



Wowza Transcoder

User Guide

Wowza Transcoder User Guide



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www.wowza.com

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Document History

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Introduction

What is Wowza Transcoder?

Wowza Transcoder enables a Wowza Streaming Engine application to ingest a live stream, decode the video and audio, and then re-encode the stream for delivery to desired playback devices. The supported workflows include:

- Transcode incoming non-H.264/VP8/VP9 video and non-AAC/Vorbis/Opus audio formatted streams to outgoing H.263, H.264, VP8, or VP9 video and AAC, Vorbis, or Opus audio renditions with different bitrates. Multiple bitrate renditions can be created from a single input stream.
- Transrate incoming H.264/AAC streams to outgoing renditions with different bitrates.

The newly encoded bitrate renditions have aligned key frames to enable adaptive bitrate delivery from Wowza Streaming Engine for Adobe HTTP Dynamic Streaming (HDS), Apple HTTP Live Streaming (HLS), Microsoft Smooth Streaming, MPEG-DASH, and Real Time Messaging Protocol (RTMP). Single bitrate streaming is supported for all transport protocols, including RTSP/RTP and MPEG-TS.

Wowza Transcoder uses a template system to match the incoming stream to an encoding template that you can customize to control the encoding parameters for the resultant transcoded streams. H.264 streams can be delivered over any protocol supported by Wowza Streaming Engine.

Installation

What do I need to install and run Wowza Transcoder?

Wowza Transcoder is a part of Wowza Streaming Engine. It's available on 64-bit versions of Windows and Linux operating systems (32-bit versions aren't supported). A 64-bit Java runtime is also required.

Note

- Wowza Transcoder is *not* available on OS X.
- To run Wowza Transcoder on 64-bit versions of Windows Server, Windows Server 2008 R2 or later is required. The following server features are also required:
 - .NET Framework 3.5.1 or later
 - Desktop Experience

Licensing requirements for Wowza Transcoder

Perpetual and Subscription licenses for Wowza Streaming Engine enable unlimited use of the Wowza Transcoder technology that's integrated with each licensed media server instance. The integrated Transcoder can decode an unlimited number of inbound live streams and encode an unlimited number of outbound live renditions (subject to CPU/hardware limitations).

A Perpetual license is best for stable, long-term demand. A Perpetual license key will have either an **EPBP4** or **EPBU4** prefix (depending on date of purchase) and is for use with one Streaming Engine instance and the integrated Transcoder technology. A Subscription license is best for variable demand. You can install as many instances of the Streaming Engine software as needed using the same license key and enable the Transcoder integrated with each instance. A Subscription license key has an **ENGM4** prefix. For details on plans, see [Wowza Streaming Engine Pricing](#).

The license key you enter when you run install Wowza Streaming Engine is displayed in the **License Keys** box in Wowza Streaming Engine Manager. If you switch your licensing option for the Wowza Streaming Engine instance, you can replace the existing license key with the new license key without reinstalling the software. If you purchased a license key to enable the integrated Transcoder for use with the licensed server instance, you can add this license key.

All license key values are stored in the **[install-dir]/conf/Server.license** file in the Wowza Streaming Engine installation.

Windows	- %WMSCONFIG_HOME%\conf\Server.license
Linux/Unix	- /usr/local/WowzaStreamingEngine/conf/Server.license

To add license keys in Wowza Streaming Engine Manager, do the following:

1. Click the **Server** tab, and then click **Server Setup** in the contents panel.
2. On the **Server Setup** page, click **Edit**.
3. In the **License Keys** box, enter your license key for Wowza Streaming Engine. If you need to enter multiple license keys (for example, for the media server software and for the Transcoder), enter each license key on a separate line.
4. Click **Save**, and then click **Restart Now** at the top of the **Server Setup** page when prompted. The new license(s) take effect after the server is restarted.

Notes

- After you restart the server, Wowza Streaming Engine Manager displays the first and last five digits of the license keys that you entered in the **License Keys** box to help protect this information.
- If you purchased a license for Wowza Streaming Engine before January 1, 2015, contact sales@wowza.com to learn more about how to license Wowza Transcoder.

Configuration files

The Transcoder configuration is stored in a set of XML files that can be configured in Wowza Streaming Engine Manager. Wowza Transcoder relies on this configuration information and a correct Wowza Streaming Engine setup. The configuration files are read when the Wowza Streaming Engine instance starts.

For more information about how to configure Transcoder by using the manager UI, see [Configuration in Wowza Streaming Engine Manager](#). For information about how to configure and tune Wowza Streaming Engine, see the [Wowza Streaming Engine User Guide](#) and [Wowza Streaming Engine Configuration Reference](#).

