

Vantage Storage Self-Qualification

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Synopsis

This document describes how to self-qualify storage systems for use with Telestream's family of Vantage Media Processing Platform solutions. It includes instructions to guide storage vendors in the execution of test plans, including the creation of all Vantage workflows necessary to cover the full functionality of both the storage and Vantage products. Two modes of testing will be done, one covering a single Vantage node system and the second covering a multiple Vantage node array system.

Overview

The storage component in a Vantage Media Processing Platform system is critical to its overall performance. The movement of large media files into and out of Vantage systems can require high transport bandwidth and storage I/O. This self-qualification plan is intended to test all scenarios relating to the movement of media to assure that qualified storage solutions will perform at their highest level and avoid being the cause of performance bottlenecks.

The fastest way to qualify your storage solution for Vantage is to self-qualify using the plans covered in this document. Storage vendors should run all applicable tests that conform to their particular storage technology and topology.

Testing responsibility and process

The storage vendor will be responsible for performing the required functional and workflow tests. If issues are identified during testing the vendor should contact Telestream for assistance so these issues are resolved as quickly possible. After all test plans have been completed and successfully passed the vendor will issue a fully documented Test Plan Report that includes test plan results, performance data and configuration settings required to support their storage solution with Vantage systems. The Test Plan Report shall also include technical and support contacts that can be used by Telestream's support personnel in the event that storage solution support is required.

System Requirements

Vantage Server

- Testing shall be run against released Vantage builds available for download on Telestream's web site or approved development builds obtained directly from Telestream.
- Appropriate Vantage licenses will be provided by Telestream.

The following system requirements are required for Vantage:

- Windows Server 2008R2 or Windows Server 2012R2
- Dual 6 core CPU's (or better)
- 16GB RAM (32GB recommended)
- Latest released version of Vantage (see www.telestream.net)
- OS configuration per the Vantage Domain Management Guide located here <http://www.telestream.net/pdfs/user-guides/Vantage-UserGuides/VantageDomainManagement.pdf>
- A local administrative user account.
- All Vantage services installed per the Domain Management Guide and it is strongly suggested the Vantage installation and configuration be performed by a Telestream representative or trained integrator.
- Supplied test workflows will need to have the Vantage input, output and store directories modified in the Vantage Management Console as well as the workflows themselves. This should ideally be done by a Telestream representative or trained Vantage user.
- QuickTime player, VLC or Telestream's Switch player should be used to validate output files are complete and usable. A full license for Switch can be provided. <http://www.telestream.net/switch/overview.htm>

Pipeline System (optional)

- For some tests you will need a Pipeline system. Pipeline is an SDI capture system for creating I-Frame based codecs into QuickTime, MXF or Telestream's TIFO containers.
- To capture from SDI you will use the included Pipeline Control software that can run on a Vantage server.
- Consult with a Telestream support engineer for more system setup details.

Performance Tuning a Vantage Server

The following adjustments can improve performance on your Vantage server. (For details, consult with your System Administrator or a Telestream Field Sales Engineer).

In Performance Options, set Windows Performance options:

1. Navigate to Start > Control Panel > System > Advanced system settings > Settings > Advanced.
2. Select Background services for Vantage transcoding nodes and SQL nodes.
3. Select Programs for editorial systems and Vantage client applications that are not running other Vantage services.
4. Data Execution Prevention tab: Select Turn on (select) Data Execution Prevention (DEP) for essential Windows programs and services only.

Disable Network throttling (see <http://support.microsoft.com/kb/948066>):

1. Locate the NetworkThrottlingIndex registry value under this registry subkey:
HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\
Multimedia\SystemProfile\
2. Set the value to: FFFFFFFF

Disable User Account Control (UAC) as follows:

1. In Start > Control Panel > User Accounts > Change User Account Control Settings, select Never Notify.

Set Power Options to High Performance with Sleep disabled:

1. Navigate to Start > Control Panel > Power Options.
2. Select the High Performance plan.
3. Set Sleep mode to Never (never sleep).
4. Select Change advanced power settings, and set all critical functions so that they are always ON (this usually means setting them to Never turn OFF).

Disable (turn OFF) any real-time software applications and processes, such as the following, that could adversely affect disk I/O performance or use excessive CPU:

1. Real-time virus scanning of media files as they are being captured
2. Automatic software updates that can preempt real-time services
3. Real-time file indexing

Disable all unnecessary Windows services in the Start > Control Panel > Administrative Tools > Services (consult your System Administrator).

