



DELIVERING MULTI-BITRATE APPLE HTTP LIVE STREAMING FILES

Synopsis 2
Creating and Deploying HLS Multi-bitrate Files 3
Copyright and Trademark Notice..... 9



Synopsis

HTTP Live Streaming from Apple enables video and audio to be sent from a Web server to iPhones, iPods, iPads, desktop computers, and other networked devices. Vantage enables you to create and distribute Apple HTTP Live Streaming (HLS) files. Media streams are encoded, segmented into smaller media files of equal duration, inventoried in an index file, then delivered (with the index file) to a selected destination.

Apple provides an iPhone/iPod/iPad media streaming guide (*HTTP Live Streaming Overview*) that explains how the technology works, which formats are supported, how to set up live broadcast or VOD sessions, how to implement encryption and authentication, and how to set up alternate bandwidth streams. This guide can be downloaded from Apple's Web site at: http://developer.apple.com/library/ios/#documentation/networkinginternet/conceptual/streamingmediaguide/Introduction/Introduction.html#//apple_ref/doc/uid/TP40008332-CH1-DontLinkElementID_39.

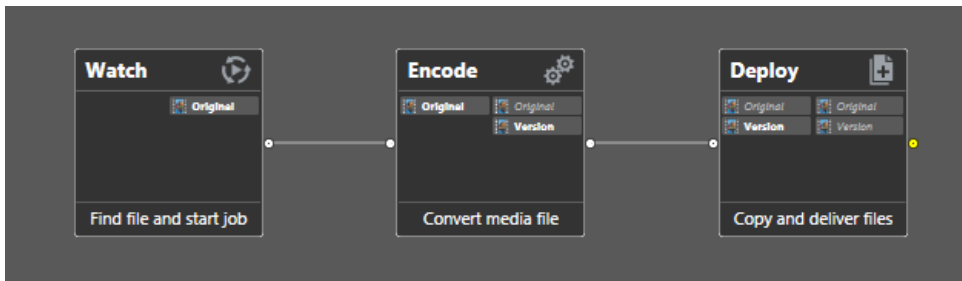
The purpose of this app note is to explain how to configure a workflow to create Apple HLS files using Vantage. The HLS files are created using the *Apple HLS H264 Video encoder*, which enables transcoding of multiple bitrate files. Using an HLS Vantage workflow, you can fully automate the encoding and deployment of your HLS content directly to your production Web servers.

Creating and Configuring HLS Multi-bitrate Workflows

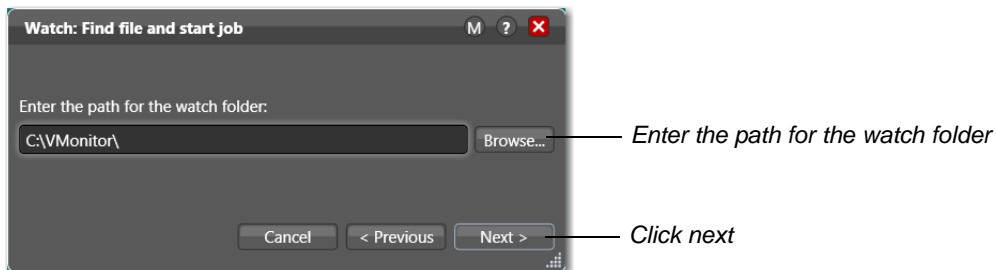
Note: This app note assumes you know how to create and configure Vantage workflows and how to submit jobs. Review the Vantage User's Guide for details.

To create and configure workflows that encode and deploy multi-bitrate HLS files, follow these steps:

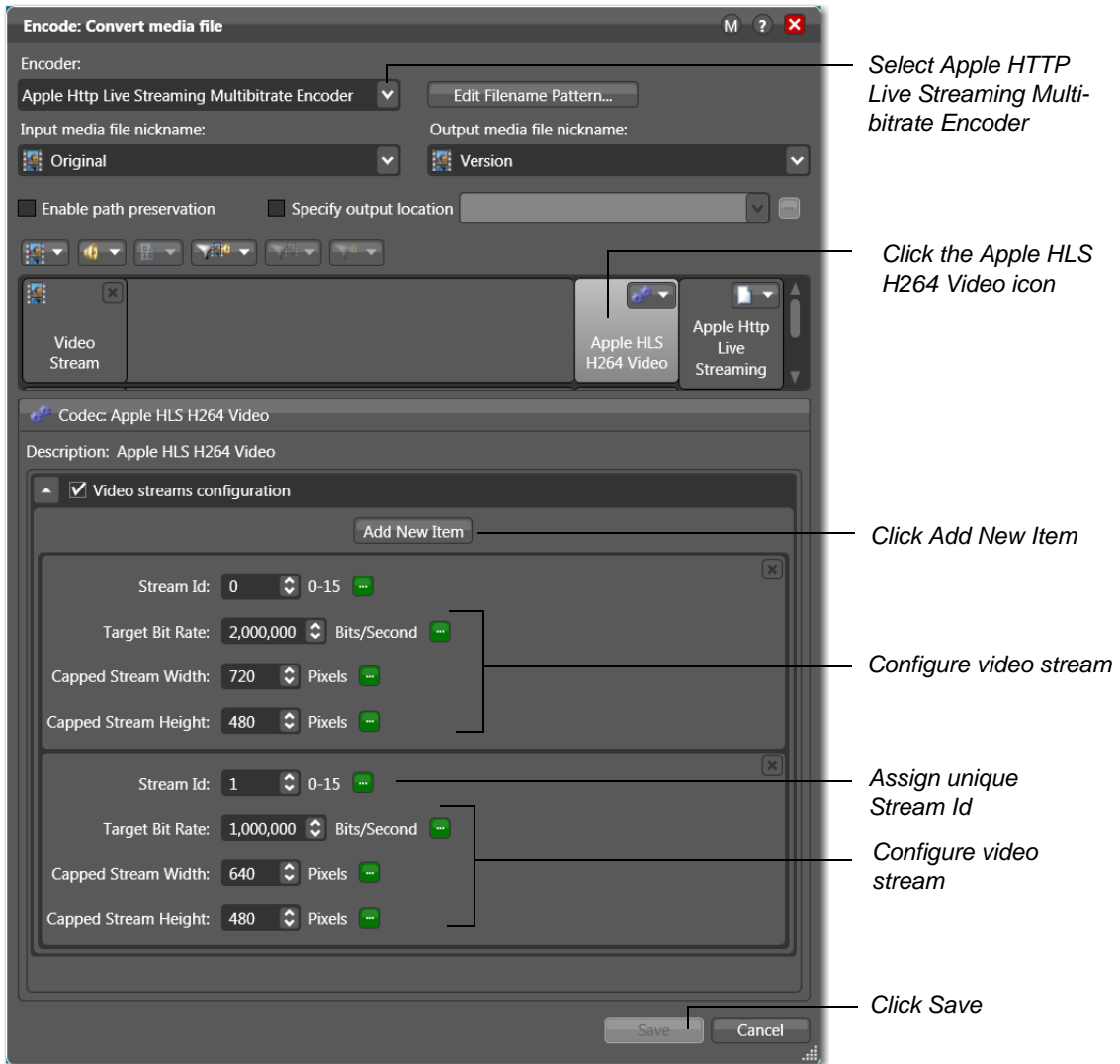
1. Create a Vantage workflow with three actions: Watch, Encode, and Deploy. The Watch action monitors the target directory for input files and submits jobs, the Encode action creates the multi-bitrate HLS files, and the Deploy action delivers these output files to a Web server for use by an iPhone, iPad, or iPod:



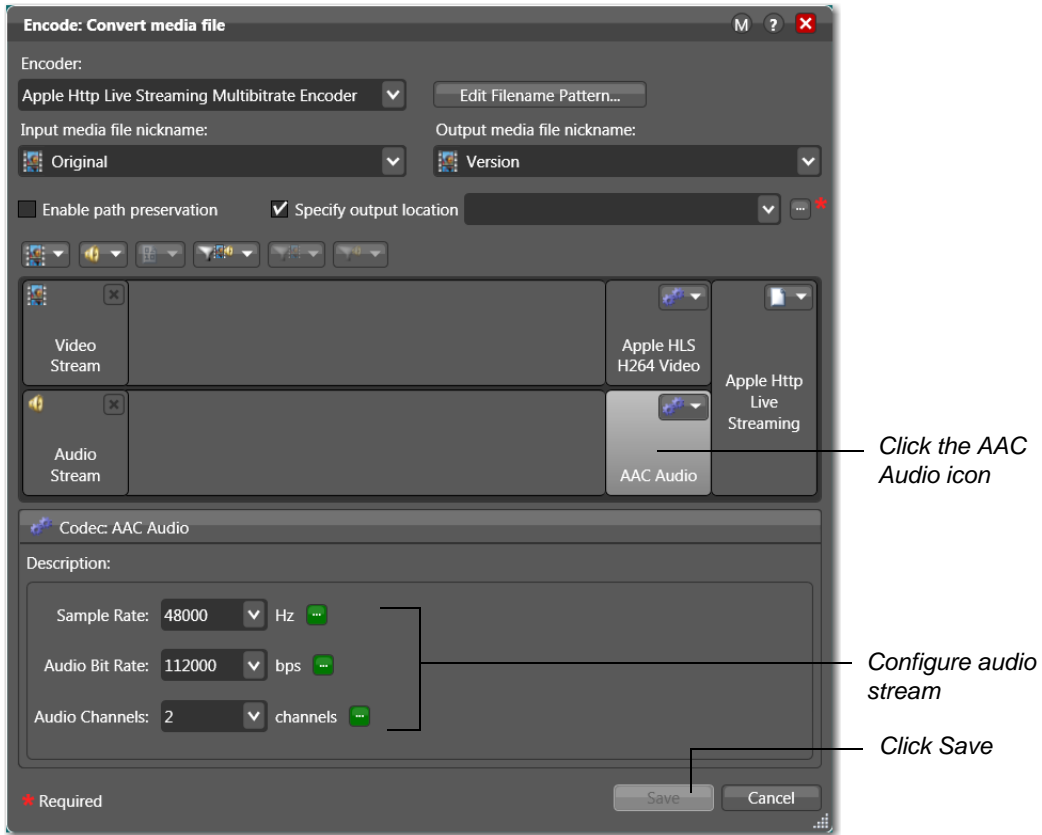
2. To configure the Watch action, double-click it to open its inspector. Navigate through the inspector panels to select *Any Media* and *Windows File System*, then enter the path for the watch folder and click Next:



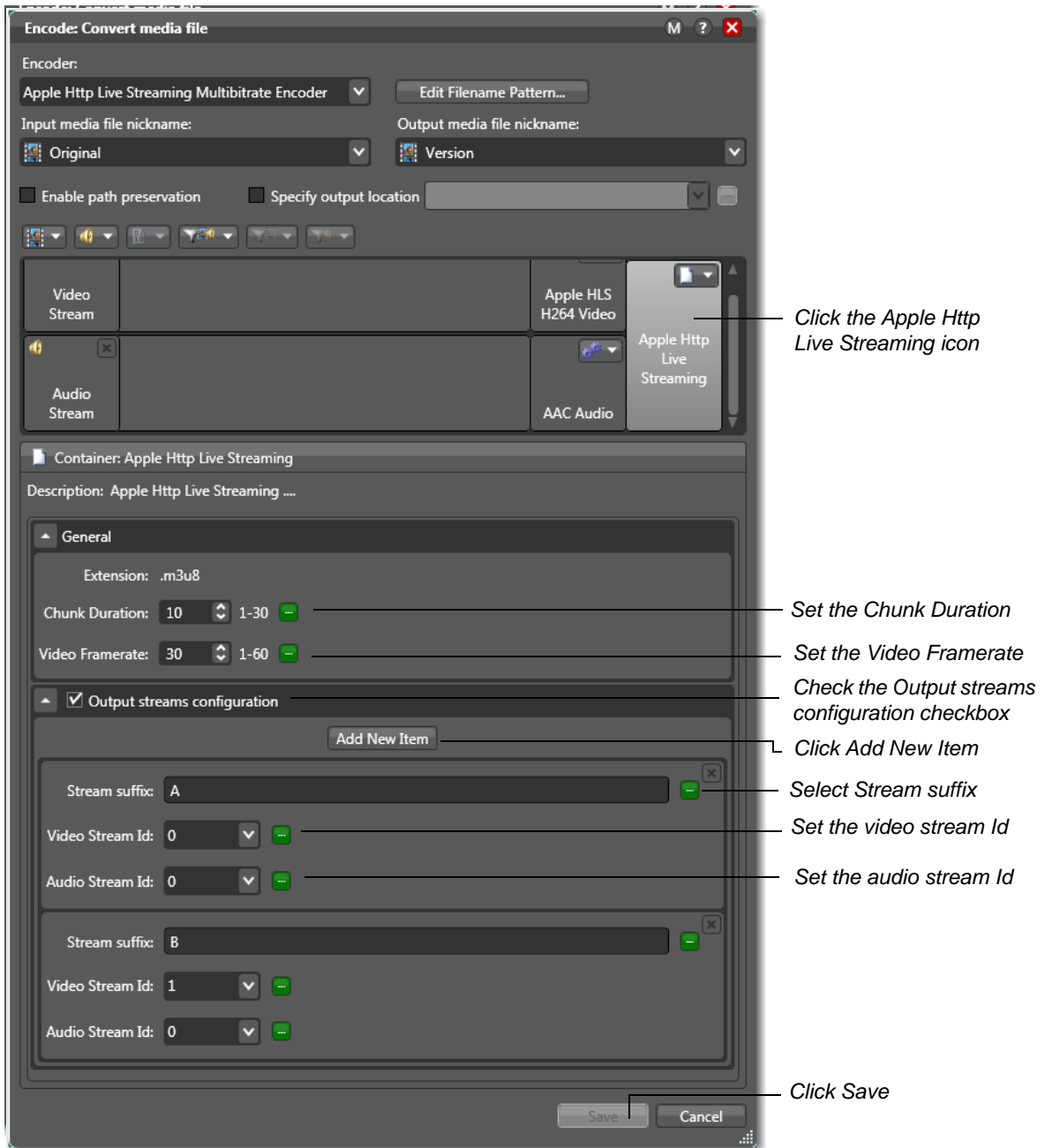
- To configure video streams, open the Encode inspector and select *Apple Http Live Streaming Multi-bitrate Encoder* from the Encoder drop-down menu. Click the *Apple HLS H264 Video* icon, then click the *Add New Item* button and configure the video stream as required. To add another video stream using a different rate and resolution, click *Add New Item* (again), assign a unique *Stream Id*, and configure this video stream as required. Click *Save* to save your settings:



4. To configure the audio stream, click the *AAC Audio* icon and configure the audio stream as required. Click Save to save your settings:



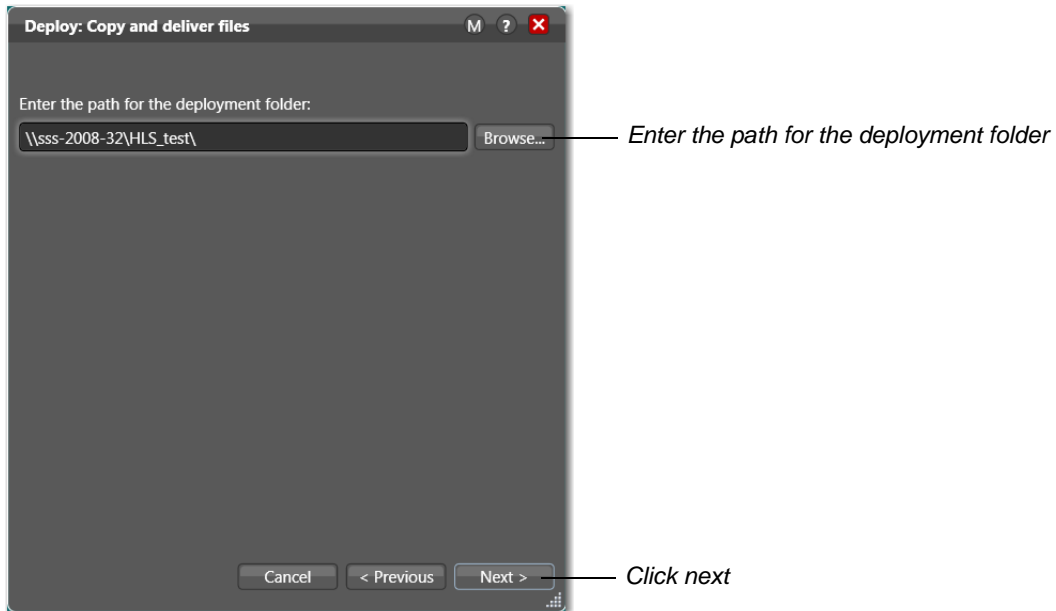
- To configure the encoder output to create HLS files, click the *Apple Http Live Streaming* icon and set the *Chunk Duration* and *Video Framerate*. Check the *Output streams configuration* checkbox, and click the *Add New Item* button. Finally, select a *Stream Suffix* (which becomes part of the file name to distinguish streams), and set the video and audio stream Id's. Click *Save* when finished:



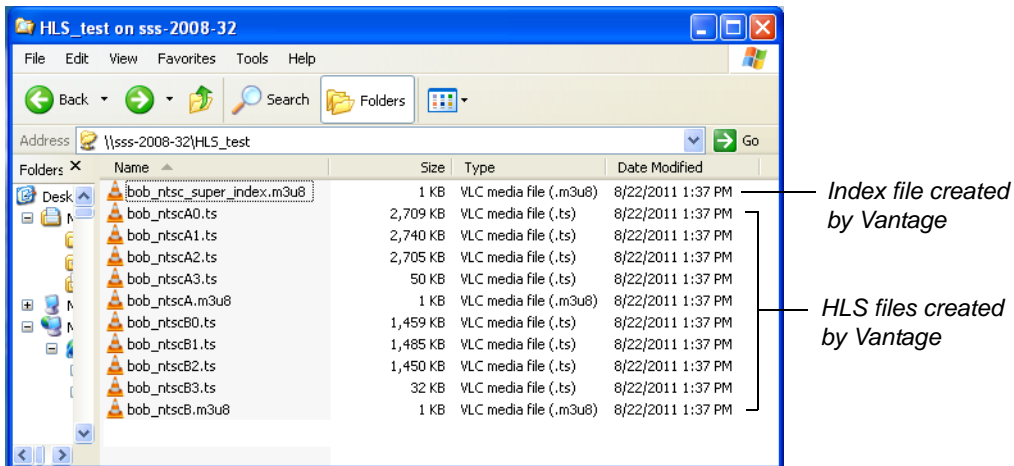
Since two video streams at different bitrates are created in this example, click *Add New Item* (again) to create a second video stream. Set a new suffix, Video Id, and Audio Id. The two video streams must have unique Id's (0 and 1 in this example). The two audio stream ID's, however, are the same since in this example there is only one audio stream shared by the two video streams.

Note: *All video streams must share the same audio stream to avoid audio artifacts. The only exception is one audio-only stream for very low bitrate situations.*

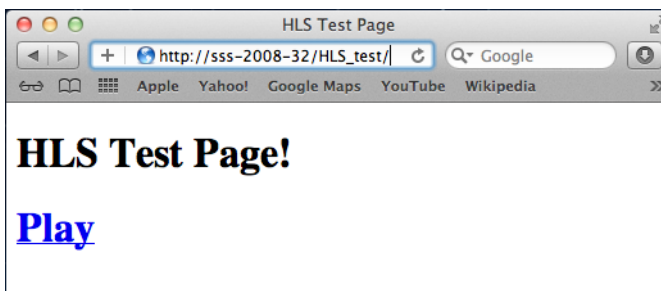
- To configure the Deploy action, open its inspector. Navigate through the inspector panels to select the deployment type (*Export* in this example), and *Windows File System*, then enter the path for the deployment folder. In this example it has been placed on a Web server. Click Next when finished:



- The encoder output files (HLS files and index file) are deployed on a Web server where they can be accessed by an Apple iPhone, iPad, Mac, etc.:



- To test this workflow, create a test page on your Web server that has a *Play* button. Use an iPhone, iPad, or iPod to access this Web page and play the HLS files:



The HTML code required to create this Web page is listed below:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
<html><head>
<meta content="text/html; charset=ISO-8859-1" http-equiv="content-type"><title>HLS Test Page</title>
</head><body>
<h1>HLS Test Page!</h1>
<h1><a href="bob_ntsc_super_index.m3u8">Play</a></h1><br>
</body></html>
```

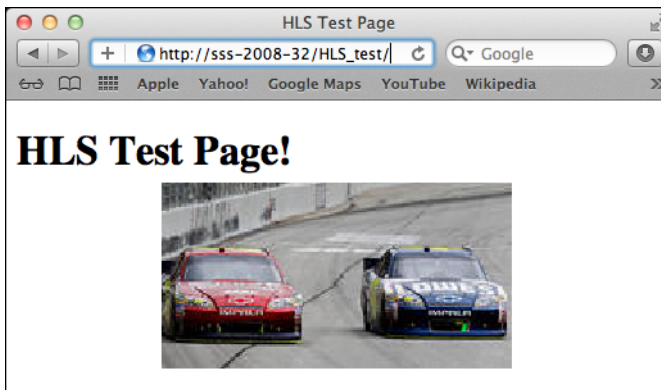
Note: The index file name bob_ntsc_super_index.m3u8 (underlined above) is automatically created by Vantage based on the input media filename: <inputFilename>_super_index.

For detailed information on how to publish your HLS files on your Web server, consult the Apple *HTTP Live Streaming Overview* at: http://developer.apple.com/library/ios/#documentation/networkinginternet/conceptual/streamingmediaguide/Introduction/Introduction.html#//apple_ref/doc/uid/TP40008332-CH1-DontLinkElementID_39.

9. You can also test your HLS file deployment using a Mac PC. Simply replace the *Play* line in the HTML code with a new line of HTML code (underlined below) that will auto-play the HLS files when the Web page is opened:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
<html><head>
<meta content="text/html; charset=ISO-8859-1" http-equiv="content-type"><title>HLS Test Page</title>
</head><body>
<h1>HLS Test Page!</h1>
<video src="bob_ntsc_super_index.m3u8" controls autoplay ></video>
</body></html>
```

When the Web page is opened in Safari on a Mac PC, the HLS file executes automatically:



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