Dialogic® PowerMedia® XMS Release 3.3

Release Notes

January 2019 05-2748-003

www.dialogic.com

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Revision History

This section summarizes the changes made in this and, if applicable, each previously published version of the Release Notes for PowerMedia XMS Release 3.3, which is a document that is planned to be periodically updated throughout the lifetime of the release.

Revision	Release Date	Notes
05-2748-003 (Updated)	January 2019	Release Issues: • Added the following XMS Known (permanent) Issues: XMS-8931, XMS-10720.
05-2748-003 (Updated)	February 2018	Release Issues: • Added the following XMS Known (permanent) Issues: XMS-8048.
05-2748-003	November 2017	Release Issues: • Added the following XMS Resolved Defects: 303088.
05-2748-002 (Updated)	October 2017	Release Issues: • Added the following XMS Known Issues: 307865.
05-2748-002	May 2017	Updates to support PowerMedia XMS Release 3.3 Service Update 1 (Build 16104). Post-Release Developments: Added PowerMedia XMS Release 3.3 Service Update. Release Issues: • Added the following XMS Resolved Defects: 299267, 299960, 299997, IPY00118601, XMS-6689, XMS-6690, XMS-6692. • Added the following XMS Known Issues: XMS-6783.
05-2748-001	May 2017	Initial release of this document.
Last modified: January 2019		

Refer to www.dialogic.com for product updates and for information about support policies, warranty information, and service offerings.

1. Welcome

These release notes address new features and issues associated with the Dialogic® PowerMedia® Extended Media Server (also referred to herein as "PowerMedia XMS" or "XMS") Release 3.3. This is a document that is planned to be periodically updated throughout the lifetime of the release.

The release notes are organized into the following sections (click the section name to jump to the corresponding section):

- Overview: This section provides an overview of this release.
- Related Documentation: This section provides information about the documentation that supports this release.
- System Requirements: This section describes the system requirements for this release.
- Release Features: This section describes the new features and functionality in this release.
- Controlled Introduction Features: This section describes the new controlled introduction features and functionality in this release.
- Installation: This section provides installation information that is useful for getting started with this release.
- Upgrading: This section provides upgrading information that is useful for getting started with this release.
- Configuration: This section provides configuration information that is useful getting started with this release.
- Licensing: This section provides licensing information that is useful for getting started with this release.
- Logging: This section provides logging information that is useful for getting started with this release.
- Post-Release Developments: This section describes significant changes to this release subsequent to the general availability release date.
- Release Issues: This section lists the issues that may affect this release.

2. Overview

Dialogic® PowerMedia® Extended Media Server (also referred to herein as "PowerMedia XMS" or "XMS") is a highly scalable, software-only media server that enables standards-based, real-time multimedia communications solutions for IMS, MRF, Enterprise, and WebRTC applications on premise or in the cloud. Built on 15+ years of software media processing experience, PowerMedia XMS is trusted by world-class service providers and large enterprises to power millions of rich media sessions.

With an extensive list of successful implementations that include MRF for VoLTE, carrier hosted contact centers, enterprise communications, voice messaging, and "mission critical" next-generation 911 services, PowerMedia XMS has proven to be a key building block to new and innovative applications. When deployed with the optional Dialogic® PowerMedia® Media Resource Broker (also referred to herein as "PowerMedia MRB" or "MRB"), PowerMedia XMS scales to meet growing service-provider and business requirements.

PowerMedia XMS

PowerMedia XMS energizes application delivery by boosting performance with:

- State of the art mixing of media-rich communications
- Software providing a seamless transition to virtualization and cloud delivery
- Telco hardened scalability
- Supercharged WebRTC integration

PowerMedia XMS elevates what developers can create for their customers, from virtually any development environment, on virtually any network, and connecting to virtually any type of communication endpoint.

PowerMedia XMS is a powerful next-generation software-only media server or software Media Resource Function (MRF) IMS network element that enables standards-based, real-time multimedia communications solutions for SIP and WebRTC for mobile and broadband environments. PowerMedia XMS enables high density real-time multimedia communication functions including inbound and outbound session/call control, audio/video play and record, transcoding, transrating, transizing of video streams, multimedia conference mixing, content streaming, and a wide range of advanced supporting functions for communication sessions.

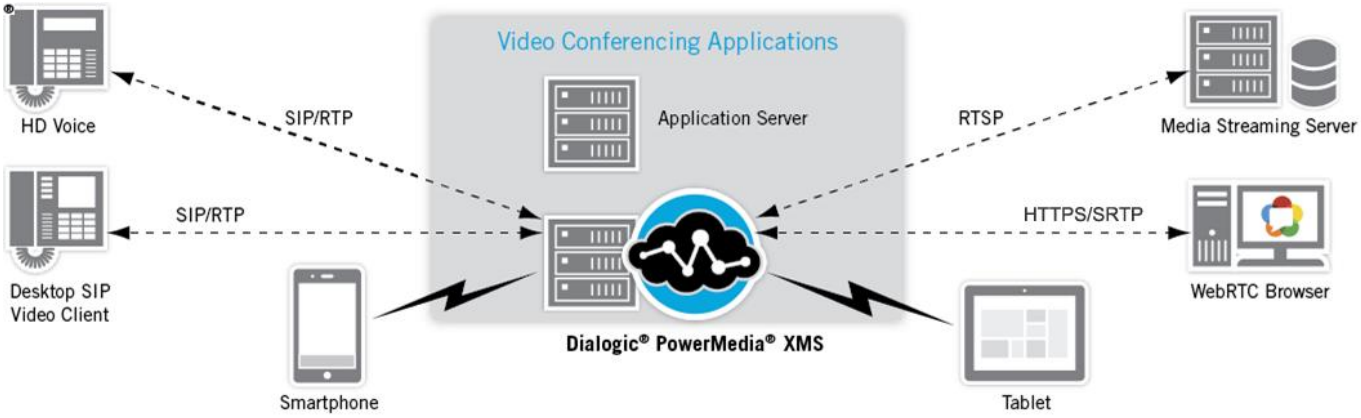
PowerMedia XMS is controlled by the business logic of applications deployed on SIP application servers and web application servers. PowerMedia XMS offers multiple media control protocols that can be used in a variety of network infrastructures. For example, a SIP application server (AS) can drive PowerMedia XMS using the MSML control interface or use the VoiceXML (VXML) browser in PowerMedia XMS to execute VXML scripts and invoke MRCP speech services, like ASR and TTS. For Web 2.0 and Cloud development, a web application written in an appropriate language can control PowerMedia XMS using the HTTP RESTful interface. Similarly, the JSR 309 Connector for PowerMedia XMS can enable Java EE developers to control real-time applications from converged application servers.

PowerMedia XMS supports multimedia audio and video, using a variety of codecs. It also provides support for handling RTP media, security (via DTLS/SRTP), and ICE negotiation from WebRTC media sources. Please refer to specific media control protocol documentation for the more detail Media Server feature coverage / support.

