

ThinkSystem Nytro 3732 Performance 12Gb SAS SSD Product Guide (withdrawn product)

The ThinkSystem Nytro 3732 Performance 12Gb SAS solid-state drives (SSDs) in capacities of up to 3.2 TB are high-performance SSDs suitable for write-intensive applications of running on ThinkSystem servers. The drives are available in 2.5-inch and 3.5-inch form factors. The family also includes self-encrypting SED drives that adhere to the Trusted Computing Group Enterprise Security Subsystem Class cryptographic standard (TCG Enterprise SSC).



Figure 1. ThinkSystem Nytro 3732 Performance 12Gb SAS SSD

Did you know?

Unlike SATA drives, the 12 Gb/s SAS interface on these drives supports full duplex data transfer for higher performance, and enterprise-level error recovery for better availability. By combining the enhanced reliability of Seagate NAND flash memory silicon with NAND Flash management technologies, Nytro 3732 SSDs deliver the extended endurance in excess of 10 drive writes per day (DWPD) for 5 years, which is suitable for many write-intensive enterprise applications.

Self-encrypting drives (SEDs) provide benefits by encrypting data on-the-fly at the drive level with no performance impact, by providing instant secure erasure thereby making the data no longer readable, and by enabling auto-locking to secure active data if a drive is misplaced or stolen from a system while in use. These features are essential for many businesses, especially those storing customer data.

Part number information

The following tables list the information for ordering part numbers and feature codes.

Withdrawn: All drives are now withdrawn from marketing

Table 1. Ordering part numbers and feature codes

| Part number | Feature code | Description |
|--|--------------|--|
| 2.5-inch hot-swap drives | | |
| 4XB7A70006 | BG07 | ThinkSystem 2.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD |
| 4XB7A70005 | BG06 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD |
| 4XB7A70004 | BG05 | ThinkSystem 2.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD |
| 4XB7A70003 | BG04 | ThinkSystem 2.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD |
| 2.5-inch hot-swap self-encrypting drives (SED) | | |
| 4XB7A70007 | BFZZ | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD SED |
| 3.5-inch hot-swap drives | | |
| 4XB7A70011 | BG03 | ThinkSystem 3.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD |
| 4XB7A70010 | BG02 | ThinkSystem 3.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD |
| 4XB7A70009 | BG01 | ThinkSystem 3.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD |
| 4XB7A70008 | BG00 | ThinkSystem 3.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD |

The part numbers include the following items:

- One solid-state drive with a hot-swap tray
- Documentation flyer

Features

The ThinkSystem Nytro 3732 Performance 12Gb SAS SSDs have the following features:

- Performance server SSD suitable for write-intensive workloads
- Endurance of 10 drive-writes per day (DWPD)
- 2.5-inch or 3.5-inch industry standard form factor with hot-swap tray
- SAS 12 Gbps interface
- Seagate 3D eTLC flash technology
- Power loss data protection
- Supports Self-Monitoring, Analysis and Reporting Technology (S.M.A.R.T)
- Supports up to 32 initiators with Tag Command Queuing (TCQ) Command Set with a queue-depth of up to 128 commands
- Compliant with SCSI specifications (SAS-3 / SPL-3 / SBC-4 / SPC-5 / SAM-6)
- RoHS Compliant
- Advanced Encrypting Standard (AES) 256-bit encryption

The features of the self-encrypting drives (SED) members of the Nytro 3732 series include:

- Compliant with the Trusted Computing Group Enterprise Security Subsystem Class cryptographic standard (TCG Enterprise SSC)

- Supports the SafeStore self-encrypting drive (SED) functionality of ThinkSystem RAID adapters
- Supports Sanitize Cryptographic Erase
- Full end-to-end data path protection:
 - Extended error correction code (ECC)
 - Exclusive-OR (XOR) parity to protect against Flash die failure
 - Parity-checked internal data paths without an external write cache
 - Power loss data management without the need for a supercapacitor

The key difference between Performance SSDs such as the Nytro 3732 SSDs described here and Entry and Mainstream SSDs, is their endurance (life expectancy). SSDs have a huge, but finite, number of program/erase (P/E) cycles, which determines how long the drives can perform write operations and thus their life expectancy. Performance SSDs have better endurance than the Mainstream and Entry SSDs, but at a higher cost/IOPS ratio.

