Level 1 Technical
Recording, Streaming and Content Management

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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 endpoints and take a look at what is coming up.

Video terminology

- **Live stream** – the ability to watch a recording as it is being made in real time
- **Content** – the sharing of a computer desktop or similar as part of a conference

Recording, Streaming and Content Management solutions

- **RealPresence Media Suite** – a network-based video conferencing solution that gives companies the ability to record conference calls, produce archive files of the recordings, and simultaneously stream the conferences to up to 500 employees to their web browsers
- **RealPresence Capture Server** – the hardware appliance that RealPresence Media Suite Appliance Version utilizes
- **RealPresence Capture Station** – a software solution also available as a turnkey appliance that records presentations in rooms that may not be equipped with Polycom conferencing technology. When used with the RealPresence Media Manager, users can easily capture and publish live or on-demand streaming media-based presentations with synchronized presentation slides
- **RealPresence Media Manager** – a software solution also available as a turnkey appliance which captures, manages and publishes video and content to the web. This helps organizations launch and expand online communications, training, and educational initiatives
- **RealPresence Media Editor** – a software solution which enables clients to tailor their media to serve a wide variety of audiences, platforms and devices. For example, users can re-publish a presentation for cross-browser and operating system compatibility, or repurpose a presentation so that it can be played back on a mobile device, or adjust presentation slides to make corrections found later in the production workflow. Media Editor does not edit video files
2 - Features

RealPresence Media Suite

There are four versions of the RealPresence Media Suite Appliance Version; all utilize the same RealPresence Capture Server chassis and software, but are licensed differently. The fundamental difference between the versions is the number of concurrent recordings and live streaming ports, as seen at the top of the table below.

For greater capacity, RealPresence Media Suite Pro is required; this is available deployed as a centrally managed Appliance Center of at least one RealPresence Capture Server, with physical or virtual nodes making up the local access point at each site. For additional expansion, further RealPresence Capture Server appliances can be added with the appropriate license to provide the capacity required, also as seen this table:

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Recording ports</th>
<th>Streaming ports</th>
<th>Deployment option</th>
</tr>
</thead>
<tbody>
<tr>
<td>RealPresence Media Suite 6/3</td>
<td>6</td>
<td>3</td>
<td>Appliance or Virtual Edition</td>
</tr>
<tr>
<td>RealPresence Media Suite 12/6</td>
<td>12</td>
<td>6</td>
<td>Appliance or Virtual Edition</td>
</tr>
<tr>
<td>RealPresence Media Suite 18/9</td>
<td>18</td>
<td>9</td>
<td>Appliance or Virtual Edition</td>
</tr>
<tr>
<td>RealPresence Media Suite 40/0</td>
<td>40</td>
<td>0</td>
<td>Appliance or Virtual Edition</td>
</tr>
<tr>
<td>RealPresence Media Suite Pro 24/12</td>
<td>24</td>
<td>12</td>
<td>Appliance Center, Physical or Virtual Distributed Nodes</td>
</tr>
<tr>
<td>RealPresence Media Suite Pro 60/30</td>
<td>60</td>
<td>30</td>
<td>Appliance Center, Physical or Virtual Distributed Nodes</td>
</tr>
<tr>
<td>RealPresence Media Suite Pro 100/50</td>
<td>100</td>
<td>50</td>
<td>Appliance Center, Physical or Virtual Distributed Nodes</td>
</tr>
</tbody>
</table>

RealPresence Media Suite can also provide up to 10,000 browser connections for end-users to view the live stream. Recordings are available for viewing and download in MP4 format, though MP3 audio files are also available.

The RealPresence Media Suite can enable playback from an endpoint, and not just a browser. It can be accessed from any open standards endpoint via IP address or E.164 alias, and controlled using far end camera control to record, pause, stop, delete and play back archives. This includes being used in conjunction with a RealPresence Collaboration Server for recording of multipoint calls.

Capability Overview

The capability of the RealPresence Media Suite is dependent not only on the licensing but also on all the other variables using processing power simultaneously. For each of the available recording ports, up to a number may be used for live streaming where required. Using the table above, for example, where 18 recording ports are available, up to 9 may be used for live streaming.

Archive Management

The RealPresence Media Suite is managed via a browser UI in a similar fashion to most RealPresence Platform products. As well as server management, it is also possible to start, pause and stop a recording as well. The UI can also be used to dial out to an endpoint to start a recording, download an existing archive or open up a live stream for viewing.

Recording Template

The RealPresence Media Suite uses templates to define the basic features of a recording such as:

- Recording rate
- Maximum resolution
- Starting recording immediately upon connection

A virtual recording room (VRR) then points to a template when created, and follows these variables when recording.

