



# Data Storage Solutions for High Performance Computing



Your high performance environment continually tests the limits of technology and requires peak performance from all of your equipment – including your storage. Spectra's data storage solutions help you push the boundaries of your operational objectives, giving you cost-effective storage that meets all of your growth and performance needs.

- **Extremely Scalable**

Spectra tape libraries are designed for intelligent expansion to accommodate massively growing data sets. A TFinity® ExaScale, for example, can scale to 2.03 EB in a single 44-frame library. Spectra tape libraries can meet your evolving needs and give you cost-effective storage during every stage of your growth.

- **Intensely Dense Storage**

When data center real estate counts, Spectra Logic tape libraries offer unsurpassed storage density and minimal footprint through a unique and highly efficient design. Based on Spectra's TeraPack® architecture, Spectra tape libraries provide up to 50% improvement in data center floor space utilization. Increase your storage capacity in increments as few as nine (IBM® TS tape technology) or ten (LTO tape technology) slots, the most granular and flexible in the industry. This dramatic, industry-leading storage density not only saves you data center space but also fits easily into co-located and standardized data center designs.

- **Highly Energy Efficient**

Save money with intelligent and energy-efficient storage. Tape is the most cost-effective media for storing mass quantities of data, and Spectra tape libraries also consume the least amount of power when compared to competing libraries.

# The Spectra® TFinity® ExaScale Tape Library: Why it's the ideal high performance computing archive target .....



## Bulk Loading: Less Media Handling

All TFinity tape libraries support BulkTAP end units as an optional hardware feature. Each Bulk TAP allows 14 TeraPacks to be imported or exported in a single user operation. The TFinity also supports the use of two BulkTAPs simultaneously for decreased load-to-work time for organizations who eject or load large amounts of media from their library.



## Secure XML Interface

Spectra Logic libraries support a secure XML command interface for control, configuration, and reporting. This XML interface enables customers to develop and deploy their own custom interfaces for the library configuration, status, inventory reporting, and diagnostics.

## Tri-Media: Three Different Tape Technologies in the Same Library

The TFinity ExaScale has the unique ability to support multiple media and drive technologies in a single tape library: LTO tape technology, IBM's TS11XX tape technology, and Oracle's T10000 tape drives and media. This feature enables customers to migrate between different media technologies within the same library, and eliminates vendor lock-in. Only Spectra offers support for all three major tape technologies, and supports Object Storage with LTFs, making your archives non-proprietary.



## High Performance Transporter

The High Performance Transporter (HPT) in the TFinity ExaScale was redesigned from the ground up to provide increased performance, enhanced reliability and superior media handling of all three tape media formats. Spectra's HPT accomplishes this and more with reduced cycle/tape mount time, providing better performance and increased mean time between failures, translating into better reliability. Each TFinity ExaScale tape library contains two HPTs for dual operations.

## Enterprise IBM® TS1160 Drive Technology .....

Spectra offers you an advanced solution to address critical HPC data growth—the TFinity ExaScale Tape Library, the T950 and T380 libraries – all paired with IBM® TS1160 Technology Tape Drives. These enterprise-level drives meet the needs of HPC users with massive data sets that need to get transferred down into and back out of the archive as quickly as possible. Plus, with an industry-best bit error rate of 1x10<sup>20</sup>, these drives provide unmatched, enterprise-class reliability for supercomputing users.

**High Capacity:** With 20TB native (50TB compressed at 2.5:1) you can consolidate your critical storage, simplify media management, and confidently protect your data.

**Fast Performance:** Experience shorter backup windows and improved data access with the fastest tape drive on the market, delivering native data transfer rates of 400 MB/s and compressed data transfer rates of 900 MB/s.

**Designed for Constant Use:** 250,000 hour MTBF to meet demanding uptime requirements and ensure data is available when it's needed.