Transcoder template files

The following sample template files are installed with Wowza Streaming Engine:

- **transcode.xml** – Use this template when the source stream isn't H.264/VP8/VP9 video (such as MPEG-2) with non-AAC/MP3/Vorbis/Opus audio and you want Transcoder to generate a full set of renditions with different bitrates for adaptive streaming delivery. When using this template, the source stream isn't included in the set of adaptive bitrate renditions available for playback.
- **transrate.xml** – Use this template when the source stream is H.264 video with either AAC or MP3 audio and you want Transcoder to generate lower bitrate renditions of the source stream for adaptive streaming delivery. When using this template, the source stream is used as the high bitrate rendition and the lower bitrate renditions are keyframe-aligned to it.
- **audioonly.xml** – Use this template to ingest an H.264 video/Speex audio stream from Adobe Flash Player and convert the Speex audio format to AAC, Vorbis, or Opus. This makes the stream compatible with additional player technologies.
- **transcode-h265-divx.xml** – Use this template when the source stream isn't H.265 video and you want Transcoder to generate H.265 renditions for MPEG-DASH playback in DivX Web Player and Apple HLS playback in VLC media player.

You can modify transcoder templates by using Wowza Streaming Engine Manager.

Features

What can I do with Transcoder?

Wowza Transcoder provides multiple options for transcoding or transrating incoming streams to outgoing renditions with multiple bitrates that can be delivered over any transport protocol supported by Wowza Streaming Engine.

Video and audio codecs

Wowza Transcoder supports the following video and audio codecs:

Video (decoding)	Video (encoding)
H.264	H.263v2
MPEG-2	H.264
MPEG-4 Part 2	VP8
VP8	VP9
VP9	H.265
Audio (decoding)	Audio (encoding)
AAC	AAC
G.711 (μ -law and A-law)	Vorbis
MPEG-1 Layer 1/2	Opus
MPEG-1 Layer 3 (MP3)	
Speex	
Vorbis	
Opus	

Notes

- The non-H.264 video and non-AAC/MP3 audio codecs listed are supported for transcoding only. They aren't available for direct playback.
- The following MP3 sample rates are supported: 48000, 44100, and 32000.
- H.263 video output isn't supported when using [hardware acceleration](#).
- To use the **VP8** and **VP9** video and **Vorbis** and **Opus** audio codecs, Wowza Streaming Engine 4.5 is required. Follow the instructions in [Transcode live streams to WebM for MPEG-DASH playback with Wowza Streaming Engine](#).
- To use the **H.265** video codec, follow the instructions in [Stream using HEVC/H.265 with Wowza Transcoder](#).
- Instream CEA-608 closed caption data can be passed through Wowza Transcoder for delivery in Apple HLS streams to iOS-based devices. For more information, see [Configure closed captioning for Wowza Streaming Engine live streams](#).

Hardware acceleration

Wowza Transcoder can be configured to take advantage of hardware acceleration on 64-bit Windows and Linux operating systems, which is recommended but not required. If your configuration doesn't include hardware acceleration, a built-in software encoder is invoked.

The Transcoder can be configured to take advantage of the following hardware acceleration technologies:

- **Intel Quick Sync Video** (for both accelerated video decoding and encoding). For recommended workstation and server-level hardware specifications, and links to configuration instructions, see [Server specifications for Intel Quick Sync acceleration with Wowza Transcoder](#).
- **NVIDIA NVENC** (for accelerated video encoding only) and **NVIDIA CUDA/NVCUVID** (for accelerated video decoding and GPU video scaling only). To our **NVIDIA NVENC** hardware acceleration encoding option, Wowza Streaming Engine 4.2 and later supports encoding H.265/HEVC video renditions. **CUDA**-based accelerated decoding is compatible with most NVIDIA graphics cards that support the legacy CUDA instruction set. Some newer NVIDIA graphics cards have fixed-function hardware that use NVIDIA CUDA Video Decoder (**NVCUVID**) video decode APIs for accelerated decoding on NVIDIA GPUs with CUDA. Additionally, Wowza Streaming Engine 4.6 and later supports transcoder video scaling with NVIDIA CUDA-based GPUs. For a list of supported NVIDIA graphics cards that are compatible with the Transcoder, and links to configuration instructions, see [Server specifications for NVIDIA NVENC and NVIDIA CUDA acceleration with Wowza Transcoder](#).

