



**DEEP STORAGE EXPERTS**

**TFinity** 



.....***SPECTRALOGIC.COM***

# Storage for **Exponential** Data .....

Organizations that need to manage large quantities of data continually face an ongoing challenge: managing data growth simply and economically. As your storage increases, you encounter a series of new challenges that range from increased footprint and power consumption to complex system management and reduced performance. These challenges become amplified when you have an existing solution that does not offer system reliability, lacks longevity and does not have the vendor commitment and support you need.



## TFinity's **Rich Feature Set** at a Glance

Spectra Logic has brought over 35 years of experience into the engineering and building of its line of digital tape libraries and the TFinity is Spectra's top of the line product. Every feature and enhancement that we have developed over the years to make a library that is reliable, flexible, scalable and easy to use has been thoughtfully and carefully built into this premier system.



Industry-leading  
storage density



Dual robotics  
technology



Multi-Redundant  
failover system



Media Lifecycle  
Management



Drive Lifecycle  
Management



Library Lifecycle  
Management



BlueScale® Vision  
Camera



Integrated encryption  
and key management



Local and remote  
management



Low power usage  
and monitoring



Assisted Self  
Maintenance



Shared Library Services  
Virtualization/Partitioning



Data Integrity  
Verification



Certified Media  
Carbide Clean®

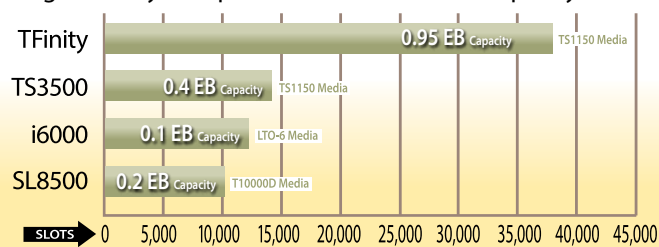


Space-saving design, high-density architecture and seamless scalability combine to help the TFinity to achieve the status of the highest capacity data storage system in the world.

## The World's Largest Capacity Tape Library

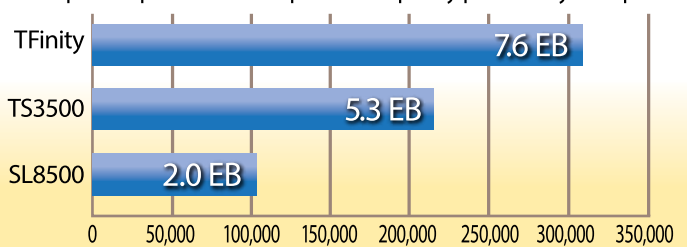
### World's Largest Single Library

Single Library Comparison: Slot Count and Capacity



### World's Largest Library Complex

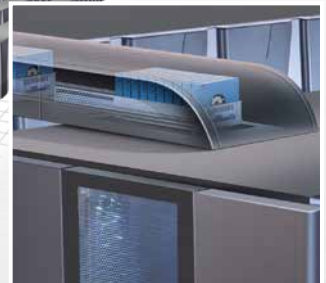
Enterprise Tape Slots & Compressed Capacity per Library Complex



## Exascale Capability with the TFinity Complex .....

Future expansion includes joining up to eight libraries in a single complex connected by our unique Skyway feature:

- 16 robots
- 320 frames
- 7.6 EB with TS1150 technology
- 960 drives: 2.4 PB/hr



## TFinity Single-Frame Specs

### Dimensions

Height: 79.15" / 201.0 cm  
 Drive/Media Frame Width: 29" / 73.7 cm  
 Service Frame Width: 31" / 78.7 cm  
 Depth: 43.21" / 109.8 cm

### Weights

Single Frame Weights  
 Base Frame: 821 lbs / 372 kg  
 Media Frame: 564 lbs / 256 kg  
 Service Frame: 737 lbs / 334 kg

### Interface Options

Fibre Channel: 4 Gb/s and 8 Gb/s  
 (LTO-5, LTO-6, LTO-7, TS1140 and TS1150 Technology)

