



VBrick 7000 Series Application Note

Using an H.264 Encoder
with a Wowza Media Server 2



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Background

This document is a step by step tutorial for acquiring the stream in a variety of ways from a VBrick encoder and delivering it to the Wowza server. It covers instructions for configuring the VBrick encoder and also the Wowza server for each of the methods for stream acquisition.

Acknowledgment

Most of the content for this document is compiled from the Wowza User forums which is a rich source of additional information that may not already be covered here. Charlie Good is a good person to speak with should you have more technical issues than what is defined here. Although most information presented here is available through the Wowza forums, this document should be able to answer most questions related to connecting a VBrick encoder to the Wowza server.

Audience

The document has been written to be used by engineers configuring the Wowza and VBrick devices in administrator mode. Other readers may find the information useful when considering a plan for deploying the joint solution.

Scope

This document is meant as a hands on tutorial to configure two systems so that they may be able to talk to each other. It is limited in scope as to how far it can go and resolve other issues that would normally be part of network infrastructure, point to point connectivity, or firewall configuration. It does address some parameter setting related to jitter tolerance but other issues like, loss of data because of limited bandwidth, or lossy networks are generally considered beyond the scope of this document.

Synopsis

The Wowza media systems server will accept live H264 encoded streams from an encoder and allow re-streaming the feed in multiple ways as a flash encapsulated stream to play onto a flash player, a stream that can be played on an Apple ipod or itouch, or through the MS Silverlight player. At present, the stream cannot be forwarded to and Adobe System Flash server.

The Wowza server does not relay (push) the stream to another server. Another Wowza server could come and get the stream from the original server.

The system has been tested with a demo license of the Wowza Media Server 2 Preview 9.

Not all streams types can be supported with release 2.0.0b of the appliance and requires a later software release. The minimum required revision for each feature is listed to allow the deploying engineer decided if the function is possible with the release they are working with.

The experienced Wowza server user may only need to read information on how to configure the VBrick in each scenario, where as the experienced VBrick encoder user may need to read how to configure the Wowza server. The experienced user in both systems can use this document as a reference when needed.

Although some of the information related to configuring the Wowza server across different modes may be repetitive subtle differences may exist, and as such each section is written to be operated independently.

Demo Mode

The Wowza media server essentially has two modes to view the stream. In demo mode, you bring up the player via a URL on the Wowza, and enter the source URL and enter the player URL and the server will initiate a stream from the source, or tune in, and play it on a window in the PC player page. This allows a single source to be played by a single player.

In non demo mode, the Wowza Mediacaster receives the stream when activated and is the active stream is available via the configured publishing point for client to use. Multiple source streams can exist in the Media caster and can be relayed to multiple clients depending on the software license and the hardware resources on the server. Although most of this document may mention demo the stream through the player/demo URL's, it is meant to used to show compatibility and the same URL used in the player can be used to feed the Wowza Mediacaster.

Operational Stream Modes

VBrick engineering has tested and documented the following stream modes:

RTP (ISMA) Streams from the VBrick Encoder

- Via RTSP – Initiated from the client (Wowza Server), UDP data stream, can be used in a LAN/WAN environment, effectively a pull from Wowza – Minimum Release 2.0b.
- Via RTSP Interleaved – Initiated from the client (Wowza Server), TCP data stream, can be used in a LAN/WAN environment, useful when the client is behind a firewall, effectively a pull from Wowza – Minimum Release 2.0b.
- Via Multicast – Requires generating a SDP file to place in Wowza, UDP Data stream, usually used only in a LAN environment, though it can be used on the I2, effectively a push to Wowza – Minimum Release 2.0b.
- Via Unicast – Requires generating a SDP file to place in Wowza, UDP data stream, can be used in a LAN/Wan environment. May have trouble penetrating firewalls, effectively a push to Wowza – Minimum Release 2.0b.
- Via Announce to Wowza – TCP connect to server to send a UDP stream to Wowza, can be used in a LAN/WAN environment. The destination Wowza server has to be available via TCP, and needs to be able to receive UDP data which can be blocked by firewalls, effectively a push to Wowza – Minimum Release 2.1.0a
- Via Announce Interleaved to Wowza – Similar to Announce above but data stream is also delivered via TCP Data stream, can be used in a LAN/WAN environment, effectively a push to Wowza – Minimum Release 2.1.0a

Transport Streams from the VBrick Encoder

- Multicast TS – Usually used in a LAN environment though could be used on the I2 or proprietary WAN. UDP stream data, does not need any SDP file to be generated for the server. UDP may be blocked by firewall to the server, effectively a push to Wowza – Minimum Release 2.1.0a
- Unicast TS – Usually used in a LAN environment though could be used on the I2 or proprietary WAN. UDP stream data, does not need any SDP file to be generated for the server. UDP may be blocked by firewall to the server. Dedicated stream to the server using the servers IP address or DNS name, effectively a push to Wowza. – Minimum Release 2.1.0a

VBrick implementation of transport stream can be in Constant or Variable mode. Variable Bit Rate mode has controlled burstiness based on whether Variable Low (Highest burst Rate), Variable Medium, or Variable High (Bursts only up to the same rate as Constant mode) is selected. For networks that require a constant stream without any burstiness, constant mode may be more suitable.

IPOD Playability

To play on an IPOD you have to configure the Wowza server to allow streaming to an IPOD by changing the output stream configuration to create the right kind of packets.

The changes require you to add `cupertinostreaming`, and `cupertinostreamingpacketizer` in the `Application.XML` file. See details below.

Silverlight Playability

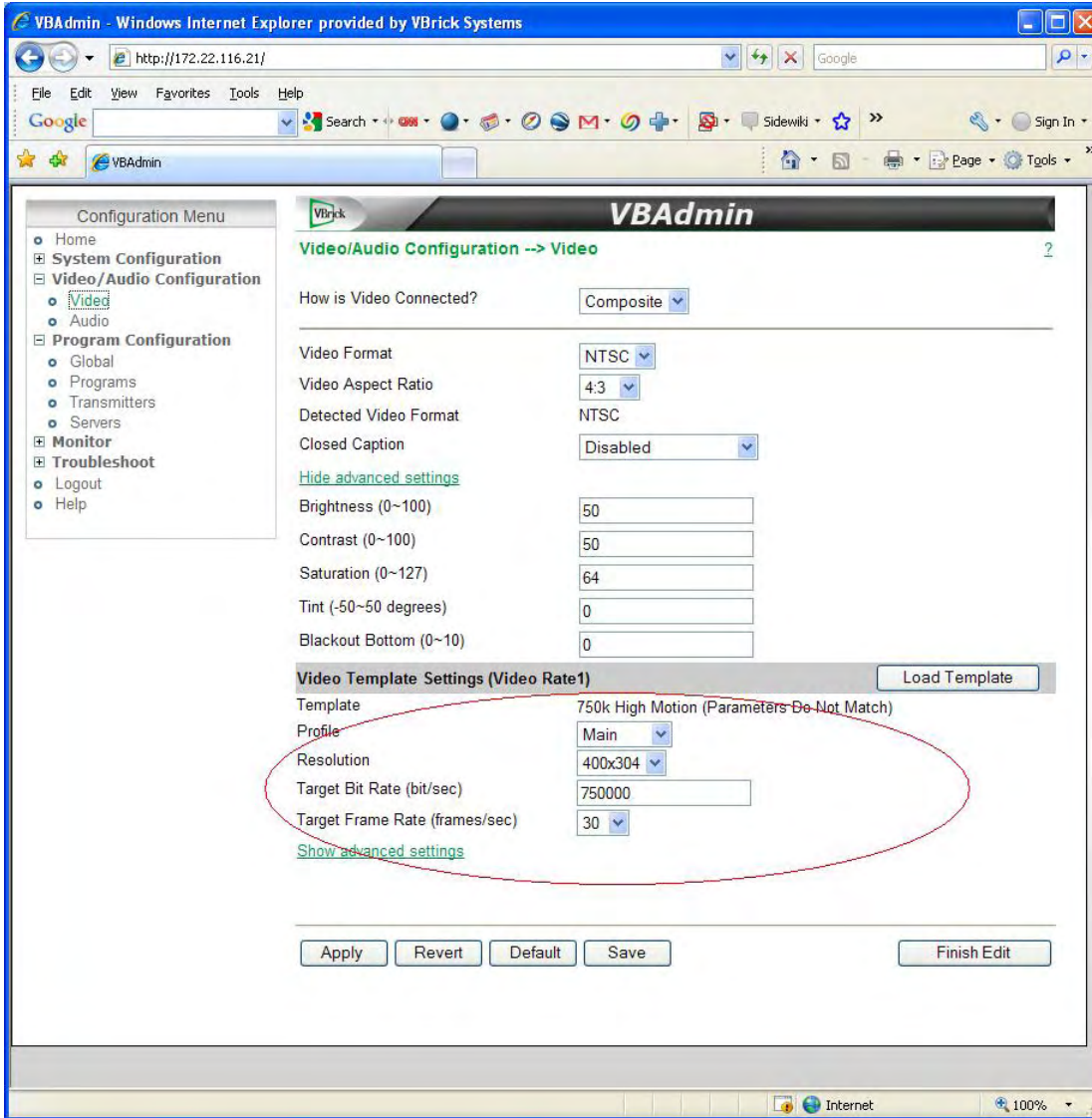
To play in a Silverlight player, you have to configure the Wowza server to allow smooth streaming by modifying the `Application.XML` file configuration to create the right kind of packets. The changes require you to add `smoothstreaming`, and `smoothstreamingpacketizer` in the `Application.XML` file. See details below.

