



Wowza Media Server[®] 2 - Overview

Wowza Media Systems

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Contents

About Wowza Media Server 2.....	1
Superior Economics.....	1
Proclaimed the #1 Media Server Choice	2
Designed for the New Streaming Order.....	2
Figure 1. Wowza Unifies Multi-Protocol, Multi-Client Media Streaming.....	2
Prior Convention: Segregated Workflow Streaming.....	3
Figure 2. Segregated workflow approach is expensive in capital, resources & labor	3
Enter Wowza: Unified Workflow Streaming	3
Figure 3. Unified workflow approach: saves costs in encoding, servers & storage	4
Flash and Beyond	4
Real-Time Messaging Protocol (RTMP): Fully Interactive Flash Streaming.....	4
Apple HTTP Streaming for iPhone, iPod touch, QuickTime and Safari browser	5
Microsoft Smooth Streaming: Delivery to the Silverlight player	5
Real-Time Streaming Protocols: QuickTime, Mobile Devices and IPTV	5
Broad Live Encoder, File Format Support.....	5
Live Stream Recording.....	6
Innovative Functionality	6
H.264 Everywhere.....	6
Figure 4. Live H.264/HE-AAC streaming with non-Flash encoders (RTSP/RTP).....	6
SHOUTcast Re-streaming.....	6
Figure 5. SHOUTcast/Icecast audio multi-protocol content re-streaming.....	7
Streaming Security	7
Future Extensibility	7
Embedding Potential	7
Infrastructure Grade Operation.....	9
Cost-Effective Scalability	9
Video on Demand Scalability	9
Live Streaming Scalability	9
Figure 6. Unlimited streaming scalability for live and on-demand.....	10
Support for More OS Platforms.....	10
Shared Services Ready	10

Flexible Administration and Management.....	10
Per-Session Logging for Complete Content Visibility	11
Centralized Configuration Management	11
Standards-Based Backend Integration	11
Wowza IDE - Free Integrated Development Environment.....	12
Deploying Wowza Media Server 2.....	13
Wowza Media Server 2 Editions	13
Application Examples.....	14
Selecting Hardware.....	14
Installation Prerequisites	14
Specifications	14
Server Tuning.....	14
Wowza Media Server 2 Performance	14
Summary	15
Resources	15

About Wowza Media Server 2

In February 2007 Wowza Media Systems launched Wowza Media Server Pro, the first commercial and truly industrial strength alternative to the Adobe® Flash® Media Server products (FMIS and FMSS). Since then, Wowza Media Server has gained over 30,000 licensees all over the world, garnered numerous awards, including being named *Streaming Media Magazine's* Editors' Pick and the Readers' Choice for Best Server two year in a row, ahead of the products from Adobe and Microsoft®.

Wowza Media Server 2 takes the proven Wowza Pro platform beyond Flash. It extends this high-performance, extensible and fully interactive media streaming software to a wide variety of media player technologies. including such popular media players as Adobe's Flash player, Microsoft's Silverlight® player, Apple's iPhone® and iPod® touch, and Apple's QuickTime® player.

Wowza Media Server 2 supports many streaming protocols, including the Real-Time Messaging Protocol (RTMP), Microsoft Smooth Streaming, Apple HTTP Live Streaming, Real-Time Streaming Protocol (RTSP), Real-time Transport Protocol (RTP), MPEG2 Transport Streams (MPEG-TS) and more.

With this unique complement of protocols, streaming capabilities, innovative features and an unbiased focus on media delivery, Wowza Media Server 2 establishes a new product category: **Unified Media Server**.

This sets Wowza Media Server apart as not only an alternative to the Adobe Flash Media Server products, but as a platform that is a much more efficient, cost cost-effective and easier-to-manage unified alternative to many separate, client-specific media servers, including Microsoft Server with IIS, Apple QuickTime Streaming Server (Darwin), and others.

With its market leading per-server performance and pricing, and innovative features, Wowza Media Server 2 makes multi-protocol, multi-client streaming practical and affordable for organizations of all sizes – from individuals to enterprises, hosting companies and content delivery networks (CDN).

Superior Economics

Wowza Media Server 2 is offered in several economical editions to fit business models and budgets of a wide variety of users.

At just \$995, **Wowza Media Server 2 Perpetual edition** delivers the multi-protocol, multi-client streaming performance with a total cost of ownership (TCO) nearly 90% lower than a single-protocol, single-client Adobe Flash Media Interactive Server (FMIS) or Microsoft Server with IIS.

The **Wowza Media Server 2 Subscription edition** takes the savings even further with a friction-free monthly subscription that starts at just \$65/month per server and even cheaper in volume. The Wowza Server Subscription includes all future upgrades at no additional cost and requires no up-front investment, no long term contract, and lets you add or delete servers as needed while only paying for the servers used.

Wowza has also teamed with Amazon Web Service to make billing quick, easy, and secure for the combination of Wowza Media Server 2 licensing, machine time with various Amazon EC2 instances and bandwidth. Offered as a self-managed, hosted solution, this is another friction-free and cost-effective option that requires no upfront investment and lets you scale up or down for streaming multi-client media using Amazon EC2 infrastructure.