PowerMedia XMS provides powerful and user-friendly OA&M functionality and can be managed remotely through a web-based operator console and the HTTP RESTful Management Interface.

A wide variety of SIP endpoints can be handled by PowerMedia XMS, resulting in the delivery of rich full-duplex audio and video media streams to a variety of fixed and mobile devices. With the additional support for WebRTC media, PowerMedia XMS provides the power to mix diverse streams and enable connectivity between legacy networks, endpoints, and WebRTC.

The following figure illustrates an example of a video conferencing delivery platform for a PowerMedia XMS-based multimedia conferencing solution.



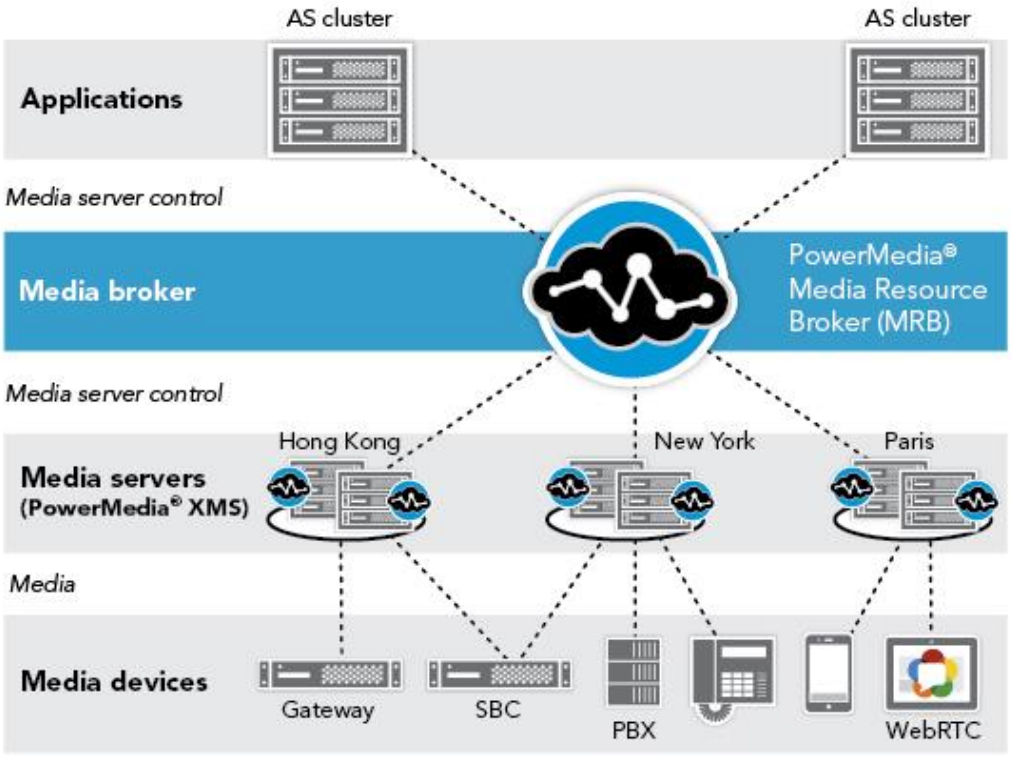
PowerMedia MRB

PowerMedia MRB is a standardized network element, defined by RFC 6917, that manages media resource availability and reliability, providing improved utilization and reliability of deployed media resources in the network. As defined in MRB specifications, the PowerMedia MRB performs critical media resource management functions, including:

- Balancing requests from multiple application servers or app server clusters
- Efficiently utilizing and allocating the Media Resource Function (MRF) and Media Server (MS) resource pools
- Providing a monitoring mechanism for media server status and capabilities
- Supporting media control payloads such as MSML, JSR 309, NETANN, and RESTful

Clustering of the PowerMedia XMS instances to support higher density and scalability requirements is supported by the PowerMedia MRB. It is designed to handle large transaction rates and can effectively and efficiently load balance the traffic among available PowerMedia XMS instances (MRFs) including those instances located in different geographic regions. The PowerMedia MRB is implemented to be a stateful load balancer and actively monitors and tracks capacity and availability of individual PowerMedia XMS instances. Since the PowerMedia MRB is stateful, it can also support real-time call preservation of conference calls and bridged calls. In case of failure, the PowerMedia MRB can dynamically restore established media sessions to an alternate PowerMedia XMS instance, providing continuity of service.

The following figure illustrates the role of the PowerMedia MRB to manage PowerMedia XMS resources among various geographic sites.



Related Information

See the following for additional information:

- PowerMedia XMS product page at http://www.dialogic.com/products/media-server-software/xms.
- PowerMedia XMS datasheet at http://www.dialogic.com/~/media/products/docs/media-server-software/12888-powermedia-xms-ds.pdf.
- PowerMedia MRB datasheet at http://www.dialogic.com/~/media/products/docs/media-server-software/14160-powermediamrb-ds.pdf.
- PowerMedia XMS Developer Portal at http://developer.dialogic.com.
- PowerMedia XMS Release 3.3 documentation at http://www.dialogic.com/manuals/xms/xms3.3.aspx.
- Dialogic Service Center at http://www.dialogic.com/support.

3. Related Documentation

This section provides information about the documentation that supports the PowerMedia XMS Release 3.3.

The following documents are available for the PowerMedia XMS Release 3.3 at http://www.dialogic.com/manuals/xms/xms3.3.aspx.

Document	Description
PowerMedia XMS	
Dialogic® PowerMedia® XMS Release 3.3 Release Notes	Addresses new features and issues associated with PowerMedia XMS Release 3.3.
Dialogic® PowerMedia™ XMS Quick Start Guide	Describes how to install software, access the PowerMedia XMS Admin Console for configuration management, and run the verification demo.
Dialogic® PowerMedia™ XMS Installation and Configuration Guide	Provides instructions for installing, configuring, administering, and maintaining PowerMedia XMS.
Dialogic® PowerMedia™ XMS WebRTC Demo Guide	Provides instructions for running WebRTC demos with PowerMedia XMS.
Dialogic® PowerMedia™ XMS Basic Network Media Services with SIP User's Guide	Provides detailed information about configuring Basic Network Media Services with SIP, focusing on Network Announcement (NETANN).
Dialogic® PowerMedia™ XMS XMS Message Session Relay Protocol Feature Guide	Describes the Message Session Relay Protocol (MSRP), which is a session-oriented instant messaging protocol used to provide peer-to-peer file transfer, photo sharing, or chat services.
Dialogic® PowerMedia™ XMS MSML Media Server Software User's Guide	Provides guidelines for using the Media Sessions Markup Language (MSML) software. The MSML media server software enables a remote client, also known as an Application Server (AS), to control media resources on a media server (MS). The connection between the AS and MS is established using the SIP protocol, thereafter media control commands/responses (in the form of MSML control syntax) are exchanged in SIP messages, such as the INFO message or the 200 OK response.

