



NBC Olympics tackles Sochi's multi-platform challenge with Telestream

U.S. broadcaster uses Telestream Vantage and Lightspeed to deliver record-breaking TV, online and mobile coverage of the 2014 Winter Olympics



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Background

NBC Olympics, a division of the NBC Sports Group, produces programming and promotions for NBCUniversal's coverage of the Summer and Winter Olympic Games across all of its properties including the NBC broadcast network, multiple cable networks and various digital and new-media platforms. To support its coverage of the 2014 Winter Olympics from Sochi, Russia, NBC Olympics employed over 2000 people at its International Broadcast Center (IBC) in the Olympic Village in Sochi and over 400 people at a companion IBC located within NBC Sports' Stamford, Ct. headquarters, with the two facilities networked via fiber-optic links.

The Challenge

For Sochi, NBC Olympics was tasked with delivering an unprecedented amount of coverage for a Winter Games totaling over 1,539 hours, more than the 2010 and 2006 Winter Games combined. That included a record 539 hours on NBC Universal's television channels, with 185 hours on broadcast network NBC, 124 hours on the fully-distributed cable channels CNBC, MSNBC and USA Network, and 230 hours on its dedicated sports channel, NBC Sports Network. The traditional TV coverage was supplemented by over 1,000 hours of coverage on digital platforms. These included live streaming coverage of all 98 events on NBCOlympics.com, along with on-demand event replays and highlight packages. Plus, live streaming and on-demand clips for mobile devices were delivered through the NBC Sports Live Extra App and on-demand highlight packages and event replays were offered through cable operators' video-on-demand platforms.

NBC Olympics had produced on-demand clips for online, mobile and cable VOD platforms for the past few Olympics and successfully used a distributed production model with editing occurring both onsite and back in the U.S. The big change for Sochi, says Darryl Jefferson, VP of digital workflow for NBC Olympics, was “just doing more of it,” including the delivery of concurrent clips from up to 17 events each day.

“With a sport like hockey, it’s not just one highlight clip from each of these matches, but multiple highlights packages, some short-form VOD, some long-form VOD, and some short-form content aimed at mobile devices,” says Jefferson. “There’s just more content and more ways of looking at processing an event.”

The Solution

NBC Olympics tapped Telestream’s Vantage product to streamline its multi-format production workflow, using it for workflow orchestration, file-based standards conversion, transcoding services, and several other applications.

Telestream Vantage combines media capture, transcoding, clip management, analysis, decision-making and metadata processing into one workflow framework. Vantage is designed to be more than a transcoder, offering a comprehensive workflow design, automation and management tool that can direct a range of video and audio processing tasks, using either Telestream video processing tools or third-party software and hardware. Vantage also integrates with all the major broadcast servers, edit systems, streaming servers, cable VOD [video on demand] servers and storage area networks [SANs].

In Sochi, NBC Olympics utilized eight identical systems provided by Telestream, each consisting of Vantage Transcode IPTV VOD, Vantage Analysis and Tachyon standards conversion software from third-party vendor Cinnafilm, all running on GPU-accelerated Telestream Lightspeed Servers. Five Vantage systems were based at the NBC Sports facility in Stamford, Ct. and three were located at the IBC in Sochi, Russia. The Vantage systems were combined by Vantage Array into a network at each site that enabled greater video processing efficiency and redundancy.

“Almost every file path for non-traditional TV was covered by Vantage in some way, either by workflow orchestration, just checking a file, or actual transcoding,” says Jefferson.

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Workflow orchestration

For Sochi, Vantage was used by NBC to perform workflow orchestration between various third-party production, encoding and transcoding systems, with a special focus on preparing content for non-traditional platforms such as cable video-on-demand, the Web and mobile devices.

“It sounds like it’s not much, but that’s a big deal,” says Jefferson. “For example, if ‘X’ vendor can only handle one folder at a time, we had to create a workflow orchestration piece using Vantage to organize and deliver what other vendors were expecting to see. Basically, it’s getting the files you needed and getting them in the way they were needed.”

Vantage enabled a variety of workflows to intelligently handle the various source formats arriving into the NBC Sports facility in Stamford, Ct. The Vantage Analysis feature set was used to automatically detect the frame rate of incoming source material from Sochi and automatically route content to proper workflows without the need for human intervention.