Notes

- NVIDIA CUDA "encoding" acceleration isn't supported in the latest NVIDIA graphics drivers (340 and later); therefore, CUDA-based accelerated video encoding is *not* supported in Wowza Streaming Engine.
- To run Wowza Transcoder on 64-bit versions of Windows Server, the following server features are required:
 - .NET Framework 3.5.1 or later
 - Desktop Experience

Adaptive bitrate delivery

Wowza Transcoder is designed to make live adaptive bitrate delivery easy. It can ingest a single high-bitrate live stream and dynamically create multiple lower bitrate renditions. These new renditions are keyframe-aligned to enable adaptive bitrate delivery. Wowza Transcoder uses a templating system to group the streams into logical groups called *Stream Name Groups* for live adaptive bitrate delivery. Stream Name Groups serve the same purpose as a Synchronized Multimedia Integration Language (SMIL) file and either method can be used for playback of live streams.

When customizing your template, you should define and successfully play the individual resultant renditions before defining your group.

For adaptive bitrate delivery, you can create new streams to offer the best possible viewing experience given a user's device and bandwidth. For example, you can encode one stream for Android/iPhone 3GS (supports Baseline Profile Level 3.0 and lower), another stream for iPhone 4/iPad 2 (supports Main Profile Level 3.1 profile and lower), and a third stream for desktops or set-top boxes. For more information, see [Stream adaptive-bitrate content with Wowza Streaming Engine](#).

Playback with Stream Name Groups

During playback, a player decides which stream in a Stream Name Group is best suited for playback based on the stream metadata. Most player technologies make the right selection, but it isn't always perfect. Stream Name Group functionality in Wowza Transcoder allows adaptive bitrate streams to take advantage of this player feature. The Stream Name Groups that are defined in a transcoder template file are available for playback using the **nggrp:** media type prefix:

To play using Adobe HDS:

```
http://[wowza-ip-address]:1935/live/nggrp:myStream_all/manifest.f4m
```

To play using Apple HLS:

```
http://[wowza-ip-address]:1935/live/ngrp:myStream_all/playlist.m3u8
```

To play using Microsoft Smooth Streaming:

```
http://[wowza-ip-address]:1935/live/ngrp:myStream_all/Manifest
```

To play using MPEG-DASH:

```
http://[wowza-ip-address]:1935/live/ngrp:myStream_all/manifest.mpd
```

Overlays

Wowza Transcoder provides the ability to apply graphic image overlays to both the decoded stream and each newly encoded output rendition.

Static images

Static overlay images in JPEG, PNG, and BMP image formats can be applied to streams to achieve stationary image effects such as a watermark to your video. You can customize the location, size, alignment, and opacity of your overlay by setting **Overlays** properties in transcoder template files for decoded streams and encoded output renditions. For more information about how to overlay static images onto your video streams, see [Set up and run Wowza Transcoder in Wowza Streaming Engine](#).

Dynamic images

You can overlay dynamic images on top of video by using the Wowza Streaming Engine Java API. Starting with a static image in GIF, JPEG, PNG, or BMP format, you can add text and configure animation sequences to achieve effects such as dynamic insertion of advertising, titling, sporting event scores, and so on. Dynamic transcode overlays can be manually configured or pre-programmed based on external events, making this a powerful tool for adding premium TV-like experiences. For details about how to create dynamic transcode overlays, see [Add graphic overlays to live streams with Wowza Transcoder](#). The examples and classes in this article provide a starting point for development. More elaborate overlays are possible with custom development by expanding the examples or by creating custom classes.

Note

The dynamic transcode overlay feature supports manipulation of images and text to generate animation sequences. It doesn't support stream manipulation such as picture-in-picture or multi-stream compositing.

Logging

Wowza Transcoder messages are logged separately in `[install-dir]/logs` to enable more generalized accounting information.

Example logging messages

```
decoder-audio-start    transcoder INFO    200 myStream    {codec: AAC,
objectType: 2, sampleRate: 44100, channels: 2}
decoder-video-start    transcoder INFO    200 myStream    {codec: H264,
profile: 77, level: 31, frameSize: 1280x720, displaySize: 1280x720,
frameRate: 29.97}
encoder-audio-start    transcoder INFO    200 myStream    {name: "360p",
bitrate: 96000, codec: AAC, objectType: 0, sampleRate: 44100, channels: 2}
encoder-video-start    transcoder INFO    200 myStream    {name: "360p",
bitrate: 850000, codec: H264, profile: 77, level: 30, frameSize: 640x360,
displaySize: 640x360, frameRate: 29.97}
decoder-video-stop    transcoder INFO    200 myStream
decoder-audio-stop    transcoder INFO    200 myStream
encoder-video-stop    transcoder INFO    200 myStream    {name: "360p"}
encoder-audio-stop    transcoder INFO    200 myStream    {name: "360p"}
```

Getting bitmap Images from Wowza Transcoder

A built-in HTTP provider is available for use when Wowza Transcoder is actively transcoding the video portion of a stream. The HTTP provider enables you to get a bitmap image of a video frame from Wowza Transcoder in either a JPEG or PNG image file format. For more information, see [Generate thumbnail images of live streams using the Wowza Streaming Engine Java API](#).

