



Spectra[®] Stack



FAQ

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Spectra Stack: What is it?

Spectra Stack is Spectra's stackable LTO tape library. Designed to be part of a modern storage architecture, it strikes the perfect balance between flexibility, scalability and affordability. Its small entry point, combined with small incremental expansions to over 10PB of native or over 25PB of compressed storage and up to 42 LTO tape drives, make it an ideal solution for backup, archive and disaster recovery in general IT as well as any vertical market needing a solid tier 1 storage offload to tape.

Components:

- Control Module – The control module is a complete, 6U tape library with up to 80 LTO tape slots and up to 6 Half-Height or 3 Full-Height LTO tape drives. It includes the main library controller, the robotic arm, remote management connection, and color LCD front panel touch screen display.
- Expansion Module – Expansion modules mount above or below the control module in an alternating fashion. Each expansion module allows for the addition of up to 80 tapes and up to 6 HH/3FH tape drives.
- Spectra Stack data management software – Fully integrated library management software that has been adapted from Spectra Enterprise BlueScale software to run optimally on the new Spectra Stack tape library. The library's data management software offers many similar features to Enterprise BlueScale software.

Expandability:

Rather than buying a large library, with slots that may or may not be activated in the future, Spectra Stack allows users to buy only the hardware they need at any given time. Once the slots are all fully activated, another expansion unit can be added to the system in under 30 minutes. Users who don't need additional slots are never left with 100's of unlicensed hardware slots they may never need.

- Control Module –
 - Starts with 10 licensed slots and can be expanded to 80 slots in increments of 10
 - Starts with 1 LTO drive and can be expanded to 6 HH or 3 FH LTO drives
- Expansion Module –
 - Starts with 10 licensed slots and can be expanded to 80 slots in increments of 10
 - Starts with no drives and can be expanded to 6 HH or 3 FH LTO drives
 - 6 expansion modules may be added to the Control Module, 3 above and 3 below, for a total of 7 modules in a standard 19-inch rack
- Total Tape Slot Expansion –
 - Up to 560 tape slots in a full, 7 chassis, 19-inch rack configuration
- Total Data Storage –
 - Up to 25.2 PB with LTO-9 (at 2.5:1 compression)
 - Up to 10.8 PB with LTO-9 (uncompressed/raw)
- Total Tape Drive Expansion –
 - Up to 42 LTO half-height tape drives / Up to 21 LTO full-height tape drives
- Total System Performance –
 - Up to 12.6 GB/s native throughput (42 HH LTO drives)
 - Up to 31.5 GB/s compressed throughput (42 HH LTO drives at 2.5:1 compression)

Drive Support:

- Spectra Stack supports LTO-5, LTO-6, LTO-7, LTO-8 and LTO-9 drives, Full-Height or Half-Height
- Spectra Stack currently ships with LTO-, LTO-8 or LTO-9 FH/HH tape drives

Migration Pass - Do all drives work with Spectra Stack?

- Upgrade your drive firmware to the latest available prior to removing from old library.
- Spectra will try to help make Migration Pass drives work but there is no guarantee.
- We will refund the cost of the sleds if your drives don't work (once the drive sleds are returned).
- Use the two hours of PS phone consulting for questions during the process.
- The Migration Pass drives are not under a Spectra support contract and will not be treated as if they were.
- [MigrationPass Video](#)

Media Support:

- Spectra Stack supports all standard LTO media readable/writeable by the above mentioned LTO tape drives.
- Users who migrate LTO-5 tape drives will be able to read back as far as LTO-3 media.
- LTO-7 "Type M" media is fully supported.
- Spectra Certified Media is fully supported with MLM functionality.

Spectra Stack Expansion:

The Spectra Stack control module can be mounted anywhere in a standard 19-inch rack. Expansion units are added above or below the control module in an alternating fashion. Spectra Stack expansion modules are designed to be out-of-box and into production in under 30 minutes.

What is the process for expansion?

- Unbox new expansion module.
- Install tool-less rack mounts inside of rack.
- Remove the top cover of the controller module (or bottom cover if expanding downward).
- Install removed cover on the expansion module (top or bottom depending on expansion direction).
- Load expansion module into the rack.
- Engage the module alignment pin located in the rear of the library.
- Connect power cable to new expansion module.
- Connect module expansion cable to connect controller module to expansion module.
- Reinitialize library and the new module will be recognized and the robotic arm self-calibrates.

