TEST REPORT POLYCOM RSS 4000

[PDF version (optimised for print)](#)

GENERAL

PERIOD

May / June 2013

SW VERSION

The test was performed with the software version 8.5.0.0 rev 35442 (hardware version 6.0). Options include 5 recording ports, 4 live streaming ports, 200 live streaming sessions, encryption and HD live streaming. Multicast was deactivated.

DEVICE CLASS

This device is a recording, streaming and replay/recall solution for video conferences and MCU conferences. Furthermore it supports user and rights management, offers several different output formats and supports mobile devices. Interfaces to a number of media servers are provided, e.g. for additional streaming.

SCOPE OF DELIVERY

The system is supposed to be mounted in a 19" server rack with 2 rack units and is delivered with all the necessary cables.

BANDWIDTHS

The system facilitates calls according to H.323 and SIP with bandwidths of up to 4096 kbps for each recording.

INSTALLATION

The installation into a server rack was not tested . It is advisable to mount the Polycom RSS in a server rack though, as its ventilation is very loud. The Polycom RSS 4000 runs on a Linux server. Two power supplies are installed and two LAN ports provided. On delivery, the LAN ports are configured with the following static IP addresses:

IP address: 192.168.1.254 or 192.168.1.253
Subnet mask: 255.255.255.0
Gateway: 192.168.1.1

These settings can be changed in two ways in order to use the RSS 4000 in the local network.
In the first case, a computer is connected to the LAN1 port of the RSS 4000 using a network cable and configured to be in the same network as the RSS 4000. Afterwards, the web interface of the RSS 4000 can be accessed with the Internet Explorer - different browsers are not supported properly - at the IP address 192.168.1.254 and open the Admin User Interface with the "Manage RSS" link. By default, login and password are "admin". All settings for IP address, subnet mask, gateway, DNS server, host name and domain can be determined here, DHCP is also possible. A restart is required, then the RSS 4000 can be used in the desired network at the configured IP address.
In the second case, a computer is connected to the respective port on the RSS 4000 with an RS-232 control cable. A connection to the RSS 4000 can be established with the help of a console or Telnet with a speed of 115200, 8 bits. Default password is "POLYCOM", the command to change the IP address is

set lan1 ip {dhcp | static <ip> netmask <mask> gw <gateway> }

where information in "<>" is to be replaced with appropriate values. In this case, too, a restart of the RSS 4000 is required.

The second LAN port is enabled only after network separation is activated. Afterwards the signalling/connection to other video conferencing devices only works with the IP address of the LAN1 port, the management and access to the web interface only works with the IP address of the LAN2 port.

TEST

OPERATION

There are 3 portals/interfaces for operating the RSS 4000. The first portal is the Viewer Portal, which can be accessed directly under the IP address of the RSS 4000 (or the IP address of the LAN2 port with network separation) with the Internet Explorer. As the name suggests, in the Viewer Portal guests and registered users can view recordings and live streams and make recording reservations depending on permissions. A description of the reservation function is included in the section "Virtual Recording Room".

Another portal appears on the video conferencing devices which are currently connected to the RSS 4000. In the portal, control is exercised via DTMF (tone dialling) or FECC (controlling the remote camera). A recording can be controlled with the portal, i.e. it can be started, paused, resumed, provided with a PIN code, terminated or aborted. Additionally, recordings which were created with the same VRR (see "Virtual Recording Room") as the current connection of the video conferencing device to the RSS 4000 can be replayed on the video conferencing device. Shared recordings can be played back as well.

The third portal is the Admin User Interface already mentioned in the section "Installation". It can be operated solely with the Internet Explorer too. The Viewer Portal has a menu item "Manage RSS", which leads to the Admin User Interface. Alternatively, the IP address of the RSS 4000 can be entered directly, followed by "/rss". In the Admin User Interface recordings and live streams can be watched, managed and started and settings concerning users, VRR, external servers, and for the RSS 4000 in general can be made. The menu structure is designed in a very clear way considering the wide range of configuration options.

CONFIGURATION SETTINGS IN GENERAL

The three portals of the RSS 4000 can be switched to different languages. The system time is obtained either via the shell or a specified NTP server. Download or upload of the entire configuration to a file, e.g. for backup purposes, is a useful additional option. Basic settings for NAT, network separation (see "Installation"), LAN speeds, and MTU can be specified, IPv6, ICMP echo, QoS and routing to specific targets can be configured too. Apart from that, settings concerning H.323 and SIP are included: An alternative gatekeeper to the standard gatekeeper can be specified. SIP can be activated separately and an optional registration with a SIP server is possible. Port ranges can be specified for H.323 and SIP.