Extending Wowza Transcoder

Java technology is used to build Wowza Streaming Engine. Because of this, the Wowza Streaming Engine can be extended by writing custom Java classes that are dynamically loaded at runtime. The media server and extensions (which are also referred to as *modules*) run at the full speed of the server. The server includes a rich Java API to interact with and control the streaming and transcoding process. For more information, see the [Wowza Streaming Engine Java API](#) docs. Transcoder functionality is included in the `com.wowza.wms.transcoder.*` packages.

Configuration in Wowza Streaming Engine Manager

How do I set up Wowza Streaming Engine for transcoding?

Configuring Wowza Streaming Engine for use with Wowza Transcoder is easy with Wowza Streaming Engine Manager. The following sections describe how to set up a transcoding application in the manager UI:

- [Create the application](#)
- [Enable Transcoder](#)
- [Select and configure template for transcoding or transrating](#)
- [Configure transcoding session for the application](#)

Create the application

1. [Start the software](#) and then open Wowza Streaming Engine Manager in a web browser using the URL

```
http://[wowza-ip-address]:8088/enginemanager
```

where [wowza-ip-address] is the IP address or domain name of the local or remote Wowza server that you want to manage.

2. Click the **Applications** tab at the top of the page, and then click **live** in the contents panel to configure the installed **live** application:

- a. On the **Setup** tab, click **Edit**.

live

Live Single Server or Origin

Setup

Properties

Modules

Configure playback options for your application. To configure incoming streams from your camera or encoder, use the [Incoming Publishers page](#).



Application Description

Default application for live streaming created when Wowza Streaming Engine is installed. Use this application with its default configuration or modify the configuration as needed. You can also copy it to create another live application.

Playback Types

- MPEG-DASH
- Apple HLS
- Adobe RTMP
- Adobe HDS
- Microsoft Smooth Streaming
- RTSP/RTP

Options

- Low-latency stream (ideal for chat applications)
- Record all incoming streams

Streaming File Directory

`$(com.wowza.wms.context.VHostConfigHome)/content`

Closed Caption Sources

None

Maximum Connections

-Not Set-

- b. Select all of the **Playback Types**, and then click **Save**.

live

Live Single Server or Origin

Setup

Properties

Modules

* = Required field

 Save

Cancel

Application Description

Default application for live streaming created when Wowza Streaming Engine is installed. Use this application with its default configuration or modify the configuration as needed. You can also copy it to create another live application.

Playback Types *

- MPEG-DASH
- Apple HLS
- Adobe RTMP
- Adobe HDS
- Microsoft Smooth Streaming
- RTSP/RTP

- c. Click **Restart Now** to apply the changes.

 Saved! You must restart the application for changes to take effect.

 Restart Now

Enable Transcoder

In the contents panel for the **live** application, click **Transcoder**, and then click **Enable Transcoder**.

The screenshot shows the Wowza Streaming Engine Manager interface. The top navigation bar includes 'Wowza Streaming Engine MANAGER', 'Home', 'Server', 'Applications', 'myUser', 'Help', and 'Sign Out'. The left sidebar shows a tree view with 'Transcoder' selected under the 'live' application. The main content area is titled 'live > Transcoder' and shows the status as 'Not Enabled'. A red box highlights the 'Enable Transcoder' button. Below the button, there are sections for 'Template Directory', 'Transcoder Options', and 'Fallback Template'.

Click **Restart Now** to apply the changes.

Transcoder has been enabled for this application. You must restart the application for changes to take effect. [Restart Now](#)

Note

Wowza Streaming Engine must be properly licensed to enable the Transcoder. For details, see [Licensing requirements for Wowza Transcoder](#).

Select and configure template for transcoding or transrating

Transcoder templates enable you to customize video and audio encoding parameters to target multiple playback devices with the encoded output renditions. The newly encoded multiple bitrate streams are keyframe-aligned with each other to enable adaptive bitrate

delivery from Wowza Streaming Engine for Adobe HDS, Apple HLS, Microsoft Smooth Streaming, MPEG-DASH, and RTMP.

Encoding presets define the parameters of the transcoded or transrated output renditions. Each preset represents an encoded bitrate rendition. Based on your needs, you can have a single template with multiple presets or you can have multiple templates. Be sure to take into account your configuration and available bandwidth when determining how many presets your server can handle. See [Performance Tuning](#) for more information.

