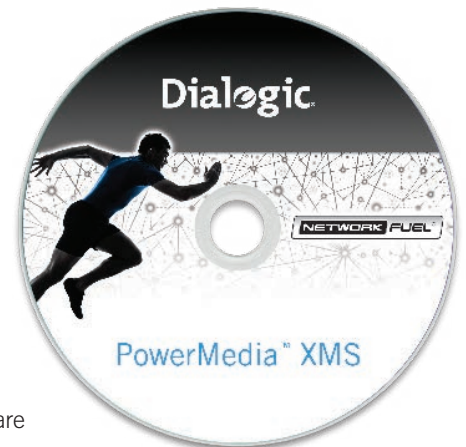


## Dialogic® PowerMedia™ XMS

PowerMedia XMS serves the needs of application developers and network operators with:

- Cloud-ready, virtualized media processing software
- Production-ready media server interfaces for web-oriented and traditional media applications
- A full suite of media application capabilities with WebRTC support
- Comprehensive audio, video, and contact center features

Offloading difficult media handling to PowerMedia XMS's flexible rich media processing software helps to improve the user experience, optimize network efficiency, and reduce development time.



Features	Benefits
<b>Support for IETF and WC3 WebRTC codecs (Opus audio, VP8 video) and technologies to provide real-time video and audio media mixing, security, signaling and NAT/firewall traversal with WebRTC-enabled HTML5 browsers</b>	Facilitates the development and deployment of rich communication apps and services across Web, VoIP/SIP, and PSTN networks to virtually all connected endpoints
<b>Up to 2,000 sessions of high performance software media processing with excellent call rates and voice quality PESQ scores, as well as low media latency on common datacenter server infrastructure</b>	Supports the development and deployment of demanding service provider applications (such as conferencing, messaging and IVR services) without the need for specialized hardware
<b>Advanced multimedia processing functionality, including HD Voice and real-time video; video transcoding, transrating and transizing up to HD720p resolution with H.264 and VP8 codecs</b>	Allows solution providers to attract new users and increase target revenue by offering multimedia solutions with a high user Quality of Experience (QoE)
<b>RESTful control interface for multimedia processing and call control via HTTP messages</b>	Simplifies development for web application programmers who do not have an in-depth familiarity with traditional telecommunications interfaces
<b>MSML (RFC 5707) interface for multimedia control protocol support</b>	Enables the delivery of standards-based solutions in IMS and other SIP-based environments
<b>JSR 309 connector software, compliant with the Java Community Process specification for a protocol agnostic media server control API</b>	Allows development of real-time multimedia applications and services on standard Java Platform, Enterprise Edition (J2EE) converged (SIP and HTTP) application servers, leveraging application redundancy and high availability capabilities of J2EE servers
<b>NetAnn (RFC 4240) and VXML control interfaces</b>	Provides standards-based control interfaces for announcements, IVR and speech enabled applications
<b>Virtualization (VMware ESXI 5.x, KVM, Oracle VM, Xenserver) support</b>	Promotes lower CAPEX, and deployment of communications solutions on virtual machines in private and service provider datacenters
<b>User-friendly OA&amp;M that includes a web-based GUI and HTTP RESTful interface for real-time control and monitoring</b>	Helps reduce deployment costs and OPEX by enabling the quick resolution of operational issues
<b>Simple yet flexible licensing model that allows scaling from ten ports to thousands of ports per server by software upgrade</b>	Can save CAPEX by allowing solutions to be scaled easily as demand grows



## WebRTC with PowerMedia XMS!

WebRTC harnesses the power of video, voice and data as built-in real-time communication features of HTML5 browsers such as Google Chrome and Mozilla Firefox. Reducing barriers to rich communication services on both client and application sides of the service delivery equation, WebRTC simplifies the integration of interactive video, voice and data communications in a wide range of solutions and on many new dimensions.