Document	Description
Dialogic® PowerMedia™ XMS RESTful API User's Guide	Provides information for application developers using RESTful API over http transport to control media and call control resources of PowerMedia XMS.
Dialogic® PowerMedia™ XMS RESTful Management API User's Guide	Provides an alternative method of performing PowerMedia XMS system management tasks in an automated or distributed manner.
Dialogic® PowerMedia™ XMS Variable Content Announcements Feature Guide	Describes how to use variable content announcements for multiple languages in PowerMedia XMS.
Dialogic® PowerMedia™ XMS VoiceXML Reference Guide	Contains an alphabetical reference of supported VoiceXML elements and provides information about application properties, SSML support, session variables, and application variables.
Dialogic® PowerMedia™ XMS WebRTC JavaScript API User's Guide	Provides information on functionality to support connecting to and performing media operations on Web Real-Time Communication (WebRTC) compliant devices or endpoints (for example, browsers) with PowerMedia XMS.
Dialogic® PowerMedia™ XMS Diagnostics Guide	Provides information on gathering diagnostics to troubleshoot PowerMedia XMS issues.
PowerMedia MRB	
Dialogic® PowerMedia™ Media Resource Broker (MRB) Quick Start Guide	Describes how to install software and configure the PowerMedia MRB to initiate a working test setup.
Dialogic® PowerMedia™ Media Resource Broker (MRB) Installation and Configuration Guide	Provides instructions for installing and configuring the PowerMedia MRB.
Dialogic® PowerMedia™ Media Resource Broker (MRB) Technology Guide	Provides an overview of the PowerMedia MRB and its capabilities.

Document	Description
JSR 309 Connector	
Dialogic® PowerMedia™ XMS JSR 309 Connector Software Installation and Configuration Guide	Provides the JSR 309 Connector installation and configuration information for the supported platforms. • Oracle Communications Converged Application Server (versions 5 and 7) • TeleStax Apache-Tomcat Application Server • TeleStax JBoss Application Server • IBM Liberty Application Server
Dialogic® PowerMedia™ XMS JSR 309 Connector Software Developer's Guide	Describes any extensions added to the JSR 309 Connector (based on JSR 309 specification) in addition to which methods/parameters are supported.
Application Notes	
Dialogic® PowerMedia™ XMS Application Note: Optimizing VMware Host Hardware and Virtual Machine to Reduce Latency	Provides instructions on optimizing VMware ESXi, server settings, and Virtual Machine (VM) guest machines to reduce latency prior to installing PowerMedia XMS.
Dialogic® PowerMedia™ XMS Application Note: Running PowerMedia XMS on Amazon Web Services	Provides instructions on running PowerMedia XMS on Amazon Web Services (AWS) Elastic Compute Cloud (EC2) and Virtual Private Cloud (VPC).

4. System Requirements

This section describes the system requirements for the PowerMedia XMS Release 3.3.

The **minimum** and **recommended** system requirements are as follows:

Item	Requirement
Hardware	Intel Architecture-based server
Operating System	**Note:** 32-bit operating systems are not supported. **ISO Method Installation:** Community ENTerprise Operating System (CentOS) 7.x **RPM Method Installation:** • CentOS 7.x and 6.4 (or later) • Red Hat Enterprise Linux (RHEL) 7.x and 6.4 (or later) • Oracle Linux 6.4 • Oracle Linux 7.2 with Unbreakable Enterprise Kernel (UEK) Release 4 **Note:** Before running the RPM Method installation, the following packages, available from the OS distributor, must first be installed: • perl-core • openssl version 1.0.1e or higher
Processor	**Minimum:** Intel Xeon E5-1620 Quad-Core (3.60 GHz, 1600 MHz, 10 MB Cache), Intel QPI (0 GT/s) for low end solutions **Recommended:** Intel Xeon E5-2665 Dual Octal-Core (2.40 GHz, 1333 MHz, 20 MB Cache), 2 Intel QPI (8 GT/s) or better for performance systems
Ethernet	Single or Dual NIC 1000Base-TX (RJ-45)
Memory	**Minimum:** 12 GB RAM **Recommended:** • 16 GB RAM or higher (high density audio) • 24 GB RAM or higher (video)
Storage	**Minimum:** 60 GB HDD **Recommended:** 250 GB HDD up to 2 TB HDD for advanced logging
Note: The recommended server configuration is applicable for higher density audio solutions of 1500 or greater sessions, video transcoding solutions, or solutions utilizing virtualization.	

Supported Virtual Machines

The supported virtual machines (VM) are as follows:

- VMWare ESXi 5.x and ESXi 6.x
- Kernel Virtual Machine (KVM)
- Oracle VM
- XenServer VM

It is recommended to use two VMs when running XMS. If more than two VMs are used, there may be performance issues.

Note: Virtualization systems chosen for PowerMedia XMS should be configured for enterprise or private virtual environments that permit customization of virtual machine (VM) settings and hypervisor performance tuning. Virtual environments running PowerMedia XMS must also restrict the number of VMs hosted on a single platform to facilitate the real-time low-latency scheduling demands required for high quality media processing. Density capacity in virtual environments may vary and is generally a factor of the host platform capacity and the number of VMs running PowerMedia XMS. Generally, the aggregate density of all VMs running PowerMedia XMS will be less than the bare metal capacity of the platform.

Refer to the *Dialogic® PowerMedia™ XMS Application Note: Optimizing VMware Host Hardware and Virtual Machine to Reduce Latency* for more information.

Cloud Environments

The qualified cloud environments include the following:

- Amazon Web Services (AWS)

Note: Refer to the *Dialogic® PowerMedia™ XMS Application Note: Running PowerMedia XMS on Amazon Web Services* for more information.

Support for Rackspace is available as a controlled introduction for Proof of Concept (PoC), development activities, and trials. For more information, refer to the following white paper:

- *Dialogic® PowerMedia™ XMS and the Rackspace Managed Cloud* at http://www.dialogic.com/~/media/products/media-server-software/download/xms-demos/Rackspace-XMS-Verification.pdf.

5. Release Features

This section describes the features and functionality supported in the PowerMedia XMS Release 3.3.

For more information, refer to the documents listed in the Related Documentation section.

