# Lenovo ThinkSystem DM3000H Unified Hybrid Storage Array
**Product Guide**

Lenovo ThinkSystem DM3000H is a unified, hybrid storage system that is designed to provide performance, simplicity, capacity, security, and high availability for small enterprises and remote offices/branch offices of large enterprises. Powered by the ONTAP software, ThinkSystem DM3000H delivers enterprise-class storage management capabilities with a wide choice of host connectivity options, flexible drive configurations, and enhanced data management features.

The ThinkSystem DM3000H is a perfect fit for small offices and remote and branch offices of large enterprises that run a wide range of general purpose workloads, including file services, virtualization, Microsoft applications, backup and archiving, and other storage I/O-intensive applications.

ThinkSystem DM3000H models are 2U rack-mount controller enclosures that include two controllers, 64 GB RAM and 8 GB battery-backed NVRAM per system (32 GB RAM and 4 GB NVMRAM per controller), and 12 LFF hot-swap drive bays (2U12 form factor). Controllers provide universal 1/10 GbE NAS/iSCSI or 4/8/16 Gb Fibre Channel (FC) ports, or 1/10 GbE RJ-45 ports for host connectivity.

A single ThinkSystem DM3000H Storage Array scales up to 144 drives with the attachment of Lenovo ThinkSystem DM120S 2U12 LFF, DM600S 4U60 LFF, and DM240S 2U24 SFF Expansion Enclosures.



Figure 1. Lenovo ThinkSystem DM3000H

Up to 12 DM3000H Storage Arrays can be combined into a clustered system in a NAS environment, or up to 6 DM3000H Storage Arrays can be combined into a clustered system in a SAN environment.

## Did you know?

A single ThinkSystem DM3000H can scale up to 1.44 PB of raw storage capacity. A cluster of the DM3000H storage arrays can scale up to 17.2 PB for NAS or up to 8.6 PB for SAN environments.

The ThinkSystem DM3000H offers unified file and block storage connectivity with support for 1 GbE or 10 GbE NAS and iSCSI, and 8 Gb or 16 Gb Fibre Channel protocols at the same time.

## Key features

The ThinkSystem DM3000H offers the following key features and benefits:

- Unified, hybrid storage with dual active/active controller configurations for high availability and performance.
- Improved performance and data protection with RAID-DP and RAID-TEC, as well as support for traditional RAID 4.
- Flexible host connectivity to match diverse client needs with support for unified NAS and SAN storage protocols, including 1/10 GbE NAS and iSCSI, and 4/8/16 Gb Fibre Channel connectivity.
- 12 Gb SAS drive-side connectivity with multipathing with up to 12x 3.5-inch large form factor (LFF) drives in the 2U12 LFF enclosures, up to 60x 3.5-inch LFF drives in the 4U60 LFF expansion enclosures, or up to 24x 2.5-inch small form factor (SFF) drives in the 2U24 SFF expansion enclosures.
- Scalability to up to 144 LFF drives with the attachment of the ThinkSystem DM120S 2U12 LFF, DM600S 4U60 LFF, or DM240S 2U24 SFF expansion enclosures to satisfy growing needs for storage capacity.
- Flexibility in storing data on capacity-optimized SAS SSDs, performance-optimized enterprise SAS HDDs, or capacity-optimized enterprise NL SAS HDDs; mixing and matching drive types within a single system to perfectly meet performance and capacity requirements for various workloads.
- Acceleration of read-centric workloads with the high-speed, low-latency onboard NVMe SSD caching.
- A comprehensive set of advanced storage management features with the ONTAP software, including SSD read cache, hybrid storage pools, snapshots, volume copy, quality of service, thin provisioning, compression, deduplication, encryption, disk-based backup, application- and virtual machine-aware backup, quick data recovery, clustering, synchronous replication, and asynchronous replication.
- A core set of storage management features with the ONTAP Fundamentals software, including SSD read cache, hybrid storage pools, snapshots, quality of service, thin provisioning, compression, deduplication, encryption, quick data recovery, asynchronous replication, and up to 84 drives.
- Optional WORM (write once, read many) (SnapLock) licensed function for the ONTAP software to reinforce permanence and integrity of stored data and to ensure compliance with applicable regulations.
- Scale-out clustering of up to 12 ThinkSystem DM Series storage systems for NAS connectivity or up to six DM Series storage systems for SAN connectivity.
- Intuitive, web-based GUI for easy system setup and management.
- Lenovo XClarity support for centralized systems management of Lenovo x86 servers, switches, and storage, which provides automated agent-less discovery, inventory, monitoring, and additional platform-specific functions across multiple systems.
- Designed for high availability with redundant hot-swap components, including controllers and I/O modules, power supplies, cooling modules (4U60 LFF enclosures only), and non-disruptive firmware upgrades.
- Certified storage for Oracle VM.
- Certified storage for Citrix XenServer: http://hcl.xenserver.org/storage/910/Lenovo_DM_Series.

The ThinkSystem DM3000H supports the following drives:

- 2U12 LFF and 4U60 LFF high-capacity nearline HDDs: 4 TB, 8 TB, and 10 TB 7.2K rpm
- 2U24 SFF capacity-optimized SSDs: 960 GB, 3.84 TB, 7.68 TB, and 15.36 TB
- 2U24 SFF enterprise SAS HDDs: 900 GB, 1.2 TB, and 1.8 TB 10K rpm

All drives are dual-port and hot-swappable.

The ThinkSystem DM3000H supports attachment of the following ThinkSystem DM Series expansion enclosures:

- Up to 11 ThinkSystem DM120S 2U12 LFF enclosures.
- Up to 2 ThinkSystem DM600S 4U60 LFF enclosures.
- Up to 5 ThinkSystem DM240S 2U24 SFF enclosures.
- A combination of the DM120S, DM600S, and DM240S enclosures for a maximum of 144 drives.

Customers can intermix 2U12 LFF, 4U60 LFF, and 2U24 SFF expansion enclosures behind a 2U12 LFF controller enclosure. This configuration delivers the added flexibility to mix 3.5-inch and 2.5-inch drives within a single system (but not within the enclosure).

More drives and expansion enclosures are designed to be dynamically added with virtually no downtime, which helps to quickly and seamlessly respond to ever-growing capacity demands.

The ThinkSystem DM3000H offers high levels of system and data availability with the following technologies:

- Dual-active controllers (high availability pair) with automatic load balancing and failover
- Mirrored, battery-backed controller NVRAM
- Dual-port SAS HDDs with automatic drive failure detection and rebuild
- Redundant, hot-swappable and customer replaceable hardware components, including SFP+ transceivers, controllers, I/O modules, power supplies, cooling modules (4U60 LFF only), and drives
- Automated failover for the data path between the host and the drives with multipathing
- Non-disruptive controller and drive firmware upgrades
- Scale-out clustering

## Components and connectors

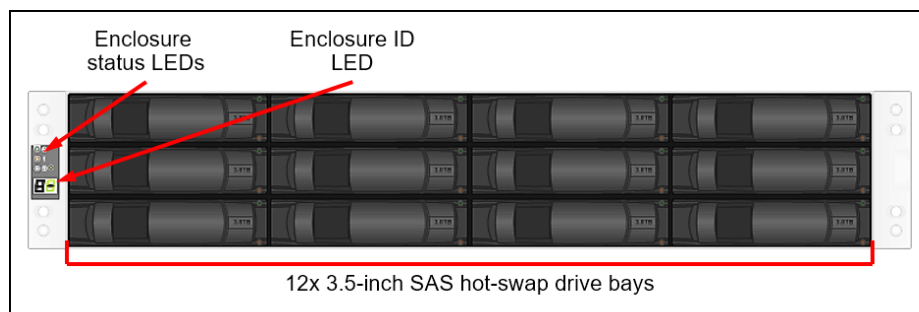The following figure shows the front of the ThinkSystem DM3000H or DM120S 2U12 LFF enclosure.



Figure 2. ThinkSystem DM3000H or DM120S 2U12 LFF enclosure front view

The front of the ThinkSystem DM3000H or DM120S 2U LFF enclosure includes the following components:

- 12 LFF hot-swap drive bays.
- Enclosure status LEDs.
- Enclosure ID LED.

The following figure shows the rear of the ThinkSystem DM3000H 2U controller enclosure with universal SFP+ host ports.
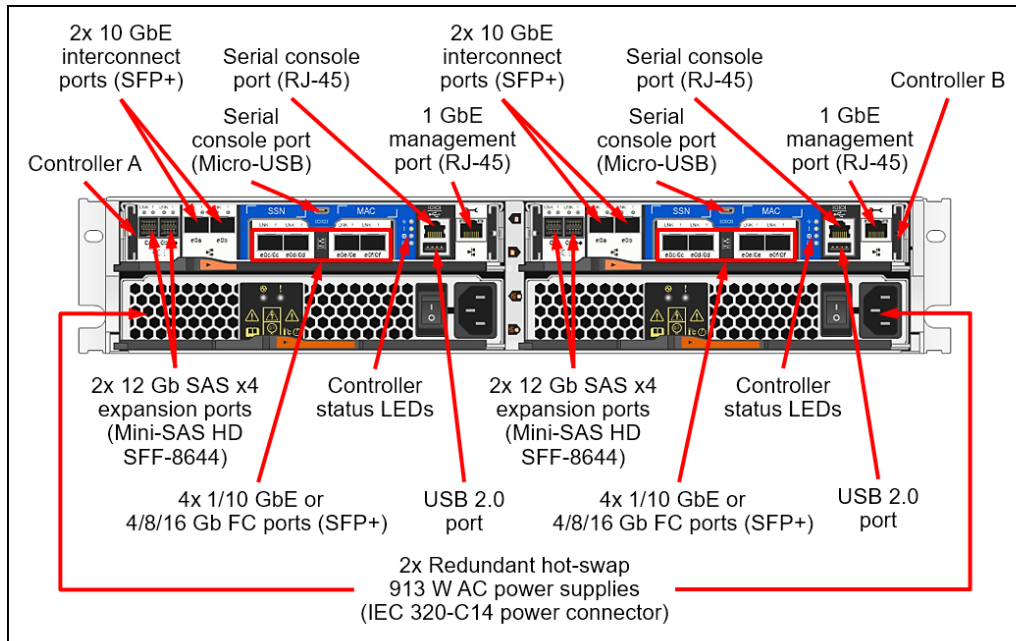


Figure 3. ThinkSystem DM3000H 2U controller enclosure rear view: Universal SFP+ host ports