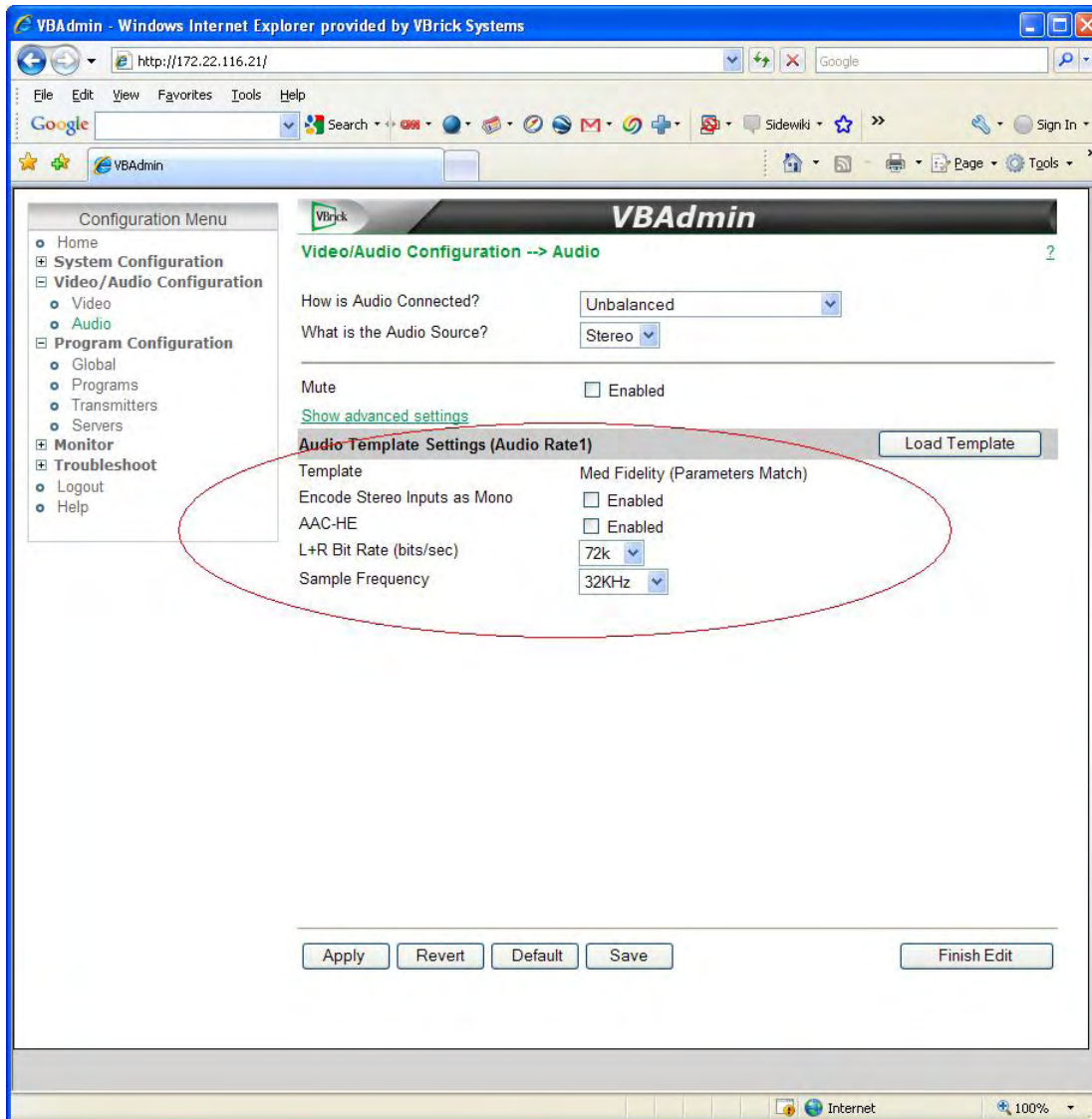
The `Application.XML` file can be modified to include both IPOD and Silverlight playability by adding both to the same `application.xml` file. The URL's will be different for the different players.

VBrick Encoder Configuration

Configure the audio and video settings suitably to be able to stream to the type of clients that are going to be watching. For Internet clients, total rates above 1 Mbps may not be suitable.

You will have to configure the Video and Audio parameters through the VAdmin interface as show below. You will also have to configure the transmitter mode to RTP or transport stream depending on how you are connecting to the Wowza server.





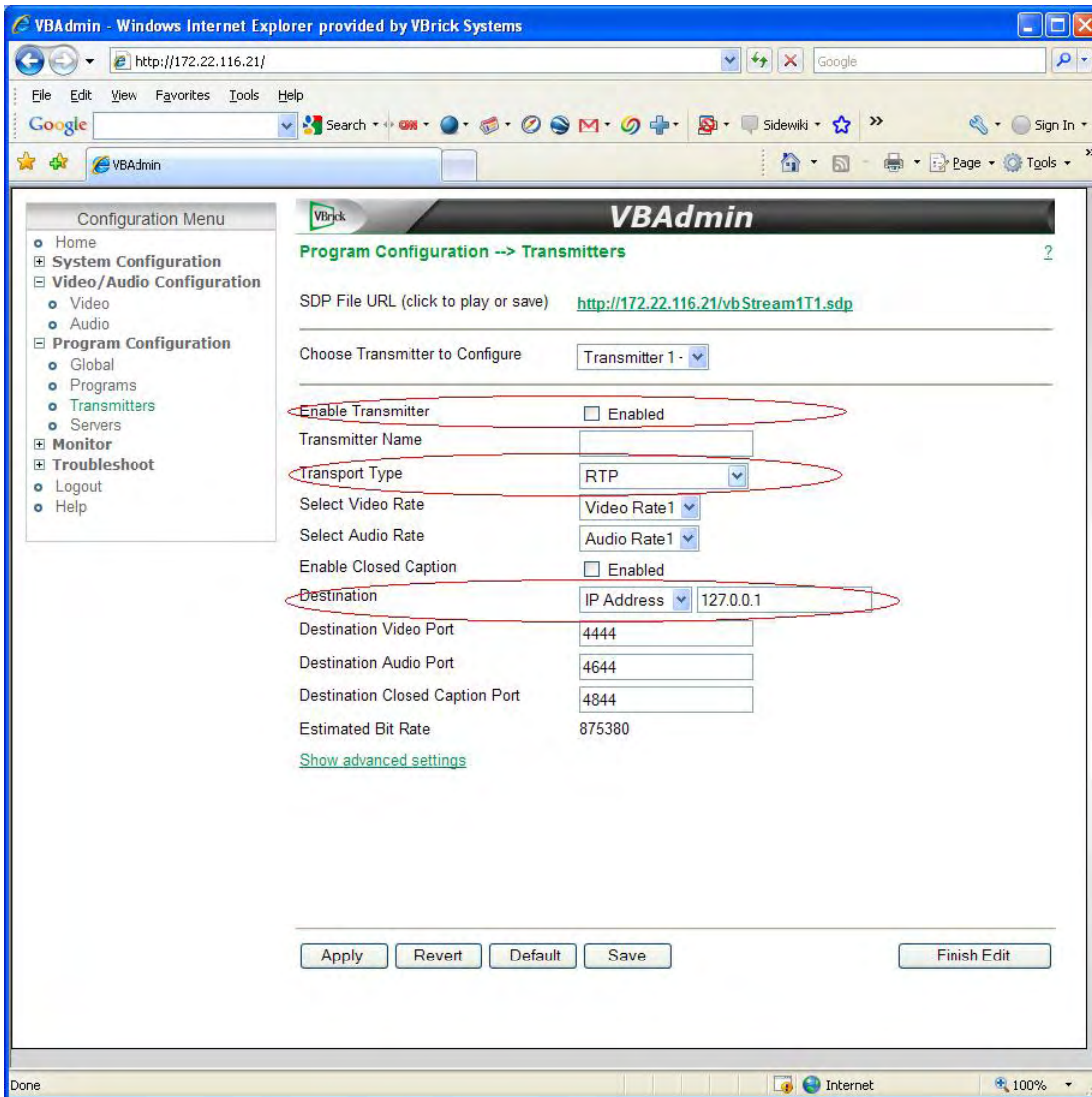
RTP vs. TS

The VBrick Encoder can deliver streams as UDP or TCP encapsulated RTP packets, or UDP encapsulated MPEG 2 TS packets based on the type of transmitter configured. Multiple transmitters can be configured in the encoder to support multiple configurations in the Wowza server. Typically this is done if there is a Wowza server internal and external to the local network that requires RTP Push (Auto Unicast) to the out of network server and TS streaming to the in-network server. Using TS streaming for an out of network server, is possible but not very common. Pushing a stream to the Wowza using Auto Unicast (UDP or TCP) will always be a RTP stream. The built-in VBrick Encoder RTSP server can deliver either RTP or TS streams, and needs to be configured to do one or the other.