### Power Requirements

Single Drive Frame with 24 LTO drives: 200-240 VAC/13 Amps/2600 Watts (Max) Service Frame: 8 Amps/1600 Watts (Max)  
 Heat Dissipation: 5,935 BTU/h (24 drives)



# TFinity Capacities

Drive Type	Configuration	Drives (max.)	Slots (max.)	Capacity Native/Compressed <sup>1</sup>	Throughput Native/Compressed <sup>2</sup> per Hr
TS1150 Technology	3-Frame Minimum	24	1350	13.5 PB / 33.8 PB	31.1 TB / 60.5 TB
	Library	120	38,115	381 PB / 953 PB	155.5 TB / 302.4 TB
	Complex <sup>3</sup>	960	304,920	3.0 EB / 7.6 EB	1.2 PB / 2.4 PB
LTO-7	3-Frame Minimum	24	1800	11.5 PB / 28.8 PB	27.2 TB / 68 TB
	Library	120	50,100	300.6 PB / 751.5 PB	136 TB / 340.2 TB
	Complex <sup>3</sup>	960	400,800	2.4 EB / 6.1 EB	1.1 PB / 2.7 PB
LTO-6	3-Frame Minimum	24	1800	4.5 PB / 11.3 PB	13.8 TB / 34.6 TB
	Library	120	50,100	125.3 PB / 313.1 PB	69.1 TB / 172.8 TB
	Complex <sup>3</sup>	960	400,800	1.0 EB / 2.5 EB	553 TB / 1.4 PB

1. Compressed capacities at 2.5:1 compression 2. Maximum Throughput Compression 3. Complex = 8 libraries

## Industry Leading Density



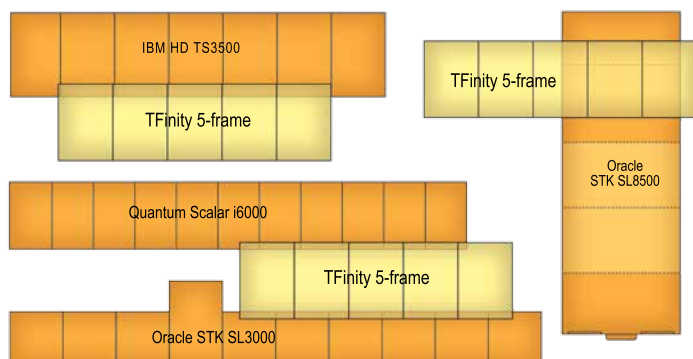
When data center real-estate counts, TFinity offers you unsurpassed storage density and the smallest footprint through a unique and highly efficient library design. Using innovative “shelves” instead of slots, and TeraPack® containers in place of individual cartridges; TFinity’s industry-best density delivers up to a 50% reduction in data center floor space required versus competing offerings.



The highly compact library design is also built to fit into a standard rack-row layout, fitting co-located and standardized data center designs that don't easily accommodate non-standard equipment footprints. These significant space-saving benefits allow you to re-task floor space for operations other than storage.

## Shrink Your Data Center Footprint

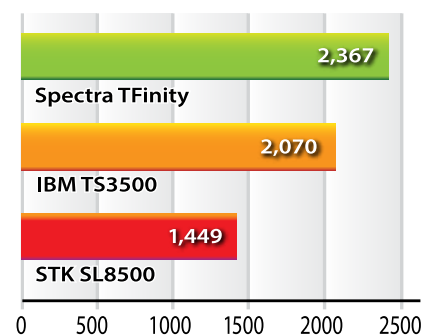
### Enterprise Library Footprint Comparison



The floorspace comparison diagrams shown at left are based on an LTO-6 tape slotcount of 4,500.

### Compressed Terabytes per Square Foot

Based on 10,000 enterprise drive tape slots (TS1150 or T10000D) and 12 enterprise drives



TS3500 Not Applicable above 15,000 slots. SL8500 Not Applicable above 10,000 slots.