Concerning recordings it can be determined whether they are to be continued when there is no live streaming resource at the moment and whether 1080p recordings should be possible with live streaming. In addition, the somewhat disturbing recording tone, which is played on the participating video conferencing devices, can be turned off. For the encryption, available options are "Required For All Calls", "Required For Video Calls", "When Available" and "Off". 256-bit AES keys are also supported. The RSS 4000 possesses predefined interfaces to the media servers Wowza Media Server, IIS 7 Media Server, QuickTime Streaming Server and Windows Media Server. In each case, the address and port of the server have to be specified, whether live streaming and video on demand should be available and, for live streaming, the respective publishing points with user name and password. An additional interface exists for FTP servers, which can be set by specifying the address, port, user name, password, and default path on the FTP server. SSL connections are possible.

Further configuration options include the possibility to connect to Active Directory Servers and Exchange Servers, for example for calendar integration. In addition, certificates for encrypted connection to the Admin User Interface and Viewer Portal can be installed. For monitoring purposes server logs can be downloaded. The log level (debug, info, error) can be specified. Warnings regarding insufficient disk space for media or protocols can be sent by mail. The frequency of reminders is to be specified in days, the memory limit in GB. Tthe RSS 4000 is SNMP-capable for monitoring and remote control. Last but not least, the RSS 4000 can be personalised by adding personal logos, background graphics and IVR audio messages.

USERS, GROUPS AND ROLES

The authentication method for users and groups of the RSS 4000 can be done locally or via Active Directory. Extensive customisable security policies exist for passwords, sessions, user accounts and assigned PINs. The following roles are available for users of the RSS 4000:

- Anonymous user: Every user who is not logged in. They can only access the Viewer Portal and view generally shared recordings and live streams.
- Registered user: A registered user can reserve meeting recordings, in addition to the same permissions an anonymous user has. They can also access the Admin User Interface. It provides access to one's own VRRs (see

"Virtual Recording Room") and the recordings or live streams that were made with them or shared with the user.
- Auditor: An auditor can only log into the Admin User Interface and download, edit or delete server protocols.
- Administrator: Administrators possess the same permissions as registered users and auditors. Additionally, they have all administrative rights and can log into the Viewer Portal and Admin User Interface.

Groups consist of a number of registered users, auditors and administrators. Empty groups are allowed and a standard group with all of the RSS 4000 registered users, auditors and administrators does exist. All the permissions which can be assigned to users can also be set for groups. If a member of a group possesses an extended permission due to their own user settings (e.g. administrator), this permission is not limited by the group settings. A user can be a member of several groups, the permissions will then also be combined.

VIRTUAL RECORDING ROOM

Recording settings are stored as so-called "Virtual Recording Rooms" (VRR) on the RSS 4000, a sequence of digits is associated with each VRR - the VRR number. The VRR number is used to identify the VRR and to determine the appropriate VRR when connecting the RSS 4000 to video conferencing devices (see "Connection").

Each VRR is based on templates that can be re-used for multiple VRRs. In these templates, the actual recording settings are specified. The settings include the streaming format (WMV or MP4 - H.264), whether live streaming should take place, the maximum bitrate (128-4096 kbps, default 768 kbps) and video quality (focus on sharpness or motion). Additionally, up to two bitrates for transcodings can be specified in the chosen streaming format, where the primary bitrate is between 128-4096 kbps with 768 kbps as default bitrate and the secondary with a maximum of 1024 kbps (default: no second transcoding). When the presentation channel is used, the layout can be chosen from the options "single window" (dual stream on a split screen available in 3 sizes), "dual window", "single window no content" and "single window video/content switch". Subsequent transcoding into the streaming format that was not selected is also possible, the bitrate can be set to a value in the range of 128 - 4096 kbps and, with existing presentation channel, the layout can be determined independently from the other settings. Other options include creating an MP3 file, Lost Packet Recovery, usage of H.264 High Profile, limiting the resolution to CIF/SIF, integration with Polycom RealPresence Media Editor and the specification of an additional backup location as a copy.

Apart from the VRR number and the template used, a VRR has a few additional settings. Each VRR is owned by one of the users, but permissions for additional users and groups for display and editing of recordings of the VRR in question can also be awarded. Access permissions for each individual recording can be changed in retrospect. Replay of recordings of the VRR can be PIN code-protected, the code can be adjusted for each recording separately. Metadata such as keywords and descriptions can be added, an automatic instant recording start after dial-up without additional selection in the Admin User Interface or portal on the video conferencing device is possible. A file naming conventions for the recordings can be specified by user name prefixes: prefix followed by "_" , the date in the format "MMDDYYYY", " _" and time, for example "vcc_06062013_150245924" with prefix "vcc".