The following figure shows the rear of the ThinkSystem DM3000H 2U controller enclosure with 10GBASE-T host ports.
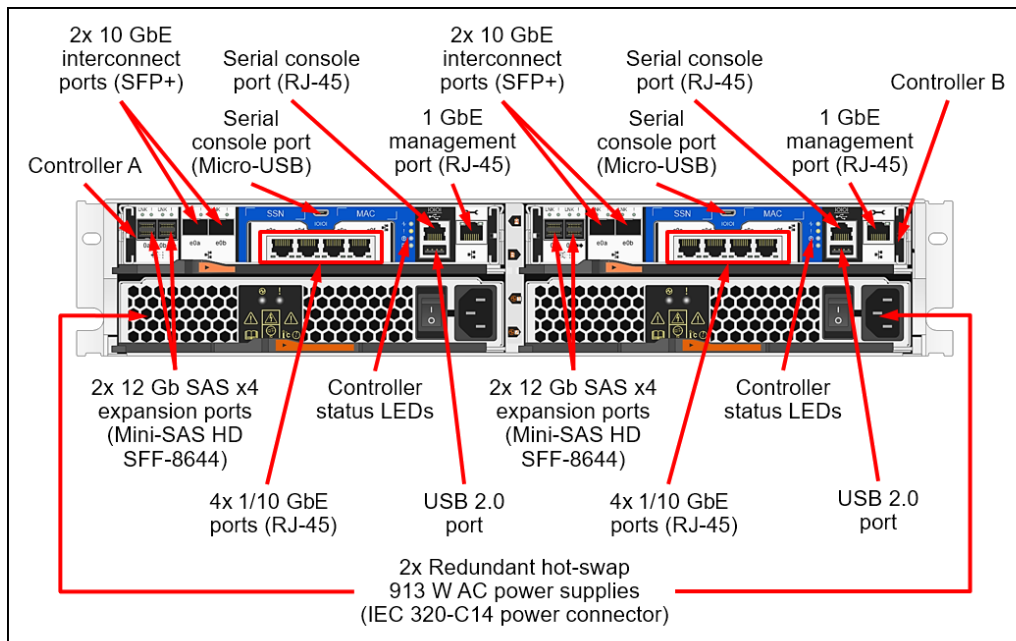


Figure 4. ThinkSystem DM3000H 2U controller enclosure rear view: 10GBASE-T host ports

The rear of the ThinkSystem DM3000H 2U controller enclosure includes the following components:

- Two redundant hot-swap controllers, each with the following ports:
  - Two SFP+ interconnect ports for direct-attach HA pair or switched cluster connections.
  - Four SFP+ host ports for 1/10 Gb GbE or 4/8/16 Gb FC connectivity, or four 1/10 GbE RJ-45 ports.
  - Two 12 Gb SAS x4 ports (Mini-SAS HD SFF-8644) for connections to the expansion enclosures.
  - One RJ-45 10/100/1000 Mb Ethernet port for out-of-band management.
  - Two serial console ports (RJ-45 and Micro-USB) for another means to configure the system.
  - One USB 2.0 Type A port (for ONTAP software installation or booting)
- Two redundant hot-swap 913 W (100 - 240 V) AC power supplies (IEC 320-C14 power connector) with integrated cooling fans.
- Controller status LEDs.

The following figure shows the front of the ThinkSystem DM240S 2U SFF expansion enclosure.



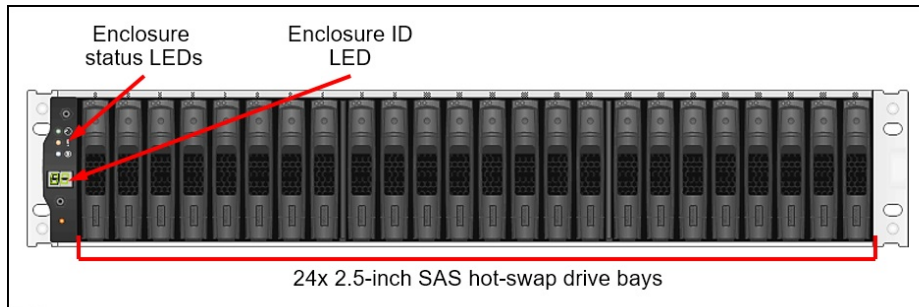Figure 5. ThinkSystem DM240S expansion enclosure front view

The front of the ThinkSystem DM240S 2U SFF expansion enclosure includes the following components:

- 24 SFF hot-swap drive bays.
- Enclosure status LEDs.
- Enclosure ID LED.

The following figure shows the rear of the ThinkSystem DM120S or DM240S 2U expansion enclosure.



Figure 6. ThinkSystem DM120S or DM240S 2U expansion enclosure rear view

The rear of the ThinkSystem DM120S or DM240S 2U expansion enclosure includes the following components:

- Two redundant hot-swap I/O Modules; each I/O Module provides four 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644) for connections to the controller enclosures and for connecting the expansion enclosures between each other.
- Two redundant hot-swap 913 W (100 - 240 V) AC power supplies (IEC 320-C14 power connector) with integrated cooling fans.
- I/O Module status LEDs.

The following figure shows the front of the ThinkSystem DM600S 4U LFF expansion enclosure.



Figure 7. ThinkSystem DM600S 4U LFF expansion enclosure front view

The front of the ThinkSystem DM600S 4U LFF expansion enclosure includes the following components:

- Five drawers, each with 12 LFF hot-swap drive bays.
- Enclosure status LEDs.
- Enclosure ID LED.

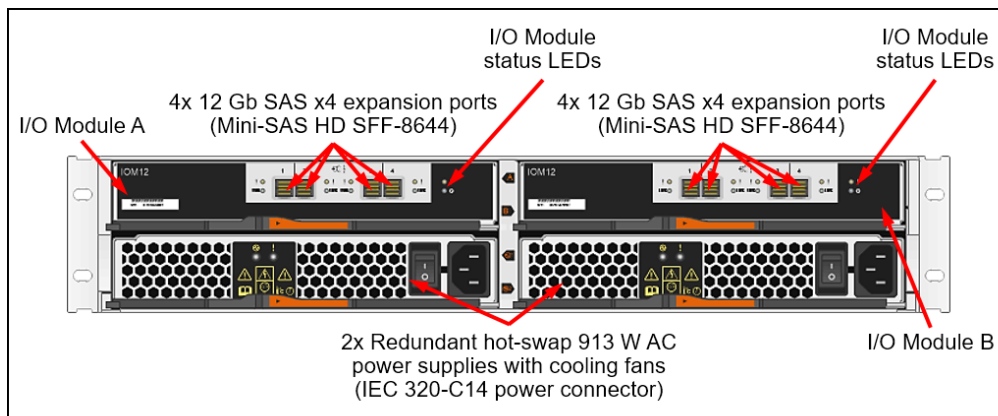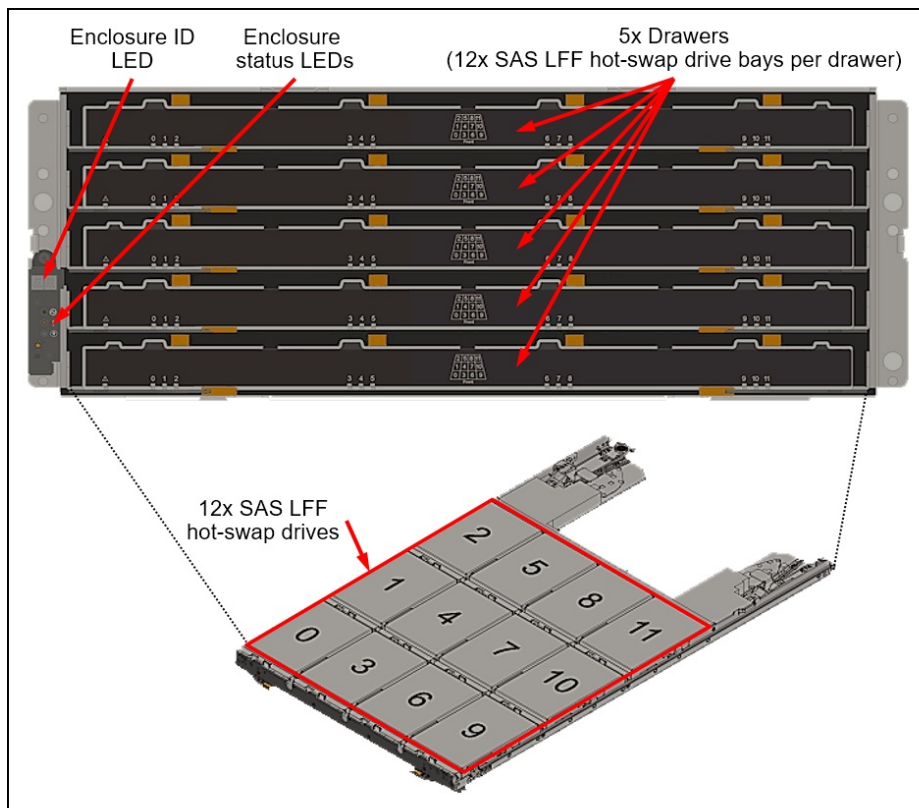The following figure shows the rear of the ThinkSystem DM600S 4U LFF expansion enclosure.
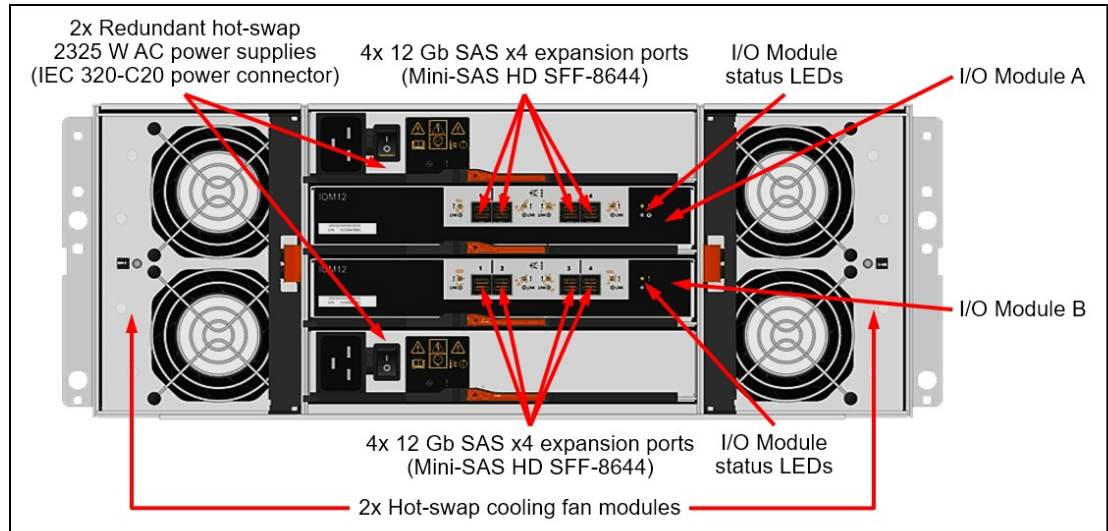


Figure 8. ThinkSystem DM600S 4U LFF expansion enclosure rear view

The rear of the ThinkSystem DM600S 4U LFF expansion enclosure includes the following components:

- Two redundant hot-swap I/O Modules; each I/O Module provides four 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644) for connections to the controller enclosures and for connecting the expansion enclosures between each other.

- Two redundant hot-swap 2325 W (200 - 240 V) AC power supplies (IEC 320-C20 power connector)

- Two hot-swap cooling fan modules; each module has two fans.
  **Note:** The failed cooling module should be replaced as soon as possible.

- I/O Module status LEDs.