These favorable economics offered by Wowza Media Server 2 are the result of its high-performance, lower licensing cost, and its innovative *unified workflow streaming* capability. The unified workflow capability eliminates the need for separate client-specific encoders and servers, saving you money in capital and operating expenses. This means you don't have to be locked into a specific player client or protocol technology, or compromise your deployment flexibility and future growth as you would with the competing servers.

Proclaimed the #1 Media Server Choice

In addition to being named Streaming Media Magazine's Editors' Pick and the #1 media server choice for two years running, Wowza Media Server 2 was recognized by the Streaming Media Magazine readers as the **Best Streaming Innovation** of 2009. Why all this praise? Because Wowza Media Server outperforms the competition in reliability, scalability, features, innovation and cost-effectiveness.

Visit Wowza Media Systems [web site](#) to see what our customers are saying about Wowza and Wowza Media Server.



Designed for the New Streaming Order

Maintaining a streaming status quo is no longer an option. Content owners and producers want their content to reach users everywhere - on the desktop, mobile devices and the living rooms. Users want their content everywhere as well, on any device without being tethered to a specific technology. That creates a number of challenges that impacts both the content production as well as delivery.

The Wowza Media Server 2 unified workflow approach is changing the way the business of online video is conducted. Wowza is setting a new benchmark for media servers in functionality, performance, flexibility, and overall value, economic and operational. It effectively addresses the multi-protocol, multi-client media delivery challenges that the content owners, producers and network operators are facing.

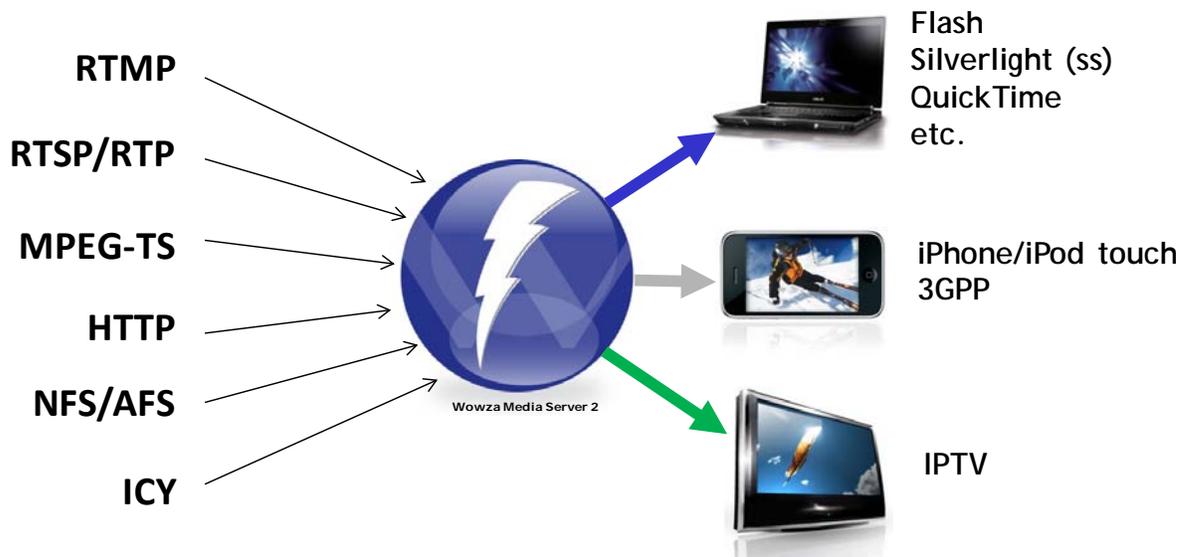


Figure 1. Wowza Unifies Multi-Protocol, Multi-Client Media Streaming

Wowza Media Server 2 is geared for high performance. It is a tightly architected 64-bit Java server built from the ground up for multi-protocol, multi-client media streaming. It scales up effectively with the growing demand for streaming content and its industrial strength architecture is specifically tuned to efficiently utilize the CPU, and memory resources, plus it scales well with higher storage I/O capacities. This scalability allows you to increase the efficiency of your server infrastructure and benefit from the opportunities offered by this rapidly growing market.

Prior Convention: Segregated Workflow Streaming

Conventionally, to deliver streams to different player client types, separate encoders and client-specific servers were used. This approach is expensive in terms of the capital investment required to acquire multiple client-specific encoders and servers plus the management costs incurred with separate delivery workflows. In many cases it is simply unfeasible to maintain separate infrastructures, limiting the delivery choices for the content owners/producers and consumers.

The example below illustrates how multi-client delivery for live streaming is approached in a conventional segregated fashion.

