# Knowledge Network Improves Workflow with Vantage

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## How British Columbia's Knowledge Network Optimizes its Operation with Telestream's Vantage Workflow

Knowledge Network–British Columbia's public broadcaster based in Burnaby, Canada–offers commercial-free creative documentaries, arts and culture, drama and children's programs from Canada and around the world.  It's funded in part through an operation grant from the Government of British Columbia (B.C.) and donations from Knowledge Partners.

Knowledge Network operates a main HD channel, a separate SD channel as well as BBC Kids, a national children's specialty channel run as a joint venture with BBC Worldwide. The program schedule is filled with programming licensed from over 30 different distributors worldwide including: primetime dramas, programs on the arts, nature, world cultures, business and technology, as well as documentary commissions produced by local and international independent producers.

As one of only two English language provincial broadcast networks in Canada, Knowledge Network is a commercial free, 24/7 network watched by over 1.4 million viewers weekly. It's primarily delivered via satellite to British Columbia cable systems as a basic, must-carry service, with a small portion of the audience tuning in via direct-to-home (DTH) satellite services.

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Since it began broadcasting in January 1981, Knowledge Network's broadcast infrastructure has shifted from an analog, tape-based SDTV operation to all-digital HDTV as of 2013. Today, the network relies upon an automated file-based workflow enabled by three complementary Telestream products: one Vantage Transcode Pro system, two Lightspeed Servers for faster, multi-server processing, and two Pipeline HD/SD-SDI video capture and play-out systems.

How important is the Vantage workflow to Knowledge Network? "Well, it's huge because Vantage and Pipeline have replaced the bank of videotape machines we used to use to prepare this high volume of program content for air," said Oliver Eichel, director of broadcast operations & engineering for Knowledge Network.

"The benefits of Pipeline, Vantage and Lightspeed are that this workflow lets us ingest and transcode multiple television shows at once, just as we would have done with tape machines. But since Vantage runs on servers, which don't need the costly maintenance and repairs of videotape machines, it's already saving us capital and operating expenses. We have also experienced an increase in efficiency.  We're now able to process multiple files simultaneously or cue a significant number of files that process overnight, something we could not do using a tape based workflow."

However, videotape has not quite disappeared from the workflow. A small number of HDCAM and other format tape machines are tied to the two server-based Pipeline ingest stations. This is necessary since–in addition to file-based ingest–much of their programming still arrives on tape. Each Pipeline system ingests this acquired HD/SD-SDI content and converts the video into the high bitrate house file format, DNxHD in a .MOV wrapper at 145-Mbps or Pro Res 4:2:2 at 147-Mbps.

"As Pipeline ingests the video into our high bitrate master file, then Vantage  creates a low res proxy of it," Eichel said. "We then FTP that proxy file to third-party closed captioning houses so they can generate the necessary captions. When they send the finished caption file back to us, Vantage merges the caption file with the high bitrate master video file as part of this overall workflow."



Knowledge Network Facilities

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"With respect to transcoding, there are three gotchca's: timecode, frame rate and standards conversion," Eichel said. "Since many files come in with non-drop-frame timecode, and we need drop-frame timecode for our automation control software, we had to create a workflow in Vantage that would automate the process of stripping off the non-drop timecode."

In some instances, frame rates also need to be converted. Since many program suppliers are independent filmmakers, it's not uncommon for them to furnish a master at a frame rate of 23.98 fps. This filmic frame rate has to be converted to the 29.97 frame rate required for television. Considering that Knowledge Network's distributors around the world represent a wide range of program suppliers, the need for frame rate, timecode and standards conversion to 1080iHD (ATSC) is, and will be, a common occurrence for the foreseeable future.

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The Pipeline with Vantage workflow is pivotal to the whole broadcast chain and preparing content for play-out to air. Eichel says, "Whether it is files we create via Pipeline ingest or files we receive from distributors, Vantage is a workhorse. Using our custom in-house-created workflow templates, we convert, merge, adjust and manipulate the files to create versions that seamlessly integrate into our broadcast and broadband platforms." Vantage takes the in-house file standard DNxHD file–or other popular file formats such as ProRes–and converts it to a 50-Mbps broadcast master in the LXF file format required by the Harris Nexio playout server.

When transcoding is complete, Vantage sends the converted LXF file right over to the Nexio server so it's ready for playout. It also puts the high resolution master file in a watch folder that's monitored by the network's Front Porch Digital Diva Archive system. Diva Archive takes new files from the watch folder and moves them to the network's Spectralogic LTO-6 media library for long-term storage.

For the most part, Knowledge Network has its Vantage system set up to easily handle routine transcoding missions. But files often come in from suppliers worldwide in formats that don't conform to the house standard and when they do, Vantage steps up to the task through the use of additional workflow designs.