**Transcoding Template**

In addition to the recording template, the transcoding template also sets some variables, used when the raw video file is transcoded to MP4, such as:
- Bit rate of transcoded file
- Maximum resolution of transcoded file
- Screen layout (used for content positioning)

**Virtual Recording Rooms**

Using a similar model to the RealPresence Collaboration Server conference platform, the RealPresence Media Suite uses rooms to identify and archive recordings. Many of the settings for these rooms are taken from the recording templates mentioned above.

VRRs can be created and associated with a local user, which makes it possible to only restrict a user’s access to only their own recordings (or those made specifically accessible to them). This can make things much simpler to navigate, especially in an environment where the RealPresence Media Suite is being heavily utilized.
RealPresence Capture Station

There are two versions of the RealPresence Capture Station. Each version will take video, audio and content inputs and produce a completed multimedia presentation for publication using RealPresence Media Manager or further editing using RealPresence Media Editor. Limited distribution capabilities are also available of up to 25 individual streams for each version. Different solutions are available depending upon geographic location, so be sure to check local information.

The solution versions are:

- **RealPresence Capture Station Pro** – A software solution which captures and publishes programs up to HD 1080i
- **RealPresence Capture Station Portable Pro** – A flexible and portable turnkey appliance which captures and publishes programs up to HD 1080i in a waterproof, dustproof case for real portability

Custom Branding

One of the key features of RealPresence Capture Station is the ability to allow custom branding to the interface. This allows publication of material in line with the customer's corporate design.

Custom Content

Encoding settings allow multiple line rates and multiple formats, along with the capability to allow end-users to choose and adjust layouts on playback.

In addition, RealPresence Capture Station enables the administrator to synchronize video and content for the most meaningful publication, and also allows the addition of chapters to assist with content navigation.

Supporting documentation may also be uploaded for publication to enable the end-users to find all the information they need from a single source.

Metadata (data which provides information about other data) may be added to a recording including the speaker, course title and description. This makes it simple to find the recording on publication.

Eagle-Eye Camera Integration

If required, EagleEye cameras can be utilized with both versions of RealPresence Capture Station to provide pan/tilt/zoom capabilities. The integration kit consists of a camera, power supply and all necessary cabling.
Post-Capture Editing

RealPresence Capture Station has the ability to include moderated Q&A during distribution of a live stream, along with editing functions such as adding and removing slides from a presentation used as content, or adding a title to a recorded program. Basic video editing enables trimming of the actual media so the program starts at the beginning and ends when finished.

RealPresence Media Manager

There are three versions of the RealPresence Media Manager for implementation onsite. Different solutions are available depending upon geographic location, so be sure to check local information. Playback for all versions may be achieved by browser, external media players such as Microsoft Windows Media Player, with options for mobile and digital signage playback also available (detailed below). The solution versions are:

- **RealPresence Media Manager Software Edition** - The customer provides their own hardware, operating system and Microsoft SQL Server. Because this version can be scaled using the customer's own hardware, it can be scaled up to 40,000 concurrent users.
- **RealPresence Media Manager Virtual Edition** - A turnkey virtual machine for implementation into the customer's data center. Virtual Edition includes RealPresence Media Manager software, operating system and SQL Server, and can scale from 250 to 1,000 concurrent users.
- **RealPresence Media Manager Appliance Edition** – A turnkey appliance that scales from 250 to 1,000 concurrent users.

In addition to the onsite implementations, Polycom also offers RealPresence Media Manager as a Hosted Edition. This is sold as a Software-as-a-Service (SaaS) subscription that avoids capital expenses and has no need for in-house technical expertise in terms of implementation or ongoing maintenance.

Importing Content

RealPresence Media Manager has the ability to monitor and ingest content from RealPresence Capture solutions, desktops, user uploads and other content capture sources either automatically or manually.

User Authentication

RealPresence Media Manager can use its own local database for managing users, or optionally, be integrated with external LDAP user authentication systems such as Microsoft Active Directory for web-based single sign on.

Media Organization and Administration

RealPresence Media Manager supports categorization and organization of content using a central library. This includes the use of metadata for searching specific data such as the recording title or speaker, and optionally transcoding content into additional media formats to gain the widest possible access for the audience.

It is also possible to schedule recordings using RealPresence Capture solutions, and automate the content management by configuring RealPresence Media Manager to publish the content automatically upon ingestion.

End User Experience and Administration

RealPresence Media Manager has several features to assist in end-user management. These include managing pre-requisite viewing, tracking and reporting on user activity. The addition
of the Test and Certification module allows basic assessments to be undertaken directly without the need for an additional Learning Management System.