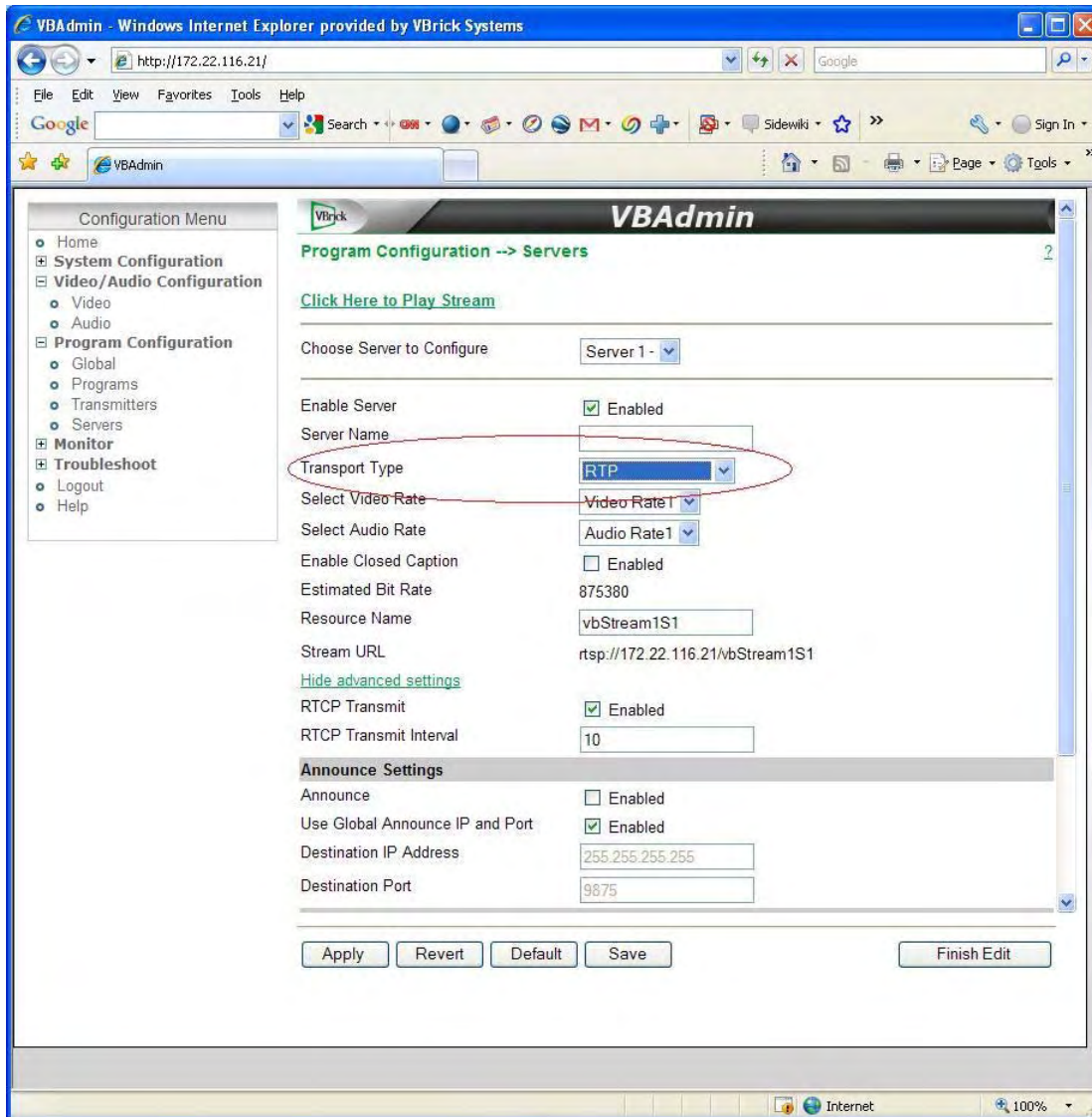
Configuring the Encoder to Deliver RTP Streams

Using VBAAdmin, Configure a transmitter destination, enable it, and select RTP as the Transport Type. If you are using the RTSP server as the source, configure a server (up to 4 servers can be configured) where the Transport Type for the server is also RTP. When using Auto Unicast (TCP or UDP) the delivered packets will always be of RTP type. When configuring a server for RTP streams, you can select either audio, video or both.

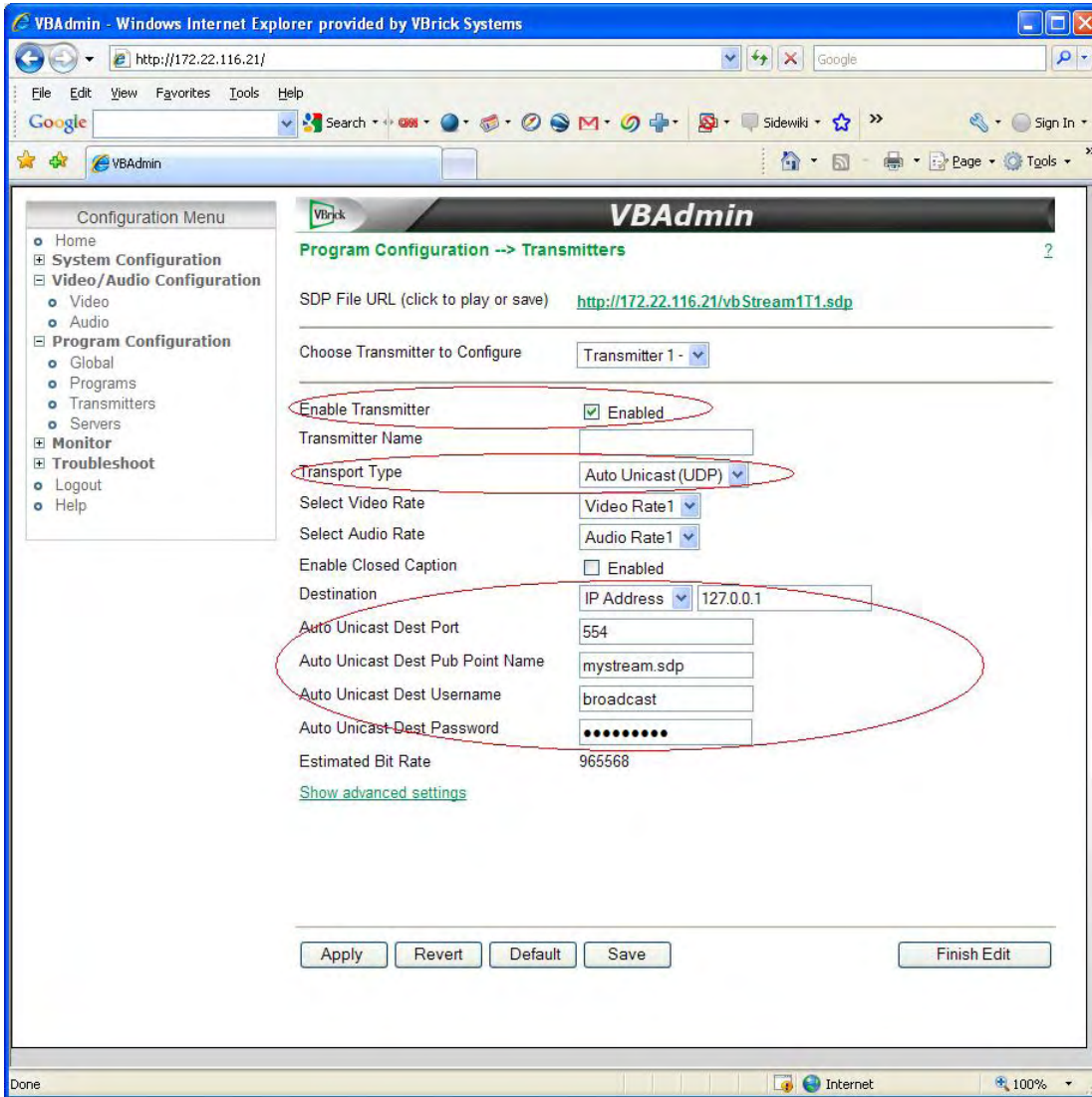
VBrick Appliance Transmitter Configuration for RTP



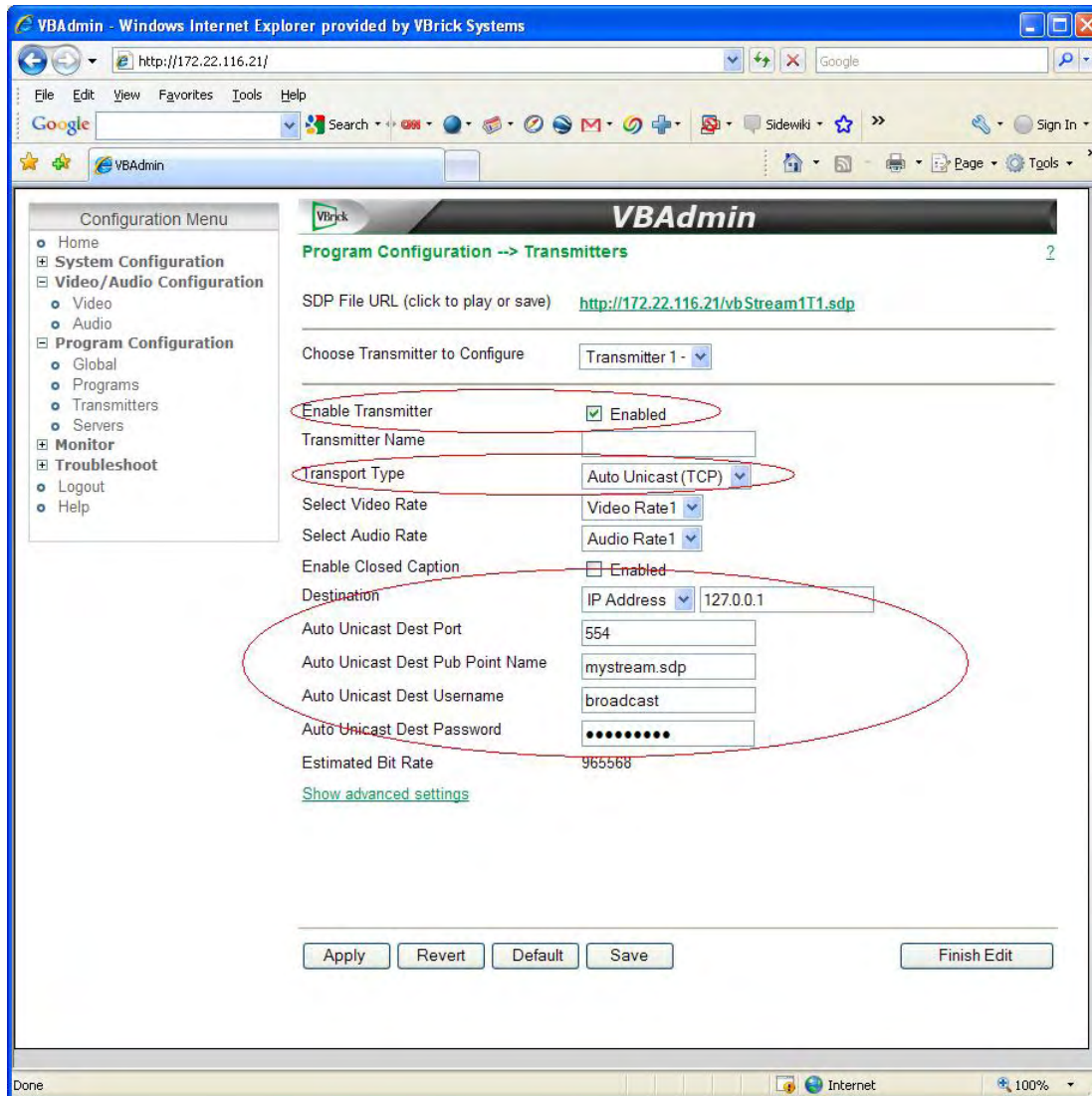
VBrick Appliance Server Configuration for RTP