Turn OFF all firewalls, including 3rd party firewalls, and packet filtering, which may cause unpredictable performance:

1. Set Start > Control Panel > Windows Firewall > Turn off Windows Firewall.

Increased network throughput may be had by increasing buffer size within your Network Adapter's transmit and receive buffers to 1024:

1. Start > Control Panel > Network and Sharing > Change Adapter Settings > Local Area Connection > Properties

Disable any screen savers in Start > Control Panel > Display > Screen Savers.

Disable disk indexing in Start > Computer. Right-click each disk and uncheck Allow files on this drive to have contents indexed in addition to file properties.

Storage Type definition

For the purpose of this self-qualification document the following storage system definitions will be used.

SAN (Storage Area Network) storage systems. SAN systems are those systems utilizing block level IO via Fiber Channel or Fiber Channel over Ethernet (FC0E), some sort client application to manage and mount these file systems and generally some type of external 'meta data' controller. SAN system mount points are generally Windows drive letters and are therefore 'session based' requiring manual or automatic user login. SAN system mounts must be the same drive letter on all Vantage systems. Examples of these types of systems would be Quantum StorNext and Scale Logic HyperFS.

Proprietary NAS (Network Attached Storage) storage systems. Proprietary NAS are those systems utilizing file level IO, TCP/IP network protocol generally via 1Gbe or 10Gbe, and often some sort of client manager application. Proprietary NAS system mount points can be either UNC paths or Windows drive letters and are most often 'session based' requiring manual or automatic user login. Examples of proprietary NAS storage systems would be Avid Isis and Quantum DLC (Distributed LAN client).

Non-Proprietary NAS (Network Attached Storage) storage systems. Non-proprietary or 'generic' NAS storage systems are those systems utilizing file level IO, TCPIP network protocol generally via 1Gbe or 10 Gbe, and utilize 'generic' off the shelf industry standard protocols such as CIFS/SMB and NFS. These storage systems do not require any special client manager and can be either UNC paths or Windows drive letters. These storage systems are most often not session based and do not require manual or automatic user login. Examples of these types of systems would be Isilon OneFS and NetApps products.

Storage Type Setup

SAN

This test plan assumes a Storage Area Network (SAN) storage system as defined in this document. Storage should be mounted as a Windows drive letter. This implies user auto login and auto mounts.

Proprietary NAS

This test plan assumes a Proprietary NAS storage system as defined in this document. Storage should be mounted as a Windows UNC path.

Non Proprietary NAS

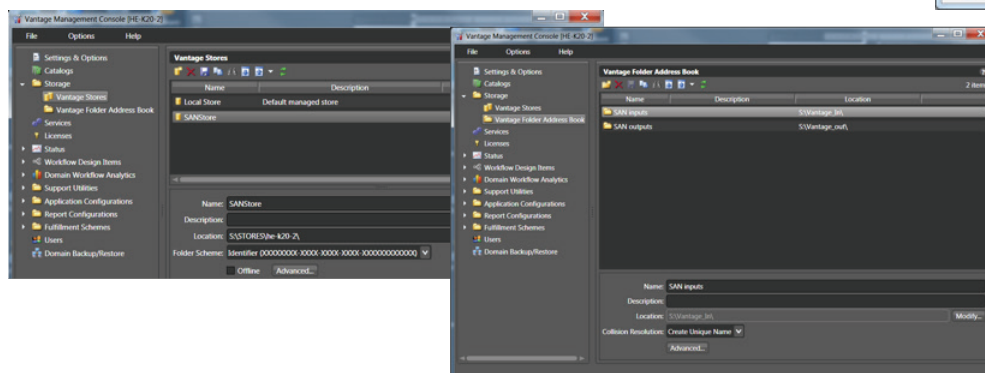
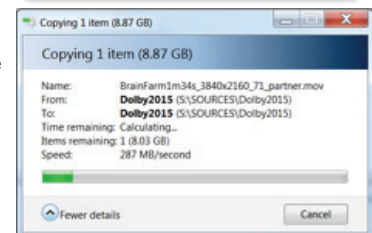
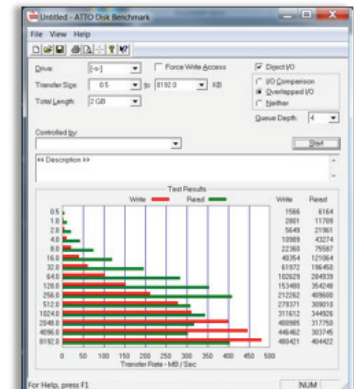
This test plan assumes a Network Attached Storage (NAS) storage system as defined in this document. Storage should be mounted as a Windows UNC path and generally does not require auto login or auto mounting.