PowerMedia XMS Release 3.3

The key new features and functionality include:

- Call Progress Analysis (CPA) Enhancements
- MRB RESTful 1PCC Outbound Dialing
- MRB Configuration Import/Export
- MRB SNMP Enhancements
- Video Enhancements
- RESTful 3PCC Support for App Specified Global Unique Session Identifier
- Support for a=ssrc SDP Parameter
- Ability to Access User-to-User SIP Header
- Changes to MSML Scripts on SIP INVITE

Call Progress Analysis (CPA) Enhancements

PowerMedia XMS Release 3.3 enhances Call Progress Analysis (CPA) capability, providing applications with greater application control and customization of call progress analysis parameters through enhanced configuration and API functionality. This release provides new capability to allow applications to control when CPA gets triggered and by providing a CPA Profile that can be used to control the call-by-call CPA parameters. The release enhancements allow flexibility for application developers to customize the CPA detection for the characteristics of their networks or call types.

The following functionality has been added to the MSML API and RESTful API in this release:

1) Retrigger CPA – The ability to start/stop CPA at any point during a call.
2) Configure CPA Profiles – The ability to configure several types of CPA parameters.
    a. General parameters – The parameters for CPA timing.
    b. PVD Qualification parameters – The parameters that define levels and thresholds for positive voice detection (PVD).
    c. PAMD Qualification parameters – The parameters that define levels and thresholds for positive answering machine detection (PAMD).
3) Retrigger CPA with CPA Profile – The ability to select CPA profile that can be used on a call-by-call basis to customize CPA for specific networks, countries, or call types.

For configuration of CPA tones and parameters, refer to the *Dialogic® PowerMedia™ XMS Installation and Configuration Guide* for more information.

For the MSML API, refer to the *Dialogic® PowerMedia™ XMS MSML Media Server Software User's Guide* for more information.

For the RESTful API, refer to the *Dialogic® PowerMedia™ XMS RESTful API User's Guide* for more information.

MRB RESTful 1PCC Outbound Dialing

The PowerMedia MRB has been enhanced in PowerMedia XMS Release 3.3 to provide support for 1PCC RESTful API outbound SIP dialing. With a 1PCC RESTful application, an application server uses the RESTful API (over HTTP transport) to control the call and media functionality and the SIP call control is handled directly by the MRB. In this release, 1PCC REST applications support outbound call SIP dialing so both inbound and outbound SIP calls can be managed by MRB for application media resource brokering and load balancing among a pool of XMS media servers.

For more information, refer to the *Dialogic® PowerMedia™ Media Resource Broker (MRB) Technology Guide*.

MRB Configuration Import/Export

In PowerMedia XMS Release 3.3, the PowerMedia MRB has been updated with the ability to Import and Export system configuration for ease of upgrade and for allowing configuration backup and restore. This feature will collect the MRB configuration data so that network operators and easily re-apply the configuration during an upgrade or system restore. The MRB import/export feature covers system configuration, high availability configuration, services configuration and security profiles.

For more information, refer to the *Dialogic® PowerMedia™ Media Resource Broker (MRB) Installation and Configuration Guide*.

MRB SNMP Enhancements

The PowerMedia MRB has been enhanced in PowerMedia XMS Release 3.3 with additional SNMP traps.

- vipManagerPromotedToMaster – A vipManagerPromotedToMaster trap signifies that the node which sent this trap was promoted to master and hosts the VIPs.
- vipManagerDemotedToSlave – A vipManagerDemotedToSlave trap signifies that the node which sent this trap was demoted to slave and no longer hosts the VIPs.

For more information, refer to the *Dialogic® PowerMedia™ Media Resource Broker (MRB) Installation and Configuration Guide*.

Video Enhancements

Maintain Video Aspect Ratio on Record

PowerMedia XMS Release 3.3 enhances video recording with a mechanism to maintain aspect ratio in the recorded file. Through XMS API control, an application can specify height, width and framerate parameters set to 0 during the record function. Setting these parameters to 0 allows XMS to automatically select the (default) record resolution based on the video stream characteristics. This video enhancement provides several benefits, such as saving on CPU cycles and improving video quality by removing unnecessary video resizing operations during record. Additionally, the feature simplifies application logic where an application may want the recording in the native resolution from the endpoint or may not know what resolution to choose for recorded content. This feature is available for H.264, VP8 and VP9 encoded multimedia files through MSML, RESTful, and VXML API.

Maintain Video Aspect Ratio in Join, Play, and MCU Conferencing

In PowerMedia XMS Release 3.3, the default video transcoding behavior has been updated to a mode that maintains the video aspect ratio during joined video calls, while playing video files or for root-size output of MCU video conference. This default mode provides better video quality by assuring that video is not stretched or resized if the endpoint can support source video resolution as part of negotiation. During negotiation, when the video level (in MPEG-4, H.264, and H.263) and/or max-fs of the remote client support frame size of incoming video, XMS will not perform resizing. Otherwise, XMS performs resizing to meet the maximum frame size specified by level and/or max-fs but maintaining the aspect ratio so that the video frame is not distorted. When the SDP includes sprop for H.264, XMS will use the frame size specified in the sprop.

Dynamic Video Frame Size Adaptation

PowerMedia XMS Release 3.3 enhances video encoding to provide dynamic video frame size and frame rate adaptation that dynamically changes the video encoding frame size and/or frame rate based on the estimated bandwidth. By dynamically adapting video resolution based on bandwidth, this feature provides good video quality of experience even at low bitrates in varying network environment conditions.

This video encoding behavior is controlled by WebGUI configuration. In this release, this feature is enabled by default for H.264, VP8, and VP9 video and disabled for H.263 and MPEG4 to maintain interoperability with legacy multimedia devices. When this parameter is set to "no", the video frame size adaptation is disabled and XMS will only output a single video resolution regardless of the network conditions.

RESTful 3PCC Support for App Specified Global Unique Session Identifier

PowerMedia XMS Release 3.3 provides the capability for a RESTful 3PCC application to specify a value for Global Unique Session Identifier (GUSID) used in XMS system logging. Support for RFC 7329, which defines a global unique session identifier SIP header for SIP calls, was introduced in PowerMedia XMS Release 3.2 with an internally created GUSID for RESTful 3PCC applications. The enhancement to XMS 3.3 allows a 3PCC application specify a GUSID value on the RESTful API Create methods. The application specified GUSID is captured in system logging and will be returned by the RESTful API to correlate the sessions.

For the RESTful API, refer to the *Dialogic® PowerMedia™ XMS RESTful API User's Guide* for more information.

Support for a=ssrc SDP Parameter

In PowerMedia XMS Release 3.3, the XMS SDP negotiation supports the identification of the synchronization source (SSRC) identifier using the a=ssrc SDP parameter for all transmitted video and audio rtp streams (as specified by RFC 5576). The a=ssrc SDP value is used by some endpoints, such as Google Chrome for WebRTC, to coordinate media level reporting statistics.

Ability to Access User-to-User SIP Header

PowerMedia XMS Release 3.3 provides the ability to access User-to-User SIP header (User to User Information defined by RFC 7433) through RESTful and VXML interfaces.

For more information, refer to the *Dialogic® PowerMedia™ XMS RESTful API User's Guide* and *Dialogic® PowerMedia™ XMS VoiceXML Reference Guide*.