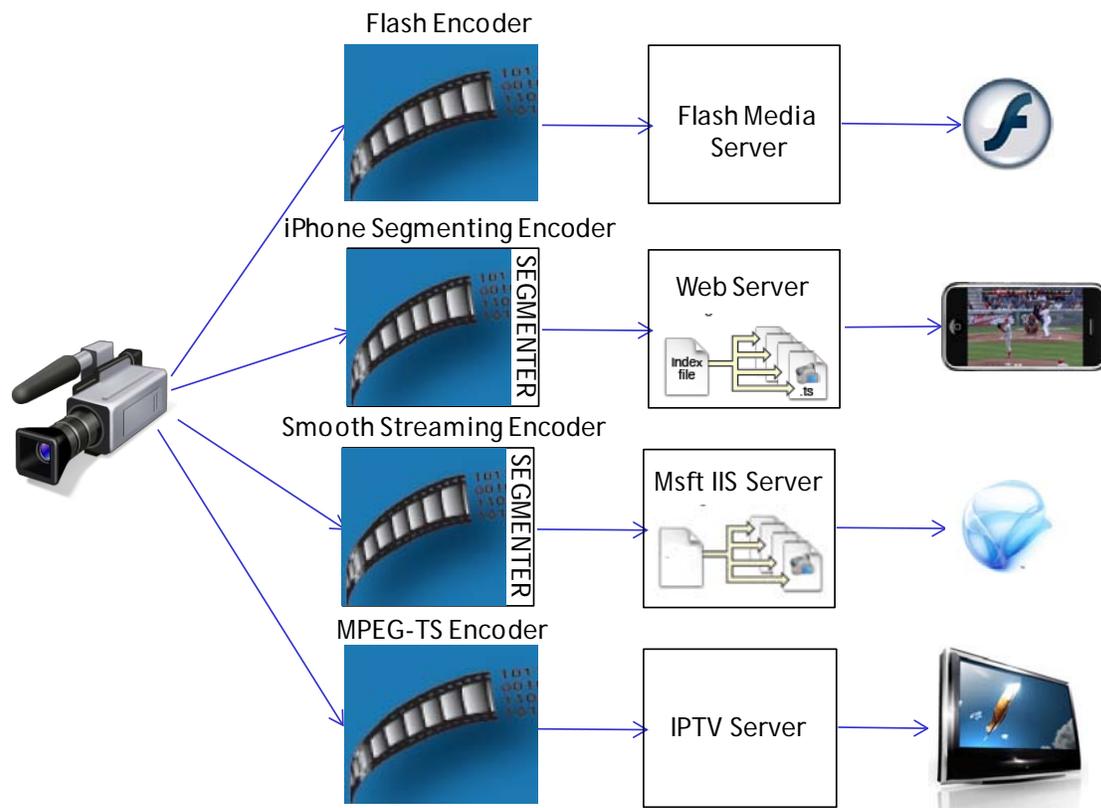


Figure 2. Segregated workflow approach is expensive in capital, resources & labor

Enter Wowza: Unified Workflow Streaming

Wowza introduced *unified workflow streaming* to help the users slash costs and increases operational efficiencies. Being able to stream from a single H.264 encode (either live or on-demand) to all client types simultaneously eliminates the need to invest in client specific encoders and servers. It also reduces the operational costs associated with the power and space required by the now eliminated

equipment while minimizing management complexity by allowing your team to focus their product knowledge only on one set of encoders and one type of server.

With the Wowza Server you have a broad choice of conventional live RTSP/RTP, MPEG-TS and even RTMP encoders – no need for expensive specialized segmenting encoders. Additionally users save in storage costs as well may not having to maintain on-demand content in client-specific formats. For VOD, Wowza Server can stream simultaneously to multiple clients from a single MP4 (QuickTime) file.

Here is a illustration of a unified multi-client live streaming workflow enabled by Wowza Media Server 2:

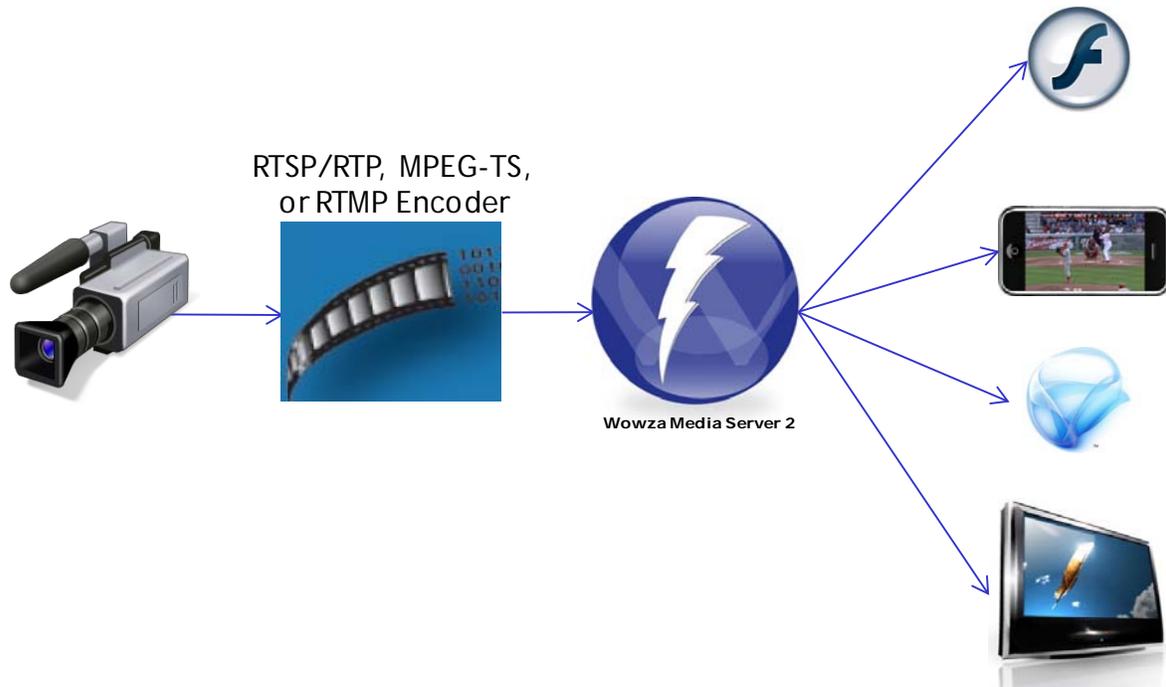


Figure 3. Unified workflow approach: saves costs in encoding, servers & storage

Flash and Beyond

Real-Time Messaging Protocol (RTMP): Fully Interactive Flash Streaming

Wowza Media Server 2 is a fully interactive Flash server. It communicates with the Adobe Flash player using the Real-Time Messaging Protocol (RTMP). It can deliver multi-bitrate live and on-demand media, data and remote procedure call information to and from the Flash player using RTMP. Additionally, Wowza Server supports features beyond media streaming such as: Shared Objects, video recording, video chat, remote procedure calls and more. Wowza Media Server 2 can deliver all video and audio formats supported by the Flash player.

Wowza Server implements five variants of the protocol required for Flash streaming: RTMP, RTMPE (encrypted RTMP), RTMPT (tunneling), RTMPTE (encrypted RTMPT) and RTMPS (RTMPT over SSL). RTMP is the base protocol and is the most efficient of the five variants. RTMPT is a tunneling variant of the RTMP protocol that can be used to tunnel through firewalls that employ stateful packet inspection. RTMPE

and RTMPTE are encrypted variants of the RTMP and RTMPT protocols that secure the data being transmitted between the Flash player and Wowza Media Server.

Wowza Server also includes bi-directional support for Action Message Format (AMF) AMF3 and AMF0 for data serialization (AMF3 was introduced in Flash Player 9 and ActionScript 3.0).

Apple HTTP Streaming for iPhone, iPod touch, QuickTime and Safari browser

Wowza Media Server 2 provides adaptive bitrate live and on-demand H.264 video (baseline level 3.0 or lower), AAC and MP3 audio content to the iPhone/iPod touch (version 3.0 OS or greater), QuickTime player (version 10 or greater) and Safari browser (version 4.0 or greater) using the Apple HTTP Live Streaming protocol. Apple HTTP Live Streaming is a chunk based streaming protocol that uses HTTP for delivery. All media chunking and packaging necessary to deliver a stream using this protocol is performed by Wowza Server.

Wowza Server also supports the encrypted version of the Apple HTTP Live Streaming protocol which uses a 128-bit version of the Advanced Encryption Standard (AES-128).

Microsoft Smooth Streaming: Delivery to the Silverlight player

Wowza Media Server 2 can stream multi-bitrate live and video on demand H.264, AAC and MP3 audio content to the Microsoft Silverlight player using the Smooth Streaming protocol. Microsoft Silverlight is cross-browser, cross-platform technology that exists on many personal computing devices. Smooth Streaming is also a chunk based streaming protocol that uses HTTP for delivery. All media chunking and packaging necessary to deliver a stream using this protocol is performed by Wowza Server so there is no need for an IIS 7 server.

Real-Time Streaming Protocols: QuickTime, Mobile Devices and IPTV

Wowza Media Server 2 can stream live H.264, AAC and MP3 audio content to players and devices that support the Real Time Streaming Protocol (RTSP), Real-time Transport Protocol (RTP) and MPEG2 Transport Stream protocol (MPEG-TS). This includes players and devices such as QuickTime Player, VideoLAN VLC player, IPTV set-top boxes and mobile devices.

Wowza Server can also accept incoming streams from encoding devices that use these same RTSP, RTP, and MPEG-TS protocols. Wowza Server supports RTP and MPEG-TS input and output over UDP as well as multicast. In addition, Wowza Server supports interleaved RTSP/RTP (which is where the RTP portion of the stream flows over the RTSP TCP connection) which enables RTSP/RTP to be delivered in network environment that do not allow UDP transmission.

Broad Live Encoder, File Format Support

Wowza Media Server 2 supports many video on demand file formats, including FLV (Flash Video - .flv), MP4 (QuickTime container - .mp4, .f4v, .mov, .m4v, .mp4a, .3gp, and .3g2) and MP3 content (.mp3). Wowza Server can accept live video and audio streams from a broad range of conventional encoders that support the RTMP, RTSP/RTP, native RTP and MPEG-TS transport protocols.

Additionally, Wowza Media Server 2 can be used to re-stream SHOUTcast and icecast (MP3, AAC and AAC+) audio streams as well as IP Camera streams (H.264, AAC and MP3) to the supported player technologies.

For details on supported encoders visit [Wowza Media Server Forums: Live Encoders](#).

Live Stream Recording

Wowza Media Server 2 allows you to instantly record any incoming live stream to either the Flash Video (FLV) or MP4 (QuickTime container) format. Recordable live stream source can be any compatible live video device, including webcams encoded through the Flash player, encoders, or IP cameras.