SSD write endurance is typically measured by the number of program/erase cycles that the drive can incur over its lifetime, which is listed as TBW in the device specification. The TBW value that is assigned to a solid-state device is the total bytes of written data that a drive can be guaranteed to complete. Reaching this limit does not cause the drive to immediately fail; the TBW simply denotes the maximum number of writes that can be guaranteed.

A solid-state device does not fail upon reaching the specified TBW, but at some point after surpassing the TBW value (and based on manufacturing variance margins), the drive reaches the end-of-life point, at which time the drive goes into read-only mode. Because of such behavior, careful planning must be done to use SSDs in the application environments to ensure that the TBW of the drive is not exceeded before the required life expectancy.

For example, the 3.2TB Nytro 3732 drive has an endurance of 58,400 TB of total bytes written (TBW). This means that for full operation over five years, write workload must be limited to no more than 32,000 GB of writes per day, which is equivalent to 10.0 full drive writes per day (DWPD). For the device to last three years, the drive write workload must be limited to no more than 53,333 GB of writes per day, which is equivalent to 16.7 full drive writes per day.

SED drives: The benefits of drive encryption

The Nytro 3732 family of drives includes self-encrypting drives.

Self-encrypting drives (SEDs) provide benefits in three main ways:

- By encrypting data on-the-fly at the drive level with no performance impact
- By providing instant secure erasure (cryptographic erasure, thereby making the data no longer readable)
- By enabling auto-locking to secure active data if a drive is misplaced or stolen from a system while in use

The following sections describe the benefits in more details.

Automatic encryption

It is vital that a company keep its data secure. With the threat of data loss due to physical theft or improper inventory practices, it is important that the data be encrypted. However, challenges with performance, scalability, and complexity have led IT departments to push back against security policies that require the use of encryption. In addition, encryption has been viewed as risky by those unfamiliar with key management, a process for ensuring a company can always decrypt its own data. Self-encrypting drives comprehensively resolve these issues, making encryption both easy and affordable.

When the self-encrypting drive is in normal use, its owner need not maintain authentication keys (otherwise known as credentials or passwords) in order to access the data on the drive. The self-encrypting drive will encrypt data being written to the drive and decrypt data being read from it, all without requiring an authentication key from the owner.

Drive retirement and disposal

When hard drives are retired and moved outside the physically protected data center into the hands of others, the data on those drives is put at significant risk. IT departments retire drives for a variety of reasons, including:

- Returning drives for warranty, repair, or expired lease agreements
- Removal and disposal of drives
- Repurposing drives for other storage duties

Nearly all drives eventually leave the data center and their owner's control. Corporate data resides on such drives, and when most leave the data center, the data they contain is still readable. Even data that has been striped across many drives in a RAID array is vulnerable to data theft because just a typical single stripe in today's high-capacity arrays is large enough to expose for example, hundreds of names and bank account numbers.

In an effort to avoid data breaches and the ensuing customer notifications required by data privacy laws, companies use different methods to erase the data on retired drives before they leave the premises and potentially fall into the wrong hands. Current retirement practices that are designed to make data unreadable rely on significant human involvement in the process, and are thus subject to both technical and human failure.

The drawbacks of today's drive retirement practices include the following:

- Overwriting drive data is expensive, tying up valuable system resources for days. No notification of completion is generated by the drive, and overwriting won't cover reallocated sectors, leaving that data exposed.
- Methods that include degaussing or physically shredding a drive are expensive. It is difficult to ensure the degauss strength is optimized for the drive type, potentially leaving readable data on the drive. Physically shredding the drive is environmentally hazardous, and neither practice allows the drive to be returned for warranty or expired lease.
- Some companies have concluded the only way to securely retire drives is to keep them in their control, storing them indefinitely in warehouses. But this is not truly secure because a large volume of drives coupled with human involvement inevitably leads to some drives being lost or stolen.
- Professional disposal services is an expensive option and includes the cost of reconciling the services as well as internal reports and auditing. Transporting of the drives also has the potential of putting the data at risk.

Self-encrypting drives eliminate the need to overwrite, destroy, or store retired drives. When the drive is to be retired, it can be cryptographically erased, a process that is nearly instantaneous regardless of the capacity of the drive.

