Quantum®

CASE STUDY

Sky's the Limit for StorNext at NASA's Kennedy Space Center

When NASA decided to create a fully digital solution for launch video capture and delivery systems at Kennedy Space Center—a 21st-century workflow for the post-Space Shuttle era— key priorities were performance, automation, and scalability. After an arduous request for proposal (RFP) process and a grueling acceptance test, the team installed a StorExcel-recommended solution based on Quantum StorNext Pro Studio and IPV Curator.
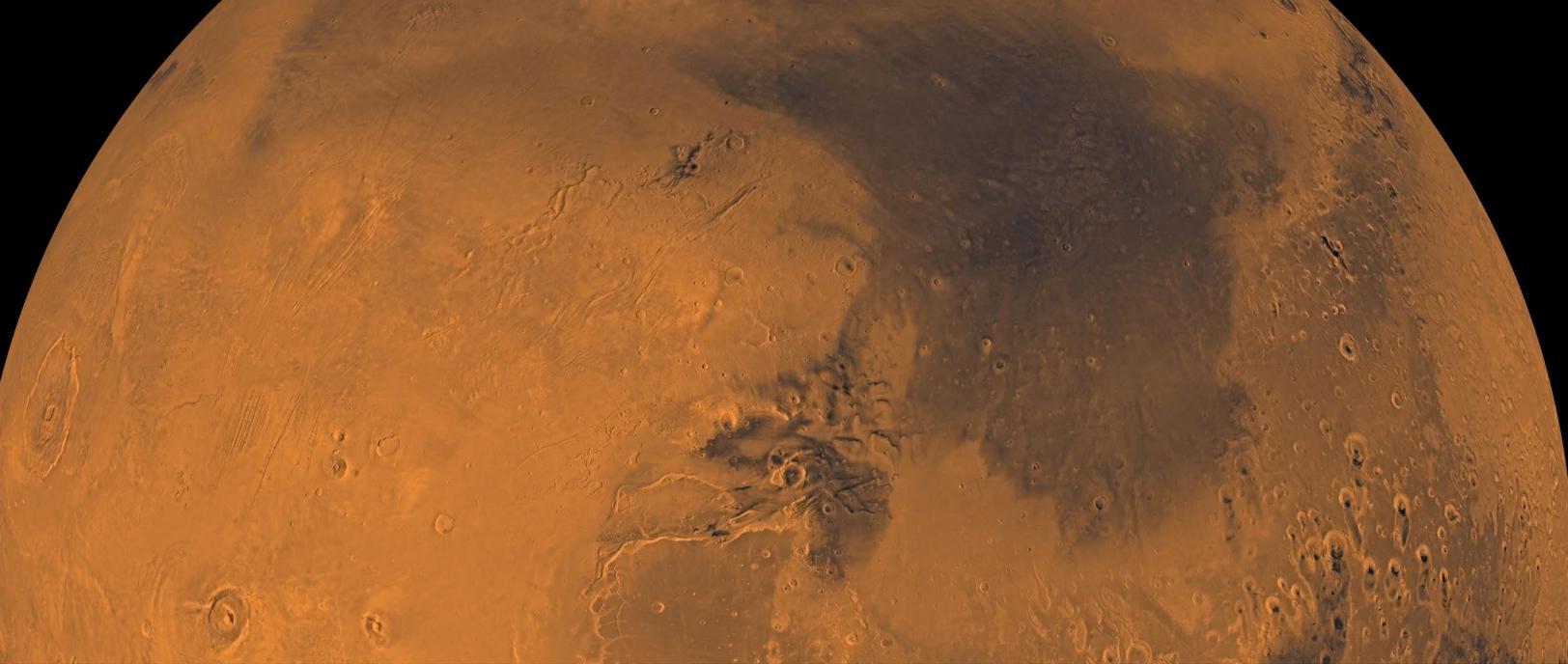

FEATURED PRODUCTS

StorNext® 5

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Jeff Wolfe
Communications system engineer, Abacus Technology