PowerMedia XMS energizes application development of WebRTC enabled solutions and services, adding to its ability to provide rich media mixing, any-to-any connectivity, software virtualization and Telco hardened scalability.

PowerMedia XMS is well suited for solution providers seeking to integrate WebRTC into new or current applications. The flexible XMS solution can handle multiple facets of WebRTC technology including audio and video transcoding security, NAT traversal or signaling to integrate with WebRTC endpoints and media streams for deployment in virtually any network environment.

## Overview

PowerMedia XMS is a powerful next-generation software media server that enables standards-based, real-time multimedia communications solutions for SIP and WebRTC in mobile and broadband environments. PowerMedia XMS is controlled by the business logic of applications deployed on SIP application servers and web application servers to execute 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 can be used to build a wide variety of real-time multimedia processing solutions. These solutions can range from traditional IVR, voice messaging, notification systems and conferencing, to innovative video conferencing and social interaction applications such as delivering internet content into a video conference in real time.

With the integration of WebRTC codecs and technologies, PowerMedia XMS allows developers to leverage their existing applications to include WebRTC endpoints and media. The flexibility of the XMS solution provides the capability to handle combinations of WebRTC technologies, including audio and video transcoding, DTLS-SRTP security, NAT traversal via ICE or signaling for deployment in virtually any network environment. For example, solution providers can use PowerMedia XMS to handle WebRTC media transcoding, security, and NAT traversal, while using their own WebRTC-to-SIP protocol converter for signaling. Additionally, the support for the Opus audio codec and the VP8 video codec allows XMS to function as a multimedia bridge between WebRTC and IMS networks, providing transcoding between any multimedia parties with VP8 and H.264 up to HD720p resolutions.

Because it offers standards-based media control interfaces and management capabilities, XMS can be deployed with a wide range of corresponding SIP, web and converged application servers, whether commercial, open source or independently developed. Applications paired with PowerMedia XMS scale efficiently on common datacenter infrastructure with high availability to meet accelerating subscriber demand.

XMS can be deployed in private and service provider datacenters, or in traditional environments such as Next Generation VoIP networks or the IP Multimedia Subsystem (IMS) as a Media Resource Function (MRF). TDM network deployments are supported as well, through VoIP gateway connectivity.

A software based IP communications product built on a robust, feature-rich, and award-winning host media processing engine, PowerMedia XMS can help reduce development and operational costs via flexible development and runtime licensing options. The simple, flexible, and scalable licensing model of PowerMedia XMS lets customers pay only for the functionality they need when they need it.

Figure 1 illustrates the wide variety of PowerMedia XMS interfaces and functions, and the real-time multimedia communications solutions it can enable in different deployment environments.