TS1150 Technology (10 TB Native) compressed at 2.5:1 in TFinity and TS3500. T10000D (8 TB native) compressed at 2.5:1 in SL8500

# Best-In-Class Tape Technology.....

## TS1150 Technology Drives and Media with TFinity



### Superior Data Integrity:

TKLM with AES-256 bit encryption and key management.

TS1150 Technology offers the most reliable tape technology ever developed. Designed to provide Enterprise-Class reliability with 24 x 7 usage, the TS1150 Technology tape drive provides 1000 times more data integrity than an LTO tape drive.

In addition to robust reliability and data integrity, the TS1150 Technology offers the largest capacity per tape and the fastest data transfer rate of any tape technology available. This translates into fewer tapes needed to store the same amount of data, less labor and time to manage the tape inventory, and reduced library, application and offsite slot costs. Superior performance provides customers with the ability to get the same amount of work done with fewer drives and reduced support costs.

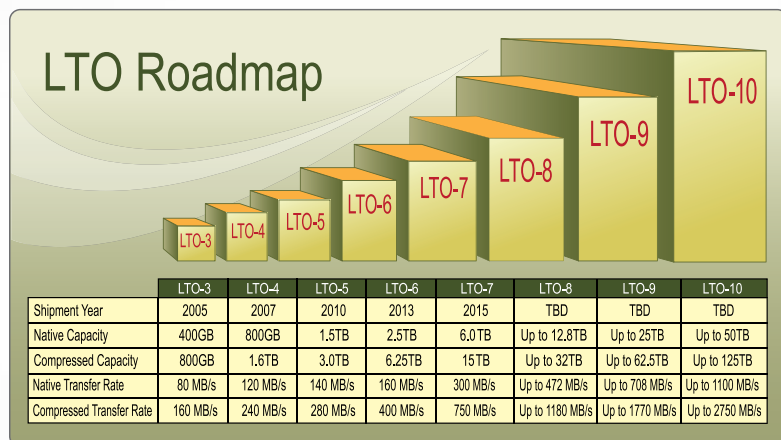
**High Capacity:** 10 TB native (25 TB compressed at 2.5:1)

**Fast Performance:** Experience shorter backup windows and improved data access with the fastest tape drive on the market, delivering native data transfer rates of 360 MB/s and compressed data transfer rates of 700 MB/s.

**Designed for Constant Use:** 237,000 hour MTBF to meet demanding uptime requirements and ensure data is available when it's needed.

## TFinity Maximizes the Industry Standard: LTO Tape Technology

LTO (Linear Tape Open) is the only open format tape technology available, resulting from a cooperative development effort in the industry. LTO media is the low-cost, yet high performance storage standard. LTO-7 is the current generation and the LTO roadmap is planned to go out to generation 10 and beyond.



**LTO-6 Capacity:** Up to 6.25 TB compressed 2.5:1 (2.5 TB native)  
**Data transfer rate:** Up to 400 MB/s compressed (160 MB/s native)  
**Speed matching data rate:** 40-160 MB/s  
**Data compression:** Streaming Lossless Data Compression (SLDC)  
**Data cartridge:** LTO-6 (rewritable) LTO-6 (WORM)  
**Cleaning cartridge:** LTO Universal Cleaning Cartridge (UCC)

**LTO-7 Capacity:** Up to 15 TB compressed 2.5:1 (6.0 TB native)  
**Data transfer rate:** Up to 750 MB/s compressed (300 MB/s native)  
**Data compression:** Streaming Lossless Data Compression (SLDC)  
**Data cartridge:** LTO-7 (rewritable) LTO-7 (WORM)  
**Cleaning cartridge:** LTO Universal Cleaning Cartridge (UCC)  
**Speed matching:** 100-300 MB/s



# Unified Management

Alternative solutions typically require a variety of resources to manage a single tape library: as many as six interfaces; onsite interaction with the library; and remotely managed applications located on additional servers. Operational complexity, dedicated skill set in personnel and additional capital cost are removed when customers select TFinity.