As expansion modules are added above and below the control module, the control module is ideally situated in the middle of the rack allowing for 3 expansion modules above and 3 expansion modules below.

What do I do if I've reached the maximum 560 slots and need more storage?

The Spectra Stack library can be transcaled to any of the Spectra TeraPack-based libraries. After the 560 slot capacity of Spectra Stack is reached, the Spectra T950 would be the most obvious library to TranScale to. All drives, and tapes would be moved from the Spectra Stack and moved to the Spectra T950. Certified media, encrypted tapes and Medial Lifecycle Management (MLM) are all compatible between the Spectra Stack and other Spectra tape libraries.

Installation:

Does Spectra Stack require Spectra/VAR installation?

No. Spectra Stack is so simple to install and expand, it can all be done by the user. Professional installation options are available through Spectra Professional Services or most VARs if the user does not chose to do installation.

Spectra Stack Data Management Software:

Spectra Stack management software is a fully integrated library management software that has been adapted from Spectra Enterprise BlueScale software to run optimally on the new Spectra Stack tape library.

What are the interface options for the library's management software?

Spectra Stack management software is accessed via an intuitive graphical user interface (GUI) available on both the color touchscreen of the control module or via remote web interface.

What are the Spectra Stack management software features?

- Local or remote control via the front panel or web browser
- Partitioning – Up to 20 partitions can be created within a full rack Spectra Stack. Each partition requires a minimum of 1 drive and 5 tape slots.
- Media Lifecycle Management (MLM) – MLM tracks over 40 pieces of information on each tape within the Spectra Stack library. The information is recorded onto the MAM chip of each LTO tape and follows tapes into offsite storage as well. Spectra Stack Data Management Software MLM and BlueScale MLM are compatible and tapes created on either are able to be shared between libraries.
- Capacity on Demand (COD) – Users can start with as few as 10 tape slots enabled and grow the number of slots needed over time. Both the control module and expansion module(s) are equipped with 80 tape slots. Slots are enabled in increments of 10.
- Spectra Stack Management Software Encryption – Built-in encryption key management. Spectra Stack Management Software Encryption and Spectra BlueScale Encryption are fully compatible. Encrypted tapes can be freely moved between all Spectra libraries provided the encryption key(s) is exported/imported for the given tape set.
- Support for SKLM, and KMIP encryption functionality as well.

How BlueScale and Spectra Stack management software features compare?

BlueScale	Spectra Stack Data Management Software
<i>Touchscreen GUI</i>	<i>Touchscreen GUI</i>
<i>Remote Management</i>	<i>Remote Management</i>
<i>Partitioning (SLS)</i>	<i>Partitioning (SLS)</i>
<i>BlueScale Encryption Key Management</i>	<i>BlueScale Encryption Key Management</i>
<i>SKLM Encryption</i>	<i>SKLM Encryption</i>
<i>Media Lifecycle Management</i>	<i>Media Lifecycle Management</i>
<i>Drive Lifecycle Management</i>	X
<i>Library Lifecycle Management</i>	<i>Library Lifecycle Management</i>
<i>Drive Throughput Indicator</i>	X
<i>Auto Support</i>	<i>Auto Support</i>
<i>Auto Drive Cleaning</i>	<i>Auto Drive Cleaning</i>
<i>Assisted Self Maintenance</i>	<i>Assisted Self Maintenance</i>
<i>BlueScale Vision</i>	<i>BlueScale Vision</i>
<i>Capacity On Demand</i>	<i>Capacity On Demand</i>
<i>Data Integrity Verification (DIV)</i>	X
<i>Global Spare</i>	X
<i>Automatic Support Log</i>	X
<i>Power Monitoring</i>	X
<i>TeraPack Recognition</i>	X

Importing/Ejecting Tapes to/from Spectra Stack:

How are tapes loaded or ejected to/from the Spectra Stack library?

There are 2 options for loading or ejecting tapes to and from the Spectra Stack Library: Entry / Exit Port (EE Port) or Bulk Loading Magazine.



