Level 1 Technical Management Applications

Contents

1 - Glossary .............................................................................................................................. 2
2 - Features .............................................................................................................................. 4
   RealPresence Distributed Media Application (DMA) ....................................................... 4
   RealPresence Resource Manager ..................................................................................... 8
   RealPresence Video DualManager 400 ........................................................................... 10
3 - Architecture ..................................................................................................................... 12
4 - Conclusion ......................................................................................................................... 13
   Available Resources .......................................................................................................... 13
Appendix 1 - Converged Management Application (CMA) 4000 ........................................ 14
1 - Glossary

Level 1 introduced three distinct learning paths which all converge when discussing telepresence solutions. They are Polycom terminology for features and functions, technical network terminology which is used to detail how those features and functions work, and also the actual solutions themselves.

We will develop each of these three paths further through each training level, but first we will recap the key points covered so far which specifically apply to resource management and take a look at what is coming up.

Network terminology

- **Call Admission Control** – method of policing calls to make sure that no more than the allocated bandwidth is utilized
- **Gatekeeper** – device which provides Call Admission Control and which endpoints register to enabling the use of E.164 aliases for simplified dialing
- **Gateway** – Device which allows two incompatible protocols or areas of the network to communicate. For example, H.320 (ISDN) requires a gateway to be in the same conference as H.323 (IP). An internet gateway is used to traverse firewalls and move traffic from the LAN to the internet
- **H.323** – an open standard protocol used for videoconferencing over IP networks
- **Proxy** – a device which takes data from one network and sends it to another, usually invisibly to the user
- **SIP** – Session Initiation Protocol; an open standard protocol used for videoconferencing over IP networks

Polycom Management Applications solutions

- **RealPresence Distributed Media Application (DMA)** – a network-based video conferencing solution that provides the following functionality:
  - Conference Management
  - Virtualization and load balancing
  - Call Control
  - Gatekeeper
  - SIP registrar and proxy server
  - SIP / H.323 gateway
  - Reporting
  - Integration into third party management and scheduling solutions
  - Available in hardware (appliance) format or software (virtual edition) format

- **RealPresence Resource Manager** – a network-based video conferencing solution that provides the following functionality:
  - Endpoint management
  - Reporting
  - Scheduling
  - Presence engine
  - Integration into third party management and scheduling solutions
  - Available in hardware (appliance) format or software (virtual edition) format

- **RealPresence Video DualManager 400** – a network-based video conferencing solution for small to mid-size customers that provides the following functionality:
o Endpoint management
o Reporting
o Scheduling
o Presence engine
o Conference Management
o Call Control
o Reporting
o Integration into third party management and scheduling solutions
o Available in hardware (appliance) format only
2 - Features

RealPresence Distributed Media Application (DMA)

The hardware (appliance) form of RealPresence Distributed Media Application (DMA) utilizes the same server to the RealPresence Resource Manager and RealPresence Video DualManager 400.

RealPresence DMA licensing is managed by number of concurrent calls. A RealPresence DMA out of the box provides licensing for 50 concurrent calls, and more can be added to in bundles of 50, 100, 500, 1000 or 5000.

Before becoming a call control server (before the release of v3.0), the licensing for the DMA was simply determined by how many MCUs were required. When upgrading a RealPresence DMA to v3 or higher, each RealPresence Collaboration Server (RMX) license will be converted to a license for 200 concurrent calls.

Redundancy is available in two different ways. The first way of achieving redundancy connects two servers with a crossover cable to create a dual-server cluster. Although each RealPresence DMA maintains its own database, they are constantly replicating each other and maintain the same state. In this configuration the RealPresence DMA dual-server cluster has a virtual IP address which is used for GUI access, gatekeeper registration and so on, and each server still has its own real IP address if direct access is required. In this format up to 5,000 concurrent calls and 15,000 device registrations are available. Optional Microsoft Active Directory integration is possible if required.

The second redundancy method is where single servers and dual-server clusters are linked to each other on the same network. Up to five servers and clusters can be linked in this way, which is known as a supercluster. A supercluster works the same way as the dual-server cluster, except that the database replication is performed across a network. In the event of a cluster failure, another cluster will take over. In this format, up to 25,000 concurrent calls and 75,000 device registrations are available.