Live stream recording is particularly useful for offering video messaging services, such as video email, instant video feedback on Web 2.0 web sites, or for applications, such as surveillance, training or education, that require content archiving or later replay.

Innovative Functionality

H.264 Everywhere

H.264 is now supported by many so players and devices that it has become a de facto standard in the industry. Wowza lets you take advantage of the H.264 codec's ubiquity by being able to deliver that content over multiple protocols simultaneously and processing the payload as may be necessary for each of the transport protocols required by your chosen clients. For example, when streaming to the iPhone or Silverlight, special segmenting encoders are not required. Wowza Server takes care of properly segmenting standard encoded streams for HTTP delivery. You only need to encode once, and Wowza Media Server 2 delivers it everywhere.

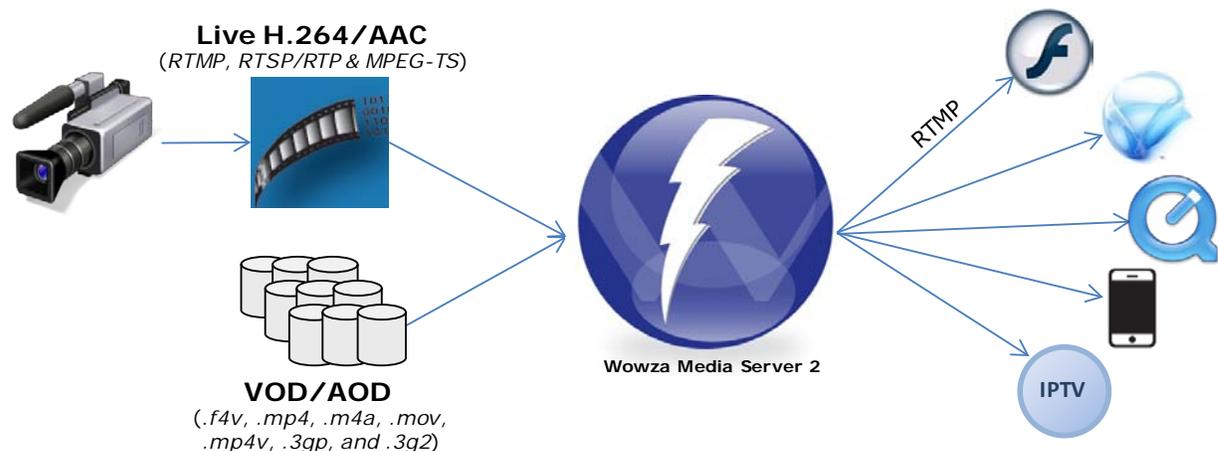


Figure 4. Live H.264/HE-AAC streaming with non-Flash encoders (RTSP/RTP)

SHOUTcast Re-streaming

Wowza Media Server 2 also expands the Wowza Pro platform's exclusive SHOUTcast (and icecast) re-streaming feature beyond Flash to the iPhone, Silverlight and other clients. This gives web radio broadcasters, streaming services providers and content delivery networks who utilize SHOUTcast an

even broader reach to audiences on the desktop, on the go and in the living room. This capability further simplifies audio delivery by eliminating the need to install SHOUTcast-specific players on every client machine and device. Wowza Server is also able to forward the embedded metadata such as song title and artist to the player clients.

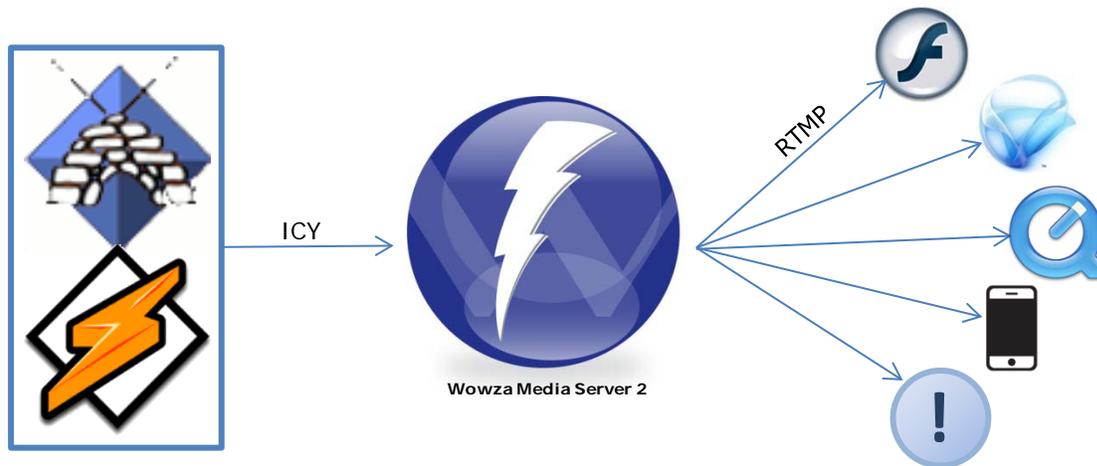


Figure 5. SHOUTcast/Icecast audio multi-protocol content re-streaming

Streaming Security

One of the main inherent advantages that streaming media has over progressive download is content protection and security. However, simply streaming your content does not always provide sufficient security against content intrusion, unauthorized diversion and stream ripping. Wowza Server provides several levels of protection to help guard your content against these threats. For Flash Wowza implements content URL protection, domain verification and link encryption (RTMPS, RTMPE, RTMPTE). In addition, Wowza's SecureToken methodology provides high level of content protection against spoofing threats like those posed by the Replay Media Catcher and similar streaming media interceptors. Additionally, AES-128 encryption is available for streaming to the iPhone.

