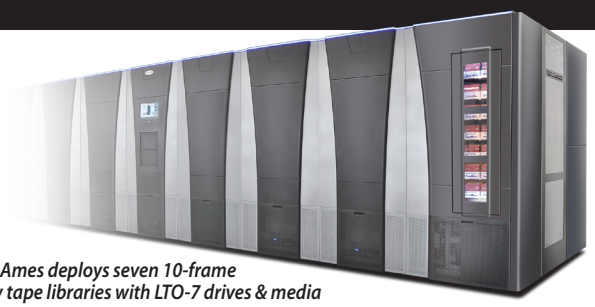
CASE STUDY

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 80 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.

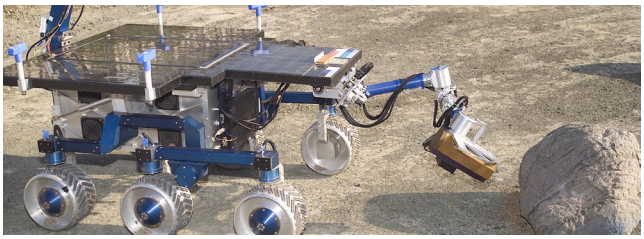
During its earliest days, NASA Ames researchers broke new ground in all flight regimes through construction of increasingly sophisticated wind tunnels, research aircraft, and methods of theoretical aerodynamics. Building upon the world’s greatest collection of wind tunnels, Ames research expanded into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

Today, NASA Ames has developed 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

- More than 600PB of data
- 1.6PB data per month
- 33% increase in data annually
- 1,400 square feet of floor space reclaimed
- 1,000 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

2009
Purchased Spectra® T950 with LTO-4 drives and media.

2010
First TFinity Exascale tape library purchased in November with LTO-4 drives.

2011
Purchased a second and a third TFinity library with LTO-5 drives and media.

2013
Upgraded to LTO-6 drives and media and installed a Spectra® Verde® NAS Solution.

2013
Fourth, fifth, sixth and seventh TFinity tape libraries purchased with LTO-6 drives.

2014
The first High Performance Transporter (HPT) is added to NASA's evaluation library.

2016
HPT implementation in two production libraries and upgrade to LTO-7.

2018
Upgraded system performance and capacity by purchasing LTO-8 tape drives and LTO-7 type M tape media.

The Challenge

As one of the leading high-performance computing (HPC) sites in the world, NASA Ames archives more than 600PB of compressed data, generating approximately 1.6PB of data each month, resulting in an estimated data growth of 33% 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 enable continuous access to a growing data set that must be preserved forever, 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 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 over time, 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.

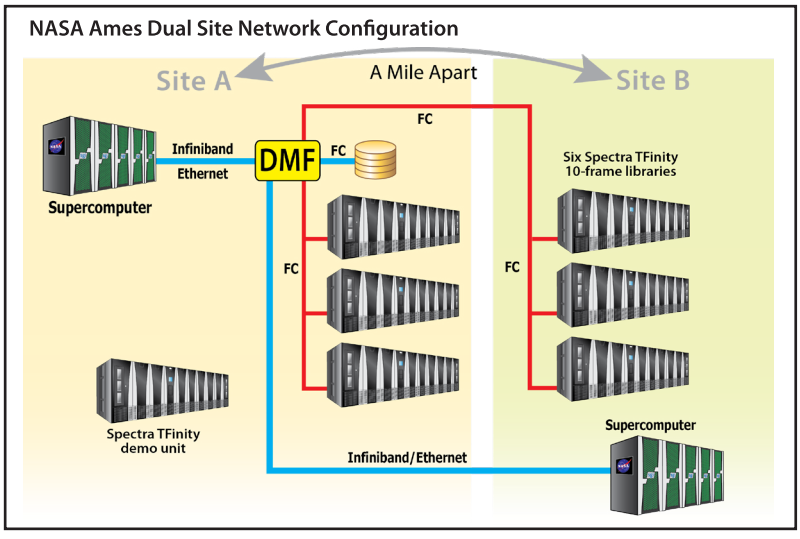
NASA Ames has an average of 1,000 users saving and accessing data on a regular basis. Due to the critical nature of its research, all data is stored forever or until the users decide to delete it. Ames utilizes Spectra Certified Media with Carbide Clean® to ensure their media is debris-free and Spectra's 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 CarbideClean technology
- Spectra MLM (Media Lifecycle Management)
- Pleiades Supercomputer
- SGI Data Migration Facility (DMF) storage virtualization system
- Active Archive Environment
- ~ 1.9EB of total system capacity*



*Assumes 2:1 compression for LTO-5 and 2.5:1 for LTO-6, LTO-7, LTO-7 Type M and LTO-8

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