VBrick Appliance Auto Unicast (RTSP Push) using UDP



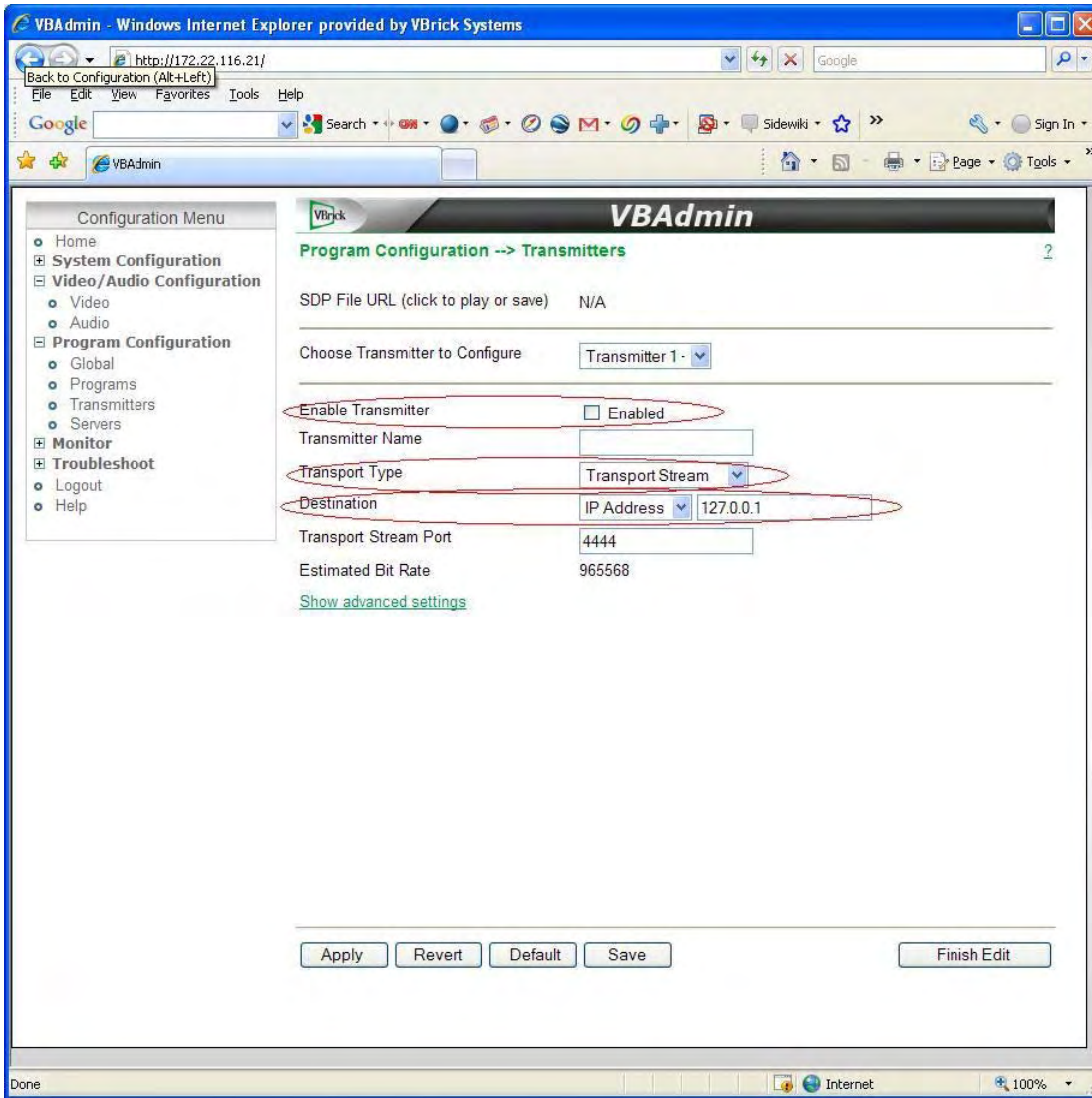
VBrick Appliance Auto Unicast (RTSP Push) using TCP



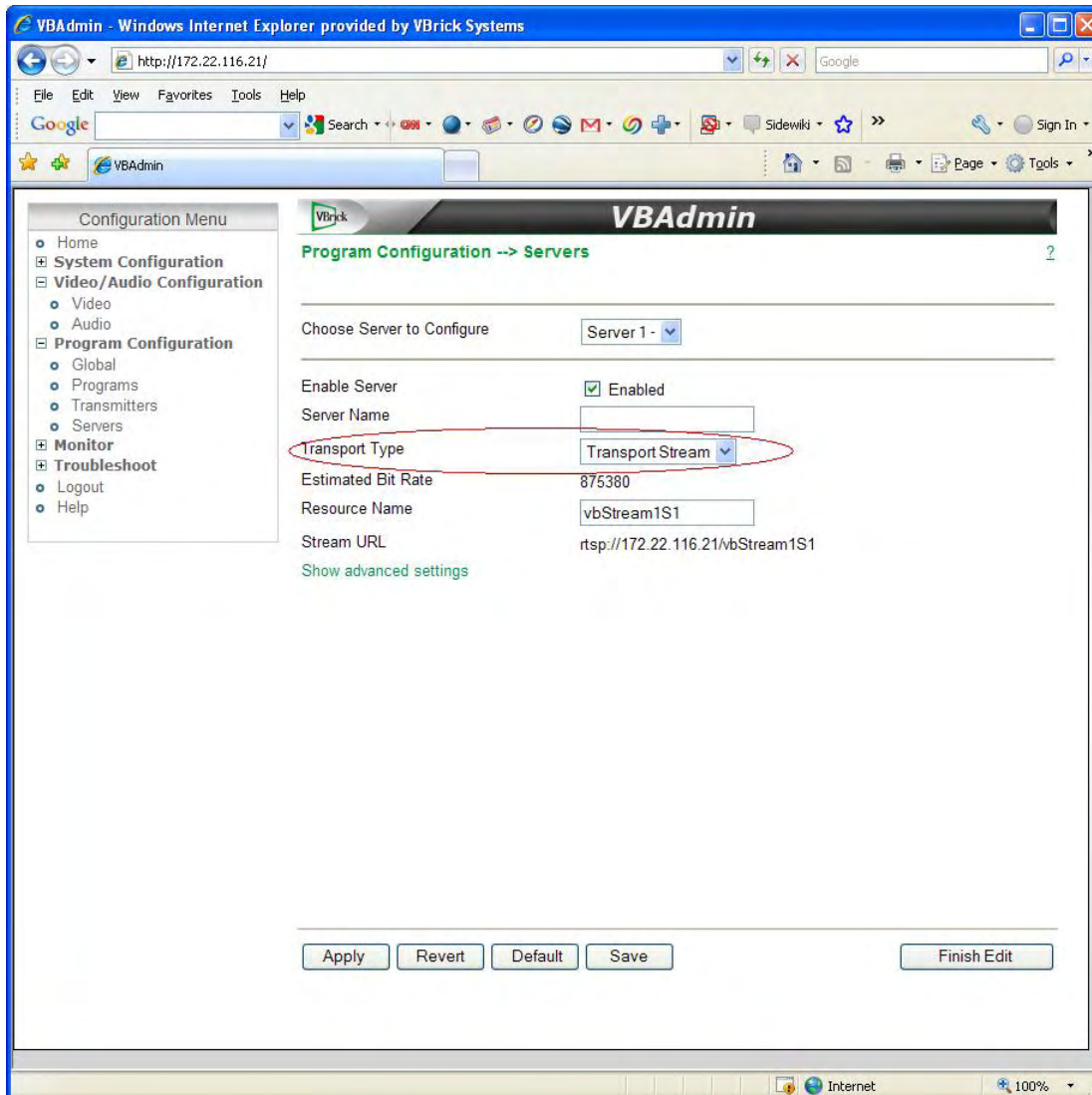
Configuring the Encoder to Deliver MPEG2-TS Streams

Using VBAAdmin, Configure a transmitter destination and select Transport Stream as the Transport Type. If you are using the RTSP server as the source, configure a server (up to 4 servers can be configured) where the Transport Type for the server is also Transport Stream. The RTSP implementation is not common with Wowza servers and not tested. When configuring a server for TS streams, you get a multiplexed stream of audio and video and cannot separate audio and video into separate TS streams.