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> **Jeff Wolfe** – Communications system engineer, Abacus Technology

SOLUTION OVERVIEW

- StorNext® Pro Studio
  - StorNext QXS-1200 RAID array
  - Xcellis™ Workflow Director
  - StorNext AEL500 Archive library
- Brocade 6505 switches
- IPV Curator media asset manager
- Telestream Vantage transcoder

KEY BENEFITS

- **Fully digital workflow** gives users fast access to files, eliminating delays
- **Faster and easier access to content** through the IPV media asset manager interface—integrating search, retrieval, and sharing of files into the workflow
- **Automated protection on multiple storage tiers** ensures safety and availability of NASA's irreplaceable assets
- **Integrated archiving** gives users access to content stored on high-capacity, economical LTO media
- **StorNext compatibility with other systems**, including Apple Xsan, makes it easy to share assets with public affairs editors
- **Scalability and support for cloud and object storage** provide options to support future growth
- **System pre-staging** simplified acceptance testing and helped streamline installation

There are not very many imaging environments more challenging—or more critical—than the one that supports launches at NASA's Kennedy Space Center. During the planned liftoff of Exploration Mission 1 (EM-1), 80 to 100 cameras will capture the event from every possible angle, and keep tracking the rocket and its payload until it is out of sight. The data—which includes images and video taken with motion picture film and high-resolution video cameras at speeds of up to 1,000 frames per second—weigh in at around 200TB per mission. This information must be available to engineers and flight specialists in several different NASA centers as rapidly as possible.

UPGRADING PERFORMANCE, ACCESS, AND CAPACITY

Defining requirements for, selecting, testing, and installing its first fully digital workflow system for launch videos was a major task for NASA and the contractors overseeing the transition. The original system, which dates back to the days of the Space Shuttle program, started with analog tape or as photographic film that had to be rushed to an out-of-state processing center after each takeoff for development and digitization.

"It would take two days to get the film processed and available as a file, so the NASA team could analyze the high-res slow-motion footage," explains Jeff Wolfe, Communications System Engineer at Abacus Technology, the NASA contractor for imaging services. "The asset management system we had at Kennedy could not handle the complete process because it was really more suited to documents than to video and image data. It meant that access to the image data was delayed."

The still images and video files collected within NASA serve multiple purposes and need to be available to different audiences in different formats and resolutions. Scientists use them to assess effectiveness of equipment, systems, and procedures. The security team uses them as part of its surveillance procedures. And the public affairs department uses them to communicate the agency's mission to its internal audience and to provide images to the general public.

At the same time, the list of organizations using Kennedy Space Center for launches is expanding, including Boeing, SpaceX, and Blue Origin.

"The video footage we collect is an irreplaceable asset that must be protected and retained, as well as being made available to a wide range of different users at different locations, which makes the management task particularly challenging," explains Wolfe.

SELECTING A DIGITAL WORKFLOW SOLUTION FOR NASA

NASA's key requirements for a 21st-century workflow solution were high performance, automation, and scalability. Perhaps one of the most critical was the capability to download all the data from the cameras within 24 hours of a launch. The new system would also need to easily scale to support future missions and higher resolution formats. And it would need to work with existing media asset management and workflow solutions used by other offices, including Apple Xsan. NASA needed to easily share data in an automated workflow, so it needed an integrated asset management foundation. NASA's data is irreplaceable—making thorough testing and evaluation of the entire system prior to installation at Kennedy Space Center a key priority. And NASA needed a cost-effective solution with a strong return on investment.

"We wanted to be absolutely sure it could handle the load we were going to throw at it," says Wolfe, "and we wanted help and support during the installation phase to make sure that any issues that might come up could get resolved quickly."

STORNEXT PRO, IPV, AND TELESTREAM AUTOMATE WORKFLOW, PROTECTION, AND RETENTION

A key partner on the project was veteran content and workflow integrator StorExcel, the designer and supplier for the NASA solution. "We wanted to give NASA a state-of-the-art video workflow system based on best-of-breed solutions that we knew would work well together and provide optimal value based on our own experience," says Kurt Clawson, CTO, Media & Technology at StorExcel.