## System specifications

The following table lists the ThinkSystem DM3000H storage system specifications.

**Note:** The supported hardware options and software features listed in this product guide are based on the ONTAP software version 9.6. For details about specific software releases that introduced support for certain hardware options and software features, refer to the Release notes of the particular software release for the ThinkSystem DM3000H that can be found at:
http://datacentersupport.lenovo.com

Table 1. ThinkSystem DM3000H system specifications

| Attribute | Specification |
|---|---|
| Form factor | <ul><li>DM3000H controller enclosure (Machine Type 7Y42): 2U rack mount.</li><li>DM120S 2U12 LFF expansion enclosure (Machine Type 7Y59): 2U rack mount.</li><li>DM600S 4U60 LFF expansion enclosure (Machine Type 7Y43): 4U rack mount.</li><li>DM240S 2U24 SFF expansion enclosure (Machine Type 7Y58): 2U rack mount.</li></ul> |
| Controller configuration | Dual active-active controller configuration (HA pair). Up to 6 HA pairs can be combined into a single SAN cluster, or up to 12 HA pairs can be combined into a single NAS cluster.<br>**Note:** The ONTAP Fundamentals software does not support clustering. |
| HA pair/cluster interconnect ports | 4x 10 GbE SFP+ ports (DAC cables or SW fiber optics [LC]) (2 ports per controller). |
| RAID levels | RAID-4, RAID-DP, RAID-TEC. |

| Attribute | Specification |
|---|---|
| Controller memory | 64 GB RAM per system (32 GB per controller). 8 GB battery-backed NVRAM per system (4 GB per controller) mirrored between the controllers. |
| Controller cache | 2 TB NVMe-based Flash Cache (1 TB per controller). |
| Drive bays | <ul><li>Up to 144 LFF hot-swap drive bays (1x 2U12 controller enclosure + up to 11x 2U12 or up to 2x 4U60 LFF expansion enclosures).</li><li>Up to 120 SFF and 24 LFF hot-swap drive bays (1x 2U12 controller enclosure + up to 5x 2U24 SFF and 1x 2U12 LFF expansion enclosures).</li></ul>Intermix of 2U12 LFF, 4U60 LFF, and 2U24 SFF enclosures is supported.<br>**Note:** ONTAP Fundamentals software supports up to 84 drives. |
| Drive technology | 12 Gb NL SAS HDDs, 12 Gb SAS SSDs, 12 Gb SAS HDDs. |
| Drive expansion connectivity | <ul><li>2x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two controllers in the controller enclosure for the attachment of the expansion enclosures.</li><li>4x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two I/O modules in the expansion enclosure for the attachment to the controller enclosure and daisy chaining of the expansion enclosures.</li></ul> |
| Drives | <ul><li>2U12 LFF drives: 4 TB, 8 TB, and 10 TB 7.2K rpm NL SAS HDDs</li><li>4U60 LFF drives: 4 TB, 8 TB, and 10 TB 7.2K rpm NL SAS HDDs</li><li>2U24 SFF drives:<ul><li>960 GB, 3.84 TB, 7.68 TB, and 15.36 TB SAS SSDs (1 DWD).</li><li>900 GB, 1.2 TB, and 1.8 TB 10K rpm SAS HDDs.</li></ul></li></ul> |
| Storage capacity | Up to 1.44 PB (144x 10 TB LFF HDDs). |
| Storage protocols | <ul><li>NAS (File access): NFS and CIFS/SMB.</li><li>SAN (Block access): iSCSI and FC.</li></ul> |
| Host connectivity | Base ports (per controller enclosure):<ul><li>8x 1 GbE (RJ-45 UTP)/10 GbE (DAC cable or SW fiber optic cable, LC) or 4/8/16 Gb FC (SW fiber optic cable, LC) SFP+ host ports (4 ports per controller); or</li><li>8x 1/10 GbE RJ-45 UTP host ports (4 ports per controller).</li></ul> |
| Host operating systems | Microsoft Windows Server 2012 R2, 2016, and 2019; Red Hat Enterprise Linux (RHEL) 6 and 7; SUSE Linux Enterprise Server (SLES) 11, 12, and 15; VMware vSphere 6.0, 6.5, and 6.7. |
| Standard software features | <ul><li>ONTAP: RAID data protection, NVMe SSD read cache (Flash Cache), hybrid storage pools (Flash Pool), snapshots, volume copy (FlexClone), storage quality of service (QoS), thin provisioning, compression, deduplication, encryption, disk-based backup (SnapVault), application-aware backup (SnapManager), quick data recovery (SnapRestore), clustering, and synchronous and asynchronous replication (SnapMirror).</li><li>ONTAP Fundamentals: RAID data protection, Flash Cache, Flash Pool, snapshots, storage QoS, thin provisioning, compression, deduplication, encryption, SnapRestore, and SnapMirror asynchronous replication.</li></ul> |
| Optional software features | ONTAP: WORM data protection (SnapLock). |
| Performance* | Up to 148 000 random read IOPS (8 KB blocks). |

| Attribute | Specification |
|---|---|
| Configuration maximums** | • Maximum raw storage capacity: 1.44 PB<br>• Maximum flash pool cache size: 24 TB<br>• Maximum aggregate size: 400 TB<br>• Maximum number of FlexVol volumes per controller: 1000<br>• Maximum FlexVol volume size: 100 TB<br>• Maximum number of LUNs per controller: 8192<br>• Maximum number of LUNs per FlexVol volume: 512<br>• Maximum LUN size: 16 TB<br>• Maximum number of drives in a RAID group (data + parity drives):<br>    ○ RAID 4: 14 (13 + 1 SAS SSDs) or 7 (6 + 1 NL SAS HDDs)<br>    ○ RAID-DP: 28 (26 + 2 SAS SSDs) or 20 (18 + 2 NL SAS HDDs)<br>    ○ RAID-TEC: 29 (26 + 3 SAS SSDs or NL SAS HDDs)<br>• Maximum number of initiators per controller: 2048<br>• Maximum number of snapshots per FlexVol volume: 1023 |
| Cooling | Redundant cooling with two cooling modules (DM600S 4U LFF) or with the fans that are built into power supplies (DM3000H, DM120S 2U12 LFF, and DM240S 2U24 SFF). |
| Power supply | Two redundant hot-swap 913 W (100 - 240 V) (DM3000H, DM120S 2U12 LFF, and DM240S 2U24 SFF enclosures) or 2325 W (200 - 240 V) (DM600S 4U60 LFF enclosures) Platinum AC power supplies. |
| Hot-swap parts | Controllers, I/O modules, drives, power supplies, cooling modules (DM600S 4U60 LFF only), and SFP+ transceivers and DAC cables. |
| Management ports | • 1x 1 GbE port (UTP, RJ-45) per controller for out-of-band management.<br>• 2x Serial console ports (RJ-45 and Micro-USB) for system configuration. |
| Management interfaces | ThinkSystem Storage Manager web-based GUI; SSH CLI; Serial console CLI; SNMP, email, and syslog alerts; optional Lenovo XClarity. |
| Security features | Secure Socket Layer (SSL), Secure Shell (SSH), user level security, role-based access control (RBAC), LDAP authentication. |
| Warranty and support | Three-, four-, or five-year customer-replaceable unit and onsite limited warranty with selectable service levels: 9x5 service coverage next business day (NBD) onsite response (Foundation) or 24x7 service coverage with 4-hour onsite response (Essential). Premier Support is also available. |
| Software maintenance | Included in the warranty and support. |
| Dimensions | Controller enclosure:<br>• Height: 87 mm (3.4 in.)<br>• Width: 447 mm (17.6 in.)<br>• Depth: 508 mm (20.0 in.)<br><br>2U12 LFF expansion enclosure:<br>• Height: 87 mm (3.4 in.)<br>• Width: 447 mm (17.6 in.)<br>• Depth: 505 mm (19.0 in.)<br><br>4U60 LFF expansion enclosure:<br>• Height: 174 mm (6.9 in.)<br>• Width: 449 mm (17.7 in.)<br>• Depth: 922 mm (36.3 in.)<br><br>2U24 SFF expansion enclosure:<br>• Height: 85 mm (3.4 in.)<br>• Width: 449 mm (17.7 in.)<br>• Depth: 484 mm (19.1 in.) |

| Attribute | Specification |
|---|---|
| Weight | <ul><li>Controller enclosure (fully configured): 28.9 kg (63.7 lb)</li><li>2U12 LFF expansion enclosure (fully configured): 28.7 kg (63.3 lb)</li><li>4U60 LFF expansion enclosure (fully configured): 111.5 kg (245.8 lb)</li><li>2U24 SFF expansion enclosure (fully configured): 24.4 kg (53.8 lb)</li></ul> |

\* Estimated performance based on internal measurements.

\*\* For a detailed list of configuration limits and restrictions for a specific version of the software, refer to the Lenovo Data Center Support website:

http://datacentersupport.lenovo.com

## Controller enclosures

Preconfigured and factory-integrated models of the ThinkSystem DM3000H Unified Hybrid Storage Array are configured by using the Lenovo Data Center Solution Configurator (DCSC):
http://dcsc.lenovo.com

The following table lists the preconfigured models of the ThinkSystem DM3000H.

Table 2. ThinkSystem DM3000H preconfigured models

| Description | Part number |
|---|---|
| Relationship models - North America (NA) | |
| ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, 8x 10Gb iSCSI SFP+ optical modules, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW Fundamentals, Encryption (No support included*) | 7Y421009NA |
| Relationship models - Europe, Middle East, and Africa (EMEA) | |
| ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 10GBASE-T, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW Fundamentals, Encryption (No support included*) | 7Y421003EA |
| ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 10GBASE-T, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW, Encryption (No support included*) | 7Y421007EA |
| ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW Fundamentals, Encryption (No support included*) | 7Y421002EA |
| ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW, Encryption (No support included*) | 7Y421006EA |
| ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 10GBASE-T, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW Fundamentals, Encryption (No support included*) | 7Y421005EA |
| ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 10GBASE-T, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW, Encryption (No support included*) | 7Y421001EA |
| ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 16Gb FC / 10GbE SFP+, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW Fundamentals, Encryption (No support included*) | 7Y421004EA |
| ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 16Gb FC / 10GbE SFP+, 2x 0.5m Passive DAC SFP+ cables, ONTAP 9.5 SW, Encryption (No support included*) | 7Y421008EA |

\* Support must be purchased with the storage system (See Warranty and support for details).

The following table lists the CTO base models of the ThinkSystem DM3000H.

Table 3. ThinkSystem DM3000H CTO base models

| Description | Machine Type/Model | Feature code |
|---|---|---|
| Lenovo ThinkSystem Storage 2U12 Chassis (with 2x PSUs) | 7Y42CTO1WW | B38M |

**Configuration note:** Two DM3000/DM5000 10GBASE-T controllers (feature code B39G) or two DM3000/DM5000 SFP+ controllers (feature code B39F) must be selected during the CTO configuration process, and both controllers must be of the same type (either 10GBASE-T or SFP+).