Future Extensibility

Wowza Media Server 2 features a flexible custom module interface (API) which can be used to create custom stream types and extend server functionality with custom modules or integrate the server with backend and other systems.

The server can be extended by customers and partners by writing custom Java classes that are dynamically loaded at runtime.

Embedding Potential

Wowza Media Server 2 is implemented to be tight, small and embeddable. Its compact size offers an opportunity to expand the applications for the Wowza Media Server technology beyond the data center by embedding it with other software and hardware products ranging from network appliances, TelePresence/video conferencing systems to mobile and consumer devices.

If your company would like to integrate Wowza Media Server streaming capabilities with your hardware or software products, or otherwise partner with Wowza, please fill out our [Partner Request form](#).

Infrastructure Grade Operation

Wowza Media Server 2 is built to deliver infrastructure grade stability and operational robustness that is well suited for deployments of all sizes -- from the smallest site to the largest CDN.

Cost-Effective Scalability

Cost-effective scalability of server infrastructure for both on-demand and live content is one of the most important challenges you will face with the demand onslaught for streamed content. Wowza Media Server effectively solves this challenge with multi-dimensional scalability:

- Thanks to its full 64-bit multi-threaded capabilities, Wowza Server efficiently manages CPU, memory and disc I/O resources to get the most streaming out of available hardware.
- Wowza Server also provides features to scale the capacity for both on-demand and live content across multiple servers to virtually unlimited numbers of concurrent streams.

In fact, Wowza is first to reach a new record streaming performance benchmark of up to **10Gbps** for VOD and live media delivery using the Wowza Media Server software on qualified off-the-shelf server hardware, such as Sun Microsystems' 16-thread Intel® Nehalem® based x4270 server.

All of these components, paired with the lower operating expenses, allow you to scale effectively while enjoying a much lower TCO.

Video on Demand Scalability

Wowza Media Server 2 provides a capability to intelligently manage traffic loads across multi-server clusters and robust demand-based load balancing to ensure that on-demand (and live stream) loads will be distributed evenly across multiple servers without overwhelming your infrastructure. Wowza may also be used with custom GeoIP modules to provide CDN-style redirection to the most local server using a custom developed load balancing module.

Live Streaming Scalability

Wowza Media Server 2 includes the Live Stream Repeater functionality that allows live stream mirroring to multiple edge servers for delivery of streams to virtually unlimited audiences. Any Wowza Media Server node can be configured to act as a Live Stream Repeater (origin) or edge server or both, giving you the maximum flexibility with the licenses you purchase.

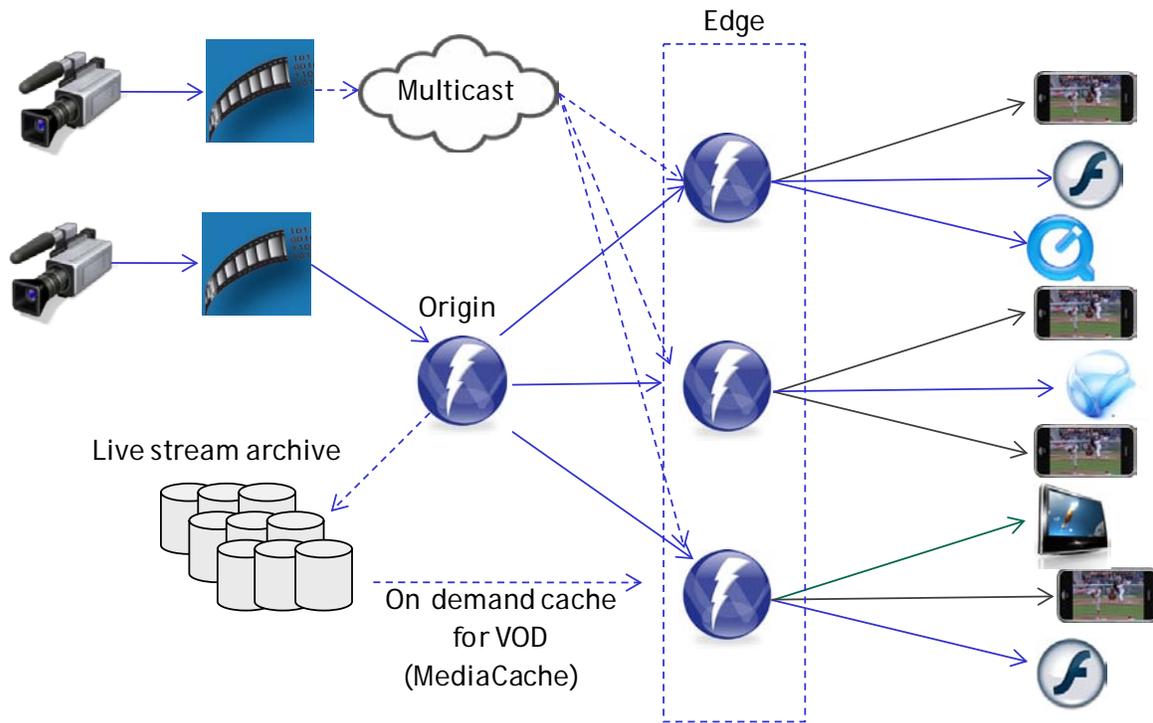


Figure 6. Unlimited streaming scalability for live and on-demand.