"When we commission our own original programs, we control the quality and formats that are delivered to us," Eichel said. "Since the shows are produced expressly for us, according to our specifications, the transcoding goes smoothly since we have efficient Vantage workflows already setup to handle them."
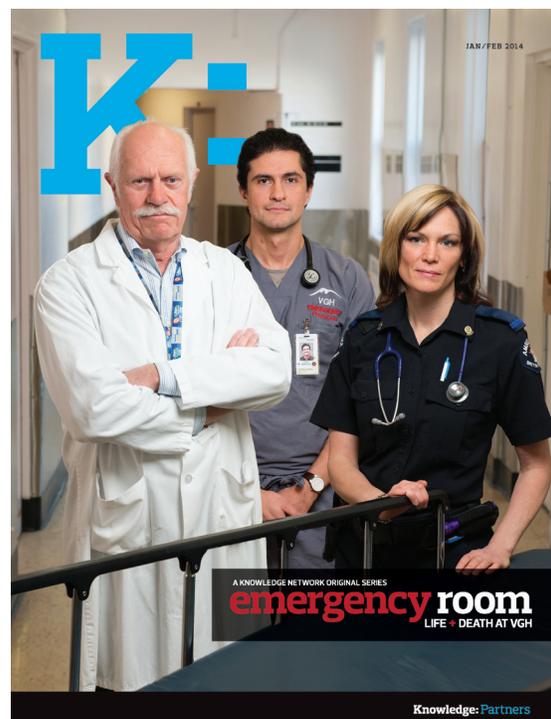
"But whenever we acquire the rights to broadcast programming from distributors around the world, it's a dog's breakfast. We get a jumbled assortment of videotape and file formats and we've had to create new Vantage workflows to handle them. This is especially true if they present any unusual or unique issues related to frame rates, timecode or other technical specs," Eichel said.

When Eichel's engineering and operations team needs to set up a new workflow to handle an unusual transcoding scenario, they often turn to their more than 25 existing Vantage workflow templates to find one designed to handle a similar problem and make further adjustments.

As the template library grows, there are more and more set-ups ready to handle a wide array of transcoding challenges.

"Technical challenges like these are bound to come up as you're implementing any advanced, cutting edge technology like this one," Eichel said. "Compared to other broadcast networks, we're lucky in that our program schedule is locked months in advance and we typically have three or four days worth of logs and program files in the system ready to go. Because of our relaxed broadcast operation, we're able to accommodate the inevitable challenges of progressing to new technologies. We've been on the vanguard of adopting this file-based Vantage workflow and we're proud of that."

When the Vantage system was installed in 2013, it was configured to run on a single 1RU Lightspeed Server. However, Knowledge Network recently added the second Lightspeed to boost processing speed and productivity as well as provide redundancy and backup to the primary server. When added to any Vantage product, Lightspeed accelerates video processing and H.264 transcoding with GPUs and multicore CPUs.



Knowledge Network Magazine Cover (January 2014)

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Having two Lightspeeds is extremely advantageous for processing complex media activities such as simultaneously merging closed caption files with multiple episodes of a series, flipping from one file format to another and ensuring the audio levels will conform to industry standards.

While Knowledge Network is available on traditional cable TV and satellite services, a growing audience segment wants to watch the programming anywhere, anytime, on any connected device. To facilitate this, Vantage Transcode Pro takes the 50-Mbps broadcast file it's created, flips the file one more time optimizing it to fulfill the requirements as a mezzanine file and FTPs it to Kaltura, an open source online video management platform and content distribution network. Kaltura handles multiplatform distribution of the program files on behalf of Knowledge Network, including video on demand and streaming media tailored for playback across all connected online and mobile devices.

Since Knowledge Network is commercial-free, most of the programs require interstitial programming to fill the gaps between shows. This interstitial content may include promos, branding, samples of programs, short programs of less than five minutes and unique commissioned B.C. content. When the two Pipelines ingest new content to create the high-bitrate master, they also send this file to one of two 24-terabyte Facilis SANs shared by the network's three Avids and Final Cut Pro editing suites. After the editors finish crafting the interstitial material, they transfer those files to the Facilis SAN that supports the Vantage workflow and broadcast chain.

"When we were looking for a comprehensive ingest and transcoding solution for our new file-based workflow, we considered many factors including the prospective vendor's market share and stability as a company, as well as its track record for service, support and product innovation, and Telestream answered our needs," Eichel said.

"The reality is that there are many cost and operational efficiencies associated with migrating to an automated file-based workflow," Eichel added. "And since we acquire content in a variety of formats from global distributors–which we broadcast to a growing audience that wants to watch our programming anywhere, anytime, on any connected device –the Vantage workflow is vital to our business."

### To learn more
To get more information about Telestream or products mentioned, call 1-530-470-1300, or visit www.telestream.net

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