CASE STUDY

NASA Langley Department of Deep Space Statistics chooses Spectra storage for analytics archive

" Since the installation of our Spectra T950, our engineers have been able to more quickly and accurately assess and allocate archive categories using Spectra's BlueScale software, which in turn has freed up valuable resources. "

John Helmsford, CIO, NASA Langley

Spectra T950 Tape Library and Spectra NAS disk unit

About NASA Langley

When the United States decided to return to the moon, NASA returned to where the U.S. space program started, near the mouth of the Chesapeake Bay in Hampton, Virginia. NASA's Langley Research Center was the initial home of the first astronauts, the Mercury 7. Langley's reputation for exceptional research started soon after it was established as the United States' first civilian aeronautics laboratory. NASA Langley's decades of contributions in aerospace, atmospheric sciences and technology commercialization are engineering a better future for all of us. NASA Langley researchers are working to continue the legacy earned over the past 90 years.

Langley Research Center (LaRC) is the oldest of NASA's field centers, located in Hampton, Virginia, United States. It directly borders Langley Field and the city of Poquoson. LaRC has focused primarily on aeronautical research, but the Apollo lunar lander was flight-tested at the facility. In addition, a number of the earliest high-profile space missions were planned and designed onsite.

Established in 1917 by the National Advisory Committee for Aeronautics, in the early 21st century the Center devotes two-thirds of its programs to aeronautics, and the rest to space. LaRC researchers use more than 40 wind tunnels to study improved aircraft and spacecraft safety, performance, and efficiency. Between 1958 and 1963, when NASA (the successor agency to NACA) started Project Mercury, LaRC served as the main office of the Space Task Group. In 1962-1963 this office was transferred to the Manned Spacecraft Center (now the Lyndon B. Johnson Space Center) in Houston, Texas.

The Challenge

In 2003, NASA Langley focused on the upcoming MER *Spirit* landing, scheduled for January 3, 2004. Langley was responsible for multiple aspects of the MER project, including analysis of *Spirit*'s entry, descent and landing data. Researchers at NASA Langley would have only weeks to assess the data, then determine and

Shown above: Artist's rendering of Rover Spirit

CASE STUDY: NASA Langley Research Center (Hampton, Virginia)

2003
Purchased Spectra® T950 in October and installed LTO-2 drives and media.

2006
Upgraded the T950 to LTO-3 drives and media.

2008
Upgraded T950 to LTO-4 drives and media in August of 2008.

2008
Purchased a Spectra T50 in October of 2008.

2013
Upgraded T950 to LTO-6 drives and media in September of 2013.

2013
Purchased a Spectra Network Attached Storage Solution in November 2013

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test potential changes before providing their recommendation to the flight software coders. The results of the analysis could then be used to adjust *Opportunity*'s entry, increasing its chances of success.

Prasun Desai, Langley's MER project lead, saw that the analysis would require facilities to store and protect a large volume of data. He assessed the research group's backup system, and realized that its current hardware was not up to the task of protecting the valuable data that would be traveling from Mars to Langley in early January. NASA Langley needed a centralized tape library that offered high-speed backups, large expansion capacity, and small footprint.

NASA's Rover *Opportunity* scored a near perfect Mars landing on January 24, 2004, thanks in part to Langley's analysis of Rover *Spirit's* trajectory and descent data, sent to Earth from Mars a few weeks earlier and stored on a Spectra T950 enterprise-grade tape library.

> **"** After our engineers realized the vast capacity of the T950 library, immediate efforts were made to migrate valuable disk-archived data from past research projects onto the less costly, but more stable tape medium. Our main data center has seen a huge drop in power consumption. **"**

John Helmsford, CIO, NASA Langley

The Solution

NASA Langley evaluated multiple backup solutions, and chose a Spectra T950 as the best product to manage data shipped from interplanetary space. NASA's storage environment today consists of Dell servers; a RedHat Linux operating system; a Brocade 2800 switch; Dell MD100 and 300 disk arrays; and of course, a Spectra T950 enterprise-class tape library.

Network Environment

- Spectra® T950 Tape Library
- Spectra NAS Solution
- Dell Servers
- RedHat Linux Operating System
- Direct-Attached Configuration
- Fibre Channel Connectivity
- Brocade 2800 Switch
- Dell MD1000 and 3000 Disk Arrays
- BakBone Software

NASA technician Ricky Hall works inside the Unitary Plan Wind Tunnel at NASA's Langley Research Center in Virginia to affix grains of sand to a precise scale model of the Dream Chaser spacecraft. The sand creates turbulence at key points to simulate the conditions the real spacecraft will encounter during its return to Earth. The data gathered from the wind tunnel was used to further test the design through the company's Commercial Crew Integrated Capability agreement with NASA.
Photo credit: NASA/ David C. Bowman

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