Instant secure erase

The self-encrypting drive provides instant data encryption key destruction via cryptographic erasure. When it is time to retire or repurpose the drive, the owner sends a command to the drive to perform a cryptographic erasure. Cryptographic erasure simply replaces the encryption key inside the encrypted drive, making it impossible to ever decrypt the data encrypted with the deleted key.

Self-encrypting drives reduce IT operating expenses by reducing asset control challenges and disposal costs. Data security with self-encrypting drives helps ensure compliance with privacy regulations without hindering IT efficiency. So called "Safe Harbor" clauses in government regulations allow companies to not have to notify customers of occurrences of data theft if that data was encrypted and therefore unreadable.

Furthermore, self-encrypting drives simplify decommissioning and preserve hardware value for returns and repurposing by:

- Eliminating the need to overwrite or destroy the drive
- Securing warranty returns and expired lease returns
- Enabling drives to be repurposed securely

Auto-locking

Insider theft or misplacement is a growing concern for businesses of all sizes; in addition, managers of branch offices and small businesses without strong physical security face greater vulnerability to external theft. Self-encrypting drives include a feature called auto-lock mode to help secure active data against theft.

Using a self-encrypting drive when auto-lock mode is enabled simply requires securing the drive with an authentication key. When secured in this manner, the drive's data encryption key is locked whenever the drive is powered down. In other words, the moment the self-encrypting drive is switched off or unplugged, it automatically locks down the drive's data.

When the self-encrypting drive is then powered back on, it requires authentication before being able to unlock its encryption key and read any data on the drive, thus protecting against misplacement and theft.

While using self-encrypting drives just for the instant secure erase is an extremely efficient and effective means to help securely retire a drive, using self-encrypting drives in auto-lock mode provides even more advantages. From the moment the drive or system is removed from the data center (with or without authorization), the drive is locked. No advance thought or action is required from the data center administrator to protect the data. This helps prevent a breach should the drive be mishandled and helps secure the data against the threat of insider or outside theft.

Technical specifications

The following tables present technical specifications for the ThinkSystem Nytro 3732 Performance 12Gb SAS SSD.

Table 2. Technical specifications

| Feature | 400 GB drive | 800 GB drive | 1.6 TB drive | 3.2 TB drive |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Interface | 12 Gbps SAS | 12 Gbps SAS | 12 Gbps SAS | 12 Gbps SAS |
| Capacity | 400 GB | 800 GB | 1.6 TB | 3.2 TB |
| SED encryption | None TCG Enterprise* | None | None | None |
| Endurance (drive writes per day for 5 years) | 10 DWPD | 10 DWPD | 10 DWPD | 10 DWPD |
| Endurance (total bytes written) | 7,300 TB | 14,600 TB | 29,200 TB | 58,400 TB |
| Data reliability (UBER) | < 1 in 10 ¹⁷ bits read | < 1 in 10 ¹⁷ bits read | < 1 in 10 ¹⁷ bits read | < 1 in 10 ¹⁷ bits read |
| MTBF | 2,500,000 hours | 2,500,000 hours | 2,500,000 hours | 2,500,000 hours |
| IOPS reads (4 KB blocks) | 170,000 | 180,000 | 180,000 | 170,000 |
| IOPS writes (4 KB blocks) | 200,000 | 200,000 | 200,000 | 200,000 |
| Sequential read rate (128 KB blocks) | 1100 MBps | 1100 MBps | 1100 MBps | 1100 MBps |
| Sequential write rate (128 KB blocks) | 950 MBps | 1000 MBps | 1000 MBps | 1000 MBps |
| Read latency (ran) | 115 µs | 115 µs | 115 µs | 115 µs |
| Write latency (ran) | 25 µs | 25 µs | 25 µs | 25 µs |
| Shock, non-operating | 1,000 G (Max) at 0.5 ms | 1,000 G (Max) at 0.5 ms | 1,000 G (Max) at 0.5 ms | 1,000 G (Max) at 0.5 ms |
| Vibration, non-operating | 11.08 G _{RMS} (20-2000 Hz) | 11.08 G _{RMS} (20-2000 Hz) | 11.08 G _{RMS} (20-2000 Hz) | 11.08 G _{RMS} (20-2000 Hz) |
| Typical power (R / W) | 8.9 W / 7.9 W | 9.3 W / 7.7 W | 9.0 W / 9.3 W | 10.1 W / 10.1 W |

* Only part number 4XB7A70007 supports SED encryption. All other drives in the Nytro 3732 family do not include SED encryption.