For the end user, the availability of multiple bandwidths and formats assists in distributing the material to the widest possible audience. Once the content is being viewed, the chapters created using RealPresence Capture Station allow the viewer to locate specific points in the content, and their position will also be bookmarked so that a recording can be left to complete at a later time without losing position.

**RealPresence Media Editor**

Prior to version 6.5, purchase of a RealPresence Capture Station includes software and one license for RealPresence Media Editor. Currently, Media Editor is sold separately. This software allows the user to create presentations, synchronize video and audio to a slide presentation, add closed captioning, and publish the resulting presentation to all popular media formats to RealPresence Media Manager and other content delivery solutions such as CD or packaged zip or exe.

**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 are available for the following features:

**RealPresence Media Suite**

- Feature upgrade
  - Increases the capacity by 6 concurrent recordings, 3 of which may be used for live streaming
- Encryption
  - This is a no-cost option which can only be added in some countries due to local laws; check availability prior to applying the license if unsure

**RealPresence Capture Station**

- Option for Blackboard integration
  - Allows direct publication to Blackboard Learning Management System (LMS)

**RealPresence Media Editor**

- RealPresence Media Editor software licenses (available in a pack of 5 or 10)
- Option for Blackboard integration
  - Allows direct publication to Blackboard Learning Management System (LMS) (available in a pack of 5 or 10 licenses)

**RealPresence Media Manager**

- Additional 250 concurrent users
- Additional 500 concurrent users

RealPresence Media Manager also has a number of integration modules which allow additional functionality. The most commonly required are listed here.

**Integration Modules**

- Directory Services integration (included in base model)
  - Enables RealPresence Media Manager to provide user authentication against an existing directory service such as Microsoft Active Directory
- Learning Management System (LMS) integration
  - Allows direct integration into several of the most popular LMS products
• Microsoft SharePoint integration
  o Enables RealPresence Media Manager content to be accessed directly via SharePoint 2010
• Mobility integration (included in base model)
  o Allows direct access from a mobile portal
• Test and Certification Module (included in base model)
  o Enables the design, deliver, track and report user training and certification
• UC Utility (included in base model)
  o Enables locally recorded IBM Sametime and Microsoft Lync sessions to be uploaded for publication
3 - Architecture

RealPresence Capture Server Chassis
All the RealPresence Capture Server appliance models are built using Linux, which is very secure and not susceptible to network threats or attacks. They have a 2RU rack-mountable chassis with dual hot swappable power supplies.

It has four 2TB hard drives configured in a RAID-10 formation, which means that pair of drives both retain a small amount (stripe) of data so that there is a complete backup of each stripe, and the other pair retain the next stripe. These stripes continue to alternate, so that each pair of drives stripe and mirror all the data.

As the RealPresence Capture Station and Media Manager are both software solutions the hardware requirements for them are more useful, and are as follows:

RealPresence Capture Station Chassis
Both RealPresence Capture Station Pro and RealPresence Capture Station Portable Pro have 16GB of memory and a 750GB hard drive for storage.

RealPresence Media Manager Hardware Requirements
- Dual Intel X5560 Xeon Processor 2.8GHz 8M Cache (or comparable)
- 8-GB RAM (minimum)
- 100GB 7.2K RPM RAID configuration (minimum)
- Microsoft Windows 2008R2 Standard Edition 64-bit
- Gigabit Ethernet or better
4 - Conclusion

This guide has provided an introduction to the Recording, Streaming and Content Management 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 -

RealPresence Media Suite -

RealPresence Capture Station Pro -


RealPresence Media Manager -

RealPresence Media Editor -


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

- RealPresence Media Suite Getting Started Guide
- RealPresence Media Suite User Guide
- RealPresence Capture Station Quick Start Guide
- RealPresence Capture Station User Guide
- RealPresence Media Manager Administration Guide
- RealPresence Media Manager Quick Branding Guide
- RealPresence Media Editor Quick Start Guide
- RealPresence Media Editor User 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 – Recording & Streaming Server (RSS) 4000

Introduction
At the time of writing this product was being replaced by RealPresence Media Suite. In order to ensure that information regarding this product remains available while necessary, the equivalent information is printed here

Features
There are three versions of the RSS 4000; all utilize the same chassis and software, but are licensed differently. The fundamental difference between the versions is the number of concurrent recordings which can be made – 5, 10 or 15 depending on the model, known as Small, Medium and Large respectively.

All three models can also provide 100 browser connections for end-users to view the live stream. In addition to this, the RSS can record and store up to two different recordings at different resolutions, for example an SD and HD version, plus an MP4 version of the same archive. MP3 audio files are also available if needed.

