



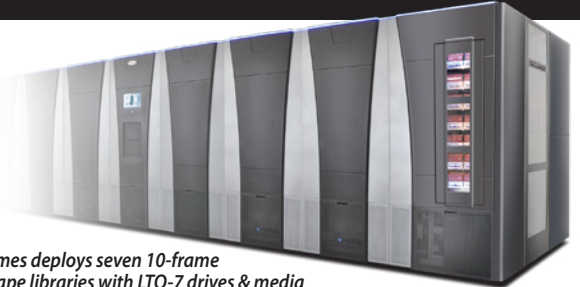
CASE STUDY

NASA Ames efficiently and cost-effectively manages 33% annual data growth with tape-based archive

“ Tape-based active archive solutions allow Federal organizations to reduce costs for indefinite data retention, ensure data integrity and reliability, and enable multiple users to retrieve classified and unclassified data simultaneously. ”

Nathan Thompson, CEO, Spectra Logic

NASA Ames deploys seven 10-frame TFinity tape libraries with LTO-7 drives & media



About NASA Ames

NASA Ames Research Center, one of 10 NASA field Centers, is located in the heart of California’s Silicon Valley. For over 70 years, Ames has led NASA in conducting world-class research and development. NASA Ames is one of the world’s leading high-performance computing sites for data and provides NASA with advancements in entry, descent and landing technologies, information technology, next-generation aviation improvements, astrobiology, airborne sciences and small satellite programs. They generate approximately 1.6 petabytes (PB) per month of data related to their research and simulation programs.

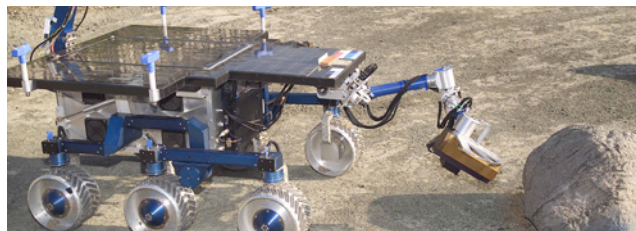
During its earliest days, Ames researchers broke new ground in all flight regimes through construction of increasingly sophisticated wind tunnels, research aircraft, and methods of theoretical aerodynamics. Building upon the world’s greatest collection of wind tunnels, Ames research expanded into computational fluid dynamics, simulation technology, information technology, air traffic management research, tilt rotorcraft, and life sciences.

Today, NASA Ames is developing into a world-class research and development campus with partners from academia, industry, and non-profit corporations. The goal is a highly collaborative environment for innovative research and educational facilities to train the future workforce.

NASA has been a key participant in the advancement and use of HPC in support of its missions. Applications have included modeling fluid dynamics phenomena and full aerospace vehicles, Earth’s weather and climate, solar physics and the formation of the universe, and much more. All of these disciplines require high-fidelity numerical modeling of complex systems and processes, and detailed analysis and visualization of large-scale data, both enabled by supercomputing, to advance human knowledge and technology.

Fast Facts

- 500 PB of data
- 1.6PB data per month
- 33% increase in data annually
- 1,400 square feet of floor space reclaimed
- 1000 users accessing data at any given time



Shown at left: NASA Ames testing of the K9 Rover in a new “Marscape” for future Martian exploration.

CASE STUDY: NASA Ames Research Center

2003

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

2007

Upgraded to LTO-4 drives and media.

2013

Upgraded to LTO-6 drives and media and installed a Verde NAS Solution

2010

First TFinity Exascale tape library purchased in November with LTO-4 drives, eventually upgrading to LTO-6 drives.

2011

Purchased a second and a third TFinity library with LTO-5 drives and media. One TFinity upgraded to LTO-7 in 2015.

2013

Fourth, fifth, sixth and seventh TFinity tape libraries purchased with LTO-6 drives. As of 2016 they have all been upgraded to LTO-7.

The Challenge: Continuous access to a growing data set that must be preserved forever

As one of the leading high-performance computing (HPC) sites in the world, NASA Ames archives approximately 500 PB of data, generating approximately 1.6 PB of data each month, resulting in an approximate increase of 33% data growth annually. All of this data must be retained indefinitely. In 2009, NASA Ames was running out of data center floor space. Also, they were capped on their available power consumption and required an energy efficient, cost effective solution. In order to meet their growing requirements, NASA purchased two Spectra T950 tape libraries to replace their six Sun/STK 9310 Powderhorn tape libraries.

The Solution: Space- and Energy-Efficient, Highly Scalable Tape Libraries

NASA Ames has since reclaimed over 1,400 square feet of their data center floor space with their initial Spectra Logic purchase. NASA has protected its initial tape hardware investment for nearly 15 years, and migrated from the T950 platform to seven Spectra TFinity ExaScale Tape Libraries, to accommodate changing needs and data growth. Since their data needs to be always available, Spectra's libraries have allowed them to complete their significant upgrades in the background without interruption to their users.

NASA Ames has an average of 1,000 users saving and accessing data on a regular basis. Due to the critical nature of their research, all data is stored forever or until

the users decide to delete it. Ames utilizes Spectra Certified Media with Carbide Clean to ensure their media is debris-free and Spectra's Media Lifecycle Management (MLM) to reduce media-related issues through its intuitive reporting of at-risk media that should be retired. The MLM reporting is accessible directly from the library or via remote web access, so they can easily identify whether a tape is safe to store data upon by simply checking its health score.

Solution Recap

The Spectra® TFinity ExaScale library's modern design provides a tape archive and backup solution to fully meet the needs of the Enterprise IT, federal government, high performance computing, and media and entertainment markets, offering industry-

leading scalability with the speed necessary to meet the requirements of the most data-intensive environments in the world.

Network Environment

- Seven TFinity ExaScale libraries with LTO-7 drives and media (one of these libraries is a demo unit)
- High Performance Transporters
- Spectra Certified Media with Carbide Clean technology
- Spectra MLM (Media Lifecycle Management)
- Pliedes Supercomputer
- SGI Data Migration Facility (DMF) storage virtualization system
- Active Archive Environment