The models of the ThinkSystem DM3000H ship with the following items:

- One chassis with the following components:
  - Two controllers with the configured software version (No Encryption or Encryption Capable)
  - Two power supplies
- Rack Mount Kit
- 2 m USB Cable (USB Type A to Micro-USB)
- *Electronic Publications Flyer*
- Two power cables:
  - CTO models: Two customer-configured power cables
  - Preconfigured models in Table 2: Two 2.8m 10A/100-250V, C13 to C14 Rack Power Cables
- Additional configured components (model-specific)

## Controllers

The ThinkSystem DM3000H controller enclosures ship with two 10GBASE-T or SFP+ controllers. A  *controller* provides interfaces for host connectivity, management, and internal drives, and it runs ONTAP storage management software. Each DM3000H controller enclosure provides 64 GB RAM, 8 GB NVRAM, and 2 TB NVMe SSD flash cache (32 GB RAM, 4 GB battery-backed NVRAM, and 1 TB NVMe SSD flash cache per controller).

The ThinkSystem DM3000H controller enclosures ship with four interconnect 10 GbE SFP+ ports (two ports per controller) to cable a directly-connected dual-controller HA pair or for switched cluster interconnect with multiple dual-controller HA pairs. Up to 6 HA pairs can be combined into a single SAN cluster or up to 12 HA pairs can be combined into a single NAS cluster.

The ThinkSystem DM3000H controller enclosures ship with one of the following interface types:

- 8x Universal SFP+ ports (four ports per controller) for 1/10 GbE NAS / iSCSI or 16 Gb FC host connectivity.
- 8x 1/10 GbE RJ-45 ports (four ports per controller) for 1/10 GbE NAS / iSCSI host connectivity.

Each DM3000H controller enclosure also provides four integrated 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644 connectors) (two ports per controller) for the attachment of the ThinkSystem DM Series expansion enclosures.

**Configuration notes:**

- Two controllers are required for selection. Both controllers must be of the same type (either 16 Gb FC / 10 GbE or 10GBASE-T, but not both types), and they must have matching configurations of the base ports (type and physical connections).
- A pair of the universal SFP+ base ports (e0c/0c and e0d/0d or e0e/0e and e0f/0f) in the system must have the same connectivity type (either Ethernet or Fibre Channel, but not both types) and the same type of physical connections; different pairs might have different types of connectivity.

The following table lists the controllers for the DM3000H storage array and supported connectivity options.

Table 4. DM3000H controllers and connectivity options

| Description | Part number | Feature code | Maximum quantity per controller enclosure |
| --- | --- | --- | --- |
| Controllers | | | |
| Lenovo ThinkSystem DM3000/DM5000 Controller, 10GBASE-T | None* | B39G | 2 |
| Lenovo ThinkSystem DM3000/DM5000 Controller, 16Gb FC / 10GbE | None* | B39F | 2 |

| Description | Part number | Feature code | Maximum quantity per controller enclosure |
|---|---|---|---|
| SFP+ options for base ports | | | |
| 1Gb RJ-45 iSCSI SFP+ Module 1 pack | 4XF7A14917 | B4K7 | 8 |
| 8Gb Fibre Channel SFP+ Module 1 pack | 4XF7A14918 | B4K8 | 8 |
| 16Gb Fibre Channel SFP+ Module 1 pack | 4XF7A14920 | B4KA | 8 |
| SFP+ options for base ports and interconnect ports | | | |
| 10Gb SW Optical iSCSI SFP+ Module 1 pack | 4XF7A14919 | B4K9 | 12 |
| OM4 cable options for 8 Gb FC, 16 Gb FC, and 10 GbE SW SFP+ optical transceivers | | | |
| Lenovo 0.5m LC-LC OM4 MMF Cable | 4Z57A10845 | B2P9 | 12 |
| Lenovo 1m LC-LC OM4 MMF Cable | 4Z57A10846 | B2PA | 12 |
| Lenovo 3m LC-LC OM4 MMF Cable | 4Z57A10847 | B2PB | 12 |
| Lenovo 5m LC-LC OM4 MMF Cable | 4Z57A10848 | B2PC | 12 |
| Lenovo 10m LC-LC OM4 MMF Cable | 4Z57A10849 | B2PD | 12 |
| Lenovo 15m LC-LC OM4 MMF Cable | 4Z57A10850 | B2PE | 12 |
| Lenovo 25m LC-LC OM4 MMF Cable | 4Z57A10851 | B2PF | 12 |
| Lenovo 30m LC-LC OM4 MMF Cable | 4Z57A10852 | B2PG | 12 |
| OM3 cable options for 8 Gb FC, 16 Gb FC, and 10 GbE SW SFP+ optical transceivers | | | |
| Lenovo 0.5m LC-LC OM3 MMF Cable | 00MN499 | ASR5 | 12 |
| Lenovo 1m LC-LC OM3 MMF Cable | 00MN502 | ASR6 | 12 |
| Lenovo 3m LC-LC OM3 MMF Cable | 00MN505 | ASR7 | 12 |
| Lenovo 5m LC-LC OM3 MMF Cable | 00MN508 | ASR8 | 12 |
| Lenovo 10m LC-LC OM3 MMF Cable | 00MN511 | ASR9 | 12 |
| Lenovo 15m LC-LC OM3 MMF Cable | 00MN514 | ASRA | 12 |
| Lenovo 25m LC-LC OM3 MMF Cable | 00MN517 | ASRB | 12 |
| Lenovo 30m LC-LC OM3 MMF Cable | 00MN520 | ASRC | 12 |
| DAC cable options for 10 GbE SFP+ connectivity (SFP+ base, adapter card, and interconnect ports) | | | |
| 0.5m Passive DAC SFP+ Cable | 00D6288 | A3RG | 12 |
| 1m Passive DAC SFP+ Cable | 90Y9427 | A1PH | 12 |
| 1.5m Passive DAC SFP+ Cable | 00AY764 | A51N | 12 |
| 2m Passive DAC SFP+ Cable | 00AY765 | A51P | 12 |
| 3m Passive DAC SFP+ Cable | 90Y9430 | A1PJ | 12 |
| 5m Passive DAC SFP+ Cable | 90Y9433 | A1PK | 12 |
| 7m Passive DAC SFP+ Cable | 00D6151 | A3RH | 12 |
| UTP Category 6 cables options for 1/10 GbE RJ-45 host connectivity and 1 GbE RJ-45 management ports | | | |
| 0.75m Green Cat6 Cable | 00WE123 | AVFW | 10 |
| 1.0m Green Cat6 Cable | 00WE127 | AVFX | 10 |
| 1.25m Green Cat6 Cable | 00WE131 | AVFY | 10 |
| 1.5m Green Cat6 Cable | 00WE135 | AVFZ | 10 |
| 3m Green Cat6 Cable | 00WE139 | AVG0 | 10 |
| 10m Green Cat6 Cable | 90Y3718 | A1MT | 10 |
| 25m Green Cat6 Cable | 90Y3727 | A1MW | 10 |

* Factory-installed only.

## Expansion enclosures

The ThinkSystem DM3000H supports attachment of the following DM Series expansion enclosures:

- Up to 11 ThinkSystem DM120S 2U12 LFF enclosures.
- Up to 2 ThinkSystem DM600S 4U60 LFF enclosures.
- Up to 5 ThinkSystem DM240S 2U24 SFF enclosures.
- A combination of the DM120S, DM600S, and DM240S enclosures for a total of up to 144 drives.
- **Note:** The ONTAP Fundamentals software supports up to 84 drives.

DM120S 2U12 LFF, DM600S 4U60 LFF, and DM240S 2U24 SFF expansion enclosures can be intermixed behind a 2U12 controller enclosure. The expansion enclosures can be added to the system non-disruptively.

The following table lists the CTO base models for the ThinkSystem DM Series expansion enclosures.

Table 5. CTO base models for the ThinkSystem DM Series expansion enclosures

| Description | Machine Type/Model | Feature code |
|---|---|---|
| Lenovo ThinkSystem Storage 2U12 Chassis (with 2x PSUs) | 7Y59CTO1WW | B38M |
| Lenovo ThinkSystem Storage 4U60 Chassis (with 2x PSUs) | 7Y43CTO1WW | B38N |
| Lenovo ThinkSystem Storage 2U24 Chassis (with 2x PSUs) | 7Y58CTO1WW | B38L |

**Configuration note:** Two I/O expansion modules (feature code B39J) are pre-selected by the configurator.

The models of the ThinkSystem DM120S, DM600S, and DM240S ship with the following items:

- One chassis with the following components:
  - Two I/O expansion modules
  - Two power supplies
  - Two cooling modules (4U60 LFF only)
- Rack Mount Kit
- *Electronic Publications Flyer*
- Two customer-configured power cables
- Additional configured components (model-specific)

Each ThinkSystem DM Series expansion enclosure ships with two SAS I/O expansion modules. Each *I/O expansion module* provides two external 12 Gb SAS x4 ports (Mini-SAS HD SFF-8644 connectors labelled Port 1-4) that are used for connections to the ThinkSystem DM3000H and for daisy chaining the expansion enclosures between each other.

The dual-path HA (high availability) connectivity topology for the enclosures is shown in the following figure.
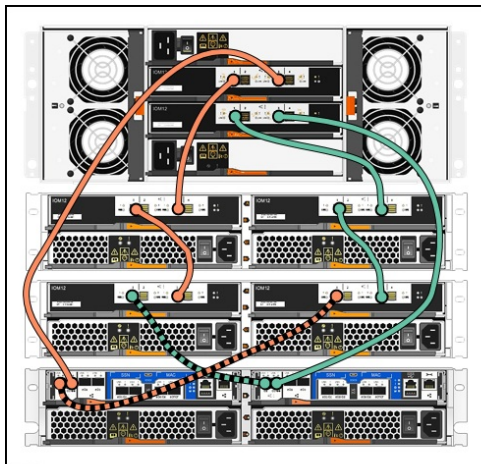


Figure 9. DM3000H expansion enclosure connectivity topology

**Expansion cabling rules:**

- Port 0b on the Controller 1 is the primary path that is connected to the Port 3 on the I/O Module A in the last expansion enclosure in a stack.
- Port 1 on the I/O Module A in the last expansion enclosure is connected to Port 3 on the I/O Module A in the adjacent expansion enclosure, and so on (until the first expansion enclosure in a stack is cabled).
- Port 0a on the Controller 1 is the secondary path that is connected to the Port 1 on the I/O Module B in the first expansion enclosure in a stack.
- Port 0b on the Controller 2 is the primary path that is connected to the Port 3 on the I/O Module B in the last expansion enclosure in a stack.
- Port 1 on the I/O Module B in the last expansion enclosure is connected to Port 3 on the I/O Module B in the adjacent expansion enclosure, and so on (until the first expansion enclosure in a stack is cabled).
- Port 0a on the Controller 2 is the secondary path that is connected to the Port 1 on the I/O Module A in the first expansion enclosure in a stack.

The following table lists ordering information for the supported expansion enclosure connectivity options.

