with the DMA system.

- Integrate the DMA system with RMX systems or other MCUs.

  Both a DMA system and a RealPresence Resource Manager system cannot both point to the same RMX platform. Only one system or the other can be integrated with each RMX platform.

For detailed information on any of these setup tasks, see the Polycom DMA System Operations Guide.

Task 7: Endpoint setup

Complete the following steps to set up endpoints:

1. Using the RealPresence Resource Manager system, add endpoints to areas.

2. For every dynamically managed endpoint associated with a room, associate the room in the RealPresence Resource Manager system with a machine account. The machine account allows the room's endpoint to connect and authenticate with the RealPresence Resource Manager system without using the endpoint user's account. After you add a room, create the machine account and associate the room with the machine account.
3 Connect the endpoint to the network.
4 Configure the IP settings on the endpoint.
5 If applicable, configure the SIP settings on the endpoint.
6 On the endpoint system, configure each automatically managed endpoint to identify either the tenant or the enterprise firewall.

For details, see the *RealPresence Resource Manager Operations Guide*.

**Task 8: RSS system initial setup**

Complete first time setup of the RSS system. For details, see the *RSS User Guide*. 
Deploying the Platform in a Service Provider Environment

This chapter helps you understand the steps you should take before beginning a deployment of the Polycom RealPresence Platform and what must happen at each stage of the deployment process. It contains these sections:

- Before Deploying in a Service Provider Environment
- Deploying and Integrating in a Service Provider Environment

Before Deploying in a Service Provider Environment

Use the following task list to determine how to plan for and implement multi-tenancy in your service provider environment:

- Planning Task 1: Review your solution goals
- Planning Task 2: Review your current network and plan for network growth
- Planning Task 3: Review your infrastructure and design a solution architecture
- Planning Task 4: Review your endpoints
- Planning Task 5: Plan areas to meet organizational and administrative needs
- Planning Task 6: Review your meeting behaviors
- Planning Task 7: Assess your UC needs
- Planning Task 8: Examine your current directory implementation
- Planning Task 9: Evaluate your security needs
Planning Task 1: Review your solution goals

Goal: Determine the type of implementation you want to deploy.
So that your tenants get the most benefit, carefully consider the deployment of the implementation.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you will be implementing a cloud infrastructure, what are your reasons for doing so?</td>
<td></td>
</tr>
<tr>
<td>What are your goals for implementing multi-tenancy?</td>
<td></td>
</tr>
<tr>
<td>What problems are you working to resolve?</td>
<td></td>
</tr>
<tr>
<td>Review your tenant use cases and verify that they are enhanced by the architecture you want to implement.</td>
<td></td>
</tr>
</tbody>
</table>

Planning Task 2: Review your current network and plan for network growth

Goal: Assess your network and how it will work for the solution.
Create a diagram of your current network. If your network spans multiple sites, and you’re implementing multi-tenancy (areas) across those sites, make sure your diagram includes all of the gear on the site networks as well. Attempt to determine, in advance, what changes may be required.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the bandwidth capabilities of the existing networks?</td>
<td></td>
</tr>
<tr>
<td>Are there redundant network topologies in place?</td>
<td></td>
</tr>
<tr>
<td>What are the existing performance characteristics of the LAN and WAN links?</td>
<td></td>
</tr>
</tbody>
</table>
Planning Task 3: Review your infrastructure and design a solution architecture

Goal: Have a UC capable infrastructure that can reach all endpoint users.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are any components of the solution infrastructure currently deployed (DMA, RMX, or CMA 5000 system)?</td>
<td></td>
</tr>
<tr>
<td>Are there any migration requirements?</td>
<td></td>
</tr>
<tr>
<td>What are the integration points with existing infrastructure and ecosystems?</td>
<td></td>
</tr>
<tr>
<td>What are the tenant's required third-party interfaces?</td>
<td></td>
</tr>
</tbody>
</table>

For deployments that use the RealPresence Resource Manager system, the DMA system must be the gatekeeper.

If you have a Polycom CMA 5000 system, it may be possible to migrated it to become a RealPresence Resource Manager system, as the hardware platform is the same. This migration requires a Polycom Professional Services engagement as the eligibility requirements for migration are stringent.