VBrick Appliance Transmitter Configuration for TS



VBrick Appliance Server Configuration for TS



Multicast Transport Stream

Using an MPEG Transport Stream (MPEG-TS) encoder with Wowza Pro (MPEG-TS)

Step by step instructions for using a MPEG Transport Stream encoder (MPEG-TS) with Wowza Pro (Flash Player version 9.0.115.0 or greater is required).

1. Send an email message to sales@wowzamedia.com to obtain a 30-day evaluation license for **Wowza Media Server 2 for MPEG-TS**
2. Download and install **Wowza Media Server 2** (version: [Wowza Media Server 2 Preview 9](#) or greater) and edit the file `[install-dir]/conf/Server.license` and enter your 30-day evaluation license

3. Create a new Wowza Pro application for streaming (may already exist if examples installed)
 - a. Create the folder **[install-dir]/applications/rtplive**
 - b. Create the folder **[install-dir]/conf/rtplive**
 - c. Copy the file **[install-dir]/conf/Application.xml** into this new folder **[install-dir]/conf/rtplive**
 - d. Edit the newly copied **Application.xml** and make the following changes:
 - Change **Streams/StreamType** to **rtp-live**
 - Add following properties to **Streams/Properties** container (there are several <Properties> containers, be sure to add to correct container)

Code:

```
<Property>
  <Name>sortPackets</Name>
  <Value>>true</Value>
  <Type>Boolean</Type>
</Property>
<Property>
  <Name>sortBufferSize</Name>
  <Value>500</Value>
  <Type>Integer</Type>
</Property>
```

4. Startup the Wowza Pro server
5. Configure the encoder to send the stream to the Wowza Pro server's ip address and a given port number of your choosing (this number is used below as the **[port]** part of the stream name when you play the stream). It is probably best to choose a port number greater than 10000 as to not conflict with regular RTSP/RTP streaming. If the Wowza Pro server is behind a router that uses NAT (network address translation) send it to the routers external ip address and be sure to map the UDP port to the correct internal ip address. Be sure that the time-to-live value on the encoder is high enough so that the stream is able to reach the server running Wowza Pro ([time-to-live explained](#))
6. To play the stream, double click **[install-dir]/examples/LiveVideoStreaming/client/live.html**, set **Server** to **rtmp://[server-ip-address]/rtplive** (where **[server-ip-address]** is the ip address of the server running Wowza Pro) and **Stream** to **udp://0.0.0.0:[port]** (where **[port]** is the UDP port to which you sent the MPEG-TS stream) and click the **Play** button.

[install-dir]

Windows (default): C:\Program Files\Wowza Media Systems\Wowza Media Server 2 [version]

Mac OS X: /Library/WowzaMediaServerPro

Linux: /usr/local/WowzaMediaServerPro

Note: If a stream name of **udp://0.0.0.0:[port]** does not work it might be necessary to use the stream name **udp://[server-ip-address]:[port]** (where

[server-ip-address] is the ip address of the server running Wowza Pro).

Note: Many players will not accept stream names that look like urls. You can use the stream name alias package to create an alias for the stream name url. This package can also be used to secure Wowza Pro so that it will only be able to restream urls that you specify. This package can be downloaded from here: [StreamNameAlias](#).

Note: If you experience problems getting either the audio or video to play through Flash, double check the version number of the Flash player (Flash player version **9.0.115.0** or above is required). If you still have problems, turn on Wowza Pro debug logging (edit **[install-dir]/conf/log4j.properties** and change the **log4j.rootCategory** on the first line from **INFO** to **DEBUG**), try the encoder several more times, zip up and send your **[install-dir]/logs** folder along with screen shots of the encoder setup screens and the **LiveVideoStreaming** player screen and send a detailed description of your problem to support@wowzamedia.com.

Unicast TS

RTSP RTP UDP

Step by step instructions for Re-streaming and RTSP stream through Wowza Pro.

1. Download and install **Wowza Media Server 2** (version: [Wowza Media Server 2 Preview 9](#) or greater is required)
2. Download and install the most recent patch to get RTSP/RTP interleaving feature: <http://www.wowzamedia.com/devbuild.html>
3. Create a new Wowza Pro application for streaming (may already exist if examples installed)
 - a. Create the folder **[install-dir]/applications/rtplive**
 - b. Create the folder **[install-dir]/conf/rtplive**
 - c. Copy the file **[install-dir]/conf/Application.xml** into this new folder **[install-dir]/conf/rtplive**
 - d. Edit the newly copied **Application.xml** and make the following changes:
 - Change **Streams/StreamType** to **rtp-live**
 - Add following properties to **Streams/Properties** container (there are several <Properties> containers, be sure to add to correct container)

Code:

```
<Property>
  <Name>sortPackets</Name>
  <Value>true</Value>
  <Type>Boolean</Type>
</Property>
<Property>
  <Name>sortBufferSize</Name>
  <Value>500</Value>
  <Type>Integer</Type>
```



```
</Property>
```

4. Startup the Wowza Pro server
5. To play the stream, double click **[install-dir]/examples/LiveVideoStreaming/client/live.html** enter the following information and click the **Play** button:

Code:

```
Server to rtmp://[server-ip-address]/rtplive
Stream to rtsp://[encoder-ip-address] (Example:
rtsp://192.168.1.8:554)
```

Where **[server-ip-address]** is the ip address of the server running Wowza Pro and **[encoder-ip-address]** is the ip address of the RTSP device.

Note: Some cameras do not support RTSP/RTP interleaving (sending the RTP packet data over the RTSP TCP connection) If this is the case then set the **forceInterleaved** property above to **false**, restart Wowza Media Server and try to play the stream.

Note: Some cameras do not send RTCP packets. If you see the warning log message:
Quote:

```
Waiting for RTCP packet. See docs for (Application.xml: RTP/AVSyncMethod and RTP/MaxRTCPWaitTime).
```

Edit **[install-dir]/rtplive/Application.xml** and change the **RTP/AVSyncMethod** to **systemclock**.

Note: By default Wowza Pro streams using UDP on ports 6970 - 9999 and TCP port 554. This can be a problem if you are streaming to a Wowza Pro server or VBrick that is behind a firewall on which these ports are blocked. To resolve this issue, you need to open up the UDP port range 6970 - 9999 and TCP port 554 on any firewalls between the VBrick encoder and Wowza Pro. You may also need to adjust the **[VBrick-ip-address]** if the VBrick is behind a router that has provided a NAT address for the device.

Note: Many players will not accept stream names that look like urls. You can use the stream name alias package to create an alias for the stream name url. This package can also be used to secure Wowza Pro so that it will only be able to restream urls that you specify. This package can be downloaded from here: [StreamNameAlias](#).

Note: If you experience problems getting either the audio or video to play through Flash, double check the version number of the Flash player (Flash player version **9.0.115.0** or above is required). If you still have problems, turn on Wowza Pro debug logging (edit **[install-dir]/conf/log4j.properties** and change the **log4j.rootCategory** on the first line from **INFO** to **DEBUG**), try the encoder several

more times, zip up and send your **[install-dir]/logs** folder along with screen shots of the encoder setup screens and the **LiveVideoStreaming** player screen and send a detailed description of your problem to support@wowzamedia.com.

RTSP RTP Interleaved

Step by step instructions for Re-streaming and RTSP (Interleaved) stream through Wowza Pro. Note the forceInterleaved property to be added to the Mediacaster/Properties.

1. Download and install **Wowza Media Server 2** (version: [Wowza Media Server 2 Preview 9](#) or greater is required)
2. Download and install the most recent patch to get RTSP/RTP interleaving feature: <http://www.wowzamedia.com/devbuild.html>
3. Create a new Wowza Pro application for streaming (may already exist if examples installed)
 - a. Create the folder **[install-dir]/applications/rtplive**
 - b. Create the folder **[install-dir]/conf/rtplive**
 - c. Copy the file **[install-dir]/conf/Application.xml** into this new folder **[install-dir]/conf/rtplive**
 - d. Edit the newly copied **Application.xml** and make the following changes:
 - Change **Streams/StreamType** to **rtp-live**
 - Add following properties to **Streams/Properties** container (there are several <Properties> containers, be sure to add to correct container)

Code:

```
<Property>
  <Name>sortPackets</Name>
  <Value>>true</Value>
  <Type>Boolean</Type>
</Property>
<Property>
  <Name>sortBufferSize</Name>
  <Value>500</Value>
  <Type>Integer</Type>
</Property>
```

- Add following properties to **MediaCaster/Properties** container (there are several <Properties> containers, be sure to add to correct container)

Code:

```
<Property>
  <Name>forceInterleaved</Name>
  <Value>>true</Value>
  <Type>Boolean</Type>
```

```
</Property>
```

4. Startup the Wowza Pro server
5. To play the stream, double click **[install-dir]/examples/LiveVideoStreaming/client/live.html** enter the following information and click the **Play** button:

Code:

```
Server to rtmp://[server-ip-address]/rtplive
Stream to rtsp://[encoder-ip-address] (Example:
rtsp://192.168.1.8:554)
```

Where **[server-ip-address]** is the ip address of the server running Wowza Pro and **[encoder-ip-address]** is the ip address of the RTSP device.

