

## Introduction

This document outlines the tested operating specifications for Telestream Vantage 5.0. It is not a complete list of supported formats and workflows; please see the Transcoding and Analysis Format Sheet for a complete list of supported video file formats.

## Transcoding: Vantage Format Sheet

At least one example of every type of decode, and one example of every type of encode, listed on the Vantage Format Sheet has been tested. Video and audio were validated, as were captions and time code where appropriate.

*Note: This does not guarantee cross-compatibility between all format types, nor does it guarantee that Vantage can decode or encode every file, even if it appears to match the formats on the Format Sheet. Telestream recommends testing the full workflow with the necessary settings before putting any system into production. Please also refer to the release notes for a list of known issues.*

## Transcoding: Cross-Compatibility

Telestream has confirmed correct preservation of VANC, time code, 608/708 captions, video, audio and color space between **all** combinations of the following common formats.

- 360 MAXX 80MbitJPEG2000 with PCM audio (720p60, 1080i29.97)
- Avid MediaStream Long-GOP 8Mbit MPEG-2 with MPEG-1 Layer 2 audio (NTSC)
- Avid MediaStream Long-GOP 18Mbit MPEG-2 HD with PCM audio (720p60, 1080i29.97)
- Avid .MOV DNxHD with PCM audio (720p60, 1080p29.97, 1080i29.97)
- Avid.MOV DV 25/50Mbit with PCM audio (NTSC)
- Avid .MOV 50Mbit IMX D-10 with PCM audio (NTSC)
- Avid.MOV 35Mbit XDCAM 4:2:0 with PCM audio (1080i29.97)
- Avid.MOV 50Mbit XDCAM 4:2:2 with PCM audio (1080i29.97)
- .DIF DVCPPro 25/50Mbit with PCM audio (NTSC)
- EVS 100Mbit MJPEG with PCM audio (720p60, 1080i29.97)
- EVS DNxHD with PCM audio (1080i29.97)
- EVS DVCPProHD with PCM audio (1080i29.97)
- Final Cut Pro .MOV 50Mbit IMX D-10 with PCM audio (NTSC)
- Final Cut Pro .MOV AVC-Intra 50Mbit with PCM audio (720p60, 1080i29.97)
- Final Cut Pro .MOV DV 25/50Mbit with PCM audio (NTSC)
- Final Cut Pro .MOV DVCPProHD with PCM audio (720p60, 1080i29.97)
- Final Cut Pro .MOV HDV with PCM audio (720p60, 1080i29.97)
- Final Cut Pro .MOV ProRes 422HQ with PCM audio (720p60, 1080i29.97)
- Final Cut Pro .MOV 35Mbit XDCAM 4:2:0 with PCM audio (1080i29.97)
- Final Cut Pro .MOV 50Mbit XDCAM 4:2:2 with PCM audio (720p60, 1080i29.97)
- Grass Valley GXF AVC-Intra 50/100Mbit with PCM audio (720p60, 1080i29.97)
- Grass Valley GXF DV 25/50Mbit with PCM audio (NTSC)
- Grass Valley GXF DVCPProHD with PCM audio (720p60, 1080i29.97)
- Grass Valley GXF Long-GOP 8Mbit MPEG-2 with PCM audio (NTSC)
- Grass Valley GXF Long-GOP 30Mbit MPEG-2 HD with PCM audio (1080i29.97)