A Polycom CMA 4000 system cannot be migrated to become a RealPresence Resource Manager system.

Planning Task 4: Review your endpoints

Goal: Increase your ability to schedule, monitor, and manage (provision and update) endpoints without the need for additional resources.

<table>
<thead>
<tr>
<th>Considerations</th>
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</tr>
</thead>
<tbody>
<tr>
<td>How many Polycom endpoints, including legacy, mobile and ITP, does the tenant have? How much does the tenant expect to grow this base?</td>
<td></td>
</tr>
<tr>
<td>How many non-Polycom endpoints does the tenant have? What are the endpoint capabilities? How much does the tenant expect to grow this base?</td>
<td></td>
</tr>
<tr>
<td>Will the solution have sufficient bridge and network capacity for the projected number of endpoints?</td>
<td></td>
</tr>
</tbody>
</table>
## Planning Task 5: Plan areas to meet organizational and administrative needs

Goal: Implement areas in a way that meets your business goal and is easily managed and administered.

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who will administer the solution?</td>
<td></td>
</tr>
<tr>
<td>How many areas will you create and based on what criteria?</td>
<td></td>
</tr>
<tr>
<td>Who will administer each of the tenant areas?</td>
<td></td>
</tr>
<tr>
<td>What type of IT management capability does each tenant have today?</td>
<td></td>
</tr>
<tr>
<td>What management practices need to be put into place to support the required level of availability?</td>
<td></td>
</tr>
</tbody>
</table>

## Planning Task 6: Review your meeting behaviors

Goal: Determine how you use conferencing now so that you can understand and plan the required changes. This ensures you are ready for improvements and growth.

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<td>What is the tenant’s current web content sharing platform?</td>
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<td>Going forward, who will schedule conferences in each of the tenant areas?</td>
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Planning Task 7: Assess your UC needs

Goal: To determine the level of integration between the different communication methods used by the businesses you serve.

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<th>Considerations</th>
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<td>What are the tenant's email and messaging platforms?</td>
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<td>Does the tenant have third-party components?</td>
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<td>Does the tenant use Microsoft OCS/Lync?</td>
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<td>What components of UC does the tenant already have deployed? What are you planning to deploy?</td>
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Planning Task 8: Examine your current directory implementation

Goal: Understand what is required to integrate the solution with your current directory and user population.

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Planning Task 9: Evaluate your security needs

Goal: Ensure secure and universal access to the video network for both remote and local endpoints users.

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Deploying and Integrating in a Service Provider Environment

Before you begin, make sure you have the network configured, IP addresses for various systems, as well as applicable DNS information. In addition, ensure all applicable ports are available for the model you deploy. See the individual product documentation for details on specific port requirements.

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- Task 4: DMA system initial setup
- Task 5: RealPresence Resource Manager system integration with DMA system
- Task 6: Additional DMA system setup
- Task 7: Endpoint setup
- Task 8: RSS system initial setup
Task 1: MCU or RMX system initial setup

If your implementation includes an MCU system, configure it as needed. If your implementation includes a Polycom RMX system, do the following:

1. Complete a first time setup of the RMX system. For more information, see the Polycom RMX System Getting Started Guide.

2. Configure the advanced RMX system features. Do not enable maximum security mode.

For more information on RMX advanced configuration options, see the Polycom RMX System Administration Guide.

Task 2: RealPresence Resource Manager system initial setup

If your implementation includes a Polycom RealPresence Resource Manager system, complete its first time setup. Do not select either of the following options, as they are not compatible with either multi-tenancy deployment model:

- Integrate with Enterprise Directory Server
- Allow Delegated Authentication to Enterprise Directory Server

For more information, see the Polycom RealPresence Resource Manager System Getting Started Guide.

Task 3: Additional RealPresence Resource Manager system setup

We recommend that you configure, as needed, the following advanced RealPresence Resource Manager system features:

- Create and manage areas.
  - Enable the Areas feature.
  - Add the areas that you want to use. Create an area for each tenant or department, as needed. If you want to use the same RealPresence Resource Manager system as your tenants, create an area for yourself.
  - Assign rooms, conference templates, and network devices to an area.

- Import and manage users.
  - Import users.
  - Add users to areas.
  - Assign roles to area users. By default, area users all have the Area Scheduler role. You need to determine which, if any, of the area users will be given the Area Administrator or Area Operator roles.