Test Plans

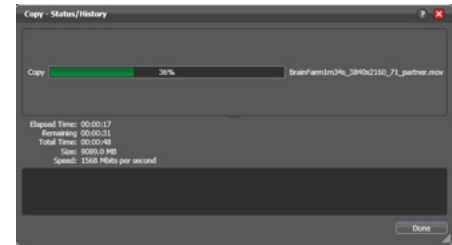
Single Node Test

Single node tests are to be performed on a single 'standalone' Vantage server that is not part of a Vantage array (cluster). Examples below are shown simply for reference and do not imply suggested or recommended storage performance. In most cases faster storage will result in greater throughput.

- Measure baseline storage bandwidth using an industry standard benchmarking tool such as ATTO's Bench32 or open source IOZone.
 - Benchmark example. In this example we can assume baseline IO to the S: drive is ~400Mbytes/s.
- Perform a copy of a large media file of some type (>=5GB) and note performance.
- Set the default Vantage Store to a folder on the storage solution being qualified. Create input and output folders from the Vantage Management Console's Vantage Folder Address Book dialog. The input and output location should also be located on the storage solution being qualified. See the Vantage Domain Management Guide for details on setting your default Vantage Stores and creating the INPUT and OUTPUT instances in Vantage Folder Address Book.



- Import the following 4 Vantage workflows into the Vantage Workflow Designer. See the Vantage User Guide for details on Importing Vantage workflows: *FileMovement*, *DirectConvert*, *SimpleTranscode*, *OpenFileIngest*
- FileMovement Test.** This workflow watches the INPUT folder for new media files. It will copy files as they arrive in the input folder location to the output folder location. To run this test Copy a large media file ($\geq 5\text{GB}$) to the Vantage input folder (the one created in the previous step). Note the performance for inclusion in your Test Report.



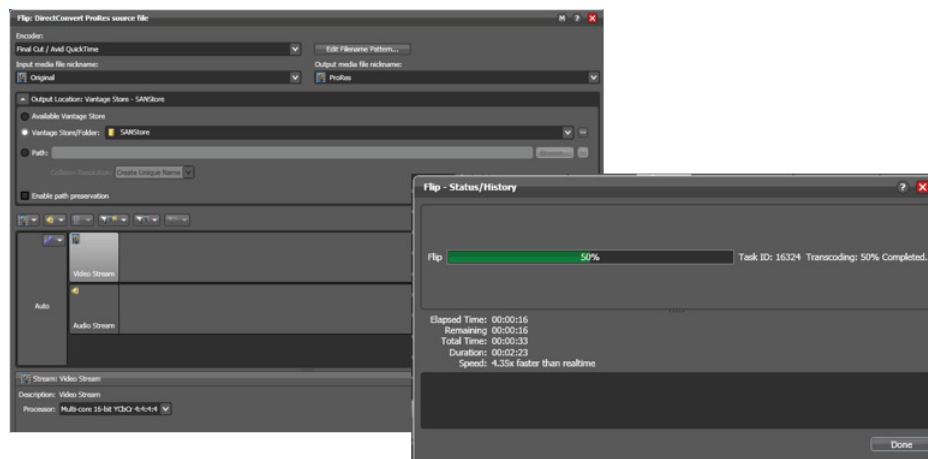
Note: Vantage will display throughput as Mb/s and not Mbytes/s, so you will need to divide by 8 to get units which match benchmarking and copy results.

In the above example the transport speed shows 1568Mb/s or $\sim 200\text{Mbytes/s}$, this number should be similar to the result of the simple file copy test performed in step above. Repeat this test copying four large media files simultaneously into the Vantage input directory and note results of each copy. Then add results to calculate total Vantage file movement throughput. In our example each Copy was running at $\sim 500\text{Mb/s}$ so $500 \times 4 = 2000\text{Mb/s}$ / $8 = 250\text{Mbytes/s}$.

Acceptance Criteria for FileMovement test: Overall Vantage throughput should be close to the simple file copy test noted above. Vantage throughput less than 50% of the file copy test would be a red flag and considered a failure case.