Grass Valley MXF Long-GOP 8Mbit MPEG-2 with PCM audio (NTSC)  
 Harris LXF Long-GOP 8MbitMPEG-2 with PCM audio (NTSC)  
 Harris LXF Long-GOP 18Mbit MPEG-2 HD with PCM audio (720p60, 1080i29.97)  
 Harris LXF AVC-Intra 50/100Mbit with PCM audio (720p60, 1080i29.97)  
 Harris LXF DV with PCM audio (NTSC)  
 Harris LXF DVCPPro 25/50Mbit with PCM audio (NTSC)  
 Harris LXF IMX 50Mbit with PCM audio (NTSC)  
 Harris Nexio MXF MPEG-2 4:2:2 150Mbit with PCM audio (720p60, 1080i29.97)  
 MPEG-2 Elementary Stream (DVD) 3.5 Mbit with MPEG-1 Layer 2 audio (NTSC)  
 MPEG-2 Program Stream 8Mbit Long-GOP with MPEG-1 Layer 2 audio (NTSC)  
 MPEG-2 Program Stream 60Mbit Long-GOP with Dolby 5.1 AC-3 (720p60, 1080i29.97)  
 MXF OP1a IMX 50 Mbit with PCM audio (NTSC)  
 MXF OP1a DV with PCM audio (NTSC)  
 MXF OP1a DVCPProHD with PCM audio (720p60, 1080i29.97)  
 MXF OP1a DNxHDwith PCM audio (720p60, 1080p24, 1080p29.97, 1080i29.97)  
 Omneon .MOV 8Mbit MPEG-2 Long-GOP with PCM audio (NTSC)  
 Omneon .MOV 30Mbit MPEG-2 HD Long-GOP with PCM audio (720p60, 1080i29.97)  
 Omneon .MOV 25/50 Mbit DV with PCM audio (NTSC)  
 Omneon .MOV IMX 30Mbit with PCM audio (NTSC)  
 Omneon .MOV DNxHD with PCM audio (720p60, 1080i29.97)  
 Omneon .MXF AVC-Intra 50/100Mbit with PCM audio (720p60, 1080i29.97)  
 Omneon .MXF 8Mbit MPEG-2 Long-GOP with PCM audio (NTSC)  
 Omneon .MXF 30Mbit MPEG-2 HD Long-GOP with PCM audio (720p60, 1080i29.97)  
 Omneon .MXF 25Mbit DV with PCM audio (NTSC)  
 Omneon .MXF IMX 50Mbit with PCM audio (NTSC)  
 Omneon .MXF DNxHD with PCM audio (720p60, 1080i29.97)  
 QuickTime .MOV DV with AAC audio (NTSC)  
 QuickTime .MOV 3Mbit H.264 with AAC audio (NTSC)  
 Seachange BML 8Mbit MPEG-2 Long-GOP with MPEG-1 Layer 2 audio (NTSC)  
 Seachange BML 18Mbit MPEG-2 HD Long-GOP with AES audio (720p60, 1080i29.97)  
 Sony XDCAM HD MXF HDV 35Mbit with PCM audio (1080i29.97)  
 Transport Stream 4.5Mbit H.264 High Profile with AAC audio (720p60, 1080i29.97)  
 Transport Stream 3.75Mbit MPEG-2 with MPEG-1 Layer 2 audio (NTSC)  
 Transport Stream 18.5Mbit MPEG-2 with Dolby AC-3 5.1 audio (720p60, 1080i29.97)  
 Transport Stream 18.5Mbit MPEG-2 with MPEG-1 Layer 2 audio (720p60, 1080i29.97)

**Note: Telestream supports a broad range of other formats; please see the Vantage Format Sheet for a complete list of supported formats. The above list represents the full cross-compatibility test performed at time of release; cross-compatibility between other formats is also supported. As with all professional grade broadcast video equipment, Telestream recommends testing the full workflow with the necessary settings before putting any system into production.**

## Long-Form Testing

All of the formats listed in “Cross Compatibility” above have been tested with long-form (longer than 1 hour) content.