For a VRR (see "Configuration Settings in General"), an operable FTP server can be connected. In that case, the data is copied to the appropriate location on the FTP server after recordings or transcodings are finished. The originals however are still available on the internal memory of the RSS 4000. Other than FTP servers, operable live streaming servers and video on demand servers can be added.

Alternatively, VRRs are also possible with reservations or as multipoint VRR. For reserved VRRs the live streaming link is already booked solid, but no resources are bound. The concrete recording reservation is made in the Viewer Portal by users that are authorized for the VRR. A distinction is made between one-time event and permanent reservation. In case of a one-time event, a start time and an idle TTL is set in minutes. The VRR is being deleted after the specified start time, if it is left unused for the idle TTL. In case of permanent reservations, the VRR is never deleted.

With multipoint VRR, two video conferencing devices can be recorded simultaneously in one VRR. The video conferencing devices only see the corresponding opposite side, or themselves if no more than one device is connected with the RSS 4000. The layout can be selected as either "CP Mode" (two videos side by side) or "Lecture Mode" (switching between lecture and video of lecturer). If a presentation channel is used, the recording layout is determined by the settings of the VRR.

DIAL-UP BETWEEN THE RSS 4000 AND VIDEO CONFERENCING DEVICES

Connections from and to the RSS 4000 via SIP worked faultlessly even without registration with an SIP server. When dialling out from the RSS 4000, the VRR is selected in the Admin User Interface, the IP provided is called. The dial-up to the RSS 4000 can be made via IP (standard VRR is used) or with the syntax "VRR_number@RSS_IP" to select the VRR that should be used.

In connections according to H.323 the RSS 4000 supports up to two gatekeepers, the registration is only carried out at the first functional gatekeeper. Collaboration with the Public Gatekeeper of the DFN and the GnuGK of the VCC worked faultlessly.

For the dial-up to the RSS 4000 there are two options according to H.323: URI dialling and dialling of the E.164 number (the IP address can be called too). For URI dialling, the syntaxes used are usually "VRR_number@RSS_IP" or "RSS_IP##VRR_number", depending on the respective video conferencing device. In some cases, it only works without gatekeeper registration of the video conferencing device. Normally the correct VRR for the connection is selected in the process, in the test the standard VRR was only selected in connection with the Cisco EX90.

The RSS 4000 registers with the gatekeeper via E.164 number and an H.323 ID. If it is selected, the RSS 4000 uses the standard VRR. To be able to select a VRR comfortably with the syntax "E.164 number of the RSS 4000 followed by the VRR number" via E.164 number, the RSS 4000 has to be set up as a gateway at the gatekeeper. The respective lines for the GnuGK read e.g.:

[RasSrv::GWPrefixes]
<H.323 ID of the RSS 4000>=<E.164 number of the RSS 4000>

The GnuGK interprets the E.164 number of the RSS 4000 as prefix and forwards all E.164 numbers with this prefix to the RSS 4000, which it identifies by the H.323 ID. This gateway solution works flawlessly. In the test, the correct VRR was always selected.

The dial-out according to H.323 from the RSS 4000 is always carried out in the Admin User Interface. The VRR can be determined and whether the call should be performed via IP or E.164 number. No problems occurred with this call version.

LIVE STREAMING AND ON-DEMAND PLAYBACK / TRANSCODINGS

The RSS 4000 supports live streaming with Windows Media and H.264 (MP4). The option to connect the following additional media servers with the help of the respective interfaces at the RSS 4000 made a positive impression: Wowza Media Server, IIS-7 Media Server, QuickTime Streaming Server and Windows Media Server. Unproblematic time delays of 15 - 30 seconds occurred during life streaming. Recordings and live streams with mobile devices were possible under iOs and Android when pop-ups were allowed.

Unfortunately, in most cases the live stream was finished very quickly after the recording ended, which is why some seconds of the actual recording were not displayed in the live stream. Displaying the presentation channel in a second window was only possible with complete transcodings, but not in the live stream. Replay on a mobile device during the connection with the RSS 4000 only worked with complete recordings, live streams could not be displayed.

Windows Media (WMV/VC1), MP4 (H.264), MP3 and ZIP (WMV/VC1) are available as transcoding formats. Re-transcoding of a single format is possible, transcodings can also be deleted and their displayed name can be changed. The transcoding time is approximately 125% of the recording time. In the test, up to 720p with 60 fps and 1080p with 50 fps for recordings were achieved. The quality of the live stream and the recordings/transcodings is assessed in the following section "Audio/Video - load test".