Table 6. Expansion enclosure connectivity options

| Description | Part number | Feature code | Maximum quantity per one expansion enclosure |
|---|---|---|---|
| External MiniSAS HD 8644/MiniSAS HD 8644 0.5M Cable | 00YL847 | AU16 | 4 |
| External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable | 00YL848 | AU17 | 4 |
| External MiniSAS HD 8644/MiniSAS HD 8644 2M Cable | 00YL849 | AU18 | 4 |
| External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable | 00YL850 | AU19 | 4 |

**Configuration notes:**

- The following quantities of SAS cables are needed for the stack of the expansion enclosures:
    - Two SAS cables per expansion enclosure in the stack for connecting the first expansion enclosure in the stack to the controller enclosure and for connections to the adjacent expansion enclosures.
    - Two additional SAS cables for connecting the last expansion enclosure in the stack to the controller enclosure.
- The length of the SAS cables that connect a 2U12 enclosure to an adjacent 4U60 enclosure should be at least 1 meter.

## Drives

The DM3000H and DM120S 2U12 LFF enclosures support up to 12 LFF hot-swap drives, the DM600S 4U60 LFF expansion enclosures support up to 60 LFF hot-swap drives, and the DM240S 2U24 SFF expansion enclosures support up to 24 SFF hot-swap drives.

The following table lists supported drive packs for the DM3000H and DM120S 2U12 LFF enclosures.

Table 7. DM3000H and DM120S 2U12 LFF drive packs for ONTAP

| Description | Part number | Feature code | Maximum quantity per 2U12 enclosure |
|---|---|---|---|
| 3.5-inch 12 Gbps NL SAS hot-swap HDDs | | | |
| ThinkSystem 24TB (6x 4TB NL SAS HDDs) 2U12 Drive Pack for DM3000H | 4XB7A16960 | B66B | 2 |
| ThinkSystem 48TB (6x 8TB NL SAS HDDs) 2U12 Drive Pack for DM3000H | 4XB7A16962 | B66D | 2 |
| ThinkSystem 60TB (6x 10TB NL SAS HDDs) 2U12 Drive Pack for DM3000H | 4XB7A16964 | B66F | 2 |

Table 8. DM3000H and DM120S 2U12 LFF drive packs for ONTAP Fundamentals

| Description | Part number | Feature code | Maximum quantity per 2U12 enclosure |
|---|---|---|---|
| 3.5-inch 12 Gbps NL SAS hot-swap HDDs | | | |
| 24TB (6x 4TB NL SAS HDDs) 2U12 Drive Pack for DM3000H - Fundamentals | 4XB7A39373 | B72R | 2 |
| 48TB (6x 8TB NL SAS HDDs) 2U12 Drive Pack for DM3000H - Fundamentals | 4XB7A39374 | B72S | 2 |
| 60TB (6x 10TB NL SAS HDDs) 2U12 Drive Pack for DM3000H - Fundamentals | 4XB7A39375 | B72T | 2 |

The following table lists supported drive packs for the DM600S 4U60 LFF expansion enclosures.

Table 9. DM600S 4U60 LFF drive packs for ONTAP

| Description | Part number | Feature code | Maximum quantity per 4U60 enclosure |
|---|---|---|---|
| 3.5-inch 12 Gbps NL SAS hot-swap HDDs | | | |
| ThinkSystem 120TB (30x 4TB NL SAS HDDs) 4U60 Drive Pack for DM3000H | 4XB7A14684 | B3X3 | 2 |
| ThinkSystem 240TB (30x 8TB NL SAS HDDs) 4U60 Drive Pack for DM3000H | 4XB7A14685 | B3WZ | 2 |
| ThinkSystem 300TB (30x 10TB NL SAS HDDs) 4U60 Drive Pack for DM3000H | 4XB7A14686 | B3X1 | 2 |

Table 10. DM600S 4U60 LFF drive packs for ONTAP Fundamentals

| Description | Part number | Feature code | Maximum quantity per 4U60 enclosure |
|---|---|---|---|
| 3.5-inch 12 Gbps NL SAS hot-swap HDDs | | | |
| 120TB (30x 4TB NL SAS HDDs) 4U60 Drive Pack for DM3000H - Fundamentals | 4XB7A39389 | B73Q | 2 |
| 240TB (30x 8TB NL SAS HDDs) 4U60 Drive Pack for DM3000H - Fundamentals | 4XB7A39390 | B73R | 2 |
| 300TB (30x 10TB NL SAS HDDs) 4U60 Drive Pack for DM3000H - Fundamentals | 4XB7A39391 | B73S | 2 |

The following table lists supported drive packs for the DM240S 2U24 SFF expansion enclosures.

Table 11. DM240S 2U24 SFF drive packs for ONTAP

| Description | Part number | Feature code | Maximum quantity per 2U24 enclosure |
|---|---|---|---|
| 2.5-inch 12 Gbps SAS hot-swap SSDs (1 Drive Write per Day) | | | |
| ThinkSystem 5.76TB (6x 960GB SAS SSDs) 2U24 Drive Pack for DM3000H | 4XB7A16999 | B677 | 4 |
| ThinkSystem 23.04TB (6x 3.84TB SAS SSDs) 2U24 Drive Pack for DM3000H | 4XB7A17001 | B679 | 4 |
| ThinkSystem 46.08TB (6x 7.68TB SAS SSDs) 2U24 Drive Pack for DM3000H | 4XB7A17003 | B67B | 4 |
| ThinkSystem 92.16TB (6x 15.36TB SAS SSDs) 2U24 Drive Pack for DM3000H | 4XB7A17005 | B67D | 4 |
| 2.5-inch 12 Gbps SAS hot-swap HDDs | | | |
| ThinkSystem 5.4TB (6x 900GB SAS 10K HDDs) 2U24 Drive Pack for DM3000H | 4XB7A17007 | B67F | 4 |
| ThinkSystem 7.2TB (6x 1.2TB SAS 10K HDDs) 2U24 Drive Pack for DM3000H | 4XB7A17009 | B67H | 4 |
| ThinkSystem 10.8TB (6x 1.8TB SAS 10K HDDs) 2U24 Drive Pack for DM3000H | 4XB7A17011 | B67K | 4 |

Table 12. DM240S 2U24 SFF drive packs for ONTAP Fundamentals

| Description | Part number | Feature code | Maximum quantity per 2U24 enclosure |
|---|---|---|---|
| 2.5-inch 12 Gbps SAS hot-swap SSDs (1 Drive Write per Day) | | | |
| 5.76TB (6x 960GB SAS SSDs) 2U24 Drive Pack for DM3000H - Fundamentals | 4XB7A39376 | B73B | 4 |
| 23.04TB (6x 3.84TB SAS SSDs) 2U24 Drive Pack for DM3000H - Fundamentals | 4XB7A39377 | B73C | 4 |
| 46.08TB (6x 7.68TB SAS SSDs) 2U24 Drive Pack for DM3000H - Fundamentals | 4XB7A39378 | B73D | 4 |
| 92.16TB (6x 15.36TB SAS SSDs) 2U24 Drive Pack for DM3000H - Fundamentals | 4XB7A39379 | B73E | 4 |
| 2.5-inch 12 Gbps SAS hot-swap HDDs | | | |
| 5.4TB (6x 900GB SAS 10K HDDs) 2U24 Drive Pack for DM3000H - Fundamentals | 4XB7A39380 | B73F | 4 |
| 7.2TB (6x 1.2TB SAS 10K HDDs) 2U24 Drive Pack for DM3000H - Fundamentals | 4XB7A39381 | B73G | 4 |
| 10.8TB (6x 1.8TB SAS 10K HDDs) 2U24 Drive Pack for DM3000H - Fundamentals | 4XB7A39382 | B73H | 4 |

**Configuration notes:**

- The DM3000H 2U12 LFF controller enclosures and DM120S 2U12 LFF expansion enclosures support from 6 to 12 drives in increments of 6 drives. For factory-installed drive packs, all drives in the enclosure must be of the same type and capacity.

- The DM600S 4U60 LFF expansion enclosures support from 30 to 60 drives in increments of 30 drives. For factory-installed drive packs, all drives in the enclosure must be of the same type and capacity.

- The DM240S 2U24 SFF expansion enclosures support from 6 to 24 drives in increments of 6 drives. For factory-installed drive packs, all drives in the enclosure must be of the same type and capacity.

- Drive packs for ONTAP are supported only with the DM3000H storage systems that run the ONTAP software. Drive packs for ONTAP Fundamentals are supported only with the DM3000H storage systems that run the ONTAP Fundamentals software.

## Software

The ThinkSystem DM3000H can be configured with one of the following software bundles:

- **ONTAP:** Provides a comprehensive set of advanced storage management features for enterprises of various sizes.

- **ONTAP Fundamentals:** Provides a core set of storage management features for small and medium enterprises and remote locations of large enterprises.
  **Note:** ONTAP Fundamentals cannot be upgraded to ONTAP.

The following features are included with the ThinkSystem DM3000H ONTAP software:

- **RAID-4, RAID-DP, and RAID-TEC data protection**: Provides the flexibility to choose the level of data protection required and helps improve performance and availability with built-in spare capacity and by distributing data across all physical drives in the aggregate, sustaining to up to one (RAID-4), two (RAID-DP), or three (RAID-TEC) concurrent drive failures.

- **SyncMirror data protection:** Adds extra level of data protection and availability by mirroring a pair of RAID aggregates.

- **Flash Cache**: Helps accelerate performance of read-centric workloads with read caching on the onboard NVMe flash module.

- **Flash Pool**: Helps accelerate performance of read- and write-centric workloads with read and write caching on aggregates with HDDs and SSDs.

- **FlexVol:** Provides abstraction layer between the logical volume and its physical location in the storage array.

- **FlexGroup:** Enables a single volume to span across multiple clustered storage arrays to maximize storage capacity and automate load distribution.

- **Thin provisioning**: Optimizes efficiency by allocating storage space based on the minimum space required by each application at any given time, so that applications consume only the space they are actually using, not the total space that has been allocated to them, which allows customers to purchase storage they need today and add more as application requirements grow.

- **Compression:** Provides transparent inline and post-process data compression to reduce the amount of storage that customers need to purchase and manage.

- **Compaction:** Works with compression to pack more data into each storage block to further reduce the amount of storage that customers need to purchase and manage.

- **Deduplication:** Performs general-purpose deduplication for removal of redundant data to reduce the amount of storage that customers need to purchase and manage.

- **Snapshots**: Enables creation of read-only copies of data for backup, parallel processing, testing, and development, and have the copies available almost immediately.

- **FlexClone:** References snapshot metadata to create writable point-in-time copies of a volume.