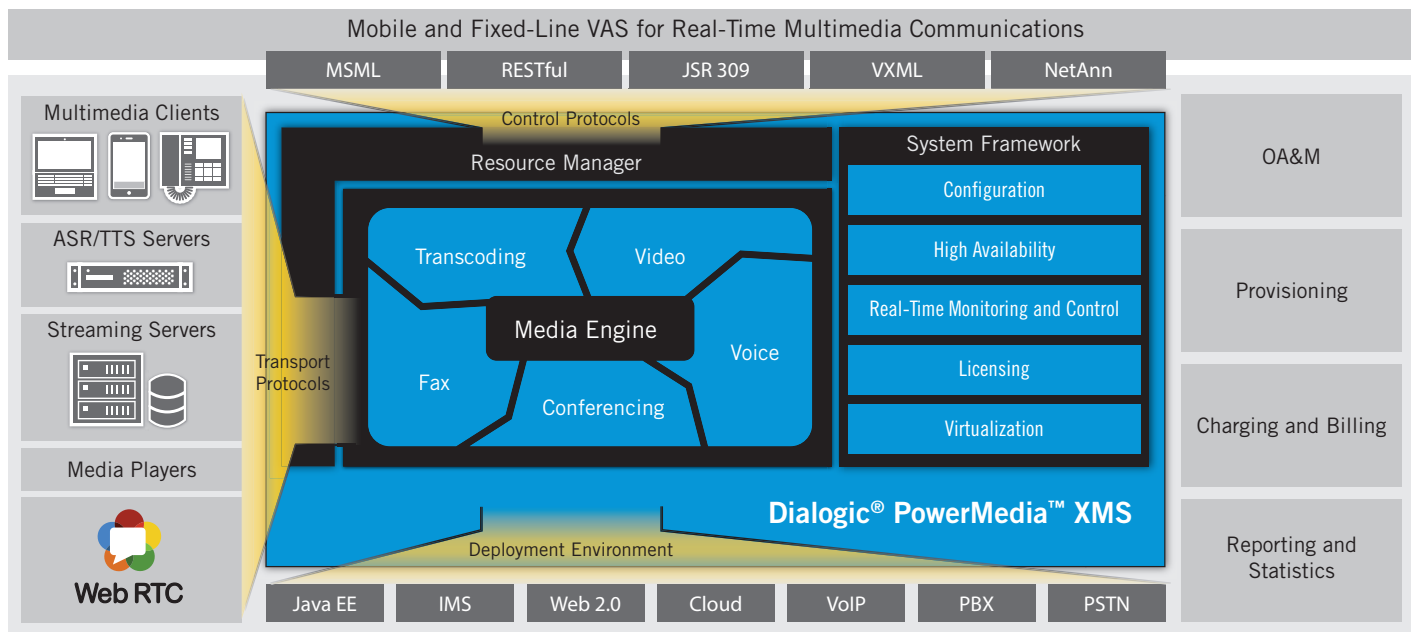


Figure 1. Dialogic® PowerMedia™ XMS: Interfaces, Functions, and Deployment Environments

## Solution Example

### Video Conferencing

Figure 2 illustrates an example of a video conferencing solution with PowerMedia XMS for business or social interaction. Users can call into the video conferencing solution from a variety of SIP endpoints, WebRTC enabled HTML5 browsers such as Google Chrome or Mozilla Firefox, or smart devices running SIP softphone clients, including smartphones, tablets, SIP desktop phones, laptop and workstations.

A solution built with PowerMedia XMS can also be used to record video conferences or stream internet-based multimedia content into a conference from an external RTSP streaming server.