Note: Some cameras do not support RTSP/RTP interleaving (sending the RTP packet data over the RTSP TCP connection) If this is the case then set the **forceInterleaved** property above to **false**, restart Wowza Media Server and try to play the stream.

Note: Some cameras do not send RTCP packets. If you see the warning log message:
Quote:

```
Waiting for RTCP packet. See docs for (Application.xml: RTP/AVSyncMethod and RTP/MaxRTCPWaitTime).
```

Edit **[install-dir]/rtplive/Application.xml** and change the **RTP/AVSyncMethod** to **systemclock**.

Note: By default Wowza Pro streams using UDP on ports 6970 - 9999 and TCP port 554. This can be a problem if you are streaming to a Wowza Pro server or VBrick that is behind a firewall on which these ports are blocked. To resolve this issue, you need to open up the UDP port range 6970 - 9999 and TCP port 554 on any firewalls between the VBrick encoder and Wowza Pro. You may also need to adjust the **[VBrick-ip-address]** if the VBrick is behind a router that has provided a NAT address for the device.

Note: Many players will not accept stream names that look like urls. You can use the stream name alias package to create an alias for the stream name url. This package can also be used to secure Wowza Pro so that it will only be able to restream urls that you specify. This package can be downloaded from here: [StreamNameAlias](#).

Note: If you experience problems getting either the audio or video to play through Flash, double check the version number of the Flash player (Flash player version **9.0.115.0** or above is required). If you still have problems, turn on Wowza Pro debug logging (edit **[install-dir]/conf/log4j.properties** and change the

log4j.rootCategory on the first line from **INFO** to **DEBUG**), try the encoder several more times, zip up and send your **[install-dir]/logs** folder along with screen shots of the encoder setup screens and the **LiveVideoStreaming** player screen and send a detailed description of your problem to support@wowzamedia.com.

Multicast RTP UDP

This requires adding a SDP file into the Wowza server. Generate the SDP file from the VAdmin interface and place the generated SDP file into the appropriate directory. The multicast group is joined by the Wowza server and re-streamed via various methods. It is up to the sender to make sure the Multicast IP and port are indeed unique for this stream.

Step by step instructions for using a native RTP encoder (an encoder without RTSP announce capabilities) with Wowza Pro (Flash Player version 9.0.115.0 or greater is required).

1. Download and install **Wowza Media Server 2** (version: [Wowza Media Server 2 Preview 9](#) or greater is required)
2. Create a new Wowza Pro application for streaming (may already exist if examples installed)
 - a. Create the folder **[install-dir]/applications/rtplive**
 - b. Create the folder **[install-dir]/conf/rtplive**
 - c. Copy the file **[install-dir]/conf/Application.xml** into this new folder **[install-dir]/conf/rtplive**
 - d. Edit the newly copied **Application.xml** and make the following changes:
 - Change **Streams/StreamType** to **rtp-live**
 - Add following properties to **Streams/Properties** container (there are several <Properties> containers, be sure to add to correct container)

Code:

```
<Property>
  <Name>sortPackets</Name>
  <Value>>true</Value>
  <Type>Boolean</Type>
</Property>
<Property>
  <Name>sortBufferSize</Name>
  <Value>500</Value>
  <Type>Integer</Type>
</Property>
```

3. Startup the Wowza Pro server
4. From the VBrick encoder generate a **Session Description Protocol (SDP)** file by logging in and going to the Encoder go to Program Configurations and click on the SDP file (e.g. <http://172.22.116.21/vbStream1T1.sdp>) link to generate a file, rename it as the filename **myStream.sdp**.
5. Copy the SDP file into the **[install-dir]/content** folder

6. To play the stream, double click **[install-dir]/examples/LiveVideoStreaming/client/live.html**, set **Server** to **rtmp://[server-ip-address]/rtplive** and **Stream** to **myStream.sdp** and click the **Play** button

[install-dir]

Windows (default): C:\Program Files\Wowza Media Systems\Wowza Media Server Pro [version]

Mac OS X: /Library/WowzaMediaServerPro

Linux: /usr/local/WowzaMediaServerPro

Note: The Session Description Protocol (SDP) information can also be made available to Wowza Pro through a URL. Using this method the stream name is **rtplive:[SDP URL]**. For example if the SDP information is hosted at the web address:

Code:

```
http://192.168.1.7/rtp/myStream.sdp
```

Use the stream name:

Code:

```
rtplive:http://192.168.1.7/rtp/myStream.sdp
```

Note: Many players will not accept stream names that look like urls. You can use the stream name alias package to create an alias for the stream name url. This package can also be used to secure Wowza Pro so that it will only be able to restream urls that you specify. This package can be downloaded from here: [StreamNameAlias](#).

Note: The Wowza server will tune into the multicast IP and ports. Be sure that the time-to-live value on the encoder is high enough so that the stream is able to reach the server running Wowza Pro ([time-to-live explained](#))

Note: If you experience problems getting either the audio or video to play through Flash, double check the version number of the Flash player (Flash player version **9.0.115.0** or above is required). If you still have problems, turn on Wowza Pro debug logging (edit **[install-dir]/conf/log4j.properties** and change the **log4j.rootCategory** on the first line from **INFO** to **DEBUG**), try the encoder several more times, zip up and send your **[install-dir]/logs** folder along with screen shots of the encoder setup screens and the **LiveVideoStreaming** player screen and send a detailed description of your problem to support@wowzamedia.com.

Unicast RTP UDP

This also requires adding a SDP file into the Wowza server. Generate the SDP file from the VBAAdmin interface and place the generated SDP file into the appropriate directory. The unicast stream will be 'tuned into' by the Wowza server opening the ports as specified in the SDP. It is up to the sender to make sure the unique ports are used for all SDP streams.

Step by step instructions for using a native RTP encoder (an encoder without RTSP announce capabilities) with Wowza Pro (Flash Player version 9.0.115.0 or greater is required).

1. Download and install **Wowza Media Server 2** (version: [Wowza Media Server 2 Preview 9](#) or greater is required)
2. Create a new Wowza Pro application for streaming (may already exist if examples installed)
 - a. Create the folder **[install-dir]/applications/rtplive**
 - b. Create the folder **[install-dir]/conf/rtplive**
 - c. Copy the file **[install-dir]/conf/Application.xml** into this new folder **[install-dir]/conf/rtplive**
 - d. Edit the newly copied **Application.xml** and make the following changes:
 - Change **Streams/StreamType** to **rtp-live**
 - Add following properties to **Streams/Properties** container (there are several <Properties> containers, be sure to add to correct container)

Code:

```
<Property>
  <Name>sortPackets</Name>
  <Value>>true</Value>
  <Type>Boolean</Type>
</Property>
<Property>
  <Name>sortBufferSize</Name>
  <Value>500</Value>
  <Type>Integer</Type>
</Property>
```

3. Startup the Wowza Pro server
4. From the VBrick encoder generate a **Session Description Protocol (SDP)** file by logging in and going to the Encoder go to Program Configurations and click on the SDP file (e.g. <http://172.22.116.21/vbStream1T1.sdp>) link to generate a file, rename it as the filename **myStream.sdp**.
5. Copy the SDP file into the **[install-dir]/content** folder
6. To play the stream, double click **[install-dir]/examples/LiveVideoStreaming/client/live.html**, set **Server** to **rtmp://[server-ip-address]/rtplive** and **Stream** to **myStream.sdp** and click the **Play** button

[install-dir]

Windows (default): C:\Program Files\Wowza Media Systems\Wowza Media Server Pro [version]

Mac OS X: /Library/WowzaMediaServerPro

Linux: /usr/local/WowzaMediaServerPro

Note: The Session Description Protocol (SDP) information can also be made available

to Wowza Pro through a URL. Using this method the stream name is **rtplive:[SDP URL]**. For example if the SDP information is hosted at the web address:

Code:

```
http://192.168.1.7/rtp/myStream.sdp
```

Use the stream name:

Code:

```
rtplive:http://192.168.1.7/rtp/myStream.sdp
```

Note: Many players will not accept stream names that look like urls. You can use the stream name alias package to create an alias for the stream name url. This package can also be used to secure Wowza Pro so that it will only be able to restream urls that you specify. This package can be downloaded from here: [StreamNameAlias](#).

Note: Configure the encoder to send the stream to the Wowza Pro server's ip address. If the Wowza Pro server is behind a router that uses NAT (network address translation) send it to the routers external ip address and be sure to map the UDP port to the correct internal ip address. Be sure that the time-to-live value on the encoder is high enough so that the stream is able to reach the server running Wowza Pro ([time-to-live explained](#))

Note: If you experience problems getting either the audio or video to play through Flash, double check the version number of the Flash player (Flash player version **9.0.115.0** or above is required). If you still have problems, turn on Wowza Pro debug logging (edit **[install-dir]/conf/log4j.properties** and change the **log4j.rootCategory** on the first line from **INFO** to **DEBUG**), try the encoder several more times, zip up and send your **[install-dir]/logs** folder along with screen shots of the encoder setup screens and the **LiveVideoStreaming** player screen and send a detailed description of your problem to support@wowzamedia.com.