Changes to MSML Scripts on SIP INVITE

PowerMedia XMS Release 3.3 includes changes and provides guidance when using MSML scripts on SIP INVITE requests.

For more information, refer to the *Dialogic® PowerMedia™ XMS MSML Media Server Software User's Guide*.

Previous Releases

PowerMedia XMS Release 3.2

For notable features and functionality included in PowerMedia XMS Release 3.2, refer to the *Dialogic® PowerMedia® XMS Release 3.2 Release Notes* at:

http://www.dialogic.com/webhelp/XMS/3.2/XMS_ReleaseNotes.pdf

PowerMedia XMS Release 3.1

For notable features and functionality included in PowerMedia XMS Release 3.1, refer to the *Dialogic® PowerMedia™ XMS Release 3.1 Release Notes* at:

http://www.dialogic.com/webhelp/XMS/3.1/XMS_ReleaseNotes.pdf

PowerMedia XMS Release 3.0

For notable features and functionality included in PowerMedia XMS Release 3.0, refer to the *Dialogic® PowerMedia™ XMS Release 3.0 Release Notes* at:

http://www.dialogic.com/webhelp/XMS/3.0/XMS_ReleaseNotes.pdf

PowerMedia XMS Release 2.4

For notable features and functionality included in PowerMedia XMS Release 2.4, refer to the *Dialogic® PowerMedia™ XMS Release 2.4 Release Notes* at:

http://www.dialogic.com/webhelp/XMS/2.4/XMS_ReleaseNotes.pdf

6. Controlled Introduction Features

In addition to general availability of new features and functionality, PowerMedia XMS Release 3.3 also introduces new functionality in a controlled introduction (CI). These are features that are under development or have a limited scope before being made generally available. These features are available for customers that are looking to perform Proof of Concept (PoC) with the listed functionality. CI features have not completed Dialogic's Quality Assurance ("QA") testing and are not recommended for production deployments without approval from Dialogic. Customers interested in these features should contact their Dialogic Sales Representative or Technical Support Service Engineer for further information on usage.

The following features are offered in the PowerMedia XMS Release 3.3 controlled introduction.

- Selective Forwarding Unit (SFU)
- High Capacity Video Session Record
- Video Encoder Sharing Support
- VP9 Video Codec
- Multitrack Recording
- CDR Remote Database

Selective Forwarding Unit (SFU)

PowerMedia XMS Release 3.3 supports a Selective Forwarding Unit (SFU) video conferencing approach for certain customer Proof of Concept (PoC) scenarios. With the SFU video conference, a video stream from each participant is routed (without transcoding) to the other participants in multimedia conference.

The SFU video conference can be used with similar video endpoints, such as WebRTC browsers, to route video between endpoints rather than processing video streams independently as is the case with a traditional Multipoint Control Unit (MCU) video conferencing. This tradeoff can be helpful to reduce CPU utilization and increase capacity when it is known all video endpoints in the video conference are compatible.

In this release, XMS provides SFU video conferencing to WebRTC and SIP endpoints by supporting a single input stream per client and a VAS (Voice Activated Switching) style output, where each client sees video based on an active talker algorithm. The SFU video conference is a conference mode that can selected upon conference creation. Once selected, video streams are routed between endpoints rather than using video transcoding to process the stream into a common format. The XMS SFU video conference uses RTCP feedback messages to provide high quality video with the client and to handle packet loss in poor network environments. In the SFU video conference, audio is still mixed as it is in a traditional audio or video conference.

For the MSML API, refer to the *Dialogic® PowerMedia™ XMS MSML Media Server Software User's Guide* for more information.

For the RESTful API, refer to the *Dialogic® PowerMedia™ XMS RESTful API User's Guide* for more information.

Google Chrome Interoperability Considerations When Using SFU

If no video is being sent into a Selective Forwarding Unit (SFU) conference and any Google Chrome clients are connected to XMS with video=recvonly, those Google Chrome clients will not render the audio that they receive. Additional information can be found at http://bugs.chromium.org/p/chromium/issues/detail?id=403710.

Primary Video Source for SFU

PowerMedia XMS Release 3.3 provides an API (dlgc:sfu_video_source for MSML and primary_video_source for RESTful) that allows setting the video to be sent to each party in a Selective Forwarding Unit (SFU) conference. This feature is available at the user level and conference level, and possible selections include "loudest speaker" (default) and all conference parties. This API is available in join and modifystream for MSML and in add_party/update_party and update_conference for RESTful.

For the MSML API, refer to the *Dialogic® PowerMedia™ XMS MSML Media Server Software User's Guide* for more information.

For the RESTful API, refer to the *Dialogic® PowerMedia™ XMS RESTful API User's Guide* for more information.

High Capacity Video Session Record

PowerMedia XMS Release 3.3 has been optimized to provide high capacity video record of hundreds of HD720p WebRTC video callers joined through the XMS system. The capability can be used by customers looking to develop call session recording services for WebRTC media applications, especially for Call Centers and caller/agent applications that require call session recordings for archiving, monitoring or training purposes.

In this use case, WebRTC video call sessions are joined natively (without transcoding) or through the SFU video conference. XMS sits in the media path and handles the audio and video from each video caller while providing video feedback between endpoints to maintain good video quality connection even under low bandwidth or varying network conditions. Video recording takes advantage of the Native Record to WebM container feature, introduced in PowerMedia XMS Release 3.2, to provide a video call recording of each endpoint in a standard WebM file format. The individual WebM call recordings can be coordinated for synchronized playback of the video session at a later point.

This feature provides a significant enhancement in XMS video record capacity, offering the ability to handle hundreds of simultaneous HD720p video session records while joined through the XMS system.

Video Encoder Sharing Support

PowerMedia XMS Release 3.3 supports video encoder sharing. Video encoder sharing includes Dialogic patented video technology that provides enhanced performance for video conferencing and video mixing applications. Video encoder sharing works by reducing the CPU cycles required to perform the most CPU intensive video function: video encoding. In video conferencing applications, such as for WebRTC video conferencing between browsers, the video conference output can be encoded once and shared among multiple users.

The video encoder sharing technology provides the capability to encode once for a number of video conference participants and perform, via Dialogic patent-pending technology, dynamic bitrate adaptation to each endpoint independently.

This feature increases the number of supported sessions while treating the network conditions to each party uniquely, which promotes better video quality at each endpoint.

This feature, combined with centralized video mixing, also provides reduced bandwidth over point-to-point video sharing between WebRTC browsers.

For more information, refer to the *Dialogic® PowerMedia™ XMS Installation and Configuration Guide*.