You should start with the sample templates using the default encoding implementation before using accelerated hardware or customizing your template. The template configuration is described in detail in [Set up and run Wowza Transcoder in Wowza Streaming Engine](#).

You can configure transcoder templates in Wowza Streaming Engine Manager by setting the active transcoder stream names and bitrates. Use the following procedure to activate streams in transcode, transrate, or audio-only templates.

Note

The following procedure configures the **Transrate** template. Make a backup copy of the file (`[install-dir]/transcoder/templates/transrate.xml`) before modifying it.

1. Under **Transcoder Templates**, click the **Transrate (Default)** template.

live > Transcoder

Live Single Server or Origin

Transcoder is enabled. Depending on your subscription license terms, your account might incur additional charges while the application is active. To stop charges for this application instance, disable Transcoder. To stop all Transcoder-related charges, disable Transcoder in all applications.

Configure transcoding of live streams.

Status: ✔ Enabled

[Edit](#) [Disable Transcoder](#)

Template Directory

S{com.wowza.wms.context.VHostConfigHome}/transcoder/templates

Transcoder Options

✔ Match incoming stream name to template name

Fallback Template

Transrate (Default)

Transcoder Templates

[Copy Template](#) [Add Template](#)

Name
Audio Only (Default)
Transcode (Default)
Transcode H265 DivX (Default)
Transrate (Default)

- In the **Presets** list, click the **Edit** icon for the **240p** preset.

live > Transcoder > Transrate (Default)

Live Single Server or Origin

[← Return to Transcoder Templates](#)

Encoding Presets



















Decoding Preset

Stream Name Groups

An encoding preset represents one resultant encoded bitrate in the output streams from the Transcoder. An adaptive bitrate stream has multiple presets.

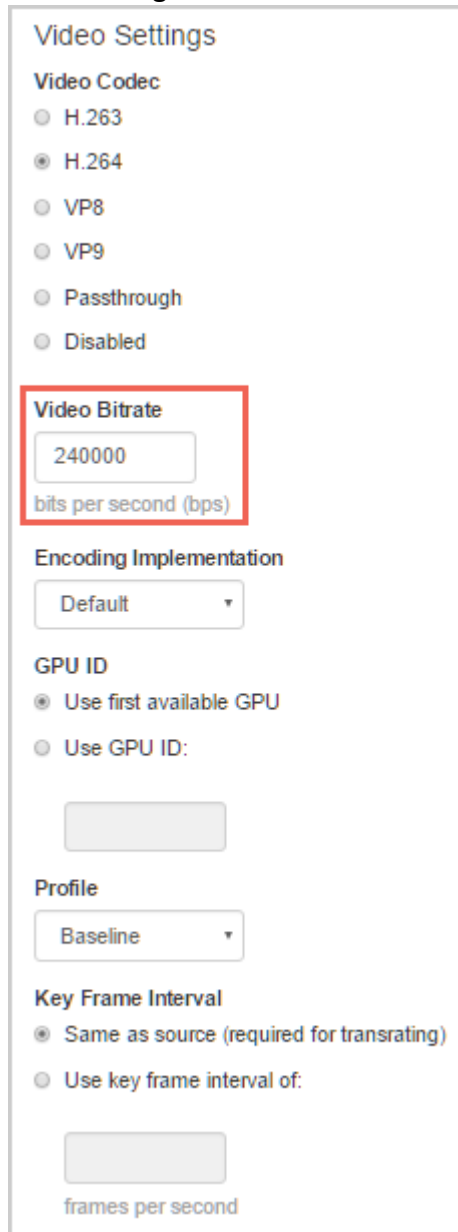
[+ Add Preset](#)

Presets

Enabled	Preset	Stream Name	Actions
<input checked="" type="checkbox"/>	source	mp4:\${SourceStreamName}_source	  
<input type="checkbox"/>	720p	mp4:\${SourceStreamName}_720p	  
<input checked="" type="checkbox"/>	360p	mp4:\${SourceStreamName}_360p	  
<input type="checkbox"/>	240p	mp4:\${SourceStreamName}_240p	Edit this preset   
<input checked="" type="checkbox"/>	160p	mp4:\${SourceStreamName}_160p	  
<input type="checkbox"/>	h263	mp4:\${SourceStreamName}_h263	  

- Set the options for a 240000 bits-per-second (bps) encoded output rendition and enable it, so it will be created along with the other enabled presets. For more information about the encoding preset options available in the user interface, see [Template details](#) in "Set up and run Wowza Transcoder in Wowza Streaming Engine."

- a. In the **Video Settings** area, enter **240000** in **Video Bitrate**. Accept the defaults for other settings.