“In one instance, ‘X’ vendor couldn’t deal with inbound sources in multiple formats in the same folder, so it couldn’t deal with 50hz and 60hz in the same folder,” Jefferson explains. “So Vantage would sniff the [incoming] folder and deliver [the video] into two different folders.”

File-based standards conversion for on-demand delivery

One key function of Vantage for Sochi was in performing file-based standards conversion from the European 1080i/50 fields-per-second HD format to the U.S. 1080i/60 format for video-on-demand content being delivered to Comcast’s Xfinity platform and other U.S. cable and telco operators. With roughly 50% of the content arriving in Stamford in 50i, including all of the video generated by host broadcaster Olympic Broadcasting Services (OBS), converting it to 60i as quickly as possible was a top priority.

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Integration between Vantage and Cinnafilm Tachyon enabled NBC to perform high-quality standards conversion from 50i to 60i in the compressed domain without decompressing the content back to baseband video, a significant time savings. The Tachyon product quickly delivered motion-compensated standards conversion, which is crucial for sports but hadn't been previously feasible in file-based conversion.

“That was one of our big desires,” says Jefferson. “Obviously we have quite a few baseband standard converters, but we wanted to stay in the file-based domain, as that picks us up a lot of time. Tachyon offers motion-compensated standards conversion, which is the holy grail for file-based conversion but hasn't been possible until now. With fast-motion sports, non-motion-compensated conversion looks awful. But Tachyon is able to do the compensation for high motion, stay in the file domain and deliver content quickly, almost in real time. It was surprisingly smooth, the best kind of technology—the kind I didn't have to think about. You dump it in the folder and magic comes out.”

Automated closed-captioning

NBC Olympics also used two Telestream products to help prepare its cable VOD content: CaptionMaker (which Telestream acquired with captioning firm CPC in 2013) and Vantage Transcode IPTV VOD.

For Sochi, NBC had reached an agreement with retail giant J.C. Penney to sponsor closed-captioning for its digital platform coverage, including the Web, mobile and cable video-on-demand (VOD).

“For VOD and Web, it was one of the bigger pushes the Web had ever seen for a real volume of closed captioning,” says Jefferson, who explains that programmers haven't been delivering closed captioning to the Web because it's not legally required.

NBC Olympics relied on Vantage to help make it happen.

CaptionMaker automated the retiming of captions from 50i to 60i, a process that typically would have required multiple disparate systems and human operation, while Vantage Transcode IPTV VOD created closed-captioned SD and HD CableLabs-compliant files for delivery to domestic cable distribution outlets.

When delivering file-based content for the Web, NBC Olympics used Vantage to do a multi-bitrate transcode that would serve as the source file for closed-captions. Vantage was also used to extract “sidecar” files that contained closed-captioning.

“We had captioners typing in the captions remotely and delivering that back into the facility, and that would get injected in the video stream as EIA 608/708 [the common closed-captioning specification],” Jefferson explains. “But for some Web and mobile applications we would take a sidecar file and use Vantage to extract the sidecar file because the video player on the website couldn't take embedded 608/708.”

Overall, the closed-captioning effort was a great success. Jefferson says that using this technology, NBC was able to caption 60% of all short-form content and 100% of long-form assets.

Audio mapping and re-mapping

NBC Olympics' source material had up to 8 different audio configurations, including different audio configurations from the OBS, a few from the NBC compounds, some from NBC News and some from ENG/field shoots. In order to normalize the audio for outbound delivery, and even for inbound delivery to cut in between sources, NBC used Vantage to remap the audio in order to make it interoperable.

File-based ingest into Avid editing

NBC also relied on Vantage to support more traditional production workflows for its on-air broadcasts, primarily for the ingest of file-based material into its Avid and Apple editing systems and Avid ISIS storage systems. To facilitate remote editing between Sochi and NBC Sports' Stamford headquarters, NBC used Avid ISIS systems linked by fiber and controlled by Avid's Interplay production asset management system and Interplay media asset management (MAM) systems.