## Transcoding: Broadcast Server, Editing and System Compatibility

Appropriate formats listed in the Format Sheet have been tested natively on the following editing and broadcast server configurations. Color, audio, visual quality, captions, VANC and other ancillary data has been validated as appropriate (according to the Format Sheet) on a Harris VideoTek analyzer:

360 Systems HD version 3.05.22	Grass Valley K2 Solo firmware 7.3.8.1466
Avid Mediastream version 20.32	Grass Valley Profile XP firmware 5.4.9.1301
Avid MediaComposer version 6.0	Harris Nexio firmware 6.1
Avid Interplay 2.6	Omneon version 6.3.1
Avid TransferEngine 2.6	Seachange BML version 10.5.12
EVS XT[2] with XFile[2] firmware 10.5.12	XDCAM SD PDW-1500
Final Cut Pro version 7.6	XDCAM HD PDW-F70
Grass Valley K2 firmware 2.0.016	XDCAM HD 422 PDW-HD1500

## Transcoding: Camera Ingest Formats

All formats listed in “Cross Compatibility” have been tested as outputs using the following camera formats as inputs.

Panasonic P2  
Ikegami GF

## Transcoding: DolbyE Support

The following source formats have been tested with full DolbyE decoding:

Grass Valley GXF	QuickTime
Harris LXF	Program Stream
MXF	Transport Stream
Omneon MXF	

The following source formats have been confirmed to support Dolby E pass-through to output:

Grass Valley GXF	Omneon MXF
Harris LXF	QuickTime
MXF	Transport Stream

The following output formats have been confirmed to support Dolby E pass-through:

Grass Valley GXF	Omneon MXF
Harris LXF	QuickTime
MXF	

**Note:** Due to the nature of Dolby E, Telestream does require that all Dolby E workflows be validated before being used for professional video production. Please contact your sales representative for more information about Dolby E decoding.



## Transcoding: Distribution and Playout Specifications

Outputs that meet the specifications of the following common web, mobile distribution, and set-top box formats, have been generated and tested using Vantage:

### Mobile and Adaptive Streaming Distribution

3GP H.264 128Kb 320x240 with AAC audio (tested on iPod Touch, iPad 3, iPhone 4)  
3GP MPEG-4 128Kb 320x240 with AMR audio (tested on iPod Touch, iPad 3, iPhone 4)  
Apple HLS 640x360 (five bitrates of H.264 segmented with AAC) (tested on iPod Touch, iPad 3, iPhone 4)  
iPod MP4 H.264 1.2Mbit 640x480 with AAC audio (tested on iPod Touch, iPad 3, iPhone 4)  
iPod/iPad MP4 H.264 1.2Mbit 640x480 with AAC audio (tested on iPod Touch, iPad 3, iPhone 4)  
Microsoft Smooth Streaming 360p30, 720p30 (tested on Chrome, IE, Firefox)  
MP3 audio at 128Kb stereo (tested on iPod Touch, iPad 3, iPhone 4)  
Sony PSP H.264 480x272, 720x480 (24p, 25p, 30p) (tested on PSP 1<sup>st</sup> Generation)  
WAVE PCM audio at 128Kb stereo (tested on iPod Touch, iPad 3, iPhone 4)  
Windows Media 320x240 1.2Mb with Windows Media audio (tested on Zune Software, Windows Media Center)

### Web Download and Proxy Formats

Adobe Flash 8 FLV 480p, 720p 1.2Mbit with MP3 audio (24p, 25p, 30p) (tested on Flash Player 11)  
Adobe Flash 9 F4A with AAC audio (tested on Flash Player 11)  
Adobe Flash 9 H.264 F4V 360p30, 480p25, 720p24, 1080p30 (tested on Flash Player 11)  
QuickTime 640x480 H.264 1.2Mbit with AAC audio (24p, 25p, 30p) (tested on QuickTime 7)  
QuickTime 640x480 MPEG-4 1.2Mbit with AAC audio (24p, 25p, 30p) (tested on QuickTime 7)  
WebM VP8 1.2Mbps, 2Mbps, 6Mbps, 480p30, 720p30, 1080p30 (tested on Firefox)

### Set Top Boxes

AppleTV MP4 H.264, 480p30, 2.5Mbps, 720p30 2.5Mbps, 1080p30 6Mbps  
Sony Playstation3 H.264 720p25, 720p30, 1080p25, 1080p30  
Roku 2 HD H.264 720p, 1080p

## Avid Integrations

The following Vantage integrations with Avid have been qualified against Interplay 2.6 and Media Composer 6.0.