Video Settings

Video Codec

- H.263
- H.264
- VP8
- VP9
- Passthrough
- Disabled

Video Bitrate

240000

bits per second (bps)

Encoding Implementation

Default ▾

GPU ID

- Use first available GPU
- Use GPU ID:

Profile

Baseline ▾

Key Frame Interval

- Same as source (required for transrating)
- Use key frame interval of:

frames per second

- b. In the **Frame Size** area, accept the default settings.

Frame Size

Fit Mode
fit-height

Width
pixels

Height
240
pixels

Crop
Pixels from each edge

Top
0

Left
0

Right
0

Bottom
0

- c. In the **Audio Settings** area, accept the default setting for the audio codec (**Passthrough**).

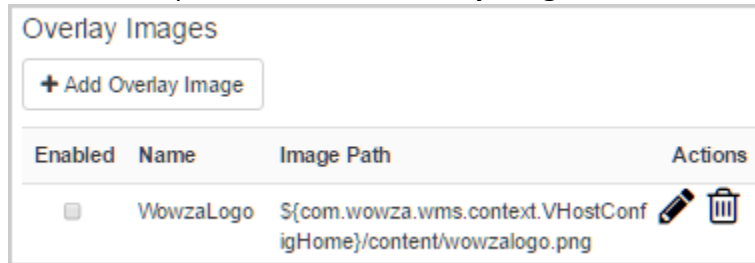
Audio Settings

Audio Codec

- AAC
- Vorbis
- Opus
- Passthrough
- Disabled

Audio Bitrate
bits per second (bps)

- d. For this example, don't enable **Overlay Images**.



4. Click **Save** to save the settings.
5. In the **Presets** list, click **240p**, and then click **Enable Preset**.

live > Transcoder > Transrate
(Default) > 240p

Live Single Server or Origin
[Return to Transcoder Template](#)

Status: ● Not Enabled

Encoding Preset

[Edit](#) **Enable Preset**

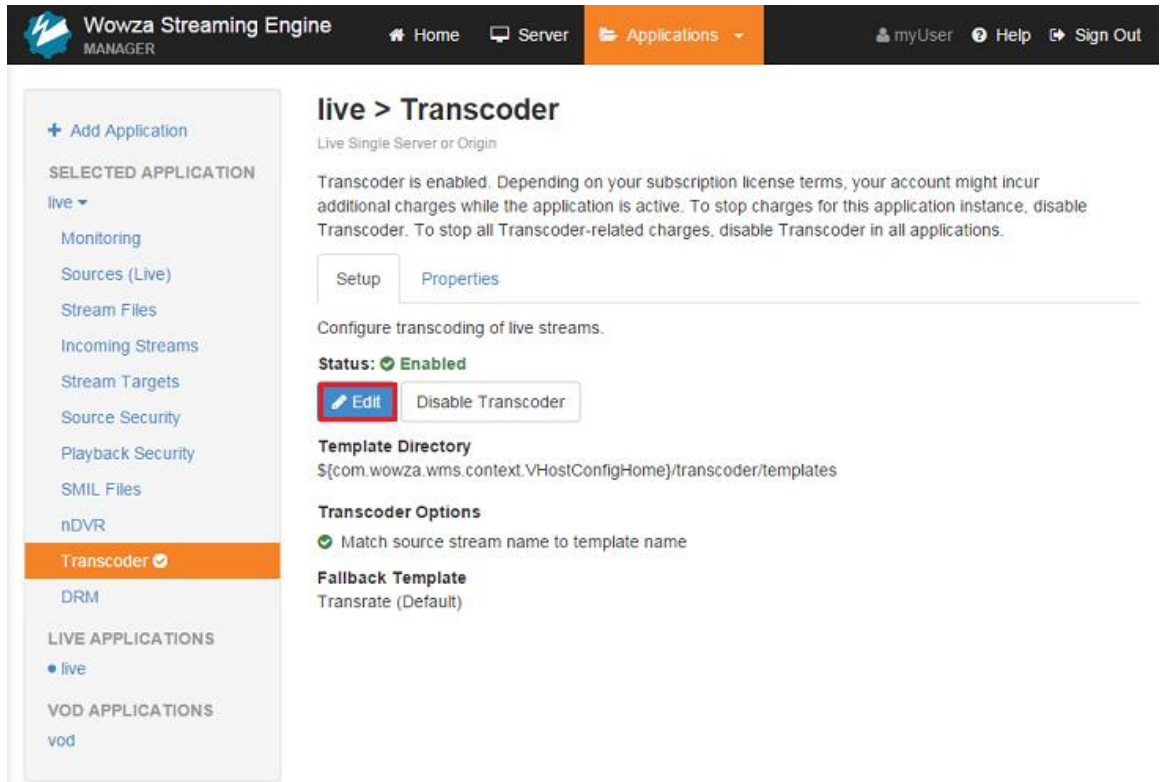
Outgoing Stream Name
mp4:\$(SourceStreamName)_240p