Announce RTP UDP

1. Download and install **Wowza Media Server 2** (version: [Wowza Media Server 2 Preview 9](#) or greater is required)
2. Create a new Wowza Pro application for streaming (may already exist if examples installed)
 - a. Create the folder **[install-dir]/applications/live**
 - b. Create the folder **[install-dir]/conf/live**
 - c. Copy the file **[install-dir]/conf/Application.xml** into this new folder **[install-dir]/conf/live**
 - d. Edit the newly copied **Application.xml** and make following edits:
 - Change **Streams/StreamType** to **live**
 - Add following properties to **Streams/Properties** container (there are several <Properties> containers, be sure to add to correct container)

Code:

```
<Property>
  <Name>sortPackets</Name>
  <Value>>true</Value>
```

```

    <Type>Boolean</Type>
  </Property>
  <Property>
    <Name>sortBufferSize</Name>
    <Value>750</Value>
    <Type>Integer</Type>
  </Property>

```

- e. Edit the file **[install-dir]/conf/rtp.password** (or **[install-dir]/conf/publish.password** if Wowza Media Server 2) and add a username and password

*Here is an example of the password file with the username **charlie** and password **changeme***

Code:

```

# RTP password file (format [username][space][password])
#username password
charlie changeme

```

- f. Startup the Wowza Pro server
3. Follow steps for “VBrick Appliance Auto Unicast (RTSP Push) using UDP” to configure the VBrick encoder to send an ANNOUNCE stream.
 4. Select the **Transmitter** tab and make the following changes:
 - a. Change the **Transport Type** dropdown to **Automatic Unicast (UDP)**
 - b. Change destination to IP Address **[server-ip-address]** and select destination port to be **1935** (where [server-ip-address] is the ip address of the server running Wowza Pro). This number may not allways be 1935 for all Wowza installations. Check your installation for the Announce receive port.
 - c. Change **Pub point name** to **live/myStream.sdp** (the format of this field as it relates to Wowza Pro is [application]/[application-instance]/[stream] if [application-instance] is omitted it defaults to _definst_)
 - d. Enter the **Username** and **Password** added to the **conf/rtp.password** file above to the appropriate fields
 5. To broadcast to Wowza Pro, click the **Broadcast** button
 6. To play the stream, double click the **LiveVideoStreaming** (previously **On2 Flix Live**) example player ([install-dir]/LiveVideoStreaming/client/live.html), enter the following values and click **Play**:

Code:

```

Server: rtmp://[server-ip-address]/live
Stream: myStream.sdp

where [server-ip-address] is the ip address of the server
running Wowza Pro

```

[install-dir]

Windows (default): C:\Program Files\Wowza Media Systems\Wowza Media Server

Pro [version]

Mac OS X: /Library/WowzaMediaServerPro

Linux: /usr/local/WowzaMediaServerPro

Note: The default frame rate and key frame rate are quite low which will cause slow startup times increase. A frame rate of greater than 15 and a key frame rate of two times the frame rate will produce much better looking video.

Note: By default UDP streams are using UDP on ports 6970 - 9999. This can be a problem if you are streaming to a Wowza Pro server that is behind a firewall on which these ports are blocked. To resolve this issue, you can either open up the UDP port range 6970 - 9999 on your firewall.

Note: If you experience problems getting either the audio or video to play through Flash, double check the version number of the Flash player (Flash player version **9.0.115.0** or above is required). If you still have problems, turn on Wowza Pro debug logging (edit **[install-dir]/conf/log4j.properties** and change the **log4j.rootCategory** on the first line from **INFO** to **DEBUG**), try the encoder several more times, zip up and send your **[install-dir]/logs** folder along with screen shots of the encoder setup screens and the **LiveVideoStreaming** player screen and send a detailed description of your problem to support@wowzamedia.com.

Announce RTP Interleaved

1. Download and install **Wowza Media Server Pro** (version: [Wowza Pro 1.7.0](#) or greater)
2. Create a new Wowza Pro application for streaming (may already exist if examples installed)
 - a. Create the folder **[install-dir]/applications/live**
 - b. Create the folder **[install-dir]/conf/live**
 - c. Copy the file **[install-dir]/conf/Application.xml** into this new folder **[install-dir]/conf/live**
 - d. Edit the newly copied **Application.xml** and make following edits:
 - Change **Streams/StreamType** to **live**
 - Add following properties to **Streams/Properties** container (there are several <Properties> containers, be sure to add to correct container)

Code:

```
<Property>
  <Name>sortPackets</Name>
  <Value>>true</Value>
  <Type>Boolean</Type>
</Property>
<Property>
  <Name>sortBufferSize</Name>
  <Value>750</Value>
  <Type>Integer</Type>
</Property>
```

- e. Edit the file **[install-dir]/conf/rtp.password** (or **[install-dir]/conf/publish.password** if Wowza Media Server 2) and add a username and password

*Here is an example of the password file with the username **charlie** and password **changeme***

Code:

```
# RTP password file (format [username][space][password])
#username password
charlie changeme
```

- f. Startup the Wowza Pro server
3. Follow steps for “VBrick Appliance Auto Unicast (RTSP Push) using TCP” to configure the VBrick encoder to send an ANNOUNCE stream.
4. Select the **Transmitter** tab and make the following changes:
 - a. Change the **Transmission** dropdown to **Automatic Unicast (TCP)**
 - b. Change destination to IP Address **[server-ip-address]** and select destination port to be **1935** (where [server-ip-address] is the ip address of the server running Wowza Pro). This number may not allways be 1935 for all Wowza installations. Check your installation for the Announce receive port.
 - c. Change **Pub point name** to **live/myStream.sdp** (the format of this field as it relates to Wowza Pro is [application]/[application-instance]/[stream] if [application-instance] is omitted it defaults to _definst_)
 - d. Enter the **Username** and **Password** added to the **conf/rtp.password** file above to the appropriate fields
5. To broadcast to Wowza Pro, click the **Broadcast** button
6. To play the stream, double click the **LiveVideoStreaming** (previously **On2 Flix Live**) example player ([install-dir]/LiveVideoStreaming/client/live.html), enter the following values and click **Play**:

Code:

```
Server: rtmp://[server-ip-address]/live
Stream: myStream.sdp

where [server-ip-address] is the ip address of the server
running Wowza Pro
```

[install-dir]

Windows (default): C:\Program Files\Wowza Media Systems\Wowza Media Server Pro [version]

Mac OS X: /Library/WowzaMediaServerPro

Linux: /usr/local/WowzaMediaServerPro

Note: *The default frame rate and key frame rate are quite low which will cause slow startup times increase. A frame rate of greater than 15 and a key frame rate of two times the frame rate will produce much better looking video.*

Note: You are sending the stream to port 1935 which should be default port open in the Wowza to accept a stream.

Note: If you experience problems getting either the audio or video to play through Flash, double check the version number of the Flash player (Flash player version **9.0.115.0** or above is required). If you still have problems, turn on Wowza Pro debug logging (edit `[install-dir]/conf/log4j.properties` and change the `log4j.rootCategory` on the first line from **INFO** to **DEBUG**), try the encoder several more times, zip up and send your `[install-dir]/logs` folder along with screen shots of the encoder setup screens and the **LiveVideoStreaming** player screen and send a detailed description of your problem to support@wowzamedia.com.

Interfacing to Wowza on Amazon EC2

The document below is an explanation on how to configure and instance and manage a stream on the Amazon EC2. This document assumes you have signed up for Amazon EC2 and have installed the EC2 command line tools or installed and configured Elasticfox. You can obtain more information about Amazon EC2 and download the command line tools and documentation by going to:

<http://www.amazon.com/ec2>

Elasticfox is a developer tool that allows you to manage your Amazon EC2 account by using it as a Firefox plug-in. Many users will find Elasticfox easier than the command line tools to manage EC2 and the Wowza AMIs. This document will describe how to manage instances from both the command line as well as by using Elasticfox. If you intend to follow the directions for Elasticfox this document assumes that you have both Mozilla Firefox and Elasticfox installed on your computer.

Please refer to the following document from Wowza:

http://www.wowzamedia.com/resources/WowzaProForAmazonEC2_UsersGuide.pdf

Latency

To achieve the lowest possible latency from video capture to playback it is best to follow these steps to setup an application for streaming:

1. Download and install **Wowza Media Server 2** (version: [Wowza Media Server 2 Preview 9](#) or greater is required)
2. Create a new Wowza Pro application for streaming
 - a. Create the folder `[install-dir]/applications/live`
 - b. Create the folder `[install-dir]/conf/live`
 - c. Copy the file `[install-dir]/conf/Application.xml` into this new folder `[install-dir]/conf/live`
 - d. Edit the newly copied **Application.xml** and and change **Streams/StreamType** to **live-lowlatency**

Note: Although zero will give you the best possible latency it might not give you the smoothest playback. So you may need to increase the buffer time to a value slightly greater than zero such as **.1** or **.25**. When using **H.264** encoded video we have found that any buffer setting greater than zero will introduce a latency of at least 2-3 seconds with 30 fps video (and even higher at lower frame rates). This seems to be a player issue.

When running with a `NetStream.setBufferTime` set to zero you can often see lower frame rates due to the way the player renders the frames immediately. You can sometimes smooth playback by decreasing **flushInterval** property. You can do this by editing `[install-dir]/conf/[application]/Application.xml` and adding the following property to the **Streams/Properties** container (be sure to get the correct container, there are several in the `Application.xml` file):

Code:

```
<Property>
  <Name>flushInterval</Name>
  <Value>25</Value>
  <Type>Integer</Type>
</Property>
```

With this setting in place the servers per-stream cpu load will increase. So you will not be able to handle as many concurrent sessions per server.