VP9 Video Codec

PowerMedia XMS Release 3.3 supports VP9 video codec for WebRTC endpoints. XMS enables full decoding and encoding of VP9-based video sessions between Google Chrome and other VP9 endpoints, as well as transcoding to non-VP9 endpoints. VP9 is an open source and royalty free video codec developed by Google. VP9 offers compression enhancements over its precursor VP8. By adding support for VP9, XMS software facilitates broad interoperability between video formats and systems.

Multitrack Recording

PowerMedia XMS Release 3.3 supports audio recording to dual-track (stereo) .wav files. This multitrack record feature enables applications to record two separate audio sources into different tracks. This feature can be utilized by call centers, E911 applications, banking applications, and monitoring applications to record two audio callers, such as agent and client, as different tracks rather than recording the mixed output of an audio conference. An additional use case of this feature enables applications to capture an audio recording of the XMS system input and output of the caller (i.e., what the caller hears and what the caller says) in a single dual-track (stereo) .wav file.

The two main use cases supported by XMS for the multitrack record feature in this release are individual party multitrack transaction recording and two-party multitrack recording, which are described in the following sections.

Individual Party Multitrack Recording

The individual multitrack transaction recording use case enables applications to record the audio of the caller speaking and the audio that the caller hears in the same file as two different tracks.

This feature provides the ability to record the system output sent to a user without the need to do packet capture on the network to get the audio as it is heard by the caller. The recording of what a caller hears includes all of the different sources that occur during a call, such as audio from another caller, output of a conference, or output from a play file. This provides the ability to record the audio a caller hears without the need to put all sources through a conference mixer.

Two-Party Multitrack Recording

The two-party recording use case enables applications to record two sources, such as two call parties, as two separate tracks in a single .wav file. The resulting file has each audio source in a separate track, which can be played back together or separated by source.

Providing recordings as multitrack recordings has unique advantages over single mixed audio recordings. A dual-track (stereo) .wav file can be played back on standard players as a stereo file with synchronized audio between the two parties. Additionally, a multitrack file also allows the audio of each individual participant track to be easily separated. Separating the audio allows post processing of the individual caller's audio that may not be possible with a mixed conference output where voices cannot easily be separated.

For example, individual tracks can be sent to speech analytics software to get an accurate per participant transcript or to analyze the speech characteristics of a caller or agent.

The multitrack record feature is available through the MSML, RESTful, and JSR 309 interfaces.

For the MSML API, refer to the *Dialogic® PowerMedia™ XMS MSML Media Server Software User's Guide* for more information.

For the RESTful API, refer to the *Dialogic® PowerMedia™ XMS RESTful API User's Guide* for more information.

For the JSR 309 API, refer to the *Dialogic® PowerMedia™ XMS JSR 309 Connector Software Developer's Guide* for more information.

Note: This feature is not supported by the MRB as of this release.

CDR Remote Database

In PowerMedia XMS Release 3.3, the CDR subsystem has been updated with the ability to utilize a remote database for CDR storage. This allows users to configure separate CDR storage from the default XMS local storage normally used for CDR storage. A remote database can also be beneficial for database replication, redundancy, and high data availability to provide a level of fault tolerance against the loss of a single database server.

7. Installation

There are two installation methods available:

- ISO Method
- RPM Method (used for a CentOS or RHEL installation)

ISO Method

The ISO installation method is a complete system installation that includes the CentOS, OS optimizations, and PowerMedia XMS software. The ISO can be installed from a DVD drive to a physical or virtual machine.

For more information, refer to the *Dialogic® PowerMedia™ XMS Quick Start Guide* and *Dialogic® PowerMedia™ XMS Installation and Configuration Guide*.

RPM Method

The stand-alone RPM installation method is used for installation on top of a pre-existing CentOS or RHEL installation. The RPM installation will install the PowerMedia XMS software and prerequisite packages required to run PowerMedia XMS. The RPM installation will also make OS adjustments for real-time audio and video processing required for optimal performance.

For more information, refer to the *Dialogic® PowerMedia™ XMS Quick Start Guide* and *Dialogic® PowerMedia™ XMS Installation and Configuration Guide*.

8. Upgrading

As part of the PowerMedia XMS Admin Console, the **Upgrade** page of the **System** menu provides the option to upgrade the system by uploading a system upgrade package.

Perform the following steps to upgrade the system:

1. Select the **System** menu.
2. Click the **Upgrade** tab.
3. Click **Browse** from the **Upload System Upgrade Package** section to access a system upgrade package file (.tgz) that has been downloaded.
4. Once you select the system upgrade package file, click **Upload**. After the upload completes, the system upgrade package file will be listed in the **System Upgrade Package** section.
5. Locate the appropriate system upgrade package file and click **Upgrade**.

Note: If upgrading from PowerMedia XMS Release 3.0 Service Update 1 or PowerMedia XMS Release 2.4 Service Update 7, you must use the command line upgrade process. There is a known defect in the XMS 3.0 SU1 and XMS 2.4 SU7 WebGUI upgrade process. If you have already attempted to upgrade using the WebGUI, you can remove and reinstall XMS using the command line installation. Refer to "RPM Installation and Script Options" in the *Dialogic® PowerMedia™ XMS Installation and Configuration Guide* for information on how to upgrade your system using the command line upgrade script.

Note: If there is already a system upgrade package file listed in the **System Upgrade Package** section, you can click **Upgrade** on the appropriate system upgrade package file.

Note: XMS configuration settings are preserved when upgrading the XMS system. Direct user modifications to XMS files may be overwritten with upgraded versions.

9. Configuration

There are two configuration methods available:

- PowerMedia XMS Admin Console
- RESTful Management API

PowerMedia XMS Admin Console

The PowerMedia XMS Admin Console ("Console") is a secure web-based GUI used to manage PowerMedia XMS. The Console can be reached using a web browser and the PowerMedia XMS IP address.

For more information, refer to the *Dialogic® PowerMedia™ XMS Quick Start Guide* and *Dialogic® PowerMedia™ XMS Installation and Configuration Guide*.

RESTful Management API

The RESTful Management API is an alternate way of configuring and performing system management tasks for PowerMedia XMS. The RESTful Management API is a remote API carried over HTTP transport that allows the option to incorporate configuration elements into an application or web interface in a more automated or distributed manner.

For more information, refer to the *Dialogic® PowerMedia™ XMS RESTful Management API User's Guide*.

10. Licensing

Verification License

PowerMedia XMS comes with a 4-port verification license to get started. The name of the license file is *verification.lic*.

PowerMedia XMS evaluation software can be requested by filling out a form through the Dialogic website at http://www.dialogic.com/products/media-server-software/xms/xms-download.aspx.

PowerMedia XMS production licenses or trial licenses for larger session installations can be obtained through your authorized Dialogic distributor or by contacting Dialogic Inside Sales (insidesales@dialogic.com).

The following licensing capabilities are supported in this release:

- **Hardware-Independent Licensing:** The license is locked to a 33-byte License Node ID retrieved from the XMS system WebGUI or RESTful Management API.
- **Additive Licensing:** To increase licensed resources or scale system capability, you can augment an existing license with multiple licenses. The licenses must be production (non-trial or non-verification) licenses.