NASA selected the solution that used Quantum StorNext 5 as the storage foundation and IPV Curator as the media asset manager. StorNext Pro Studio offers an end-to-end workflow solution built with StorNext Q-Series high-performance disk storage and an LTO-based StorNext AEL500 archive, which includes StorNext Storage Manager for data management. IPV Curator provides an end-to-end asset management layer that coordinates media production, editing, and content management. Also included in the final system were Telestream Vantage for transcoding and a Brocade fabric switch.

With the new StorNext solution, all the cameras record the launch events digitally, and the content is downloaded to the StorNext QXS-1200 high-performance RAID storage. As soon as the content is ingested, metadata is created and it is logged into the IPV media asset manager, and two copies are created in the Fibre Channel-attached StorNext AEL500 archive on LTO media. The primary disk copy is accessed by users directly while the files are active. As content ages and becomes inactive, it is removed from the disk, but a copy remains available in the archive for users to access. With StorNext, files and metadata are visible through the media asset manager for all content, whether they are located on disk or in the archive. For long-term retention, the second tape copy is removed from the library and stored in a secure, off-line location.

"With StorNext, video files get into the system at high speed. Everything is protected immediately so the data is safe and secure, and all the assets are available immediately to users using a single IPV management interface," says Wolfe.

"StorNext is designed to give everyone faster access to the data, to make content searches and retrieval quick and easy, and to reduce the amount of administration time. It's a win on every count."

"One of the things that we like about StorNext is that it gives us lots of options for solving issues when they come up, including use of the cloud and object storage."

Jeff Wolfe
Communications system engineer, Abacus Technology

ABOUT NASA

Founded in 1958, the National Aeronautics and Space Administration (NASA) leads the world in the science associated with aeronautics and space exploration in accordance with its mission to reach for new heights and reveal the unknown for the benefit of humankind. NASA conducts its work in four principal organizations, called mission directorates. *Aeronautics* manages research focused on meeting global demand for air mobility in ways that are more environmentally friendly and sustainable, while also embracing revolutionary technology from outside aviation. *Human Exploration and Operations* focuses on International Space Station operations, development of commercial spaceflight capabilities, and human exploration beyond low-Earth orbit. *Science* explores the Earth, solar system and universe beyond; charts the best route of discovery; and reaps the benefits of Earth and space exploration for society. And *Space Technology* rapidly develops, innovates, demonstrates, and infuses revolutionary, high-payoff technologies that enable NASA's future missions while providing economic benefit to the nation.

PRE-STAGING SIMPLIFIES SYSTEM ACCEPTANCE TESTING

The key to making the testing and evaluation process run smoothly was the collaboration between Quantum and StorExcel. Both companies worked together to pre-stage the entire system for acceptance prior to installation—validating the storage system, and identifying and solving potential issues at the final installation site.

"Quantum gave us space in their Englewood, Colorado facility to set up and configure the exact system that we would be installing so that we could perform the factory acceptance testing without interrupting any of the operations at Kennedy—it really worked well for us," says Wolfe. "Since we had good test data from the system itself, when we saw performance differences at our site, it helped us identify issues that we needed to resolve."

Besides meeting the current requirements at Kennedy Space Center, the NASA team is looking ahead to the next generation of storage challenges.

"We know that we are going to see huge increases in our storage requirements in the future," Wolfe says, "with much higher resolution formats, more users needing access, and increased numbers of missions, which use even more cameras. One of the things that we like about StorNext is that it gives us lots of options for solving issues when they come up, including use of the cloud and object storage."

ABOUT STOREXCEL

StorExcel is a reseller and systems integrator that provides next-generation content management and workflow automation solutions to meet the needs of scale-out storage environments in the public and private sector markets. The company's focus is on helping clients reduce their operational costs while accelerating innovation with their business and mission-critical information. StorExcel provides cost-optimized strategies, solutions and services to complement current operations with future extensibility and scalability for its clients.

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