The software (virtual edition) format of RealPresence DMA is able to support the same capacities as the appliance version with the appropriate server specification.
Software Keys
As mentioned in Level 1, a software key is used to ‘unlock’ extra features should they be required by the customer. Software keys for RealPresence DMA are available for the following features:

- Single-server Upgrade (used to create a dual-server cluster)
- Upgrade to add 50 concurrent calls
- Upgrade to add 100 concurrent calls
- Upgrade to add 500 concurrent calls
- Upgrade to add 1000 concurrent calls
- Upgrade to add 5000 concurrent calls (appliance version only)
- Upgrade to allow access to API (Application Programming Interface) suite for third party integration and management

Virtualization and load balancing
The primary conference management function of RealPresence DMA is to provide virtualization and load balancing services for all connected conference platforms. Supported conference platforms (MCUs) are:

- RealPresence Collaboration Server series
- Cisco TelePresence MCU 4000 Series
- Cisco TelePresence MSE 8000 Series

The RealPresence DMA manages this by providing ad-hoc conferencing services through the use of virtual meeting rooms. Rather than all the MCUs holding individual meeting rooms, users dial into a RealPresence DMA virtual meeting room and the RealPresence DMA finds an MCU to take the call. Instead of dialing the MCU E.164 alias followed by the meeting room ID, the user dials into the RealPresence DMA E.164 alias followed by the virtual meeting room ID. This is shown very simply in the diagram below where the RealPresence DMA E.164 alias is 10.

As can be seen here, the RealPresence DMA becomes a virtual conference platform and can place each call on the appropriate MCU to balance the load in a suitable manner. This can be done in a number of ways using MCU ‘pools’ to determine which calls go where. For example, the above diagram can be amended to show a simple geographical MCU setup, the incoming calls will go to the nearest MCU, but in the event of a failure the other MCU can be utilized if necessary.
If more than one MCU is required for any reason, the RealPresence DMA manages all necessary hardware so that the end user is not aware of how the call has been connected. With Active Directory integration it is even possible to have the RealPresence DMA generate VMR numbers for every user automatically, so a VMR number will match each user’s phone number.

In the same way that the RealPresence Collaboration Server uses profiles when meeting rooms are created, the RealPresence DMA also uses profiles so that it can explain to the RealPresence Collaboration Server exactly what is required when the call fires up. All of this intelligence is performed ‘behind the scenes’ so that the end user does not know (or care) which MCU they are connected to, but no matter where they are connected from they will be sure to join the right conference in the best manner possible.

**Gatekeeper**

At the foundation of the gatekeeper functionality is the capacity to configure a network showing sites and site links. From there, correctly configured, RealPresence DMA will know when a call starts up in London trying to contact Sydney, whether there is adequate bandwidth available on the links in between to allow the call through.

RealPresence DMA will also resolve the E.164 alias of an endpoint registered to it to route the call correctly to the IP address of that endpoint.

The gatekeeper has two ‘modes’ or methods of operation. These are known as direct mode or routed mode and differ in the management of the signaling traffic.

In routed mode, one endpoint dials another, the call goes to RealPresence DMA, as RealPresence DMA decides where to route it. After resolving the destination address, the media (audio/video) is sent directly from one endpoint to the other, but the signaling still goes through RealPresence DMA. This enables RealPresence DMA to manage the connection for call admission control and reporting purposes:
When using direct mode, although the initial signaling goes via RealPresence DMA, as soon as RealPresence DMA has resolved the alias and sent the call to the other endpoint, it drops the signaling and lets the endpoints take over. Although this method allows more concurrent calls on RealPresence DMA (as in effect RealPresence DMA is doing less), it also means that RealPresence DMA cannot manage bandwidth or reporting as it has no further knowledge of the call:

In addition to registering endpoints and infrastructure to it, RealPresence DMA gatekeeper can also support gatekeeper neighboring, where one gatekeeper is made aware of another, so that when a call comes in and the E.164 alias is not recognized it is first passed to all neighbors for resolution.

RealPresence DMA also supports alternate gatekeeper settings, which is where the gatekeeper registrations will pass to a nominated alternate IP address in the event of a failure. It also supports prefix dialing, where a prefix is dialed followed by the E.164 alias to route the call to a specific gatekeeper.

The gatekeeper function can also be used to provide a global address book (GAB) where Active Directory integration is not used; each endpoint which registers can be set to appear if required for ease of dialing.

Where a RealPresence Resource Manager is present in the network, the RealPresence DMA can be 'joined' to the RealPresence Resource Manager solution in question, allowing it to share the sites, site links and other topographical information without the need to duplicate the configuration manually.