- **Encryption:** Provides software-based encryption for data at rest for enhanced data security with the traditional drives and embedded key management (requires the encryption-capable version of the ONTAP software).
- **Balanced placement:** Provides automated workload distribution across the cluster to help increase utilization and performance.
- **Dynamic capacity expansion:** Allows the capacity of a volume or aggregate to be expanded by adding new physical drives.
- **Adaptive Quality of Service:** Simplifies operations and maintains consistent workload performance by defining QoS policies and automatically adjusting storage resources to respond to workload changes.
- **SnapVault disk-based storage backup:** Enables data stored on multiple systems to be backed up to a central, secondary system quickly and efficiently as read-only snapshot copies.
- **SnapRestore:** Enables quick recovery of data by reverting a local volume or file to its previous state from a particular snapshot copy stored on the file system.
- **SnapManager:** Provides application- and virtual machine-aware backup and restoration of data by using the Snapshots technology and leverages the SnapMirror capabilities of storage systems to provide onsite or offsite backup set mirroring for disaster recovery.
- **SnapMirror synchronous and asynchronous replication:** Provides storage system-based data replication between the storage systems containing source (local) and destination (remote) volumes by using synchronous (as soon as the data is written to the source volume) or asynchronous (at specified regular intervals) data transfers over iSCSI or Fibre Channel communication links.
  **Note:** The SnapMirror feature of the ThinkSystem DM3000H interoperate with other ThinkSystem DM Series storage arrays.

The following features are included with the ThinkSystem DM3000H ONTAP Fundamentals software:

- RAID-4, RAID-DP, and RAID-TEC
- SyncMirror
- Flash Cache
- Flash Pool
- FlexVol
- Thin provisioning
- Compression
- Compaction
- Deduplication
- Snapshots
- Encryption (requires the encryption-capable version of the ONTAP Fundamentals software)
- Dynamic capacity expansion
- Adaptive Quality of Service
- SnapRestore
- SnapMirror asynchronous replication
- Scalability to up to 84 drives
- No clustering support

The following table lists the software selection options for the ThinkSystem DM3000H.

Table 13. Software selection

| Description | Feature code |
|---|---|
| ONTAP software | |
| Lenovo ThinkSystem DM Series ONTAP 9.5 SW, Encryption | B6KC |
| Lenovo ThinkSystem DM Series ONTAP 9.5 SW, Non-Encryption | B6KD |
| ONTAP Fundamentals software | |
| Lenovo ThinkSystem DM Series ONTAP 9.5 SW Fundamentals, Encryption | B72V |
| Lenovo ThinkSystem DM Series ONTAP 9.5 SW Fundamentals, No Encryption | B72W |

**Configuration note:** The encryption-capable version of the ONTAP Software is not available in the following countries:

- Belarus
- Kazakhstan
- People's Republic of China
- Russia

Software maintenance is included in the ThinkSystem DM3000H warranty and support (see Warranty and support for details).

The ThinkSystem DM3000H ONTAP capabilities can be expanded with the optional **SnapLock** WORM data protection licensed function, which creates non-rewritable, non-erasable data on hard disk drives to prevent files from being altered or deleted until a predetermined or default retention date.

The following table lists the Feature on Demand (FoD) upgrade for the ThinkSystem DM3000H to enable optional software features. Each optional DM3000H function is licensed on a per-controller basis; that is, two licenses are needed per system, and these two licenses are contained in a single orderable part number. The optional software licenses include 5-year software support entitlement.

Table 14. Optional software features

| Description | Part number | Feature code | Maximum quantity per system |
|---|---|---|---|
| DM Series SnapLock License | 4P47A16547 | None* | 1** |

\* Field upgrade only; no factory installation.
\** Contains two licenses.

## Management

The ThinkSystem DM3000H supports the following management interfaces:

- Lenovo ThinkSystem Storage Manager, a web-based interface via HTTPS for single-system management or centralized management of the cluster of systems, that runs on the storage system itself and requires only a supported browser (Microsoft Internet Explorer, Google Chrome, or Mozilla Firefox), so there is no need for a separate console or plug-in.

- Command line interface (CLI) via SSH or through serial console.

- Syslog, SNMP, and e-mail notifications.

- Optional Lenovo XClarity for discovery, inventory, monitoring, and alerts.

## Power supplies and cables

The ThinkSystem DM3000H, DM120S 2U12 LFF, and DM240S 2U24 LFF enclosures ship with two redundant hot-swap 913 W (100 - 240 V) Platinum AC power supplies, each with an IEC 320-C14 connector.

The ThinkSystem DM600S 4U60 LFF expansion enclosures ship with two redundant hot-swap 2325 W (200 - 240 V) Platinum AC power supplies, each with an IEC 320-C20 connector.

Each ThinkSystem DM Series enclosure requires the selection of two power cables.

The following table lists the rack power cable and line cord options that can be ordered for the DM3000H, DM120S 2U12 LFF, and DM240S 2U24 SFF enclosures (two power cords per enclosure).

Table 15. Power cables for DM3000H, DM120S 2U12 LFF, and DM240S 2U24 SFF enclosures

| Description | Part number | Feature code |
|---|---|---|
| Rack power cables | | |
| 1.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 00Y3043 | A4VP |
| 1.0m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08367 | B0N5 |
| 1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable | 47C2491 | A3SW |
| 1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 39Y7937 | 6201 |
| 1.5m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08368 | B0N6 |
| 2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08365 | B0N4 |
| 2.0m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08369 | 6570 |
| 2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable | 47C2492 | A3SX |
| 2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08366 | 6311 |
| 2.8m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08370 | 6400 |
| 2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable | 39Y7938 | 6204 |
| 2.8m, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable | 47C2493 | A3SY |
| 4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable | 47C2494 | A3SZ |
| 4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable | 39Y7932 | 6263 |
| 4.3m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable | 4L67A08371 | 6583 |
| Line cords | | |
| Argentina 2.8m, 10A/250V, C13 to IRAM 2073 Line Cord | 39Y7930 | 6222 |
| Argentina 4.3m, 10A/250V, C13 to IRAM 2073 Line Cord | 81Y2384 | 6492 |
| Australia/New Zealand 2.8m, 10A/250V, C13 to AS/NZS 3112 Line Cord | 39Y7924 | 6211 |
| Australia/New Zealand 4.3m, 10A/250V, C13 to AS/NZS 3112 Line Cord | 81Y2383 | 6574 |
| Brazil 2.8m, 10A/250V, C13 to NBR 14136 Line Cord | 69Y1988 | 6532 |
| Brazil 4.3m, 10A/250V, C13 to NBR14136 Line Cord | 81Y2387 | 6404 |
| China 2.8m, 10A/250V, C13 to GB 2099.1 Line Cord | 39Y7928 | 6210 |
| China 4.3m, 10A/250V, C13 to GB 2099.1 Line Cord | 81Y2378 | 6580 |
| Denmark 2.8m, 10A/250V, C13 to DK2-5a Line Cord | 39Y7918 | 6213 |
| Denmark 4.3m, 10A/250V, C13 to DK2-5a Line Cord | 81Y2382 | 6575 |
| Europe 2.8m, 10A/250V, C13 to CEE7-VII Line Cord | 39Y7917 | 6212 |
| Europe 4.3m, 10A/250V, C13 to CEE7-VII Line Cord | 81Y2376 | 6572 |
| India 2.8m, 10A/250V, C13 to IS 6538 Line Cord | 39Y7927 | 6269 |
| India 4.3m, 10A/250V, C13 to IS 6538 Line Cord | 81Y2386 | 6567 |
| Israel 2.8m, 10A/250V, C13 to SI 32 Line Cord | 39Y7920 | 6218 |

| Description | Part number | Feature code |
|---|---|---|
| Israel 4.3m, 10A/250V, C13 to SI 32 Line Cord | 81Y2381 | 6579 |
| Italy 2.8m, 10A/250V, C13 to CEI 23-16 Line Cord | 39Y7921 | 6217 |
| Italy 4.3m, 10A/250V, C13 to CEI 23-16 Line Cord | 81Y2380 | 6493 |
| Japan 2.8m, 12A/125V, C13 to JIS C-8303 Line cord | 46M2593 | A1RE |
| Japan 2.8m, 12A/250V, C13 to JIS C-8303 Line Cord | 4L67A08357 | 6533 |
| Japan 4.3m, 12A/125V, C13 to JIS C-8303 Line Cord | 39Y7926 | 6335 |
| Japan 4.3m, 12A/250V, C13 to JIS C-8303 Line Cord | 4L67A08362 | 6495 |
| Korea 2.8m, 12A/250V, C13 to KS C8305 Line Cord | 39Y7925 | 6219 |
| Korea 4.3m, 12A/250V, C13 to KS C8305 Line Cord | 81Y2385 | 6494 |
| South Africa 2.8m, 10A/250V, C13 to SABS 164 Line Cord | 39Y7922 | 6214 |
| South Africa 4.3m, 10A/250V, C13 to SABS 164 Line Cord | 81Y2379 | 6576 |
| Switzerland 2.8m, 10A/250V, C13 to SEV 1011-S24507 Line Cord | 39Y7919 | 6216 |
| Switzerland 4.3m, 10A/250V, C13 to SEV 1011-S24507 Line Cord | 81Y2390 | 6578 |
| Taiwan 2.8m, 10A/250V, C13 to CNS 10917-3 Line Cord | 81Y2375 | 6317 |
| Taiwan 2.8m, 15A/125V, C13 to CNS 10917-3 Line Cord | 81Y2374 | 6402 |
| Taiwan 4.3m, 10A/250V, C13 to CNS 10917-3 Line Cord | 81Y2389 | 6531 |
| Taiwan 4.3m, 15A/125V, C13 to CNS 10917-3 Line Cord | 81Y2388 | 6530 |
| United Kingdom 2.8m, 10A/250V, C13 to BS 1363/A Line Cord | 39Y7923 | 6215 |
| United Kingdom 4.3m, 10A/250V, C13 to BS 1363/A Line Cord | 81Y2377 | 6577 |
| United States 2.8m, 10A/125V, C13 to NEMA 5-15P Line Cord | 90Y3016 | 6313 |
| United States 2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord | 46M2592 | A1RF |
| United States 2.8m, 13A/125V, C13 to NEMA 5-15P Line Cord | 00WH545 | 6401 |
| United States 4.3m, 10A/125V, C13 to NEMA 5-15P Line Cord | 4L67A08359 | 6370 |
| United States 4.3m, 10A/250V, C13 to NEMA 6-15P Line Cord | 4L67A08361 | 6373 |
| United States 4.3m, 13A/125V, C13 to NEMA 5-15P Line Cord | 4L67A08360 | AX8A |

The following table lists the rack power cable and line cord options that can be ordered for the DM600S 4U60 LFF expansion enclosures (two power cords per enclosure).