Description
-Not Set-

Configure transcoding session for the application

All transcoding sessions can use the same transcoder template. This is the default configuration. To configure all transcoding sessions for an application to use the same transcoder template, do the following:

1. In the contents panel for the **live** application, click **Transcoder**, and then click **Edit**.



2. Under **Transcoder Options**, clear the **Match incoming stream name to template name** check box, and then click **Save**.

live > Transcoder

Live Single Server or Origin

Transcoder is enabled. Depending on your subscription license terms, your account might incur additional charges while the application is active. To stop charges for this application instance, disable Transcoder. To stop all Transcoder-related charges, disable Transcoder in all applications.

* = Required field

Template Directory

Transcoder Options

Match incoming stream name to template name

Fallback Template

Clearing the check box means that all incoming streams will use the same template.

The active transcoder template can also be based on the stream name. To configure all transcoding sessions for a particular stream to use the same transcoder template:

1. Under **Transcoder Options**, select the **Match incoming stream name to template name** check box, click **Save**, and then restart the application.

live > Transcoder

Live Single Server or Origin

Transcoder is enabled. Depending on your subscription license terms, your account might incur additional charges while the application is active. To stop charges for this application instance, disable Transcoder. To stop all Transcoder-related charges, disable Transcoder in all applications.

* = Required field

Template Directory

Transcoder Options

Match incoming stream name to template name

Fallback Template

2. Under **Transcoder Templates**, click **Copy Template**.

live > Transcoder

Live Single Server or Origin

Transcoder is enabled. Depending on your subscription license terms, your account might incur additional charges while the application is active. To stop charges for this application instance, disable Transcoder. To stop all Transcoder-related charges, disable Transcoder in all applications.

Configure transcoding of live streams.

Status: Enabled

Template Directory

\$\{com.wowza.wms.context.VHostConfigHome\}/transcoder/templates

Transcoder Options

Match incoming stream name to template name

Fallback Template

Transrate (Default)

Transcoder Templates

Name	Actions
Audio Only (Default)	
Transcode (Default)	
Transcode H265 DivX (Default)	
Transrate (Default)	

3. In the **Copy Transcoder Template** dialog box, select **Transcode (Default)**. Name the template (for example, **myStream**.) and then click **OK**.

Copy Transcoder Template X

This will copy all settings from the selected transcoder template to a new template.

Enter a name for the copied transcoder template:

If this template will be used to transcode a specific stream, enter the stream name.

4. Edit the encoding preset options or add new presets for the copied template.

Transcoder Template copied.
















live > Transcoder > myStream
Live Single Server or Origin
[← Return to Transcoder Templates](#)

Encoding Presets Decoding Preset Stream Name Groups

An encoding preset represents one resultant encoded bitrate in the output streams from the Transcoder. An adaptive bitrate stream has multiple presets.

[+ Add Preset](#)

Presets

Enabled	Preset	Stream Name	Actions
<input type="checkbox"/>	720p	mp4:\${SourceStreamName}_720p	  
<input checked="" type="checkbox"/>	360p	mp4:\${SourceStreamName}_360p	  
<input type="checkbox"/>	240p	mp4:\${SourceStreamName}_240p	  
<input checked="" type="checkbox"/>	160p	mp4:\${SourceStreamName}_160p	  
<input type="checkbox"/>	h263	mp4:\${SourceStreamName}_h263	  

This will become the transcoding template for the stream named **myStream**. Other incoming streams to this application can have a template with a corresponding name for transcoding or transrating; otherwise, they will use the **Fallback** template.

For information about playback using transcoded or transrated streams, see [Stream adaptive-bitrate content with Wowza Streaming Engine](#) or [Create and play SMIL files with streams created by Wowza Transcoder](#).

Using passthrough

If your source stream is already encoded with H.264 video and AAC audio and you don't want to make any changes to the stream, then it's not necessary to decode and re-encode the source file for playback. In this case, you should set the **Video Codec** and/or **Audio Codec** setting to **Passthrough** to the output renditions. The video or audio stream is passed through to the output renditions without making any changes. Note that you can pass through the video, the audio, or both.

If the source stream is already encoded with H.264 video and you want to create a different bitrate, profile, resolution, or make any other change, then set the **Video Codec** setting to **H.264**, not **Passthrough**.