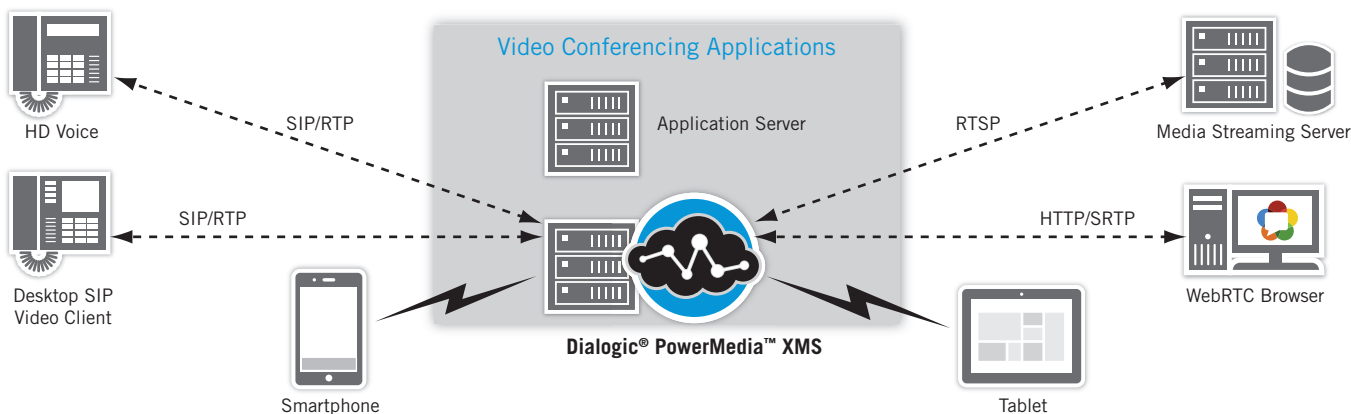


Figure 2. Video Conferencing Solution with SIP and WebRTC Endpoints

## Deployment Environments

PowerMedia XMS can be deployed on premise, in private and public datacenters, and in service provider networks, allowing deployment flexibility for enterprise and service provider solutions. Support for VMWare KVM, Xen Server and Oracle VM virtualization means that XMS can be installed on a virtual machine image and is ready for application control within distributed cloud environments. The control interfaces offered with XMS provide developers with the following choices of deployment environments:

- Traditional VoIP / IMS and LTE Network Deployments** — A SIP Application Server (AS) controls XMS using the MSML control interface (RFC 5707) to enable deployment as an IP media server or IMS Media Resource Function (MRF). Additionally, SIP developers can choose to use the NetAnn interface (RFC 4240) to provide basic network media services over SIP, such as network announcements, basic conferences, or VXML dialogs. The PowerMedia XMS VoiceXML 2.0/2.1 compliant interface can be used to interpret VXML scripts and create voice-enabled applications that utilize MRCP-enabled speech servers for Automatic Speech Recognition (ASR) and Text to Speech (TTS) capabilities. In all of these examples, PowerMedia XMS can also handle SIP calls with WebRTC media, DTLS-SRTP security, and NAT traversal via ICE that originate from WebRTC-enabled browsers.
- J2EE Converged Application Server Deployments** — A converged application server handles both web applications (HTTP) and SIP services using SIP Servlets (JSR 289). An application deployed on a J2EE Converged Application Server can use the JSR 309 connector software for PowerMedia XMS (licensed from Dialogic) to enable XMS as an external media server resource. Dialogic's JSR 309 connector software enables a J2EE Converged Application Server access to the real-time communications capabilities of PowerMedia XMS through JSR 309 compliant API calls. The Dialogic JSR 309 Connector also supports multimedia applications with WebRTC media.
- Next-Generation IP and Web 2.0 Deployments** — A web application written in an appropriate language (Python, JavaScript, etc.) can control XMS using the HTTP RESTful interface. Developers can use call processing functionality built into XMS or use a third-party call control model where SIP or WebRTC signaling is handled by an Application Server. The XMS RESTful API offers web-centric HTTP control of media services for WebRTC applications.

Figure 3 shows an example of a typical deployment of PowerMedia XMS in a Java EE environment. This type of solution can be used for delivering media-rich services such as IVR, conferencing and announcements, as well as in call center applications. In the depicted environment, the J2EE server capabilities can be leveraged to provide application redundancy and high availability for enterprise or service provider applications. J2EE Application Servers and media resources may be geographically distributed, allowing remote access for operation and management.