- DirectConvert Test.** Before running this test confirm all other Vantage workflows are in the Deactivated state. This test requires an Apple ProRes QuickTime test file that is $\geq 5\text{GB}$. Contact Telestream if you do not have such a file and one will be provided for you. This test takes the media file and creates another media file of the same type. This not only tests Vantage file movement, but also the Vantage file writers. Before running this test, please ensure that the Vantage Store is set to the storage location as configured above. Copy the large Apple ProRes QuickTime media file ($\geq 5\text{GB}$) to the Vantage input directory (as configured above). Note the performance for inclusion in your Test Report.

Note: Vantage will display throughput as Mb/s and not Mbytes/s, so you will need to divide by 8 to get units which match benchmarking and copy results.



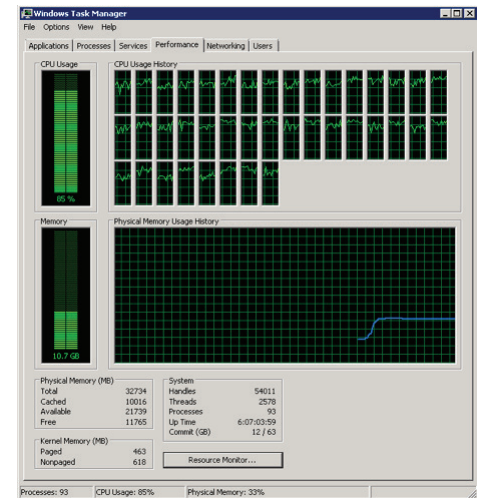
In the above test we are seeing $\sim 4.3\text{x}$ faster than real time conversion. Repeat the same test with 4 x Apple Pro Res source files submitted simultaneously and note performance. In our example each DirectConvert performed at 2.7x real time or an aggregate throughput of 10.8x real time.

Acceptance Criteria for DirectConvert test: Faster than real time performance is expected here and anything less than real time would be considered a red flag and failure case.

- **SimpleTranscode.** This test will test encoding times of a few popular formats. Throughput here will be much less as Vantage will be converting the input format to various output formats. Throughput here will vary based on storage performance and host system specifications. In general you should see close to real time performance from each Transcode action and very high CPU utilization. This test will require a supported Vantage media file. You may use the ProRes file from the DirectConvert test or most any other large ($\geq 5\text{GB}$) media file. Copy the media file ($\geq 5\text{GB}$) to the Vantage input directory as configured above. Note the performance for inclusion in your Test Report.

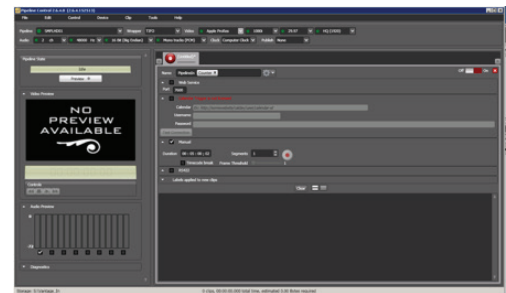
Note: Vantage will display throughput as Mbits/s and not Mbytes/s, so you will need to divide by 8 to get units which match benchmarking and copy results.

Acceptance Criteria for SimpleTranscode test: Test results here will vary, however anything less than 50% CPU utilization would be considered a red flag and a failure case.



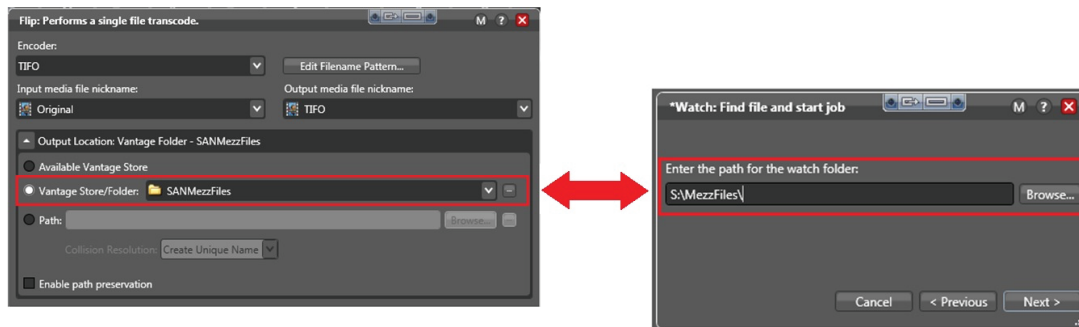
- **OpenFileIngest.** This workflow will test the storage system and/or file systems ability to handle open, growing media files. This test requires a Telestream Pipeline encoder and some knowledge of Pipeline. This test will most likely require the input of a Telestream representative. Configure Pipeline to create a ProRes HQ file in a TIFO container. Using Pipeline Control for Windows capture a file to the Vantage input directory used in all other tests. Use a capture duration of 5 minutes. Note the performance for inclusion in your Test Report.