**Superior Data Security:** SKLM with AES-256 bit encryption and key management.

**Recommended Access Ordering:** Improves multiple block recall/retrieval times.

**Virtual Back Hitch:** Maximizes data capacity by eliminating lengths of unwritten tape.



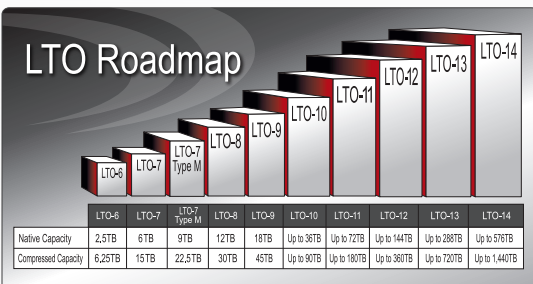
**IBM's TS1160 Drive and Media**



**LTO-9 Drive and Media**

## LTO: The Industry Standard for Tape Technology .....

Spectra libraries with LTO (Linear Tape Open) Ultrium Technology offer innovative storage solutions for small businesses up to the largest Enterprises. LTO technology has become the most-used data protection media by organizations that need to store terabytes to petabytes of data. Entering its ninth generation, LTO-9 tapes natively store 18TB of data and 45TB when compression is used.

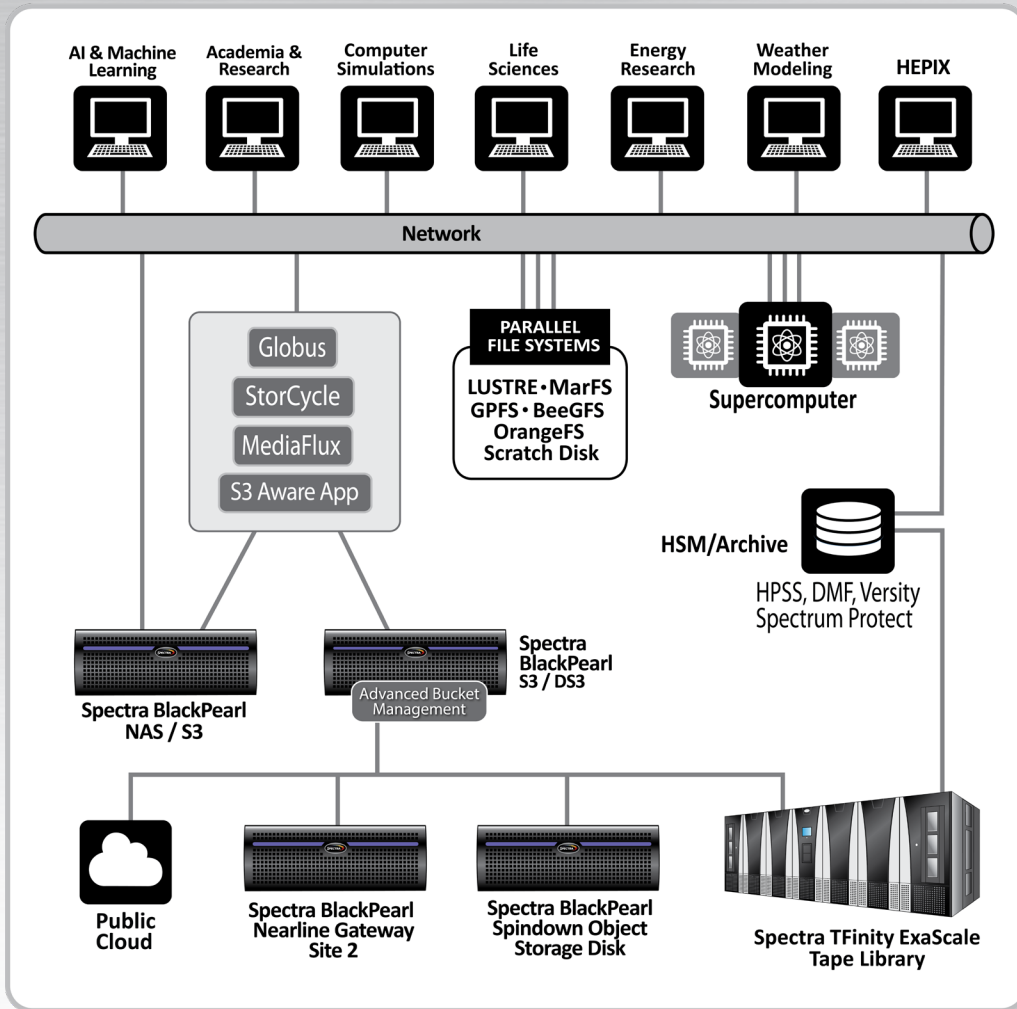


Note: Compressed capacities assume 2.5:1 compression (achieved with larger compression history buffer).  
Source: The LTO Program. The LTO Ultrium roadmap is subject to change without notice and represents goals and objectives only.