Table 16. Power cables for DM600S 4U60 enclosures

| Description | Part number | Feature code |
|---|---|---|
| Rack power cables | | |
| 2.5m, 16A/100-250V, C19 to IEC 320-C20 Rack Power Cable | 39Y7916 | 6252 |
| Line cords | | |
| Argentina 4.3m, 16A/250V, C19 to IRAM 2073 Line Cord | 40K9777 | 6276 |
| Australia/New Zealand 4.3m, 15A/250V, C19 to AS/NZS 3112 Line Cord | 40K9773 | 6284 |
| Brazil 4.3m, 16A/250V, C19 to NBR 14136 Line Cord | 40K9775 | 6277 |
| China 4.3m, 16A/250V, C19 to GB2099.1 Line Cord | 40K9774 | 6288 |
| Denmark/Switzerland 4.3m, 16A/250V, C19 to IEC 309 P+N+G Line Cord | 40K9769 | 6283 |
| Europe 4.3m, 16A/250V, C19 to CEE7-VII Line Cord | 40K9766 | 6279 |
| India 4.3m, 16A/250V, C19 to IS6538 Line Cord | 40K9776 | 6285 |
| Israel 4.3m, 16A/250V, C19 to SI 32 Line Cord | 40K9771 | 6282 |
| Italy 4.3m, 16A/250V, C19 to CEI 23-16 Line Cord | 40K9768 | 6281 |
| Japan 4.3m, 15A/200V, C19 to JIS C-8303 Line Cord | 41Y9233 | 6291 |
| Korea 4.3m, 15A/250V, C19 to KSC 8305 Line Cord | 41Y9231 | 6289 |
| South Africa 4.3m, 16A/250V, C19 to SABS 164 Line Cord | 40K9770 | 6280 |
| Switzerland 4.3m, 16A/250V, C19 to SEV 1011 Line Cord | 81Y2391 | 6549 |
| Taiwan 4.3m, 16A/250V, C19 to CNS 10917-3 Line Cord | 41Y9230 | 6287 |
| United Kingdom 4.3m, 13A/250V, C19 to BS 1363/A Line Cord | 40K9767 | 6278 |
| United States 4.3m, 15A/250V, C19 to NEMA 6-15P Line Cord | 00D7197 | A1NV |
| United States 4.3m, 18A/250V, C19 to NEMA L6-20P Line Cord | 40K9772 | 6275 |

## Rack installation

The individually shipped ThinkSystem DM3000H and DM120S enclosures come with the ThinkSystem Storage Rack Mount Kit 2U12, and the individually shipped ThinkSystem DM600S and DM240S enclosures come with the ThinkSystem Storage Rack Mount Kit 2U24/4U60. The rack mount kits are listed in the following table.

Table 17. 4-post rack mount kits

| Description | Feature code | Quantity |
|---|---|---|
| Lenovo ThinkSystem Storage Rack Mount Kit 2U12 | B38X | 1 |
| Lenovo ThinkSystem Storage Rack Mount Kit 2U24/4U60 | B38Y | 1 |

When the ThinkSystem DM Series enclosures are factory-integrated and shipped installed in a rack cabinet, the rack mount kits that support Ship-in-Rack (SIR) capabilities are derived by the configurator. The SIR-capable rack mount kits are listed in the following table.

Table 18. 4-post SIR rack mount kits

| Description | Feature code | Quantity |
|---|---|---|
| Lenovo ThinkSystem Storage Rack Mount Kit 2U12 | B38X | 1 |
| Lenovo ThinkSystem Storage SIR Rack Mount Kit (for 2U24 enclosures) | B6TH | 1 |
| DM/DE 4U Adjustable Rail Kit (SIR) | B742 | 1 |

The following table summarizes the rack mount kit features and specifications.

Table 19. Rack mount kit features and specifications summary

| Attribute | Screw-in fixed rail with adjustable depth | | | |
| | 2U12 | 2U24/4U60 | 2U24 SIR | 4U SIR |
|---|---|---|---|---|
| Feature code | B38X | B38Y | B6TH | B742 |
| Enclosure support | DM3000H DM120S | DM240S DM600S | DM240S | DM600S |
| Rail type | Fixed (static) with adjustable depth | Fixed (static) with adjustable depth | Fixed (static) with adjustable depth | Fixed (static) with adjustable depth |
| Tool-less installation | No | No | No | No |
| In-rack maintenance | Yes* | Yes* | Yes* | Yes* |
| Ship-in-rack (SIR) support | Yes | No | Yes | Yes |
| 1U PDU support | Yes | Yes | Yes | Yes |
| 0U PDU support | Limited** | Limited** | Limited** | Limited** |
| Rack type | IBM or Lenovo 4-post, IEC standard-compliant | IBM or Lenovo 4-post, IEC standard-compliant | IBM or Lenovo 4-post, IEC standard-compliant | IBM or Lenovo 4-post, IEC standard-compliant |
| Mounting holes | Square or round | Square or round | Square or round | Square or round |
| Mounting flange thickness | 2 mm (0.08 in.) – 3.3 mm (0.13 in.) | 2 mm (0.08 in.) – 3.3 mm (0.13 in.) | 2 mm (0.08 in.) – 3.3 mm (0.13 in.) | 2 mm (0.08 in.) – 3.3 mm (0.13 in.) |
| Distance between front and rear mounting flanges^ | 605 mm (23.8 in.) – 812.8 mm (32 in.) | 605 mm (23.8 in.) – 812.8 mm (32 in.) | 605 mm (23.8 in.) – 812.8 mm (32 in.) | 605 mm (23.8 in.) – 812.8 mm (32 in.) |

* The majority of the enclosure components can be serviced from the front or rear of the enclosure, which does not require the removal of the enclosure from the rack cabinet.
** If a 0U PDU is used, the rack cabinet must be at least 1000 mm (39.37 in.) deep for 2U12 and 2U24 enclosures, or at least 1200 mm (47.24 in.) deep for 4U60 enclosures.
^ Measured when mounted on the rack, from the front surface of the front mounting flange to the rear most point of the rail.

## Physical specifications

The ThinkSystem DM3000H controller enclosure has the following dimensions and weight (approximate):

- Height: 87 mm (3.4 in.)
- Width: 447 mm (17.6 in.)
- Depth: 508 mm (20.0 in.)
- Weight (fully configured): 28.9 kg (63.7 lb)

The ThinkSystem DM120S 2U12 LFF enclosures have the following dimensions and weight (approximate):

- Height: 87 mm (3.4 in.)
- Width: 447 mm (17.6 in.)
- Depth: 505 mm (19.0 in.)
- Weight (fully configured): 28.7 kg (63.3 lb)

The ThinkSystem DM600S 4U60 LFF enclosures have the following dimensions and weight (approximate):

- Height: 174 mm (6.9 in.)
- Width: 449 mm (17.7 in.)
- Depth: 922 mm (36.3 in.)
- Weight (fully configured): 111.5 kg (245.8 lb)

The ThinkSystem DM240S 2U24 SFF enclosures have the following dimensions and weight (approximate):

- Height: 85 mm (3.4 in.)
- Width: 449 mm (17.7 in.)
- Depth: 484 mm (19.1 in.)
- Weight (fully configured): 24.4 kg (53.8 lb)

## Operating environment

The ThinkSystem DM3000H, DM120S 2U12 LFF, and DM600S 4U60 LFF enclosures are supported in the following environment:

- Air temperature:
  - Operating:
    - DM3000H and DM240S 2U24 SFF: 5 °C - 45 °C (41 °F - 113 °F)
    - DM120S 2U12 LFF and DM600S 4U60 LFF: 10 °C - 40 °C (50 °F - 104 °F)
  - Non-operating: -40 °C - +70 °C (-40 °F - 158 °F)
  - Maximum altitude: 3050 m (10,000 ft)
- Relative humidity:
  - Operating: 8% - 90% (non-condensing)
  - Non-operating: 10% - 95% (non-condensing)
- Electrical power:
  - DM3000H
    - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 4.31 A
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 2.15 A
    - Maximum system power load: 409 W
  - DM120S 2U12 LFF
    - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 3.56 A
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 1.78 A
    - Maximum system power load: 338 W
  - DM600S 4U60 LFF
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 8.11 A
    - Maximum system power load: 1541 W
  - DM240S 2U24 SFF
    - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 4.11 A
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 2.05 A
    - Maximum system power load: 390 W

- Heat dissipation:
    - DM3000H: 1396 BTU/hour
    - DM120S 2U12 LFF: 1153 BTU/hour
    - DM600S 4U60 LFF: 5258 BTU/hour
    - DM240S 2U24 SFF: 1331 BTU/hour
- Acoustical noise emission:
    - DM3000H: 6.9 bels
    - DM120S 2U12 LFF: 6.3 bels
    - DM600S 4U60 SFF: 7.2 bels
    - DM240S 2U24 SFF: 6.9 bels

## Warranty and support

The ThinkSystem DM Series enclosures can be configured with a three-, four-, or five-year Customer Replaceable Unit (CRU) and onsite limited warranty with various levels of coverage with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

Lenovo's support services provide a sophisticated, unified support structure for a customer's data center, with an experience consistently ranked number one in customer satisfaction worldwide.

The following Lenovo support services are available:

- **Premier Support** provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following capabilities:
    - Direct technician-to-technician access through a dedicated phone line.
    - 24x7x365 remote support.
    - Single point of contact service.
    - End to end case management.
    - 3rd Party collaborative software support.
    - Online case tools and live chat support.
    - On-demand remote system analysis.
- **Warranty Service Levels (Preconfigured Support)** are available to meet the on-site response time targets that match the criticality of customer's systems:
    - 3, 4, or 5 years of service coverage.
    - **Foundation Service:** 9x5 service coverage with next business day onsite response.
    - **Essential Service:** 24x7 service coverage with 4-hour onsite response.
  **Note:** Either Foundation or Essential Service *must* be purchased with the storage system.
- **Managed Services**
  Lenovo Managed Services provide continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of a customer's data center using state of the art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

  Quarterly reviews check error logs, verify firmware and operating system device driver levels, and software as needed. Lenovo will also maintain records of latest patches, critical updates, and firmware levels, to ensure customer's systems are providing business value through optimized performance.
- **Technical Account Management (TAM)**
  A Lenovo Technical Account Manager helps customers optimize operations of their data centers based on a deep understanding of customer's business. Customers gain direct access to a Lenovo TAM, who serves as their single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. Also, a TAM helps proactively make service recommendations and manage service relationship with Lenovo to make certain that customer's needs are met.
- **Health Check**
  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that customer systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

Some regions might have different warranty terms and conditions than the standard warranty. This is due to local business practices or laws in the specific region. Local service teams can assist in explaining region-specific terms when needed. Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

If warranty terms and conditions include onsite labor for repair or replacement of parts, Lenovo will dispatch a service technician to the customer site to perform the replacement. Onsite labor under base warranty is limited to labor for replacement of parts that have been determined to be field-replaceable units (FRUs). Parts that are determined to be customer-replaceable units (CRUs) do not include onsite labor under base warranty.

If warranty terms include parts-only base warranty, Lenovo is responsible for delivering only replacement parts that are under base warranty (including FRUs) that will be sent to a requested location for self-service. Parts-only service does not include a service technician being dispatched onsite. Parts must be changed at customer's own cost and labor and defective parts must be returned following the instructions supplied with the spare parts.

Lenovo support services are region-specific. Not all support services are available in every region. For information about Lenovo support services that are available in a specific region, refer to the following resources:

- Service part numbers in Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com/#/services

- Lenovo Services Availability Locator
  https://lenovolocator.com/

For service definitions, region-specific details, and service limitations, refer to the following documents:

- Lenovo Statement of Limited Warranty for Data Center Group (DCG) Servers and System Storage
  http://pcsupport.lenovo.com/us/en/solutions/ht503310

- Lenovo Data Center Services Agreement
  http://support.lenovo.com/us/en/solutions/ht116628

## Services

Lenovo Services is a dedicated partner to customer success. Lenovo's goal for customers is to reduce capital outlays, mitigate IT risks, and accelerate time to productivity.