**SIP registrar and proxy server**

It is common in a SIP environment to use a proxy (often referred to as just a SIP server) to enable simplified dialing. To compare at a high level, in H.323 you dial an IP address, or
when registered to a gatekeeper, via E.164 alias. In SIP, without registration to a proxy server you can also dial an IP address or via a SIP URI (Uniform Resource Identifier). A SIP URI has a format of username@SIP server, and the username could be letters or numbers, for example, if your SIP server is video.polycom.com and your username is johnsmith, your SIP URI would be johnsmith@video.polycom.com. If you were using numbers and IP addresses it might look something like 1000@140.242.6.100.

However, when registered to a SIP server, you can dial without needing to add the SIP server on the end, enabling dialing via username only.

The registrar is a separate function (often hosted on the same server) which acts in a similar manner to a DNS server, it records the location (IP address) of a SIP endpoint with the username to assist with call setup.

**SIP / H.323 gateway**

The SIP / H.323 gateway supports calls between SIP and H.323 devices without the need for an MCU. The RealPresence DMA will automatically first try to resolve the call using SIP or H.323 at both ends, and will only start a gateway session if there is no other way for the call to proceed.

**Reporting**

Several reports are available on the RealPresence DMA, they are:

- **Alert History** – shows system alerts (can be filtered by date)
- **Call History** – shows details of each point to point call (can be filtered and exported)
- **Conference History** – shows details of each call using an MCU (can be filtered)
- **Call Detail Records (CDRs)** – shows call details records (can be filtered and exported)
- **Registration History** – shows details of each endpoint registration (can be filtered)
- **Active Directory Integration** – where Active Directory integration is configured, shows contact results for each domain in the forest and lists any which couldn’t be contacted (only a domain user can view this report)
- **Orphaned Groups and Users** – where Active Directory integration is configured, shows all users and groups which are no longer contactable
- **Conference Room Errors** – where Active Directory integration is configured, shows all errors with regards to conference room numbering such as conflicts caused by number generation (only a domain user can view and export this report)
- **Enterprise Passcode Errors** – where Active Directory integration is configured, shows all errors with regards to passcode generation such as conflicts caused by number generation (only a domain user can view and export this report)
- **Network Usage** – shows bandwidth usage on sites and site links, including call statistics showing average packet loss, jitter and delay (can be filtered and exported)

**RealPresence Resource Manager**

The hardware (appliance) version of RealPresence Resource Manager has an entry point of 100 devices, but can provide registrations for up to 10,000 devices. In addition to this, the RealPresence Resource Manager has the ability to be clustered for redundancy in a similar way that RealPresence DMA does, using dual-server clusters directly linked to each other and residing 'behind' a virtual IP address.

RealPresence Resource Manager also supports integration into Active Directory and multi-tenancy. This means that the available resources licensed within the server may be
separated virtually, enabling a service provider or large enterprise to host different networks with no access to the others unless specifically allowed.

The software (virtual edition) format of RealPresence Resource Manager is able to support the same capacities as the appliance version with the appropriate server specification.

**Software Keys**

Software keys for RealPresence Resource Manager are available for the following features:

- Upgrade to add 100 licenses
- Upgrade to add 500 licenses
- Upgrade to add 1000 licenses
- Upgrade to add 2500 licenses
- Upgrade to add 5000 licenses
- Upgrade to add 100 licenses for service provider (multi-tenancy) environments
- Upgrade to add 500 licenses for service provider (multi-tenancy) environments
- Upgrade to add 1000 licenses for service provider (multi-tenancy) environments
- Upgrade to add 2500 licenses for service provider (multi-tenancy) environments
- Upgrade to add 5000 licenses for service provider (multi-tenancy) environments
- Upgrade to add 10000 licenses for service provider (multi-tenancy) environments
- Upgrade to allow access to API (Application Programming Interface) suite for third party integration and management
- High availability (used to create a dual-server cluster)

**Endpoint management**

RealPresence Resource Manager can be used for a number of endpoint management functions, from basic control via the GUI to upgrading endpoint software automatically. They are summarized here:

- Simple to use browser UI which can be used to find and manage each endpoint
- Software update function can be used to push software to each endpoint individually or in groups, or can be used to automatically update at a scheduled time
- Provisioning profiles can be created to provide a settings template for each endpoint. This can be automatically applied or it can be manually pushed out when required

**Reporting**

Several reports are available on the RealPresence Resource Manager, they are:

- **Report Considerations for Multi-tenancy** – reports on specific Areas where multi-tenancy is in use
- **Site Statistics** – shows the status of each site in real time
- **Site Link Statistics** – shows the status of each site link in real time
- **Endpoint Usage** – shows the usage of each endpoint including hours in use, bandwidth used, time of day
- **Conference Usage** – shows the time, date and duration of conferences
- **Conference Type** – shows whether conferences were point to point or multipoint, scheduled or adhoc etc. (may be exported)
- **View and Export System Log Files** – shows all system log entries (may be exported)
- Download Log Files – downloads a package including system log entries, hardware status and other information
- View and Download Audit Log Files (may be exported)
- Resource Manager System – produces a text file describing the system configuration

Scheduling

Please note direct scheduling using Management Application solutions is not connected with Polycom Conferencing for Outlook (PCO) in any way, and is a completely separate solution with a different value proposition. A conference scheduled directly is automatically dialed out at the appropriate time, and the RealPresence Resource Manager will try and connect all participants unless a participant is configured during the booking process as ‘dial in’.

If any of the endpoints are in use or are not answered the call to that site will fail, as opposed to PCO which offers a dial-in model where each participant dials from wherever they are attending the meeting.

When positioning scheduling with a customer, be very careful to position the correct solution, and if possible double check with a Solutions Architect or post-sales engineer prior to suggesting one method over the other.

Presence Engine

RealPresence Resource Manager provides a presence engine, allowing compatible desktop and mobile solutions to not only be provisioned and managed on the server, but also provides presence services to allow end-user visibility.

Compatible Polycom products include RealPresence Mobile and RealPresence Desktop, which are fully featured H.323 and SIP clients.

API (Application Programming Interface) Integration

RealPresence Resource Manager comes complete with a full API suite for integrating scheduling and monitoring tasks with existing third party solutions. So should a customer have already invested in a network management and monitoring solution, adding the API license to the RealPresence Resource Manager will enable the customer to integrate the solutions, avoiding the necessity for monitoring the Polycom solution separately.

Note that the RealPresence Resource Manager does NOT include gatekeeper functionality; it must be used in conjunction with RealPresence DMA to provide a full call control and management solution.

RealPresence Video DualManager 400

Although it shares the same server type, unlike RealPresence DMA and RealPresence Resource Manager, RealPresence Video DualManager 400 is only available in a hardware (appliance) version, and does not support redundancy. It is designed for small to midsize customers who require a cost-effective solution for their video environment management.

It provides both the functionality of RealPresence Resource Manager, supporting up to 400 devices, and the functionality of RealPresence DMA, supporting up to 150 concurrent calls.

Software Keys

Software keys for RealPresence Video DualManager 400 are available for the following features:

- Upgrade to add 100 devices to Resource Manager and 50 concurrent calls to DMA
- Upgrade to add 200 devices to Resource Manager and 100 concurrent calls to DMA
• Upgrade to allow access to API (Application Programming Interface) suite for third party integration and management
3 - Architecture

As previously stated, all three hardware (appliance) versions of the Management Application solutions share the same server type.

They run on a Linux platform which is very secure and not susceptible to network threats or attacks, and have a 1RU rack-mountable chassis, complete with dual power supplies. Each server has two 146GB hard drives configured in a RAID-1 formation, which means that one of the hard drives is used for data storage and the other automatically makes a complete copy of the first hard drive in case of failure or corruption. (RAID stands for Redundant Arrays of Inexpensive Disks and there are a number of standards which have all been given a number for simple identification).
4 - Conclusion

This guide has provided an introduction to the Management Application solutions and how they fit into the RealPresence Platform. Your next step following the qualifying assessment will be Level 2 Instructor-Led Training, where you will learn more about how to set up, configure and manage the individual components of this solution family.

Available Resources

In addition to the information contained in this document, please also take a moment to familiarize yourself with the following resources available:

Solution brochures –


Product documentation –
http://support.polycom.com/PolycomService/support/us/support/network/index.html
- DMA Getting Started Guide
- DMA Operations Guide
- RealPresence Resource Manager Getting Started Guide
- RealPresence Resource Manager Operations Guide
- RealPresence Video DualManager Getting Started Guide

Infrastructure solution matrix (registration to Polycom Connect required)
- From the homepage Resources > Sales Tools > Product Reference Matrices
- Select NA (North America) or ROW (Rest of the World)
Appendix 1 - Converged Management Application (CMA) 4000

Introduction
At the time of writing this product had been replaced by RealPresence Resource Manager and RealPresence Video DualManager 400. In order to ensure that information regarding this product remains available while necessary, the equivalent information is printed here.