The RSS can enable playback from an endpoint, and not just a browser. The RSS can be accessed from any open standards endpoint via IP address or E.164 alias, and controlled using far end camera control to record, pause, stop, delete and play back archives.

Capability Overview
The capability of the RSS is dependent not only on the licensing but also on all the other variables using processing power simultaneously. The number of resources supported by the RSS 4000 for live streaming depends on the system version. This table shows the relationship between the model and the resources it supports:

<table>
<thead>
<tr>
<th>Model</th>
<th>Resources Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small 5</td>
<td>4</td>
</tr>
<tr>
<td>Medium 10</td>
<td>6</td>
</tr>
<tr>
<td>Large 15</td>
<td>8</td>
</tr>
</tbody>
</table>

The combination of frame rate, resolution, number of rates used and video layout affects the number of resources required on the RSS to support live streaming. This table shows the relationship between those aspects and the amount of resources that are used:
Using this table it is possible to calculate the number of live streams supported by the system in concrete scenarios.

Take a Small model that supports four resources as the example. If there is an ongoing live streaming sending video at 720p 30fps and recording video at 1080p 30fps/1080p 60fps/720p 60fps, using two rates and single window layout, it occupies three resources on the system. Then there is one resource free, which allows for running one live stream at CIF/4CIF/720p 30fps, using a single rate and single window layout concurrently.

The following table shows the maximum capacity when live streaming of different parameters:

### Archive Management

The RSS 4000 is managed via a browser UI in a similar fashion to most RealPresence Platform products. As well as server management, it is also possible to start, pause and stop a recording as well. The UI can also be used to dial out to an endpoint to start a recording, download an existing archive or open up a live stream for viewing.

### Active Directory Integration

A simple integration process allows every user in the Active Directory to have their own logon to the RSS. Access controls can also be applied at a user or group level to restrict administrative access without the loss of availability for all other users.
RealPresence Collaboration Server Recording Links

The RealPresence Collaboration Server can also be integrated with the RSS 4000 to provide recording and streaming capability for conferences. Many companies use this function to allow people who miss meetings to hear and see what went on, or to purposefully keep recordings for reference and historical reasons. It is often used in education for teachers to deliver real-time lessons and simultaneously record them for future delivery. A church with satellite campuses and homebound members can participate in services from a variety of venues, and then the recording would be available to distribute over the Internet and on PDAs. There are many reasons for simultaneously recording and streaming a conference.

Recording Template

Using a similar model to the RealPresence Collaboration Server conference platform, the RSS uses templates to define the basic features of a recording such as:

- Primary recording rate
- Secondary recording rate
- MP4 recording rate (used for podcasting)
- Screen layout (used for content positioning)

A virtual recording room (VRR) then points to a template when created, and follows these variables when recording.

Virtual Recording Rooms

The RSS also uses recording rooms to identify and archive recordings. Many of the settings for these rooms are taken from the templates already discussed.

Polycom Conferencing for Outlook

The RSS is also available as part of the PCO solution. If joined as part of the overall implementation, conferences can be recorded and streamed using the link in the calendar invitation. These recordings can also be downloaded after the event.

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 are available for the following features:

- 5 to 10 concurrent recording upgrade
  - Can only be added to a 5-port RSS 4000
- 10 to 15 concurrent recording upgrade
  - Can only be added to a 10-port RSS 4000 (upgrading from 5 to 15 ports requires both licenses)
- HD Live Streaming upgrade
  - This can be added to any RSS 4000 version
  - Unlocks the capability of allowing an additional 100 viewers
  - Unlocks the capability of streaming 1 HD recording live
- Encryption
  - This is a no-cost option which can only be added in some countries due to local laws; check availability prior to applying the license if unsure
- Multicast
  Multicast is a capability which allows the sending of the same stream to many participants simultaneously. As standard the RSS sends streams unicast, meaning that each stream is sent separately, even those being transmitted at the same time. The restriction of a maximum
of 200 web viewers is due to the processing requirement of sending 200 individual streams. This restriction does not apply when using multicast, which can support up to approximately 3000 users accessing a single multicast stream.

**Architecture**

All the RSS models are also built using Linux.

The RSS has a 2RU rack-mountable chassis, complete with dual hot swappable power supplies. It has two 1TB hard drives configured in a RAID-1 formation, which means that one of the hard drives is used for recording and the other automatically makes a complete copy (a mirror) 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).

**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 -**

Recording and Streaming Server (RSS) -


**Product documentation -**

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

- RSS 4000 Getting Started Guide
- RSS 4000 User Guide