MailSlot Magazine



Bulk Loading Magazine

EE Port – The EE Port is a 10-cartridge magazine located behind the magazine access door on the right front of each unit. From the front panel, select the control or expansion module you'd like to load/unload; tap, "open EE Port" on the touchscreen panel; open the magazine access door and remove the 10-cartridge magazine. Tapes are added or removed via this magazine. The EE Port option must be enabled via the Spectra Stack data management software. If not enabled, the 10-slot cartridge will remain as storage slots as part of the larger, 40 slot magazine referred to as the Bulk Loading Magazine.

Bulk Loading Magazines – Each unit contains 2 bulk load tape magazines. The magazines are located internally on each side of the library behind the magazine access door. The magazines are each capable of holding up to 40 cartridges. For bulk loading or unloading the library, select the module to be loaded/unloaded from the front panel, select "open magazine," open the magazine door and remove the 40-cartridge magazine. The 40-cartridge magazine is supported by a rail slide and can be fully extended while containing 40 cartridges without the user needing to support it.

Compatibility:

Is Spectra Stack compatible with other Spectra libraries?

Yes. Both LTO tapes and LTO tape drives used in other Spectra libraries may be migrated into the new Spectra Stack library protecting user investment. Likewise, tapes and drives used in the Spectra Stack library can be migrated to larger Spectra libraries should users need more tape storage than the 560 slots provided by the *Spectra Stack*.

Is Spectra Stack compatible with non-Spectra libraries?

In many cases, yes. LTO tapes (LTO-3 and higher) can be migrated from any tape library. As an industry first, Spectra allows tape drives from many non-Spectra libraries to be migrated to the Spectra Stack library as well. This investment protection makes migration to Spectra Stack an easy financial decision. New drive sleds may be needed but the majority of the cost is in the tape drive itself, and that drive can be then be moved and the investment can be protected. See further details under the MigrationPass section below.

Are Spectra Stack Management Software MLM and Encryption compatible with BlueScale MLM and Encryption?

Yes. Both Spectra Stack Management Software Media Lifecycle Management and BlueVision Encryption are compatible with BlueScale libraries and vice versa. The media would be imported to the new library and inventoried. The MLM database is read from the MAM chip on the Spectra Certified LTO tape, and the library's MLM databased is updated. For encrypted tapes, the encryption key must also be exported/imported from/to the old/new library.

Is Spectra Stack compatible with ISV software used for backup, archive, migration, and disaster recovery?

Yes. All software packages currently compatible with Spectra libraries are compatible with the *Spectra Stack* library.

Is Spectra Stack compatible with standard LTO media?

Yes. Spectra Stack is fully compatible with all standard LTO media as well as LTO-7 Type M media. With LTO-5 drives, the oldest LTO drive supported by Spectra Stack, LTO-4 media could be read and written and LTO-3 media could be read.

Is Spectra Stack compatible with Spectra Certified Media®?

Yes

BlackPearl Compatibility:

Is Spectra Stack compatible with BlackPearl?

Yes. BlackPearl supports Spectra Stack just as it does all other Spectra libraries. This means users have immediate access to all clients and data movers (over 20 all told) that are currently offered with BlackPearl.

This makes Spectra Stack an ideal candidate for those desiring a relatively small tape offload for their Object Storage environment including using Spectra Stack as a “backup for the cloud.”

Support:

What are the support options for Spectra Stack?

Spectra Stack can be supported via any of the current support options offered for other Spectra tape libraries:

- Onsite Next Business Day Support
- Onsite 4-Hour Support
- Overlay addendums to support contracts:
 - Assisted Self Maintenance (ASM)
 - 24x7 Phone Support

What parts can be replaced by the user?

- Tape drives
- Power supplies
- Power control module
- Library control module
- Expansion control module
- Expansion cable
- Tape robot

What parts are included with an ASM Kit?

- Tape robot
- Library control module
- Power supply

Can ASM be purchased as a stand-alone support option?

No. Just as with our existing libraries and ASM support agreements, ASM is an overlay on any of the support options we offer. ASM doesn't have its own “phone support,” so that element is determined by the support option selected. Onsite Next Business Day may be augmented with an upgrade to 24x7 phone support.

Migration:

How does Spectra Stack make migrating from other libraries more cost effective?

This question is possibly the most important question to answer for users and resellers. **Spectra Stack is the only library on the market that allows most LTO-5 and newer, existing, non-Spectra LTO tape drives to be migrated into a new Spectra Stack library.**

A few manufacturers allow users to move LTO drives from their existing libraries into a new library as long as the manufacturer in question provided both the older library and the new library the drives are to be moved into. We know of no other manufacturer that will allow LTO drives to be moved from a library they did not originally provide. This offers tremendous investment protection for users.