Server support

The following tables list the ThinkSystem servers that are compatible.

Table 3. Server support (Part 1 of 4)

| Part Number | Description | AMD V3 | | | | 2S Intel V3/V4 | | | | | | 4S 8S Intel V3 | | Multi Node V3/V4 | | 1S V3 | | | | | |
|---|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|------------------------|------------------------|
| | | SR635 V3 (7D9H / 7D9G) | SR655 V3 (7D9F / 7D9E) | SR645 V3 (7D9D / 7D9C) | SR665 V3 (7D9B / 7D9A) | ST650 V3 (7D7B / 7D7A) | SR630 V3 (7D72 / 7D73) | SR650 V3 (7D75 / 7D76) | SR630 V4 (7DG8 / 7DG9) | SR650 V4 (7DGC / 7DGD) | SR650a V4 (7DGC / 7DGD) | SR850 V3 (7D97 / 7D96) | SR860 V3 (7D94 / 7D93) | SR950 V3 (7DC5 / 7DC4) | SD535 V3 (7DD8 / 7DD1) | SD530 V3 (7DDA / 7DD3) | SD550 V3 (7DD9 / 7DD2) | ST45 V3 (7DH4 / 7DH5) | ST50 V3 (7DF4 / 7DF3) | ST250 V3 (7DCF / 7DCE) | SR250 V3 (7DCM / 7DCL) |
| 2.5-inch hot-swap drives | | | | | | | | | | | | | | | | | | | | | |
| 4XB7A70006 | ThinkSystem 2.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD | Y | Y | N | N | N | N | N | N | N | N | Y | Y | N | N | N | N | N | N | N | |
| 4XB7A70005 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD | Y | Y | N | N | N | N | N | N | N | N | Y | Y | N | N | N | N | N | N | N | |
| 4XB7A70004 | ThinkSystem 2.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD | Y | Y | Y | Y | N | Y | Y | N | N | N | Y | Y | N | N | N | N | N | N | N | |
| 4XB7A70003 | ThinkSystem 2.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD | Y | Y | Y | Y | N | Y | Y | N | N | N | Y | Y | N | N | N | N | N | N | N | |
| 2.5-inch hot-swap self-encrypting drives (SED) | | | | | | | | | | | | | | | | | | | | | |
| 4XB7A70007 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD SED | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| 3.5-inch hot-swap drives | | | | | | | | | | | | | | | | | | | | | |
| 4XB7A70011 | ThinkSystem 3.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD | N | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| 4XB7A70010 | ThinkSystem 3.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD | N | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | |
| 4XB7A70009 | ThinkSystem 3.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD | N | Y | Y | Y | N | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N | |
| 4XB7A70008 | ThinkSystem 3.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD | N | Y | Y | Y | N | Y | Y | N | N | N | N | N | N | N | N | N | N | N | N | |

Table 4. Server support (Part 2 of 4)

| Part Number | Description | GPU Rich | | | | | Edge | | | | | Super Computing | | | | | | | |
|---|---|------------------------|------------------------|------------------|------------------|------------------|--------------|---------------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|-----------------|-------------------|-----------------|-------------------|-------------------|
| | | SR670 V2 (7Z22 / 7Z23) | SR675 V3 (7D9Q / 7D9R) | SR680a V3 (7DHE) | SR685a V3 (7DHC) | SR780a V3 (7DJ5) | SE100 (7DGR) | SE350 (7Z46 / 7D1X) | SE350 V2 (7DA9) | SE360 V2 (7DAM) | SE450 (7D8T) | SE455 V3 (7DBY) | SC750 V4 (7DDJ) | SC777 V4 (7DKA) | SD665 V3 (7D9P) | SD665-N V3 (7DAZ) | SD650 V3 (7D7M) | SD650-I V3 (7D7L) | SD650-N V3 (7D7N) |
| 2.5-inch hot-swap drives | | | | | | | | | | | | | | | | | | | |
| 4XB7A70006 | ThinkSystem 2.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 4XB7A70005 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 4XB7A70004 | ThinkSystem 2.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 4XB7A70003 | ThinkSystem 2.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 2.5-inch hot-swap self-encrypting drives (SED) | | | | | | | | | | | | | | | | | | | |
| 4XB7A70007 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD SED | Y | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 3.5-inch hot-swap drives | | | | | | | | | | | | | | | | | | | |
| 4XB7A70011 | ThinkSystem 3.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 4XB7A70010 | ThinkSystem 3.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 4XB7A70009 | ThinkSystem 3.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |
| 4XB7A70008 | ThinkSystem 3.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |

Table 5. Server support (Part 3 of 4)

| Part Number | Description | 1S Intel V2 | | | 2S Intel V2 | | | AMD V1 | | | | Dense V2 | | | 4S V2 | 8S | | | |
|---|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------|---------------------|-----------------|---------------------|---------------------|-----------------|-----------------|-------------------|-----------------|------------------------|------------------------|---------------------|
| | | ST150 V2 (7D8K / 7D8J) | ST250 V2 (7D8G / 7D8F) | SR250 V2 (7D7R / 7D7Q) | ST650 V2 (7Z75 / 7Z74) | SR630 V2 (7Z70 / 7Z71) | SR650 V2 (7Z72 / 7Z73) | SR635 (7Y98 / 7Y99) | SR655 (7Y00 / 7Z01) | SR655 Client OS | SR645 (7D2Y / 7D2X) | SR665 (7D2W / 7D2V) | SD630 V2 (7D1K) | SD650 V2 (7D1M) | SD650-N V2 (7D1N) | SN550 V2 (7Z69) | SR850 V2 (7D31 / 7D32) | SR860 V2 (7Z59 / 7Z60) | SR950 (7X11 / 7X12) |
| 2.5-inch hot-swap drives | | | | | | | | | | | | | | | | | | | |
| 4XB7A70006 | ThinkSystem 2.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | Y | Y | Y | Y |
| 4XB7A70005 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | Y | Y | Y | Y |
| 4XB7A70004 | ThinkSystem 2.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | Y | Y | Y | Y |
| 4XB7A70003 | ThinkSystem 2.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | Y | Y | Y | Y |
| 2.5-inch hot-swap self-encrypting drives (SED) | | | | | | | | | | | | | | | | | | | |
| 4XB7A70007 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD SED | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | Y | Y | Y | Y |
| 3.5-inch hot-swap drives | | | | | | | | | | | | | | | | | | | |
| 4XB7A70011 | ThinkSystem 3.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | N | N | N | N |
| 4XB7A70010 | ThinkSystem 3.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | N | N | N | N |
| 4XB7A70009 | ThinkSystem 3.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | N | N | N | N |
| 4XB7A70008 | ThinkSystem 3.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | Y | Y | Y | Y | N | Y | Y | N | N | N | N | N | N | N |

Table 6. Server support (Part 4 of 4)