A single BlueScale® user interface manages an entire TFinity library without any external servers. This consolidation eliminates your need for additional equipment, software license charges or increased power or cooling requirements of extra hardware. BlueScale also offers you unparalleled operator efficiency, giving you the ability to manage your library, configurations, partitions, encryption key management and all of your library/media/drive health monitoring in a single interface.



## Better **Reliability** Through Lifecycle Management



To ensure the viability of your data, Media Lifecycle Management (MLM) tracks and reports on health and security related statistics for Spectra Certified Media. Detailed reporting mitigates media problems and restore issues, allowing you to copy and move your data onto new tapes before degraded media affects your data.

Like MLM, Drive Lifecycle Management (DLM) extends the same proactive approach to drives by integrating tape drive analysis and reporting within the library. Using easy-to-manage, color-coded icons, you can quickly identify the health status of a drive. DLM also offers easy-to-use tape drive diagnostics to test and verify drive health and operation.

Managing the health of your library's critical components is made easy with Library Lifecycle Management (LLM). By delivering utilization metrics relative to the expected useful life of library robotics, filters and other critical components; you are able to service your library before issues occur.



## Data Integrity Verification

To give you data integrity verification, Spectra offers a sophisticated suite of standard features that allow you to actively check data already written to tape. PreScan checks each imported tape and verifies that the tape can be written to, scanning the tape for potential issues including broken or dislodged leader and write-protected status. QuickScan scans a tape uni-directionally by reading the length of one track of the tape to provide a rapid indicator of integrity of data written. FullScan confirms that there are no media errors on the tape by reading the entire length

of the tape up to the end of the recorded data. To ensure that the data is valid, you can set triggers to check the health of tapes over an interval of time or verify a specific tape's data integrity on request. This process allows for rapid spot-checks of data integrity.



## TFinity's High **Availability** Architecture

Data intensive environments with large scale archive and backup storage require high availability solutions that produce constant uptime without continuous administrative attention and immediate vendor response support. TFinity offers you great reliability and delivers that high uptime through redundant componentry including:

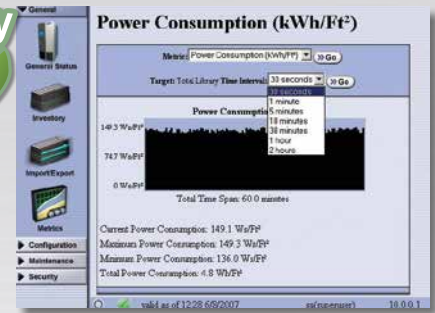
- Dual Robotics
- Robotics Control Modules
- Power Supplies
- Power Transmission Networks
- Hot Spare (Global Spare) Tape Drive



# Industry-Leading **Energy Savings** .....

## Highly Power-Efficient

TFinity's built-in, not bolted-on architecture provides the features you need and eliminates the requirement for multiple external servers to be purchased, powered, cooled and serviced for the purpose of library management. In comprehensive testing and comparison, TFinity's power consumption is shown to be less than competing systems (in some cases, by a factor of 4x to 6x). Additionally, power consumption monitoring is an integral part of BlueScale's feature set to help users keep track of their substantial energy cost savings.



## Spectra Logic's **Black Pearl**®



### Spectra's Deep Storage Solution: An S3 Gateway to Object Storage On Tape For Limitless Storage Capacity

To meet the demands of extreme data growth and long-term retention, the Spectra BlackPearl™ Deep Storage Gateway enables users to easily store massive data forever at virtually no cost. Designed for organizations where data is a significant part of their operations, BlackPearl allows data to move seamlessly into mass tape storage in a way not previously possible. BlackPearl enables users to deploy a tier of deep storage that is cost effective, easy to manage and scalable to Exabytes of data. With BlackPearl's simple RESTful S3 interface and embedded tape management software, organizations will confidently store all of their data forever at costs as low as pennies per Gigabyte.