In the event that an existing tape drive cannot be migrated due to incompatible drive sled, Spectra offers discounted trade-in on reconditioned drives. Other drives will have to be returned to Spectra for sled fitting or be fitted with sleds in the field.

In the following table, Tier 1 drives can be installed directly into a Spectra Stack library. Tier 2 drives will require the addition of a drive sled from Spectra in order to be installed in a Spectra Stack library. Tier 3 drives are not supported by Spectra Stack.

Tier 1	Tier 2	Tier 3
HPE StoreEver 1/8 G2	IBM TS3310	LTO-1 Drives
HPE MSL2024	IBM TS4300	LTO-2 Drives
HPE MSL4048	IBM TS2900	LTO-3 Drives
HPE MSL8048	Quantum i500	LTO-4 Drives
HPE MSL8096	Quantum i40	
HPE MSL6480	Quantum i80	
Overland NEOxl 8000	Quantum i3	
Overland NEOxl 80	Quantum i6	
Overland NEO T48	Quantum i6000	
Overland NEO T24	Oracle SL150	
Overland StorageLoader	Dell ML6000 family	
Qualstar Q8		
Qualstar Q24		
Qualstar Q48		
Qualstar Q80		
Fujitsu Eternus LT20		
Fujitsu Eternus LT40		
Fujitsu Eternus LT60		
Fujitsu Eternus LT260		
IBM TS3200		
IBM TS3100		
Dell PowerVault TL4000		
Dell PowerVault TL2000		

Does Spectra allow for LTO drives from other Spectra libraries to be migrated into the new Spectra Stack?

Yes. Any LTO-5 through LTO-8 tape drives, installed in current Spectra tape libraries, may be moved to the new Spectra Stack. Drives from the T50e do not need to be “re-sledded.” Drives from all other Spectra libraries will require new sleds.

How does Spectra Stack make migrating from other tape libraries or applications easier?

The ability to work with up to 20 partitions in a single Spectra Stack library make this unit a “game changer” when it comes to migration or consolidation.

In order to migrate from data movement applications – backup, disaster recovery, archiving software, etc. – users may dedicate a partition to existing tape applications and configure another partition for new tape applications. In this way, both older and newer application may be run in parallel until all data is migrated from the original application.

Likewise, separate partitions may be configured with varying levels of LTO tape drives. LTO-5 through LTO-8 tape drives may be used in the same Spectra Stack library.

If users are running multiple tape libraries, partitions and drives may be used to “virtually” represent multiple libraries allowing for multiple libraries to be consolidated into one library. The ability to support up to 20 partitions and up to 42 tape drives make Spectra Stack an appealing solution for those looking to migrate or consolidate their current tape solution.

Positioning Stack Against Existing Spectra Libraries:

What is the general positioning of Spectra Stack vs. other Spectra libraries?

Spectra Stack is designed for customers who:

- Are looking for the simplest approach to tape possible:
 - Unit can be installed by the end user
 - Unit can be upgraded by the end user
 - Majority of parts can be replaced by the end user
- Are looking for least expensive approach to tape:
 - Spectra Stack will be our price leader for tape with automated tape as low as 1 cent/GB
- Don't anticipate the need for more than 8 PB of tape storage
 - This is roughly 80% capacity of a Spectra Stack library

What is the general positioning for Spectra TeraPack Libraries vs. Spectra Stack?

Spectra BlueScale/TeraPack based libraries are designed for customers who:

- Are starting at capacities already out of the range of Spectra Stack
- Require greater redundancy in components / fault tolerance
- Require dual robotics
- Require larger/faster tape export via TeraPacks
- Require the ease of media handling via ejected TeraPacks

Market Considerations / Verticals:

Are there specific verticals that are targeted for Spectra Stack?

While Spectra Stack could be a strong solution for any of our vertical markets, it's simplicity and 560-tape capacity make it especially interesting for General IT, Video Surveillance and other verticals who don't historically archive tens of PB's of information to tape (as do M&E and HPC). Spectra Stack is also a good fit for customers who require a tape library that fits in a standard 19-inch rack.

For more information on Spectra Stack, contact sales@spectrallogic.com.

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