Once the capture is started Vantage workflow should immediately begin to transcode the incoming growing file. With this test you will never see greater than real time throughput since Pipeline is ingesting base band video in real time. For this test you should simply see reliable encodes and captures and neither Pipeline nor Vantage should display any errors. Note the performance for inclusion in your Test Report.



Acceptance criteria for OpenFileIngest test: Vantage output files should all match Pipeline input files duration and all Vantage encodes should complete. Any transcode failures or output files with durations less than input files would be considered a red flag and failure case.

- Make Open Files/Read Open Files. These workflows will test the storage system and/or file systems ability to handle open, growing media files. This test does NOT require a Pipeline encoder and therefore is easier to perform, but not as common as workflows detailed in OpenFileIngest test. For this test make sure the output location specified in the MakeOpenFiles Flip action is the same location specified in the ReadOpenFiles Watch action.



Copy a Media to the Watch action location in MakeOpenFiles, first making sure both workflows are active, and both workflows should begin processing. Note the performance for inclusion in your Test Report.

Note: The Flip action in the ReadOpenFiles workflow will not show a progress bar, but the output file will be growing. This is a known shortcoming and will be addressed in a future Vantage release.

Acceptance criteria for MakeOpenFiles/ReadOpenFiles: Vantage output files should all match Vantage input files duration and all Vantage encodes should complete. Any transcode failures or output files with durations less than input files would be considered a red flag and failure case.

Multiple Node Array Testing

Array testing requires at least two Vantage systems configured as a Vantage array (cluster). The Vantage array configuration should be performed by a qualified Telestream representative. Single node testing should be performed prior to array testing and test plan differences are noted below.

- Baseline performance tests using Bench32 and Windows Explorer file copy should be performed concurrently on all Vantage systems in the array.
- FileMovement tests should be performed with a minimum of eight input files and concurrent jobs.
- DirectConvert tests should be performed with a minimum of eight input files and concurrent jobs.
- SimpleTranscode tests should be performed with a minimum of eight input files and concurrent jobs.
- OpenFile Ingest tests may not be practical for test purposes as the test requires a Pipeline HD encoder channel for each input file and job.
- MakeOpenFiles/ReadOpenFiles tests should be performed with a minimum of eight input files and concurrent jobs.

Telestream Contact Information

Partner Contact

Jim Leighton – Partner Manager
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(530) 264-7815

Technical Contact

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(530) 470-2095

Storage Self-Certification approval

After all test plans have been completed and successfully passed the vendor shall issue a fully signed and documented Test Plan Report that includes all test plan results, performance data and configuration settings required to support their storage solution with Vantage systems.

Telestream will assume first line customer support for storage solutions in support of an overall Vantage system. If it is determined that the fault requiring support services lies within the storage component, Telestream will direct the user to the storage vendor's support process.

The storage vendor will accept all responsibility for the accuracy and thoroughness of their testing. Support services for storage solutions that fail to perform to the level stated in the Test Plan Report will be the responsibility of the storage vendor.

Storage Vendor Support Contacts

North American and International support phone numbers: _____

North American and International support email addresses: _____

Vantage Storage Self-Qualification

Company Name: _____

Testers Name: _____

Testers Title: _____

I hereby certify that our storage solution has been successfully tested in conjunction with Vantage solutions as described in this Self-Qualification Test document.

Sign Here:



Vantage Storage Compatibility Test Results

(To be used in conjunction with the Vantage Storage Self Qualification Document and returned to Telestream once completed)

Storage Manufacturer: _____

Model: _____

Storage Type (circle one): SAN Proprietary NAS Non-Proprietary NAS

Tested with Vantage Version#: _____ Test Date: _____

Single Node Test Plans:

File Movement Test

Results: _____

Direct Convert Test

Results: _____

Simple Transcode Test

Results: _____

Open File Ingest Test

Results: _____

Multiple Node Array Test Plans:

File Movement Test

Results: _____

Direct Convert Test

Results: _____

Simple Transcode Test

Results: _____

Open File Ingest Test

Results: _____