- Set up RealPresence Resource Manager system redundancy for higher reliability and greater call success.
• Manage site topology. (If you are not using a RealPresence Resource Manager system, set up site topology on the DMA system.)
• Manage certificates.
• Set up address books for tenants.

For more information on these and other configuration options, see the *Polycom RealPresence Resource Manager System Operations Guide*.

**Task 4: DMA system initial setup**

Complete first time setup of the DMA system. Make sure you do not enable maximum security mode on the DMA system.

Perform the following DMA system setup, as needed:

• Ensure that the DMA system can communicate with your RealPresence Resource Manager system, or other management system, on the same DNS.
• Configure clustering. Set up super nodes or a supercluster for failover.
• Set up site topology or, if you set up site topology on a RealPresence Resource Manager system, verify that the site topology from that system now appears within the DMA system.

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When the DMA system is integrated with a RealPresence Resource Manager system, the RealPresence Resource Manager system owns and manages the site topology. At the time of integration, any DMA site topology data will be overwritten by the site topology data from the RealPresence Resource Manager system.

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• Add MCUs.
  - Create MCU pools.
  - Create MCU pool orders.

• Integrate the DMA system with RMX systems or other MCUs.

Both a DMA system and a RealPresence Resource Manager system cannot both point to the same RMX platform. Only one system or the other can be integrated with each RMX platform.

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For more information on basic setup, see the *Polycom DMA System Getting Started Guide*. 
**Task 5: RealPresence Resource Manager system integration with DMA system**

If your implementation includes a Polycom RealPresence Resource Manager system, integrate it with the DMA system:

1. On the DMA system, select the **Join Resource Manager** option and provide the information required. For more information, see the *Polycom DMA 7000 System Operations Guide*.

2. Verify that the pool orders you created on the DMA system have been imported to the RealPresence Resource Manager system.

3. Add pool orders to areas.

For more information, see the *Polycom RealPresence Resource Manager System Operations Guide*.

**Task 6: Additional DMA system setup**

Perform the following additional DMA system setup, as needed:

- Configure clustering. Set up super nodes or a supercluster for failover.

- If the DMA system has more than one cluster, indicate the domain name (FQDN) for the specific cluster to use.

- Verify the site topology that you set up on the RealPresence Resource Manager system now appears on the DMA system.

  When the DMA system is integrated with the RealPresence Resource Manager system, the RealPresence Resource Manager system owns and manages the site topology. The DMA site topology becomes read-only.

- Set up signaling by enabling the call protocols to support, and then opening the appropriate ports:
  - SIP (You can, optionally, create DNS records and add external SIP peer proxies.)
  - H.323
  - XMPP

- Add an external SBC and integrate it with the DMA system.

For detailed information on any of these setup tasks, see the *Polycom DMA System Operations Guide*.
Task 7: Endpoint setup

Complete the following steps to set up endpoints:

1. Using the RealPresence Resource Manager system, add endpoints to areas.

2. For every dynamically managed endpoint associated with a room, associate the room in the RealPresence Resource Manager system with a machine account. The machine account allows the room's endpoint to connect and authenticate with the RealPresence Resource Manager system without using the endpoint user's account. After you add a room, create the machine account and associate the room with the machine account.

3. Connect the endpoint to the network.

4. Configure the IP settings on the endpoint.

5. If applicable, configure the SIP settings on the endpoint.

6. On the endpoint system, configure each automatically managed endpoint to identify either the tenant or the enterprise firewall.

   For details, see the RealPresence Resource Manager Operations Guide.

Task 8: RSS system initial setup

Complete first time setup of the RSS system. For details, see the RSS Getting Started Guide.
area – An area isolates one tenant or department from another. If you (as an enterprise or service provider) share a RealPresence Platform with tenants, then you have your own area. An area contains a logical collection of resources that are used only by one tenant. Areas do not overlap. That is, a resource belongs to no more than one area.

common pool - If a network device or DMA pool order does not belong to an area, it is in the “common pool” and is available for the system to use for any area.

tenant – The company or organization that is a video conferencing customer of an enterprise or service provider.

For details on these terms, see the RealPresence Resource Manager Operations Guide.