| Part Number | Description | 4S V1 | | | 1S Intel V1 | | | 2S Intel V1 | | | | | | Dense V1 | | | | | | |
|---|---|---------------------|----------------------|---------------------|--------------------|---------------------|--------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------|--------------|--------------|--------------|
| | | SR850 (7X18 / 7X19) | SR850P (7D2F / 2D2G) | SR860 (7X69 / 7X70) | ST50 (7Y48 / 7Y50) | ST250 (7Y45 / 7Y46) | SR150 (7Y54) | SR250 (7Y52 / 7Y51) | ST550 (7X09 / 7X10) | SR530 (7X07 / 7X08) | SR550 (7X03 / 7X04) | SR570 (7Y02 / 7Y03) | SR590 (7X98 / 7X99) | SR630 (7X01 / 7X02) | SR650 (7X05 / 7X06) | SR670 (7Y36 / 7Y37) | SD530 (7X21) | SD650 (7X58) | SN550 (7X16) | SN850 (7X15) |
| 2.5-inch hot-swap drives | | | | | | | | | | | | | | | | | | | | |
| 4XB7A70006 | ThinkSystem 2.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD | Y | Y | Y | N | N | N | N | N | N | N | Y | Y | Y | Y | Y | N | N | Y | Y |
| 4XB7A70005 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD | Y | Y | Y | N | N | N | N | N | N | N | Y | Y | Y | Y | Y | N | N | Y | Y |
| 4XB7A70004 | ThinkSystem 2.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD | Y | Y | Y | N | N | N | N | N | N | N | Y | Y | Y | Y | Y | N | N | Y | Y |
| 4XB7A70003 | ThinkSystem 2.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD | Y | Y | Y | N | N | N | N | N | N | N | Y | Y | Y | Y | Y | N | N | Y | Y |
| 2.5-inch hot-swap self-encrypting drives (SED) | | | | | | | | | | | | | | | | | | | | |
| 4XB7A70007 | ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD SED | Y | Y | N | N | N | N | N | N | N | N | Y | Y | Y | Y | Y | N | N | Y | Y |
| 3.5-inch hot-swap drives | | | | | | | | | | | | | | | | | | | | |
| 4XB7A70011 | ThinkSystem 3.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | N | N | N | N | N | N | Y | Y | Y | Y | N | N | N | N | N |
| 4XB7A70010 | ThinkSystem 3.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | N | N | N | N | N | N | Y | Y | Y | Y | N | N | N | N | N |
| 4XB7A70009 | ThinkSystem 3.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | N | N | N | N | N | N | Y | Y | Y | Y | N | N | N | N | N |
| 4XB7A70008 | ThinkSystem 3.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD | N | N | N | N | N | N | N | N | N | N | Y | Y | Y | Y | N | N | N | N | N |

Operating system support

SAS and SATA SSDs operate transparently to users, storage systems, applications, databases, and operating systems.

Operating system support is based on the controller used to connect to the drives. Consult the controller product guide for more information:

- RAID controllers: <https://lenovopress.com/servers/options/raid>
- SAS HBAs: <https://lenovopress.com/servers/options/hba>

Warranty

The ThinkSystem Nytro 3732 Performance 12Gb SAS SSD carry a one-year, customer-replaceable unit (CRU) limited warranty. When the SSDs are installed in a supported server, these drives assume the system's base warranty and any warranty upgrades.

Solid State Memory cells have an intrinsic, finite number of program/erase cycles that each cell can incur. As a result, each solid state device has a maximum amount of program/erase cycles to which it can be subjected. The warranty for Lenovo solid state drives (SSDs) is limited to drives that have not reached the maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the SSD product. A drive that reaches this limit may fail to operate according to its Specifications.

Physical specifications

ThinkSystem Nytro 3732 Performance 12Gb SAS SSD have the following physical specifications:

Dimensions and weight (approximate, without the hot-swap tray, if applicable):

- Height: 15 mm (0.6 in.)
- Width: 70 mm (2.8 in.)
- Depth: 100 mm (4.0 in.)
- Weight: 163 g (4.9 oz) 3.2TB drive, 136 g (5.7 oz) all other capacities

Operating environment

The drives are supported in the following environment:

- Temperature, operating: 0 to 70 °C (32 to 158 °F)
- Temperature, non-operating: -40 to 75 °C (-40 to 167 °F)
- Relative humidity: 5 to 95% (noncondensing)
- Altitude, operating: -300 to 4,572 m (-1,000 to 10,000 feet)

Agency approvals

The drives conform to the following regulations:

- UL
- TUV
- FCC
- IC
- CB
- CE Mark
- C-Tick Mark
- BSMI (Taiwan)
- KCC (Korea EMI)
- VCCI

For details see the Seagate HDD and SSD Regulatory Compliance and Safety document:
<https://www.seagate.com/files/www-content/forms/compliance/regulatory-compliance-and-safety-100838899-A.pdf>

Related publications and links

For more information, see the following documents:

- Lenovo Press product guides and papers on RAID adapters and HBAs
<https://lenovopress.com/servers/options/raid>
- Lenovo RAID Management Tools and Resources
<https://lenovopress.com/lp0579-lenovo-raid-management-tools-and-resources>
- Lenovo RAID Introduction
<https://lenovopress.com/lp0578-lenovo-raid-introduction>
- Seagate Nytro SAS SSDs home page
<https://www.seagate.com/products/enterprise-drives/nytro-sas-ssd/>

Related product families

Product families related to this document are the following:

- [Drives](#)

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