Overview

**Converged Management Application (CMA)** – a network-based video conferencing solution that provides the following functionality:
- Endpoint management
- Reporting
- Scheduling
- Presence engine
- Gatekeeper

Key Features
The CMA 4000 has an entry point of 100 licenses, but can provide registrations for up to 400 devices registered concurrently and support up to 240 concurrent calls. It also supports integration into Active Directory.

The CMA utilizes an internal SQL database for registration, call scheduling and network data, but integration with an external SQL Server is also possible for additional resilience.

Software Keys
Software keys are available for the following features:
- Upgrade to add 100 licenses
- Outlook scheduling
- Lotus Notes scheduling plug-in

Endpoint management
CMA can be used for a number of endpoint management functions, from basic control via the GUI to upgrading endpoint software automatically. They are summarized here:
- Simple to use browser UI which can be used to find and manage each endpoint
- Software update function can be used to push software to each endpoint individually or in groups, or can be used to automatically update at a scheduled time
- Provisioning profiles can be created to provide a settings template for each endpoint. When the endpoint connects the CMA, this can be automatically applied, or it can be manually pushed out when required

Reporting
Several reports are available on the CMA, they are:
- **Site Statistics** – shows the status of each site in real time
- **Site Link Statistics** – shows the status of each site link in real time
- **IP Call Detail Report** – shows the detail of each IP call (can be filtered and exported)
- **Endpoint Usage Report** – shows the usage of each endpoint including hours in use, bandwidth used, time of day
- **Conference Detail Report** – shows the conference usage, whether conferences were point to point or multipoint, scheduled or adhoc etc.

**Scheduling**

Please note direct scheduling using Management Applications is not connected with Polycom Conferencing for Outlook (PCO) in any way, and is a completely separate solution with a different value proposition. A conference scheduled directly is automatically dialed out at the appropriate time, and the CMA will try and connect all participants unless a participant is configured during the booking process as ‘dial in’.

If any of the endpoints are in use or are not answered the call to that site will fail, as opposed to PCO which offers a dial-in model where each participant dials from wherever they are attending the meeting.

There are three different methods of providing direct scheduling. The first is via the browser UI, which is the most straightforward and only requires a login account.

The second is via an Outlook plug-in. This will work only up to Outlook 2003, and uses a calendar template which links into the CMA itself for booking.

The third is via a Lotus Notes plug-in. This will only work on the default Lotus template, and adds a new option for meetings which can be selected by the user.

**Presence Engine**

CMA provides a presence engine, allowing compatible desktop and mobile solutions to not only be provisioned and managed on the server, but also provides presence services to allow end-user visibility.

Compatible Polycom products include CMA Desktop, Telepresence m100 (both now replaced), RealPresence Mobile and RealPresence Desktop, which are all fully featured H.323 and SIP clients.

**Gatekeeper**

At the foundation of the gatekeeper functionality is the capacity to configure a network showing sites and site links. From there, correctly configured, the CMA will know when a call starts up in London trying to contact Sydney, whether there is adequate bandwidth available on the links in between to allow the call through.

The CMA will also resolve the E.164 alias of an endpoint registered to it to route the call correctly to the IP address of that endpoint.

The gatekeeper has two ‘modes’ or methods of operation. These are known as direct mode or routed mode and differ in the management of the signaling traffic.

The CMA is set by default to routed mode and this is the recommended setting.

In addition to registering endpoints and infrastructure to it, the CMA gatekeeper can also support gatekeeper neighboring, where one gatekeeper is made aware of another, so that when a call comes in and the E.164 alias is not recognized it is first passed to all neighbors for resolution.

The CMA also supports alternate gatekeeper settings, which is where the gatekeeper registrations will pass to a nominated alternate IP address in the event of a failure.

The gatekeeper function can also be used to provide a global address book (GAB) where Active Directory integration is not used; each endpoint which registers can be set to appear for ease of dialing.

**Architecture**
The CMA runs on a Windows Server 2003 platform. The CMA has a 1RU rack-mountable chassis, complete with dual power supplies. It has one 72GB hard drive.

**Available Resources**


http://support.polycom.com/PolycomService/support/us/support/network/index.html

- CMA Getting Started Guide
- CMA Operations Guide