The other place that latency is introduced into the process is on the encoding side. We have found that you can achieve very low latency encoding using the Flash player's built in encoding (Microphone and Camera). To achieve low latency it is important that you configure your encoding to produce a reasonable quality at the lowest possible bitrate. The **VideoChat** example that ships with Wowza Media Server 2 is a good example of how to use the built in Flash encoder to produce a low latency stream.

Configuring Jitter Buffer

To turn on an RTP jitter buffer and to log packet loss add the following properties to the **RTP/Properties** section of `[install-dir]/conf/[application]/Application.xml`

Code:

```
<Property>
  <Name>rtpDePacketizerWrapper</Name>
  <Value>com.wowza.wms.rtp.depaketizer.RTPDePacketizerWrapperPacketSorter</Value>
</Property>
<Property>
  <Name>rtpDePacketizerPacketSorterBufferTime</Name>
  <Value>500</Value>
  <Type>Integer</Type>
</Property>
<Property>
  <Name>rtpDePacketizerPacketSorterFlushTime</Name>
  <Value>10</Value>
```

```

        <Type>Integer</Type>
</Property>
<Property>
    <Name>rtpDePacketizerPacketSorterLogPacketLoss</Name>
    <Value>>true</Value>
    <Type>Boolean</Type>
</Property>

```

- **rtpDePacketizerPacketSorterBufferTime:** Size in milliseconds of the jitter buffer. This time will add to the overall latency of the live stream.
- **rtpDePacketizerPacketSorterFlushTime:** Time in milliseconds the buffer will be flushed.
- **rtpDePacketizerPacketSorterLogPacketLoss:** Set to **true** if you want packet loss to be logged to the Wowza Pro log file.

Flash Players, iPhone/Ipod Touch, and Silverlight Playability

Below are the steps to set up an application named **rtplive** to stream live content to the Adobe Flash player, the Microsoft Silverlight player, the Apple iPhone or iPod touch and RTSP/RTP based players. This tutorial provides the basic steps for using a live encoder that publishes a stream using the Real-time Transport Protocol (native RTP) with Session Description Protocol (SDP) files.

1. Create application folder [install-dir]/applications/rtplive
2. Create configuration folder [install-dir]/conf/rtplive and copy [install-dir]/conf/Application.xml into this new folder
3. Edit the newly copied Application.xml file and make the following changes (some of these settings may already be present):
 - a. Set the **Streams/StreamType** property to: **live**
 - b. Set the **HTTPStreamers** property to: **cupertinostreaming,smoothstreaming**
 - c. Set the **LiveStreamPacketizers** property to: **cupertinostreamingpacketizer,smoothstreamingpacketizer**
 - d. Set the **RTP/Authentication/PlayMethod** to: **none**
4. *Smooth Streaming only:* Using a text editor create the file **[install-dir]/conf/clientaccesspolicy.xml** with the following content (For more information see the article [Network Security Access Restrictions in Silverlight](#)):

Code:

```

<?xml version="1.0" encoding="utf-8"?>
<access-policy>
  <cross-domain-access>
    <policy>
      <allow-from http-request-headers="*">
        <domain uri="*" />
      </allow-from>
    </policy>
  </cross-domain-access>
</access-policy>

```

```
</allow-from>
<grant-to>
  <resource path="/" include-subpaths="true"/>
</grant-to>
</policy>
</cross-domain-access>
</access-policy>
```

- Using a text editor, edit the file **[install-dir]/conf/admin.password** and add a username and password that will be used to start and stop the publishing of the camera (below is an example of the file with the username **myuser** and password **mypassword**):

Code:

```
# Admin password file (format [username][space][password])
# username password
myuser mypassword
```

- Start Wowza Media Server 2 Advanced
- Consult your encoder's documentation and configure an outgoing stream and send it to the IP address of the server running Wowza Advanced. From the encoder software or interface generate an SDP file that describes the stream. Give it the name **myStream.sdp** and copy it to the **[install-dir]/content** folder.
- Use the Stream Manager to start the MPEG-TS stream
 - Open a web browser and enter the url: [http://\[wowza-address\]:1935/streammanager](http://[wowza-address]:1935/streammanager)
 - Enter your admin username and password from above
 - Click the **[start-receiving-stream]** link just below the **rtplive** application folder
 - Select the **MediaCaster** Type: **rtp**
 - Enter **myStream.sdp** into the **Stream Name** field
 - Click OK

Playback:

- To play using Adobe Flash player:**

Double-click **[install-dir]/examples/LiveVideoStreaming/client/live.html**, enter the information below and click the Play button.

Code:

```
Server: rtmp://[wowza-address]/rtplive
Stream: myStream.sdp
```

- **To play using iPhone or iPod touch:**

Enter the following URL into the Safari web browser:

Code:

```
http://[wowza-address]:1935/rtplive/myStream.sdp/playlist.m3u8
```

- **To play using Microsoft Silverlight:**

- a. Download the Smooth Streaming player from here:
[IIS_Smooth_Streaming_Player_Development_Kit_1.0_Be ta_1.exe](#)
- b. Double click
IIS_Smooth_Streaming_Player_Development_Kit_1.0_Be ta_1.exe to extract the player
- c. Edit **Default.html** and change the **mediaSource** property (line 85) to:

Code:

```
http://[wowza-address]:1935/rtplive/myStream.sdp/Manifest
```

- d. Double click **Default.html** and the video will begin to play.

- **To play using RTSP/RTP player or device:**

Enter the following URL into the RTSP/RTP player:

Code:

```
rtsp://[wowza-address]:1935/rtplive/myStream.sdp
```

Note: *[wowza-address]* is the IP address or domain name of the server running Wowza Advanced.

Troubleshooting

Here is a brief list of suggestions for troubleshooting common live streaming issues:

1. **Video and Audio out of Sync**

Try inserting a server side sort buffer (Wowza Media Server 2 Preview 9 or greater is required). Edit **[install-dir]/conf/[application]/Application.xml** (where **[application]** is the name of the application you have configured for streaming) and add the following two properties to the **Streams/Properties** container (be sure you

add these properties to the correct <Properties> container, there are several in this configuration file):

Code:

```
<Property>
  <Name>sortPackets</Name>
  <Value>>true</Value>
  <Type>Boolean</Type>
</Property>
<Property>
  <Name>sortBufferSize</Name>
  <Value>750</Value>
  <Type>Integer</Type>
</Property>
```

To verify the sorting buffer is configured properly check the log file. You should see a statement that looks like this when the stream is first published. If you do not see this in the logs, then go back and double check to be sure you put the properties in the correct Properties container and that they are not commented out:

Code:

```
sortPackets[1]: sortBufferSize:750
```

2. **Poor Video/Audio Quality** (native RTP, MPEG-TS over RTP or RTSP/RTP streaming only)

Poor video and audio quality when streaming using RTP over UDP can be caused by packet loss or packets being delivered out of order. This forums post describes how to insert a jitter buffer and to log/debug packet loss when doing native RTP or RTSP/RTP streaming. This method will not work for MPEG-TS streaming unless the stream is wrapped in RTP:

<http://www.wowzamedia.com/forums/showthread.php?t=2624>

3. **MPEG-TS/RTP UDP Packet Loss Remedies**

If think you might be having packet loss issues with an incoming MPEG-TS or RTP stream that is being delivered over UDP or Multicast, try making the following server adjustments:

1. First be sure you are running [Wowza Media Server 2.1.7.2-patch8](#) or greater.
2. Be sure the server is properly tuned (always very, very important):

<http://www.wowzamedia.com/forums/showthread.php?t=1320>

3. Edit **[install-dir]/conf/VHost.xml** and change the **RTP/Datagram** section to this:

Code:

```
<DatagramConfiguration>
  <ReuseAddress>true</ReuseAddress>
  <ReceiveBufferSize>1024000</ReceiveBufferSize>
  <SendBufferSize>65000</SendBufferSize>
  <!--
  <MulticastBindToAddress>true</MulticastBindToAddress> -->
  <!-- <TrafficClass>0</TrafficClass> -->
  <MulticastTimeout>50</MulticastTimeout>
  <DatagramMaximumPacketSize>8192</DatagramMaximumPacketSize>
</DatagramConfiguration>
```

4. MPEG-TS Missing Audio

Some MPEG-TS based encoders send unaligned AAC packets. To instruct Wowza Pro to properly deal with these unaligned AAC packets edit **[install-dir]/conf/[application]/Application.xml** (where **[application]** is the name of the application you have configured for streaming) and add the following property to the **RTP/Properties** container (be sure you add these properties to the correct **<Properties>** container, there are several in this configuration file):

Code:

```
<Property>
  <Name>audioIsAligned</Name>
  <Value>>false</Value>
  <Type>Boolean</Type>
</Property>
```

5. Native RTP, MPEG-TS, RTSP/RTP stream goes down

If you have an native RTP or MPEG-TS stream that frequently goes down and you want Wowza Media Server to monitor the stream and reconnect when it becomes available you can set the **MediaCaster/Property streamTime**. To do this, edit **[install-dir]/conf/[application]/Application.xml** and add the following properties to the **MediaCaster/Properties** container (there are several containers in the file be sure to get the right one):

Code:

```
<Property>
  <Name>streamTimeout</Name>
  <Value>8000</Value>
  <Type>Integer</Type>
</Property>
```

This will instruct the Wowza Media Server to monitor the incoming stream and if it goes away for longer 8 seconds it will attempt to reconnect to the stream.

Issues Reported in the Field with VBrick Encoder and Wowza

- Silverlight playability may require you default audio settings in the encoder.
- Remember to not have closed caption selected when sending to the Wowza server. It does seem to handle VBrick CC streams.



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