Applicable Third Party License Information

This software uses libraries from the FFmpeg project licensed under the LGPLv2.1, and source code for these libraries can be downloaded from the distributable image for PowerMedia XMS.

11. Logging

In PowerMedia XMS, the default logging level is set to WARN. For production-level traffic or high density testing, it is recommended to set the logging level to ERROR because the ERROR setting provides the lightest logging levels. To set the logging level, go to the **System** > **Diagnostics** page in the PowerMedia XMS Admin Console.

The DEBUG setting provides the most intensive logging levels. When running PowerMedia XMS Diagnostics logging at increased logging levels (e.g., DEBUG), there is additional CPU and hard drive access loading. The loading is dependent on the channel density of the system and also the level of logging that has been enabled. If system performance issues are encountered, users may need to reduce the channel load or reduce some of the debugging prints.

12. Post-Release Developments

This section describes significant changes subsequent to the general availability release.

PowerMedia XMS Release 3.3 Service Update

This Service Update for PowerMedia XMS Release 3.3 is now available. Service Updates provide fixes to known problems, and may also introduce new functionality. It is intended that new versions of the Service Update will be released periodically.

For information about installing this release, refer to the *Dialogic® PowerMedia™ XMS Installation and Configuration Guide*.

13. Release Issues

This section lists the issues that may affect the PowerMedia XMS Release 3.3.

PowerMedia XMS Release 3.3 includes all of the applicable resolved issues from the following releases:

- PowerMedia XMS Release 3.2 Service Update 9 (Release Notes)
- PowerMedia XMS Release 3.1 Service Update 10 (Release Notes)
- PowerMedia XMS Release 3.0 Service Update 8 (Release Notes)
- PowerMedia XMS Release 2.4 Service Update 12 (Release Notes)

Limitations

PowerMedia XMS Release 3.3 has the following limitations:

- The RPM installation method can automatically install prerequisite operating system packages. If installing PowerMedia XMS on an existing system, it is recommended to have the yum package manager configured to use the online repository or a repository consisting of a locally mounted DVD or ISO of the operating system version being installed on.
- When upgrading a previous PowerMedia XMS installation and using the RESTful programming interface, verify the route entries in the **Routes** page of the PowerMedia XMS Admin Console after the upgrade completes.
- When using the web upgrade method for PowerMedia XMS, ensure your system has net-snmp (x86_64), net-snmp-libs (x86_64), and net-snmp-libs (i686) installed before the upgrade, or have yum enabled with the standard repository that matches your OS (the prerequisite packages will be installed automatically).

  Note: When using the command line upgrade method for PowerMedia XMS, appropriate messages will be displayed instructing the user to install those packages if yum is not configured.
- When using JSR 309 and recording a party that is joined to a conference, the video freezes. JSR 309 has DEFAULT_BEEP enabled by default, which causes this PowerMedia XMS behavior. To overcome this limitation, set DEFAULT_BEEP to FALSE before starting the recording.
- The PowerMedia MRB does not support MRCP in RESTful.

Selective Forward Unit (SFU)

When using SFU, all of the clients connected to SFU conference must:

- Support GNACK and PLI (e.g., WebRTC clients such as Google Chrome and Mozilla Firefox).
- Support VP8 and negotiate the VP8 codec.
- Use the same video codec (currently restricted to VP8).
- Use the same video resolution.

The following precautions should be taken:

- Avoid setting layout options as any video layout options are not supported as of this release. When using MSML, the layout must be specified as "auto".
- Video transcoding is not supported while using SFU. Features requiring video transcoding may have undesirable effects. These features include but are not limited to:
    - Conference background image and color, and borders.
    - Text and image overlay.
    - Video layouts and root sizes.
    - SIP re-INVITEs which change the video coder.

Considerations

GNU Bourne Again Shell (Bash) Vulnerability

A vulnerability "Shellshock" has been reported in the GNU Bourne Again Shell (Bash), the common command-line shell used in most Linux/UNIX operating systems (OS). The flaw could allow an attacker to remotely execute shell commands by attaching malicious code in environment variables used by the OS. Patches have been released to fix this vulnerability for affected OS versions. Note that the current solution does not completely resolve the vulnerability. We recommend that the user install existing patches and pay attention for updated patches.

PowerMedia XMS makes use of the bash shell in several components. For ISO installations, we recommend that the user log into the PowerMedia XMS command line and update the bash package with the following command line:

```
# yum update bash
```

For PowerMedia XMS RPM installations, the user should check the version of bash package installed and apply any patches if required. Additional information about Shellshock can be found at http://www.us-cert.gov/ncas/alerts/TA14-268A.

Issues Tables

The tables in this section list issues that affect the PowerMedia XMS. The issues are sorted by issue type. The following information is provided for each issue:

- **Issue Type** – This classifies the type of release issue based on its effect on users and its disposition:
    - **Known** – A minor issue. This category includes interoperability issues and compatibility issues. Known issues are still open but may or may not be fixed in the future.
    - **Known (permanent)** – A known issue or limitation that is not intended to be fixed in the future.
    - **Resolved** – An issue that was resolved (usually either fixed or documented) in this release.
- **Defect No.** – A unique identification number that is used to track each issue reported.
- **SU No.** – For defects that were resolved in a Service Update, the Service Update number is shown.
- **Product or Component** – The product or component to which the issue relates; for example, an API.
- **Description** – A summary description of the issue. For non-resolved issues, a workaround is included when available.

Note: The [CI] superscript represents a controlled introduction (CI) feature or functionality.

PowerMedia XMS

Issue Type	Defect No.	SU No.	Product or Component	Description
Resolved	IPY00118601	1	HMP	When <modifyconference> is being issued, a condition has been observed that may result in an HMP service crash.
Resolved	303088	1	MSML	The stream gain is applied to the outbound (from XMS perspective) side of the stream instead of the inbound side as per RFC 5707.
Resolved	XMS-6692	1	MSML	A race condition has been observed when processing a wildcard unjoin that may result in a msmlserver crash.
Resolved	XMS-6689	1	MSML	A fax that is in progress cannot be stopped with dialogEnd. XMS never responds with the msml.dialog.exit to the dialogEnd.
Resolved	299997	1	VXML	When bargein is not set, audio delays are seen on VXML playback.
Resolved	299960	1	WebGUI	Diagnostic logging levels are displayed in alphabetical order rather than tracing level in drop-down list.
Resolved	299267	1	XMS	When attempting to make outgoing call, XMS stops responding to 180 Ringing.
Resolved	XMS-6690	1	XMS	When a MSML join from control leg and the ACK to 200 OK arrive at the same time, the join request never receives a response. If the join is before or after the ACK, there is no issue.
Known (permanent)	XMS-8931	1	MSML	Due to limitations in the CentOS 6 regular expression processing library, the MSML <pattern> element does not support regex patterns on CentOS 6.