**Send to Playback** – delivery to Vantage from Avid Interplay 2.6 using Transfer Engine 2.6

**Transfer Engine Delivery** – delivery from Vantage to Avid Interplay 2.6 using Transfer Engine 2.6

**Web Services** – asset creation and delivery from Vantage to Avid Interplay 2.6 using web services

Note: Please see the Format Sheet for more details about which specific video and audio codecs are supported.

## Transcoding: Video and Audio Processing Filters

The following video and audio filters have been tested with multiple input files, and multiple output encoding profiles, validating video and/or audio to ensure correct function:

3:2 Pulldown (telecine – for 24p inputs only)	GraphicsFactory Template Application
Audio Correction from ITU1770.2 analysis	Image Overlay
Audio Correction from EBU R128 analysis	Image Processing
Audio Channel mapping	Interlaced Resize (for NTSC to PAL)
Audio Fade In/Out	Interlaced Rules
Audio Levels	Inverse Telecine (for 29.97 inputs only)
Audio Overlays	Mask
Audio Silent Channels	Media Expansion
Black bumpers and trailers	Media Trimming
Blur	Movie Overlay
Color Space	Noise Reduction
Color Rescale	Performance
Contrast	QuickTime bumpers and trailers
Crop	Resizing
Darken Region	Screen Burnt-In Subtitles
Deinterlacing (for 1080i to 720p)	Sharpen
Down Convert (for HD to SD conversions)	Source Color Processing
Field Order Conversion	Source Timecode Burn-In
Frame Rate Conversion	Text Overlay
Gamma Correction	Video Fade In/Out

The following video and audio filters have been tested with multiple input files, and multiple output encoding profiles, validating captions, time code and audio as appropriate to the filter:

Audio SMPTE 337M (DolbyE) insertion	VANC insertion
Caption Conversion	VBI caption decoder
SCC caption file generation	VBI synthesis
SCC caption insertion	VITC synthesis
Timecode override	VITC decoder



## Analysis

All video formats listed on the Format Sheet have been tested as inputs to Analysis for the following measurements:

Identify: File Bit Rate	Identify: Video Frame Size
Identify: File Size	Identify: Video Frame Rate
Identify: Video Bit Rate	Analysis: Content Duration

All formats listed in the “Cross Compatibility” section have additionally been tested as inputs for:

Identify: Video Interlacing Configuration	Analysis: 608 Captions Present
Identify: Field Order	Analysis: 708 Captions Present
Compare: PSNR	Analysis: Content Duration

Finally, the following Analysis functions have been tested across a broad range of formats including test cases appropriate to each function:

Identify: Container Type	Analysis: AFD information
Identify: Has Video, Has Audio	Analysis: SCC file generation
Identify: Video Codec	Analysis: SMPTE-2052 file generation
Identify: Audio Codec	Analysis: Letterbox and Curtains
Identify: Audio Bit Rate	Analysis: Black Detection
Identify: Audio Number of Channels	Analysis: Slate and SMPTE Bars Detection
Identify: Audio Sample Rate	Analysis: ITU1770.2 Loudness, EBU R128 Loudness
Identify: Audio Bits per Sample	Analysis: Telecine Detection, Macroblock Detection
Identify: Aspect Ratio Flag from Container Header <sup>1</sup>	Analysis: Color Levels, Gamut <sup>2</sup>

<sup>1</sup>Aspect ratio with Identify reads from the file header and is only available for MPEG-2 Transport Stream, QuickTime, MXF, LXF, and GXF formats. Please use the Ancillary Data Detection filter if you wish to detect AFD.

<sup>2</sup>Levels and Gamut checking is supported for MPEG-2, ProRes and DNxHD video codecs.