The default **Transrate** template has several sample encoding presets where the **Audio Codec** setting is set to **Passthrough** because the source audio is already AAC, a supported playback audio codec for Wowza Streaming Engine software. The **Video Codec** setting is set to **H.264** because other properties are set to customize the resultant stream.

H.263 encoding

Wowza Transcoder supports H.263 encoding for live video streams, enabling users to stream to older devices. To transcode source streams to a rendition that uses the H.263v2 video codec, set the **Video Codec** setting for the rendition to **H.263**.

Note

H.263 output isn't supported when using hardware acceleration. If you set the **Encode Implementation** setting for a preset to one of the accelerated encoding options (**QuickSync** or **NVENC**), the setting is ignored and the default MainConcept encoder is used to generate the H263-encoded video.

Transcoding and audio bitrate

You must configure the **Video Codec** and the **Audio Bitrate** settings when transcoding. If you forget to assign a value for **Audio Bitrate**, a default value is assigned so that the encoding of the resultant stream won't fail.

Using profiles

For adaptive bitrate delivery, you can create new streams to offer the best possible viewing experience given a user's device and bandwidth. For example, you can encode one stream for Android/iPhone 3GS (supports Baseline Profile Level 3.0 and lower), another stream for iPhone 4/iPad 2 (supports Main Profile Level 3.1 profile and lower), and a third stream for desktop or set-top boxes.

Under **Video Settings**, set the **Profile** option to **Baseline** for:

- A mix of mobile devices (Android, iOS devices, or other mobile devices)
- iPhone 3GS and older
- Earlier iPod touch devices

This profile will also work for newer iOS devices such as iPhone 4, iPad 2, and iPod touch (4th generation).

Set the **Profile** option to **Main** for:

- iPhone 4, iPad 2
- Desktop players
- Set-top boxes (Roku, Amino, or other set-top boxes)
- High-end delivery

Note

Wowza Transcoder supports bi-directional frame (B-frame) encoding when **Encode Implementation** is set to **Default** and **Profile** is set to **Main**. B-frame encoding isn't supported when using hardware acceleration. For more information, see [Configure B-frame support with Wowza Transcoder](#).

Performance Tuning

How do I tune Wowza Streaming Engine for transcoding?

It's important that Wowza Streaming Engine and the hardware it runs on are tuned properly so that Wowza Streaming Engine can take best advantage of the available hardware resources. The default tuning of the server is sufficient for application development, but it's not ideal for production use. Without proper tuning, the server under medium or heavy load may run out of resources and stop working properly. This chapter describes performance tuning considerations for Wowza Transcoder.

Template settings for bitrate and resolution

Determining the ideal settings for your configuration is a balancing act based on multiple factors. Increasing the target bitrate will increase the quality. When you make this kind of change, keep in mind that clients must have enough bandwidth available to play the higher bitrate stream. In addition to client bandwidth and how the resultant stream is played—the playback device, content type, and purpose should be considered. For example, security camera settings for streaming a video of a busy street where audio isn't important would be different from settings for streaming an interview where there's little movement but audio quality is critical. Experimentation is usually required to determine the right balance of settings.

Your checklist should include the following items:

- Make sure that your deployed server that's running Wowza Streaming Engine is tuned properly. For more information, see [Tune Wowza Streaming Engine for optimal performance](#).
- Turn off TCP auto-tuning on **Windows 7, Server 2003, and Server 2008**. For more information, see [How to disable Windows Vista TCP/IP auto-tuning](#).
- Determine available server-to-client bandwidth by using our bandwidth checker tool. See [Test server-to-client bandwidth for RTMP clients](#).

Number of transcoder templates

Whether you have multiple encoding presets in one template or multiple templates, performance isn't affected given the same number of incoming live streams and the same number of encoded output renditions.

Hardware

Hardware acceleration is recommended, but not required for transcoding. When Wowza Streaming Engine starts the first time, it checks to see if hardware acceleration resources are available and records the results in Wowza Streaming Engine logs. You can check the log files and then modify transcoder template files to either use a supported hardware acceleration technology or use the default MainConcept encoder if your configuration doesn't include hardware acceleration. For more information, see [Verify which Wowza Transcoder implementation is invoked](#).

Performance benchmarks

As a guideline for estimating transcoding performance for your Transcoder configuration, see [Wowza Transcoder performance benchmark](#). This article presents performance benchmark numbers captured for software (default) encoding, Intel Quick Sync accelerated encoding, and NVIDIA NVENC accelerated encoding. Wowza provides these benchmark numbers only as general guidance. Your results may vary depending on network traffic, source file composition, configuration, overall operating system overhead, and other factors.