For quicker replay of a recording on a video conferencing device, a Quick Code is generated for each recording, which can be used like a VRR number during dial-up. After the dial-up, the respective recording is immediately replayed.

AUDIO/VIDEO - LOAD TEST

Video and audio quality was good to very good during the test. Major quality problems only occurred in the presentation channel (see "H.239 / BFCP"). Occasionally, there were artefacts, mostly when using the additional presentation channel or a high transmission rate (e.g. with 1080p and 50 fps with the RadVision (Avaya) Scopia XT5000). The quality of live stream and recordings did not differ considerably. The kind of dial-up did not have any influence on the quality either.

Up to 5 parallel recordings in good to very good quality were possible during the load test, however, only one parallel live stream could be transmitted with a high resolution and frame rate. In the User Guide of the RSS 4000 Polycom offers a table, which shows how many live streaming ports are used with respective resolution, frame rate and presentation channel usage. The 4 available live streaming ports did not suffice for two live streams in the quality used, only one parallel live stream could be achieved from the Polycom Video App on the iPad.

H.239 / BFCP

Principally, the RSS 4000 supports the protocols H.239 and BFCP for the purpose of using an additional presentation channel with H.323 or SIP. In the connections with the Polycom HDX 8004 and LifeSize Softphone it worked within the scope of the connection quality (resolution respectively 1024x768 with 7fps or 1280x1024 with 4fps). In connections with other devices, recording the presentation channel was very challenging: Some video conferencing devices did not record the sent presentation channel or did not show the channel in the live stream (e.g. Cisco EX90, Polycom RealPresence Group 500), others only showed/recorded single freeze images in big intervals when a certain amount of motion occurred - e.g. in HD videos (e.g. Cisco C40). In connection with the RSS 4000 it was not possible to open a second presentation channel at the RadVision (Avaya) Scopia XT5000.

SERVICE DFNVIDEOCONFERENCE

The dial-up of the MCU within the service DFNVideoConference with the RSS 4000 worked mostly faultlessly. In the test, a resolution of 4CIF and Siren 14 was negotiated for the connection.

During the dial-up of the MCU to the RSS 4000 the URI dialling worked with the syntax "VRR_number@RSS_IP", only the standard VRR was selected though. The dial-up via E.164 number with the syntax "E.164 number of the RSS 4000 followed by the VRR number" worked faultlessly, the correct VRR was always selected. The dial-up via SIP with the syntax "VRR_number@RSS_IP" worked impeccably.

The dial-out from the RSS 4000 to the MCU via E.164 number was always successful. The dial-up via SIP at the MCU with the syntax "conference_ID@mcu.vc.dfn.de" did work, but the RSS 4000 fell out of the MCU conference after being shortly connected with only audio and without a recording being started. It did not make a difference whether the RSS 4000 was registered with an SIP registrar.

Apart from that, the same problems as described in the section "H.239 / BFCP" occurred in the presentation channel, i.e. the presentation channel sent by the MCU is not recorded or not displayed in the live stream.

CONNECTION OF EXTERNAL MEMORY

The RSS 4000 has an internal memory capacity of two times 1 TB. The files of the RSS 4000 or the recordings cannot be accessed directly. Nevertheless, an FTP server can be set up for backup purposes, where an image of the RSS 4000, database included, or the media files or both can be saved in their entirety. An SSL connection to the FTP server is possible. For both backup types (image, media) an automatic backup can be performed with specification of frequency in days and time of execution. Media files can be deleted automatically from the RSS 4000 after successful backup. Other possibilities to connect external memory do not exist.

MISCELLANEOUS

The RSS 4000 supports secured signalling (TLS-1024).

CONCLUSION

The RSS 4000 supports the established protocols H.323 and SIP and only shows small weaknesses in audio and video quality. In the presentation channel however, there are considerable problems, which limit the availability of H.239 or BFCP to selected video conferencing devices. Especially the collaboration with the MCU within the service DFNVideoConference is not possible in this case. Other isolated problems occurred with dial-up and when terminating the live stream. A positive impression was made by the well thought out user management and the extensive configuration possibilities of the RSS 4000.

DOCUMENTATION

We would like to thank Ms U. Lätzsch from the company Polycom GmbH for providing the test.

Manufacturer: Polycom GmbH
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Supported General Standards	H.323, SIP, H.239, BFCP
Audio Encodings	Siren 14, Siren 22, G.711, G.722, G.722.1C, G.728
Video Compression	H.263+, H.264, H.264 HP, H.264 HiP
Resolution	Up to 1080p with 50 fps
Bandwidth	Up to 4096 kbps per recording