Issue Type	Defect No.	SU No.	Product or Component	Description
Known (permanent)	XMS-10720	1	XMS	If dhclient versions earlier than *dhclient-4.2.5-60* are installed, XMS may fail to start certain RTP sessions. When this failure occurs, an error that contains "ssp_x86Linux_boot: rtpSocketGet: bind returned an error" will appear in */var/log/messages*. This is due to an issue in dhclient that is resolved in *dhclient 4.2.5-60* or higher. To resolve the issue, open a terminal session on the XMS system and update dhclient: `yum update dhclient`
Known (permanent)	XMS-8048	1	WebRTC	When using Firefox and connecting to the verification demo (or using *webrtc.js* for other applications), no audio or video will be established. This issue is fixed in XMS 3.5 or later.
Known	307865	1	HMP	XMS will fail to start due to a xmserver crash after upgrading openssl to openssl-1.0.2.k-8.0.1.el7.x86_64. Do not update openssl until this issue is fixed in a future release of XMS. **Note:** Installing XMS software on a new installation of CentOS/RHEL 7.x (or later) that does not have the redhat-lsb package installed or upgrading the redhat-lsb package on existing systems will encounter this issue because the latest redhat-lsb package automatically pulls down the latest version of openssl. There is no simple way to revert back to the 1.0.1e version. For new systems, installing XMS using the ISO method may be used as a workaround as the ISO image contains compatible redhat-lsb and openssl packages.

Issue Type	Defect No.	SU No.	Product or Component	Description
Known	XMS-6783	1	XMS	MCU video conference creation returns a 520 "Bad layout regions" error if the MCX device chosen for the conference was previously used as a SFU conference.
Known	XMS-6593		CDR	QOS, audio, and video statistics are not always populated in the CDR record for a given call.
Known	XMS-6636		HMP	If a prompt is played from an http server (http://) and is not completely fetched and cached, any attempt to play the prompt will fail. The */var/log/messages* will indicate the name of the file and that the reader has "reached EOF prematurely". To correct this condition, flush the http cache or restart XMS (which flushes the cache automatically).
Known	XMS-6288		HMP	Files recorded by XMS to the .3gp container will occasionally not play due to corruption. The */var/log/messages* file will contain prints indicating the file that failed to play followed by a print indicating "error 35(FILE_CORRUPT)".
Known	XMS-5561		HMP	When recording to .mp4 container, XMS will occasionally fail to record the file and return "410: [record]: 0 No Error: error", and */var/log/messages* will contain prints indicating failure to write frames to the recording.
Known	XMS-6699		MRB	Additional SNMP traps for VIP failover are needed.

Issue Type	Defect No.	SU No.	Product or Component	Description
Known	XMS-6695		MRB	If the MRB process is killed, an rtpengine instance may be left behind. If this happens, the system where the MRB is running on must be restarted.
Known	XMS-6485		MRB	MRB does not support manual HANGUP ACK in REST.
Known	XMS-5619		XMS	If you are using the variable content announcements feature with Chinese or Spanish languages, a 500 response can be received when using MSML <var>, VXML <say-as>, or NETANN (var://) in specific configurations running on RHEL 6.x or CentOS 6.x. To prevent or address this issue, an httpd service restart or server reboot is required.

Issue Type	Defect No.	SU No.	Product or Component	Description
Known (permanent)	XMS-2863		HTTP	When using both HTTPS and lighttpd under high stress, XMS performance is negatively impacted. The factors that cause this are as follows: • Lighttpd can cause performance issues when handling HTTPS transactions. • XMS uses libcurl, which has code that blocks during HTTPS transactions. The performance penalty of using both HTTPS and lighttpd grows under the constant load. This causes the XMS to perform negatively in various ways. For example, delays in fetching prompts and lost media transactions have been observed. During Dialogic testing, these issues were not observed when using Apache, so consider using alternative HTTP servers for high volume deployments.
Known (permanent)	XMS-3028		Install (ISO)	In some cases, text and image overlays for conferencing captions are not visible in video conferences after installing XMS on CentOS 7. To resolve the issue, open a terminal session on the XMS system, update the following packages, and restart the system: • yum update glib2 • yum update gdk-pixbuf2
Known (permanent)	XMS-2830		Install (ISO)	Newer servers require OS install boot media to be UEFI bootable.
Known (permanent)	MRB-378		MRB	If a MSML join command is sent to a media server prior to receiving an ACK and P-MRB headers are not used, the MSML join command does not function properly in non-proxy mode.

Issue Type	Defect No.	SU No.	Product or Component	Description
Known (permanent)	IPY00102868		MSML	Simultaneous play and record with record beep is not possible because both play and record cannot transmit to the same connection.
Known (permanent)	IPY00102674		MSML	When playing audio and video, both files must reside on either local (file://) or server (http://).
Known (permanent)	IPY00102025		MSML	MSML returns error when using the <var> element with "duration" type and "yrs" subtype.
Known (permanent)	XMS-2579		MSML	MSML legacy does not accept session IDs and session versions longer than 9223372036854775807, which causes re-INVITEs to be ignored.
Known (permanent)	XMS-2999		SR140 Software	When using driver modules that are not supplied by Red Hat, the following message is found after rebooting XMS: kernel: boston: module verification failed: signature and/or required key missing - tainting kernel. However, the message is not an indication of an issue.
Known (permanent)	XMS-2885		WebGUI	Changing user settings (user passwords, polling times in options menu) can make user credentials temporarily invalid. Refreshing the page in the browser resolves the issue.
Known (permanent)	IPY00117889		XMS	When the creation of a call fails because the destination URI is invalid, the call failure response is not reported and the resources remain in the USE state. If a resource leak is discovered, verify that the destination URI is correct.
Known (permanent)	XMS-6660		XMS	Media files cannot have spaces.

Issue Type	Defect No.	SU No.	Product or Component	Description
Known (permanent)	XMS-3232		XMS	The API supports both 8 kHz and 16 kHz for the sampling rate of Opus recordings, but XMS internally uses the sampling rate of 16 kHz for generating Opus audio streams.
Resolved	XMS-6412		MRB	The Conference Clean Up functionality is not working even when enabled.
Resolved	XMS-6393		MRB	After failover, the REST call is not moved.
Resolved	XMS-6391		MRB	The End Call button does not end the REST call.
Resolved	XMS-6390		MRB	The End All Calls button does not end all REST calls.
Resolved	XMS-6335		MRB	SNMP notifications are delayed and as a result, MRB will not send SNMP traps.
Resolved	XMS-6272		MRB	No audio after moving calls to another media server with rtpengine.
Resolved	XMS-6423		MSML	XMS will reject calls that contain MSML in the INVITE.