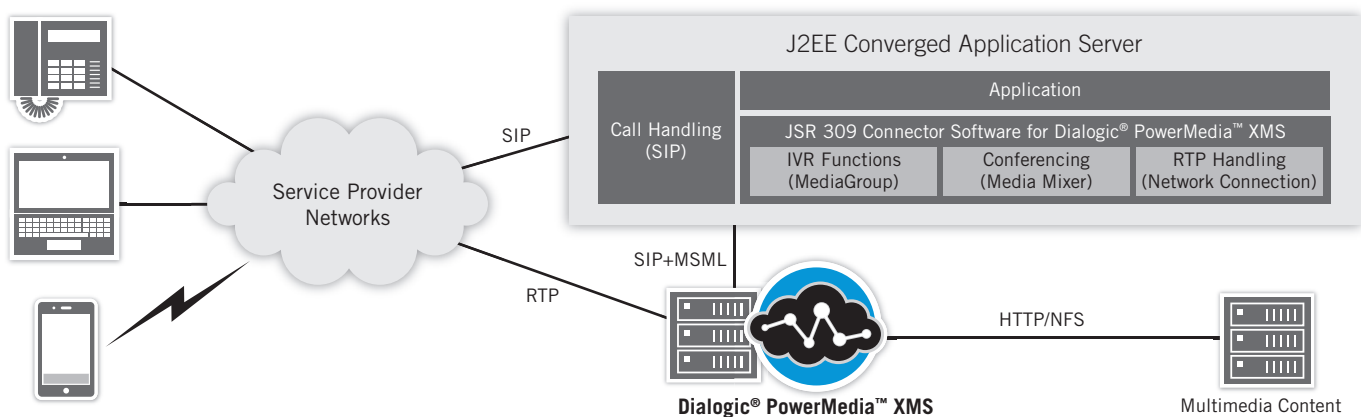


Figure 3. Dialogic® PowerMedia™ XMS in a J2EE Converged Application Server Deployment Example

## Operations, Administration, and Maintenance

PowerMedia XMS provides powerful and user-friendly OA&M functionality, and generally can be installed and configured for initial use in 30 minutes or less. In order to reduce operational costs when deploying solutions, XMS can be managed remotely through a web-based operator console and an HTTP RESTful Web management interface. XMS also supports remote real-time monitoring, alarms, logging, and tracing.

## Licensing

The simple, flexible, and scalable licensing model of PowerMedia XMS lets customers pay only for the functionality they need when they need it. With XMS, a customer can start with licenses for basic audio services and can later add HD Voice or video capabilities when required by the application. XMS-based solutions can be scaled from ten to thousands of ports by simple software upgrade.

A time-limited trial license is available for evaluation of PowerMedia XMS and can be obtained from a link off the PowerMedia XMS product page (<http://www.dialogic.com/en/products/media-server-software/xms.aspx>). For more information about development licenses, please contact dialogic inside sales ([insidesales@dialogic.com](mailto:insidesales@dialogic.com)).

## Performance

Software media processing deployed on conventional computer server hardware has been shown to be an effective alternative to specialized DSP-based hardware typically found in service provider networks supporting value-added services (VAS) applications. PowerMedia XMS has undergone independent testing by the Tolly Group, which found that PowerMedia XMS “meets the performance requirements necessary to support VAS applications such as IVR, messaging and conferencing for service provider applications.” Moreover, the Tolly Group’s testing concluded that “PowerMedia XMS meets or exceeds criteria in areas of media server density, host CPU and memory utilization, call processing rates, media latency and voice quality as defined by the International Telecommunications Union (ITU) for media latency and the PESQ algorithm for voice quality.” More details from the Tolly Group’s testing (which was performed on PowerMedia XMS Release 1.1) are available from Dialogic upon request.

## Technical Specifications

### Session Capacity

Typical media sessions per server (specific per server results will depend on a variety of factors, including but not limited to deployment conditions, configurations and equipment):

- **Audio** — Up to 2000 sessions of G.711 or 1000 sessions with full-duplex (RTP-RTP) transcoding
- **Video** — Up to 450 unidirectional sessions per server (also includes audio transcoding), depending on system capacity, codec, resolution, and frame rate

### Signaling, Protocol and Control Interfaces

#### Signaling and Session Protocols

- SIP (RFC3261)
- WebRTC JavaScript API
- RTSP client support for streaming multimedia content from RTSP servers
- MRCPv2 for connection to speech servers for ASR/TTS - see “Third Party MRCP Speech Vendor Capability” below

#### Media Protocols

- IPv4
- RTP, RTCP, RTCP-XR, RTCP-HR
- DTLS-SRTP
- ICE Lite, Trickle ICE

- Remote Application Interfaces
- **RESTful API** - HTTP-based RESTful web services interface for controlling media processing and SIP signaling operations
  - **MSML (RFC5707)** – Media Server Markup Language, an XML-based media control API
  - **JSR 309 Connector** – A Java Community Process Java API software connector to control external servers running PowerMedia XMS
  - **VXML** - A standard XML interface for specifying interactive voice dialogs for IVR or speech enabled applications.
  - **NetAnn (RFC4240)** – Basic Network Media Services with SIP for announcements, dialogs, and simple conferences