Support for More OS Platforms

Wowza Media Server 2 can be deployed on any platform that supports the Java Runtime Environment. It is multi-threaded at its core and can take full advantage of the OS and Java's 64-bit capabilities. To simplify deployment, the following downloadable installation packages are available:

- Windows
- Linux - RPM - Red Hat Package Manager
- Linux - DEB - Debian Package Manager
- Mac OS X
- Linux/ /Unix/Solaris - straight install using tar command

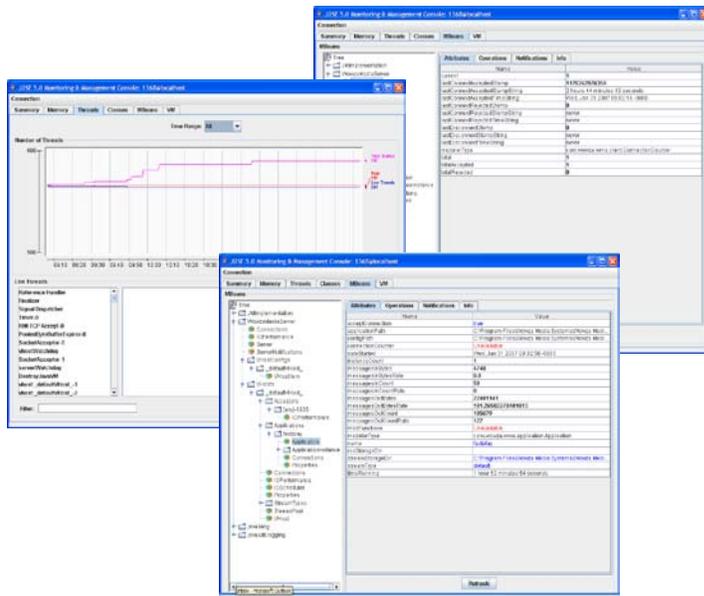
To download Wowza Media Server 2 installer for you specific OS visit www.wowzamedia.com/store.

Shared Services Ready

For applications in shared hosting environment, Wowza Media Server 2 can be configured to run multiple virtual hosts or separate applications. Each of the virtual host environments has its own set of configuration files, application folders and log files. Separation by application offers similar benefits without the complexity of managing virtual hosts. Either approach enables a single server to efficiently serve multiple users in separate environments.

Flexible Administration and Management

Wowza Media Server 2 provides standards-based mechanisms that fit into existing management and administrative infrastructure. For event logging it uses the Java-based log4j logging system. By default the server is configured to log basic information to the console window and detail information in W3C Extended Common Log Format (ECLF) to log files.



Wowza Media Server 2 uses the Java Management Extension (JMX) interface that works with the Wowza IDE JMX perspective and a variety of administration consoles and management systems, such as HP OpenView, IBM Websphere, BEA Weblogic and many others.

For simple administration you can use JConsole, available with most Java SDKs, or the open source MC4J browser, to monitor and control both local and remote servers. These administration consoles capture a wide range of data, giving you a detailed view of server performance, the status of applications, connections and virtual hosts, bandwidth utilization and more.

You can see the data as a snap shot or capture it over time to let you analyze and manage your operations effectively.

Per-Session Logging for Complete Content Visibility

Content providers and their customers need access to precise logging to see how their business is performing. This information is used for a variety of uses such as billing, to ascertain the users' behavior or see how a specific piece of content is performing. Wowza Server gives you complete visibility by providing the pre-session logging for all supported client types.

Centralized Configuration Management

To simplify the deployment and operation of multi-server environments, Wowza offers a free centralized configuration management utility. The utility includes examples with all the functionality needed for deployment. These examples can be easily extended to fit your specific environment.

Standards-Based Backend Integration

The Wowza Media Server 2 extensible Java API provides a wide variety of system integration options. This custom module interface can be used to integrate Wowza Media Server 2 with other systems directly through Java, Service-Oriented Architectures (SOAP), remote procedure calls (RPC) or the Java Native Interface (JNI).

Wowza IDE - Free Integrated Development Environment



To simplify and streamline the tasks of extending, configuring and managing Wowza Media Server we offer Wowza Integrated Development Environment (Wowza IDE), a free tool based on popular Eclipse application framework. Wowza IDE provides a rich integrated development environment that greatly simplifies the leap into the Java development world for Wowza Media Server users. It allows you to easily create, debug and validate your server-side code prior to deployment. Additionally, Wowza IDE includes Java Management Extensions (JMX) perspective for managing and monitoring Wowza Servers. Wowza IDE is available for the Windows and Mac OS X platforms.

Deploying Wowza Media Server 2

This section provides the basic information you will need to plan a Wowza Media Server 2 deployment.