## High Volume Transcoding

Vantage successfully performed 100,000 transcode jobs on a two node cluster with 100% up-time.

*Notes: Performed on two dedicated Windows 2008 R2 Servers with SQL Standard as the primary database on a separate database server. Each job included a 10-second transcode from MPEG-2 to Apple 3GP.*

## Large-Scale Deployments and Load Balancing

Vantage Array and Enterprise Control load balancing has been tested on a 20-node cluster, with full utilization of all servers and 100% up-time.

## Web Dashboard

The Master Control web dashboard been tested against a 20-node cluster, with over 10,000 jobs. The web dashboard has been tested on Mac OSX (Safari), and Windows XP, Vista, Windows 7, Server 2003, and Server 2008 (IE9, Chrome, Firefox)

## Workflow Portal

The Workflow Portal has been qualified with catalogs up to 10,000 assets in detail view, 1,500 assets in thumbnail view. Frame accurate preview has been verified for NTSC and PAL proxies up to four hours long. Proxies have been tested at UNC paths on network-attached, and local storage locations. The Portal has also been tested in the Workflow Examples as appropriate.

## Tested Example Workflows

The following Vantage workflows have been tested and are available on the Vantage web site for use in deployments:

File Name and Duration to XML File	Screen Open STL Subtitling Application
Measure & Correct Loudness (EBU R-128/ITU 1770.2)	Multi-Format Transcoding
Ingest XML File to Label	Smart SD and HD Transcoding
Interlacing Configuration Validation	Telecine Detection and Removal
Multiple Audio Overlays	Workflow Portal Review and Approval
SCC Caption Insertion	Workflow Portal Trimming
SCC Caption File Generation	Workflow Portal Stitching Clips from Catalog
SMPTE 2052 File Generation	Automated Black Detection and Removal

## Professional Services Example Workflows

The following Vantage workflows have been tested and are available on the Vantage web site as examples of professional services deployments. Note: For these workflows, Telestream requires that professional services be provided to customize and validate the workflow to the specific needs of the operating environment.

News Ingest into Avid Interplay 2.6 from Reuters and AP  
News Ingest into Avid Transfer Engine 2.6 from Reuters and AP  
Workflow Portal Metadata Entry for Cablelabs 1.1 ADI  
Workflow Portal Metadata Entry for iTunes delivery  
Commercial Ingest, Operator Review/Trimming and Broadcast Preparation

## Hardware Specifications

Vantage Transcoding and Analysis services are tested on the following operating systems:

Windows Server 2008 R1 32/64 bit, R2 64 bit, both U.S. and Japanese character sets  
VMWareESXi 4.1 virtualization environments

*Please see the Vantage datasheet for the latest Vantage minimum system requirements*

Vantage Transcoding and Analysis services are tested on the following services:

Dell R710 Dual, Quad-Core Intel Processors with 8GB of RAM and 500GB drive  
Dell 2850 Dual, Dual-Core Intel Processors with 8GB of RAM and 500GB drive  
Dell R715 8-Core AMD Opteron with 8GB of RAM and 600GB drive  
Telestream Lightspeed Server

*Please see the Vantage datasheet for the latest Vantage minimum system requirements*

Vantage has been qualified with the following storage devices:

Isilon EMC x200  
Rorke Aurora LS with Stornext  
XSAN (please see release notes)

Vantage requires SQL 2008. SQL Express may be used for single-machine deployments with fewer than 500 entries in the system job history. Larger deployments require SQL Standard or Enterprise.

Vantage has been qualified with the following deployment environments; please see documents available on web site for details:

Single-Server installation with SQL Express on same machine  
Dual-Server installation with SQL Standard on a separate machine and using shared local drive as storage  
Multi-Server installation with SQL Standard on a separate machine and fiber-attached SAN storage  
Multi-Server installation with mirrored SQL Standard on separate machines and network-attached NAS storage