- The only open format tape technology available, providing the first and only cooperative development effort in the industry
- Provides the lowest cost storage available with multiple vendor sources for the drive and the media
- Very low power consumption reduces operating expenses
- Provides high quality through the use of proven enterprise-level technology and volume-driven quality assurance
- Offers Linear Tape File System (LTFS) functionality. LTFS allow users to organize and search the contents of a tape with the same methodology as a hard disk, improving access time to data. LTFS also makes it possible to drag and drop files in the same manner that files are dragged and dropped to disk



# Spectra's Hybrid Storage Ecosystem: High Performance Computing Digital Preservation Workflow



## Keys to High Performance Computing Storage

The three key components of a high performance computing system are computing, networking, and storage. Because storage is one of the most important elements, it's key to have a powerful, modern data storage solution if you're using or plan to use HPC. Spectra delivers a modern approach to preserving data and making it accessible and usable for future use through its wide range of hardware and software components.

To be able to accommodate the vast amount of data involved in high performance computing, the HPC system's data storage system should be able to:

- Make data from any node available at any time
- Handle any size of data request
- Support performance-oriented protocols
- Scale rapidly to keep up with increasingly demanding latency SLAs
- Protect and secure data against internal and external threats



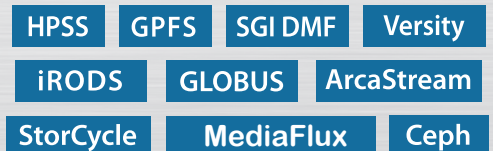
**SPECTRA**  
**BLACKPEARL®**

## Spectra BlackPearl Platform: Simply & Affordably Preserve Your Data Forever

Spectra's BlackPearl Platform storage system solves the problem of costly and complex approaches to digital preservation by combining NAS and S3-based interfaces with multiple storage targets into a simple and affordable solution. Designed for numerous concurrent workflows, BlackPearl reduces the need for expensive third-party data movers by integrating Spectra S3 with a range of certified clients and simple file movers.

## High Performance Computing Tiered Storage Support

The Spectra Logic TFinity ExaScale tape library is engineered to support demanding HPC storage environments. With native support for Spectra StorCycle®, HPSS, SGI DMF, and Versity Storage Manager, and through extensive integrations with Spectra Logic's BlackPearl® Platform, the TFinity ExaScale can meet the storage needs of any HPC environment.





## Spectra Maintains a Strong Focus On Research & Development

Spectra Logic consistently invests 12 to 15 percent of annual revenues into R&D, and an additional 12 percent in customer support. With over 100 patents and a strong investment in research and development, Spectra Logic and its products have won many industry awards. These investments enable Spectra to deliver market-leading advantages such as scalability, density, energy efficiency and data integrity verification, as well as excellent customer service to support our long-standing commitment to customer satisfaction.

**Spectra TFinity ExaScale libraries have been installed in the NCSA facility.**

*"NCSA designed Blue Waters to be one of the largest, most powerful supercomputing ecosystems in the world. The Spectra Logic TFinity met our rigorous requirements."*

**Bill Kramer, Deputy Director of the Blue Waters Project**



## Support When, Where and How you want it

Support for Spectra libraries range from our standard worldwide next business day replacement to more advanced alternatives, including next day, same day, four hour onsite service or Assisted Self-Maintenance for secure sites. Our support staff is cross-trained over the entire storage environment – not just hardware – so we can assist you with all aspects of a problem. From open to close, we are committed to resolving any issue.

## Ideal for Secure Sites: Spectra's Assisted Self-Maintenance (ASM) .....

In addition to Spectra's 24x7 support offerings, Spectra has available an industry-first support supplement designed for customers requiring maximum security and the need for minimal downtime. A select group of customer-replaceable parts are stocked at your secure site for immediate repairs, thus eliminating the hassle and intrusiveness of onsite visits.



Drive → Power Supply → Robotics → I/O Blade (RIM)

## About Spectra Logic .....

Spectra Logic develops a full range of Attack Hardened™ data management and data storage solutions for a multi-cloud world. Dedicated solely to data storage innovation for more than 40 years, Spectra Logic helps organizations modernize their IT infrastructures and protect and preserve their data with a broad portfolio of solutions that enable them to manage, migrate, store and preserve business data long-term, along with features to make them ransomware resilient, whether on-premises, in a single cloud, across multiple clouds, or in all locations at once.

To learn more, visit [www.spectralogic.com](http://www.spectralogic.com).