## Most Scalable **Long-Term Storage Available**

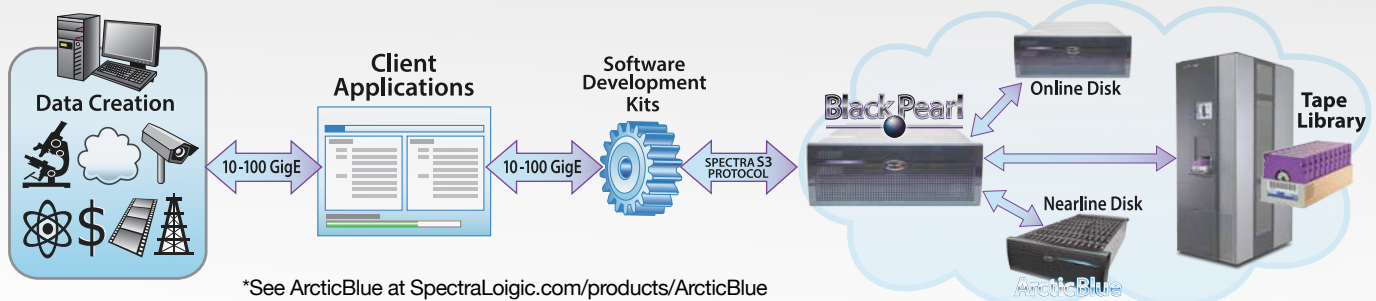
### Easily expands to Exabytes and beyond

BlackPearl unlocks tape's economies of scale, allowing you to drive the total cost of your deep storage down as your system grows. Standard LTO and IBM TS Technology tape roadmaps also span across future generations with significant capacity improvements to help you realize even greater capacity and storage density benefits.

### Designed to keep data forever

BlackPearl enables you to realize the long-term benefits of deep storage, helping you retain your data indefinitely. BlackPearl includes support for built-in media migration for seamless transfer of data to other deep storage media formats including Spectra's ArcticBlue.\* It also includes and supports different drive generations to ensure a seamless transition to newer tape media formats.

## Moving Objects to Spectra Deep Storage



\*See ArcticBlue at [SpectraLogic.com/products/ArcticBlue](http://SpectraLogic.com/products/ArcticBlue)

## SpectraGuard Support .....

Support for Spectra TFinity ranges from our standard worldwide next business day replacement to more advanced alternatives, including next day, same day, four-hour onsite service, our exclusive Assisted Self-Maintenance option and Price Lock which guarantees the list price of your service will not rise faster than the consumer price index. 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.

**SPECTRAGUARD**  
Worldwide Support

## Assisted Self-Maintenance (ASM) .....



Drive



Power Supply



Robotics



I/O Module

When a component does need replacement, Spectra gives you the option to do it yourself — without onsite support. ASM is an industry-first support option designed for customers that require minimal downtime for environments where normal support services are not feasible (e.g. high-security facilities, mobile sites such as ships). ASM stocks all customer replaceable parts at your site, giving you the ability to make immediate repairs and eliminate the delays that a site visit can involve.

## Spectra Service PriceLock .....

Concerned with the continual rising costs of support contracts on the equipment in your data center? Shocked each year when your vendor informs you of the recent 30% across the board support price increase? Spectra is keenly aware of the pain this causes customers and instead follows a unique, industry-first price protection plan on all of our support offerings. Our SpectraGuard Service and Support organization guarantees the list price of your support offering will never go up more than the rate of inflation. No more dreading that yearly renewal. No more surprise rate increases. Just straightforward, simple pricing with no hidden cost structures.\*



\*Adjustments for currency fluctuations to the US dollar and changes to unit configuration will still apply. Only available on currently sold products.

## About Spectra Logic Corporation .....

Spectra Logic develops deep storage solutions that solve the problem of long term storage for business and technology professionals dealing with exponential data growth. Dedicated solely to storage innovation for more than 35 years, Spectra Logic's uncompromising product and customer focus is proven by the largest information users in multiple vertical markets globally. Spectra enables affordable, multi-decade data storage and access by creating new methods of managing information in all forms of deep storage — including archive, backup, cold storage, cloud and private cloud.



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