Vantage connected to both Interplay asset management systems and was used to convert file-based source material, such as video off a flash-memory card, into the right format for editing. The Vantage system wrote content directly to the ISIS storage system and processed Interplay check-ins via Avid's Web Services system. This workflow enabled hands-off delivery to the Avid Interplay production asset management system without requiring legacy transfer engine systems, making it both more reliable and more efficient.

"With Interplay we have two layers of asset management, and we used Vantage on both sides of that," says Jefferson. "In some cases we used Vantage to create versions for hi-res [delivery], and another way we used it was to normalize and re-wrap inbound content going into the production level."

Other workflows

Vantage was also used to create screeners in the MPEG-4/H.264 format, says Jefferson, basically a "lightweight version of some content, the DVD [quality] version but file-based, which we would post up on Media Silo or just email for review and approval." Another new application for Vantage in Sochi was using the system to stitch "top" and "tail" animations onto each video that featured a spinning NBC Olympics shield.

The Result

NBC Olympics' multi-platform effort for Sochi was an outstanding success, with its coverage reaching more viewers via more platforms than any previous Winter Olympics. According to data from NBC Universal's Total Audience Measurement Index (TAMi), which tracks both traditional TV viewing and consumption on digital platforms, the Sochi Games generated 242.3 million media exposures across NBC Universal's various platforms, a 3.5-million increase over the 2010 Vancouver Winter Olympics.

While broadcast and cable network ratings were predictably strong, with NBC winning the primetime broadcast ratings for all 18 nights of the Games, the biggest viewing leap for Sochi was on digital platforms. NBC Sports Group's digital platforms counted 61.8 million unique users, a 29% improvement from the Vancouver Games.

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A Winter Olympics-record 10.8 million hours of video were consumed on NBC Olympics' digital platforms, more than triple the hours of video streamed for Vancouver, with the combination of NBCOlympics.com and the NBC Sports Live Extra app capturing 24.6 million video viewers. That was an impressive 160% gain over Vancouver and 8% higher than the 2012 London Summer Games.

NBC Olympics' "TV Everywhere" initiative for Sochi, whereby cable and telco TV subscribers were authenticated to watch live streams and event replays online, also saw significant growth from past Olympics. Some 225 multichannel distributors offered verification for their customers with a 54% success rate, a 50% improvement from the 36% success rate for the 2012 London Games, and 4.8 million devices were successfully verified. And 2.1 million unique online users watched the Feb. 21 ice hockey semifinal between the U.S. and Canada, which is believed to be the largest "TV Everywhere" verified streaming audience in U.S. history.

Jefferson says that changes in how, when and where viewers are consuming NBC's Olympic coverage are driving innovation in NBC Olympics' production and delivery schemes.

"We've taken the traditional Olympics model, and absolutely applied it to our new digital efforts," says Jefferson. "But there have also been a lot of technology changes from Games to Games, primarily in things 'beyond our borders'. For example, for the last Winter Games in Vancouver, iPads didn't exist. You want to talk about a significant change of outlets? That was a sea change in terms of people's appetite for watching longer videos [online], and it changed our thinking about it."

Life After Sochi

Since the merger of Comcast and NBC Universal in early 2011 and the subsequent formation of the NBC Sports Group, which includes NBC Sports, NBC Sports Network (formerly Versus), Golf Channel and 11 regional cable sports networks, the company's mandate is to seek technology that has broader application than just Olympics coverage.

"The goal here is to build things that live on beyond the 18 days," says Jefferson. "The hope is to keep using these systems and improving them and making them more efficient, so we don't have to build from scratch each time."

NBC had previously used Telestream technology across different business units, including NBC Olympics and NBC Sports Network. Now that everything is under the single NBC Sports Group umbrella and located in a 320,000-square-foot facility in Stamford, NBC is moving to more of a centralized content ingest and preparation architecture.

"With Telestream, all the component parts had been used off and on," says Jefferson. "Now that we're all under one roof, we're building more and more nodes, with centralized transcoding."

For example, some of the content ingest, transcoding and asset management systems that NBC used to deliver coverage from Sochi had already been used for streaming coverage of Premier League Soccer and NBC's Football Night in America. And the Vantage-based system created for Sochi will be used for other big events like the Kentucky Derby and the French Open.

To learn more

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