Wowza Media Server 2 Editions

Wowza Media Server 2 is available in several editions. All Wowza Media Server 2 editions are licensed software products and require acceptance of an end user license agreement (EULA), which contains additional details, terms and conditions. For the most current pricing, volume discounts and to find out which licensing option is applicable to your specific business, please visit www.wowzamedia.com/pricing.html.

In brief, the following licenses are offered:

- **Wowza Server Developer***: This **free** edition is intended for developers and for non-commercial use, and provides the same functionality as Wowza Media Server 2 Subscription, except it is limited to 10 concurrent connection for Flash (RTMP), RTSP/RTP and MPEG-TS streaming and further restrict continuous streaming time duration for HTTP delivered streams to iPhone and Silverlight.
- **Wowza Server Evaluation**: This **free** license offers the same functionality as Wowza Server Subscription but is limited to 30 days of use for evaluation or pilot production deployment. Use is restricted to one time only, one license per customer. Other restrictions apply.
- **Wowza Server Subscription**: This standard license includes all the functionality for multi-protocol, multi-client streaming offered at a very economical monthly fee. Subscription licensees receive a single license key that can be used on multiple servers. You provide the hardware, bandwidth and management. All upgrades, even **full version upgrades are free!** This is a software only subscription.
- **Wowza Server Perpetual***: This license offers the same functionality as the Wowza Server Subscription edition except a separate unique license key is required for each server. Full version upgrades are charged an additional upgrade fee. **Not valid for use by Service Providers.**
- **Wowza Server for Amazon EC2**: The same functionality as the Subscription edition combined with machine time on various Amazon EC2 instances and bandwidth at a very attractive price. This is the only type of license valid for use on Amazon EC2.

Note: While the Wowza Server Evaluation, Subscription, Perpetual and EC2 editions do not limit the number of connections, connection capacity will depend on your choice of hardware (or the Amazon EC2 instance) and specific application.

*These licensing options are not available to service providers such as **content delivery networks (CDNs), streaming service and hosting providers**. Please visit www.wowzamedia.com/service.html for additional details.

Application Examples

Each download of Wowza Media Server 2 includes examples to assist you in developing and deploying your applications. A bandwidth checker, simple streaming, live streaming, video chat, video recording, fast play (Fast Forward and Rewind), SHOUTcast, and several other applications and module examples are included. Additional examples and packages are available on the Wowza forums – please visit www.wowzamedia.com/forums for more information.

Selecting Hardware

In video on demand applications, a lot of Wowza Media Server 2 performance is driven by the underlying system's I/O performance and will be limited by how fast the hardware can deliver the streamed file bits from the disk. To get the most throughput out of your hardware we suggest you use RAID 0 or RAID 10 configurations with as many disks as possible in the RAID array.

As a basic hardware configuration we recommend is a dual- or quad-core system with a minimum of 1 GB of RAM per core, a dual disc in a RAID 0 configuration and a Gigabit Ethernet interface.

Wowza Media Server 2 software is licensed for use on servers with up to 16 CPU cores. Please review the EULA for any limitations and restrictions.

Installation Prerequisites

Wowza Media Server 2 requires the Java 6 (a.k.a. 1.6) or later Runtime Environment (JRE). You can download the JRE free of charge. The www.wowzamedia.com/support.html page provides links to sites where the JRE or Java Development Kit (JDK) downloads are available.

Specifications

Please visit www.wowzamedia.com/specs.html to see a summary of the Wowza Server specifications.

Server Tuning

To optimize Wowza Media Server software performance on production hardware, we provide a set of the suggested general tuning instructions on the [Wowza forums](#).

Wowza Media Server 2 Performance

The performance of Wowza Media Server 2 depends on your hardware selection and the applications you intend to run. For example, on any given hardware configuration, connection capacity for video chat or live streaming applications will likely be higher than connection capacity for video-on-demand applications since disc I/O is less of a factor in the former examples.

On the properly configured modern multi-threaded servers, like Sun Microsystems' 16-thread Intel Nehalem based x4270, Wowza Server has demonstrated in lab tests the ability to deliver **up to 10Gbps** of streaming throughput for both the on-demand and live content.

Wowza offers a free Load Testing Tool to enable customers to benchmark the Wowza Media Server software performance on the hardware of their choice. To request this tool email to test@wowzamedia.com.

Summary

The volume of video viewing on the Internet is growing exponentially and it now spans a wide spectrum of devices and players -- from traditional desktops to mobile devices and IP-enabled TVs. Content producers and network operators now realize that building out parallel media delivery networks to meet this media sprawl will not scale economically or operationally – they need to unify the infrastructure to harness the economies of scale.

Wowza Media Server 2 offers you a solution: a high-performance, unbeatably priced unified media delivery platform that lets you take full advantage of the growing market opportunities. Get Wowza Media Server 2 now or contact one of the [Wowza Streaming Partners](#) and let your content flourish.

Resources

For most up to date information on Wowza Media Server 2 please visit www.wowzamedia.com.

For technical questions please visit the Wowza forums at www.wowzamedia.com/forums or email us to support@wowzamedia.com

Wowza Media Server 2 documentation is available at www.wowzamedia.com/resources.html.