## Media and Coders

- Audio
- Voice and HD Voice play/record
  - Tone generation/detection (DTMF, RFC2833/RFC4733)
  - Call progress analysis
  - Positive Voice Detection (PVD) and Positive Answering Machine Detection (PAMD) for outbound calling scenarios
- Audio Codecs
- Narrowband codecs: G.711u/a, G.723, G.726, G.729a, G.729b, GSM-FR, GSM-EFR, AMR-NB and iLBC
  - Wideband codecs: Opus, G.722 and AMR-WB (G.722.2) – see “Obtaining Third Party Licensing” below
  - Voice activity detection, silence suppression, comfort noise generation
- Audio Conferencing
- N-way (including HD Voice) audio mixing
  - Automatic Gain Control (AGC)
  - Per party gain/volume control
  - Active talker detection
  - DTMF clamping
  - Coach-pupil (whisper) mode
  - Loudest N-party mixing
  - Privileged party mixing
  - Echo cancellation
- Video
- Play/record
  - Video transcoding, transrating, and transizing
  - Video overlays (text and image overlay with scrolling)
- Video Codecs
- MPEG 4, H.264 Baseline Profile
  - VP8
  - H.263, H.263+, H.263++ Baseline Profile
  - Image sizes: HD720p, 4CIF, VGA, CIF, QVGA, QCIF, SQCIF (and custom resolutions)
  - Frame rates: Up to 30 FPS
  - Bit rates: Up to 2Mbps
  - Video Fast Update (VFU): Configurable responses to I-Frame Update requests
  - Fully adaptive video jitter buffer
  - Packet Loss Concealment (PLC)
  - Dynamic Bitrate Adaptive Encoding
  - RTCP feedback support (TMMBR, FIR)
- Media Handling
- File operations: HTTP1.1, HTTPS, and/or NFS; RTSP/RTP
  - Audio File Containers: .wav, .pcm, .vox, .aud
    - Codec Formats: 8k lin PCM, 11k lin PCM, 16k lin PCM, 8k alaw PCM, 8k mulaw PCM
  - Multimedia File Formats: .3gp via .vid/.aud

## Language Support

- Variable content announcement / language phrasing:
  - “date”, “digits”, “duration”, “month”, “money”, “number”, “silence”, “time”, “weekday”
- Customizable to support any language or dialect
- Built-in voice files: US English, Mandarin Chinese, Spanish

## Virtualization

- VMWare ESXi 5.x
- Kernel-based Virtual Machine (KVM)
- Oracle VM
- XEN Virtual Machine

## System Management

- Web GUI
- Real-time monitoring and management via HTTP RESTful control interface
- Remotely managed tracing and logging

## Hardware Support and Minimum System Requirements

- Hardware: Intel Architecture-based server
- Operating System (64-bit OS):
  - CentOS Release 6.4 ISO installation OR
  - RedHat Enterprise Linux 6.4
  - Oracle Enterprise Linux 6.4
- Processor: Intel Dual 56xx or greater
- Ethernet: Single or Dual 1000Base-TX (RJ-45)
- Memory: 8 GB RAM minimum
- Storage: 120 GB HD minimum

## Third Party MRCP Speech Vendor Compatibility\*

- Lumenvox (ASR and TTS)
- Nuance (ASR and TTS)
- Vestec (ASR)

\* For a current list of compatible speech vendors, and other third party interoperability and compatibility information, visit:  
<http://www.dialogic.com/en/interoperability/powermedia.aspx>

## Obtaining Third-Party Licenses

Using the AMR-WB resource in connection with a Dialogic® product described herein does not grant the right to practice the AMR-WB standard. To seek a patent license agreement to practice the standard, contact the applicable patent holder(s).

# Dialogic®

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