Here is a more in-depth look at what Lenovo can do for their customers:

- **Asset Recovery Services**
  Asset Recovery Services (ARS) helps customers recover the maximum value from their end-of-life equipment in a cost-effective and secure way. On top of simplifying the transition from old to new equipment, ARS mitigates environmental and data security risks associated with data center equipment disposal. Lenovo ARS is a cash-back solution for equipment based on its remaining market value, yielding maximum value from aging assets and lowering total cost of ownership for customers.

- **Assessment Services**
  An assessment helps solve customer IT challenges through an onsite, multi-day session with a Lenovo technology expert. Lenovo performs a tools-based assessment which provides a comprehensive and thorough review of a company's environment and technology systems. In addition to the technology-based functional requirements, the consultant also discusses and records the non-functional business requirements, challenges, and constraints. Assessments help organizations, no matter how large or small, get a better return on their IT investment and overcome challenges in the ever-changing technology landscape.

- **Design Services**
  Professional Services consultants perform infrastructure design and implementation planning to support customer's strategy. The high-level architectures provided by the assessment service are turned into low level designs and wiring diagrams, which are reviewed and approved prior to implementation. The implementation plan will demonstrate an outcome-based proposal to provide business capabilities through infrastructure with a risk-mitigated project plan.

- **Basic Hardware Installation**
  Lenovo experts can seamlessly manage the physical installation of customer's server, storage, or networking hardware. Working at a time convenient for the customer (business hours or off shift), the technician will unpack and inspect the systems on customer site, install options, mount in a rack cabinet, connect to power and network, check and update firmware to the latest levels, verify operation, and dispose of the packaging, allowing customers to focus on other priorities.

- **Deployment Services**
  When investing in new IT infrastructures, customers need to ensure that their business will see quick time to value with little to no disruption. Lenovo deployments are designed by development and engineering teams who know Lenovo products and solutions better than anyone else, and Lenovo technicians own the process from delivery to completion. Lenovo will conduct remote preparation and planning, configure and integrate systems, validate systems, verify and update appliance firmware, train on administrative tasks, and provide post-deployment documentation. Customer's IT teams leverage Lenovo skills to enable IT staff to transform with higher level roles and tasks.

- **Integration, Migration, and Expansion Services**
  Integration, Migration, and Expansion Services allow to move existing physical and virtual workloads easily, or to determine technical requirements to support increased workloads while maximizing performance. These services include tuning, validation, and documenting ongoing run processes, and they leverage migration assessment planning documents to perform necessary migrations.

Some service options may not be available in every region. For more information about Lenovo service offerings that are available in a specific region, contact a local Lenovo sales representative or business partner.

## Regulatory compliance

The ThinkSystem DM Series enclosures conform to the following regulations:

- United States: FCC Part 15, Class A; UL 60950-1
- Canada: ICES-003, Class A; CAN/CSA-C22.2 60950-1
- Mexico NOM
- European Union: CE Mark (EN55032 Class A, EN55024, IEC/EN60950-1); ROHS Directive 2011/65/EU
- Russia, Kazakhstan, Belarus: EAC
- China: CCC GB 4943.1, GB 17625.1, GB 9254 Class A; CELP; CECP
- Japan: VCCI, Class A
- Taiwan: BSMI CNS 13438, Class A; CNS 14336-1
- Korea KN32/35, Class A
- Australia/New Zealand: AS/NZS CISPR 22 Class A

## Interoperability

Lenovo provides end-to-end storage compatibility testing to deliver interoperability throughout the network. The ThinkSystem DM3000H Unified Hybrid Storage Array supports attachment to Lenovo ThinkSystem, System x, ThinkServer, and Flex System hosts by using NAS (NFS and CIFS/SMB), iSCSI, and Fibre Channel storage connectivity protocols. Hybrid storage connectivity also is supported.

For end-to-end storage configuration support, refer to the Lenovo DM Series Interoperability Matrix that can be found on the ThinkSystem DM3000H Documentation page on the Lenovo Data Center Support web site: http://datacentersupport.lenovo.com/us/en/products/storage/lenovo-storage/thinksystem-dm3000h/documentation/userguide

The following sections list adapters and Ethernet LAN and FC SAN switches that are currently offered by Lenovo that can be used with the ThinkSystem DM3000H Hybrid Storage Array in IT solutions:

- Adapters
- Ethernet LAN switches
- Fibre Channel SAN switches

**Note:** Tables that are provided in these sections are for ordering reference purposes only. End-to-end storage configuration support *must* be verified through the Lenovo ThinkSystem DM3000H Interoperability Matrix.

## Adapters

This section lists the adapters for the following types of storage connectivity:

- NAS and iSCSI connectivity
- Fibre Channel connectivity

### NAS and iSCSI connectivity

The ThinkSystem DM3000H supports NAS and iSCSI attachments via standard 1 Gb and 10 Gb Ethernet connections (direct attach or switch-based). Any compatible Ethernet switch, including Lenovo ThinkSystem and RackSwitch Ethernet switches and embedded Flex System Ethernet I/O modules, can be used to provide NAS and iSCSI connectivity for the ThinkSystem DM3000H storage.

With software iSCSI initiators, any supported 1 Gb or 10 Gb Ethernet adapter for Lenovo servers is compatible with the ThinkSystem DM3000H NAS and iSCSI storage.

### Fibre Channel connectivity

The ThinkSystem DM3000H supports FC switch-based attachments. Lenovo B Series and DB Series FC SAN switches and directors can be used to provide FC connectivity.

Currently available FC adapters for Lenovo servers that are compatible with the ThinkSystem DM3000H FC storage are listed in the following table. Other FC HBAs also might be supported (see the Interoperability Matrix for details).

Table 20. Fibre Channel adapters

| Description | Part number |
|---|---|
| ThinkSystem HBAs: 32 Gb FC (8/16/32 Gb FC connectivity) | |
| ThinkSystem Emulex LPe32000-M6-LP PCIe 32Gb 1-Port SFP+ Fibre Channel Adapter | 7ZT7A00517 |
| ThinkSystem Emulex LPe32002-M6-LP PCIe 32Gb 2-Port SFP+ Fibre Channel Adapter | 7ZT7A00519 |
| ThinkSystem QLogic QLE2740 PCIe 32Gb 1-Port SFP+ Fibre Channel Adapter | 7ZT7A00516 |
| ThinkSystem QLogic QLE2742 PCIe 32Gb 2-Port SFP+ Fibre Channel Adapter | 7ZT7A00518 |
| System x HBAs: 16 Gb FC | |
| Emulex 16Gb Gen6 FC Single-port HBA (LPe31000) | 01CV830 |
| Emulex 16Gb Gen6 FC Dual-port HBA (LPe31002) | 01CV840 |
| Emulex 16Gb FC Single-port HBA (LPe16000) | 81Y1655 |
| Emulex 16Gb FC Dual-port HBA (LPe16002) | 81Y1662 |
| QLogic 16Gb Enhanced Gen5 FC Single-port HBA (QLE2690) | 01CV750 |
| QLogic 16Gb Enhanced Gen5 FC Dual-port HBA (QLE2692) | 01CV760 |
| QLogic 16Gb FC Single-port HBA (QLE2660) | 00Y3337 |
| QLogic 16Gb FC Dual-port HBA (QLE2662) | 00Y3341 |
| ThinkServer HBAs: 16 Gb FC | |
| ThinkServer LPe16000B Single Port 16Gb Fibre Channel HBA by Emulex | 4XB0F28653 |
| ThinkServer LPe16002B Dual Port 16GB Fibre Channel HBA by Emulex | 4XB0F28650 |
| ThinkServer LPe16002B-M6-L PCIe 16Gb 2 Port Fibre Channel Adapter by Emulex | 4XB0F28705 |
| ThinkServer LPe16004B-M6-L PCIe 16Gb 4 Port Fibre Channel Adapter by Emulex | 4XB0F28681 |
| ThinkServer LPm16002-M6-L AnyFabric 16Gb 2 Port Fibre Channel Adapter by Emulex | 4XB0F28706 |
| ThinkServer QLE2672 PCIe 16Gb 2 Port Fibre Channel Adapter by QLogic | 4XC0F28745 |
| Flex System HBAs: 16 Gb FC | |
| ThinkSystem Emulex LPm16002B-L Mezz 16Gb 2-Port Fibre Channel Adapter | 7ZT7A00521 |

| Description | Part number |
|---|---|
| ThinkSystem Emulex LPm16004B-L Mezz 16Gb 4-Port Fibre Channel Adapter | 7ZT7A00522 |
| ThinkSystem QLogic QML2692 Mezz 16Gb 2-Port Fibre Channel Adapter | 7ZT7A00520 |
| Flex System FC5052 2-port 16Gb FC Adapter | 95Y2386 |
| Flex System FC5054 4-port 16Gb FC Adapter | 95Y2391 |
| Flex System FC5172 2-port 16Gb FC Adapter | 69Y1942 |

## Ethernet LAN switches

The following table lists currently available rack-mount Ethernet switches that are currently offered by Lenovo that can be used with the ThinkSystem DM3000H Unified Hybrid Storage Array in IT solutions.

Table 21. Ethernet rack-mount switches

| Description | Part number |
|---|---|
| 1 Gb Ethernet (1 GbE connectivity; NAS and iSCSI) | |
| Lenovo ThinkSystem NE0152T RackSwitch (Rear to Front) | 7Y810011WW |
| Lenovo ThinkSystem NE0152TO RackSwitch (Rear to Front, ONIE) | 7Z320O11WW |
| Lenovo RackSwitch G7028 (Rear to Front) | 7159BAX |
| Lenovo RackSwitch G7052 (Rear to Front) | 7159CAX |
| Lenovo CE0128TB Switch (3-Year Warranty) | 7Z340011WW |
| Lenovo CE0128TB Switch (Limited Lifetime Warranty) | 7Z360011WW |
| Lenovo CE0128PB Switch (3-Year Warranty) | 7Z340012WW |
| Lenovo CE0128PB Switch (Limited Lifetime Warranty) | 7Z360012WW |
| Lenovo CE0152TB Switch (3-Year Warranty) | 7Z350021WW |
| Lenovo CE0152TB Switch (Limited Lifetime Warranty) | 7Z370021WW |
| Lenovo CE0152PB Switch (3-Year Warranty) | 7Z350022WW |
| Lenovo CE0152PB Switch (Limited Lifetime Warranty) | 7Z370022WW |
| 10 Gb Ethernet (10 GbE connectivity; NAS and iSCSI) | |
| Lenovo ThinkSystem NE1032 RackSwitch (Rear to Front) | 7159A1X |
| Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front) | 7159B1X |
| Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front) | 7159C1X |
| Lenovo RackSwitch G8272 (Rear to Front) | 7159CRW |
| 25 Gb Ethernet (10 GbE connectivity out of an SFP28 port; NAS and iSCSI) | |
| Lenovo ThinkSystem NE2572 RackSwitch (Rear to Front) | 7159E1X |
| Lenovo ThinkSystem NE2572O RackSwitch (Rear to Front, ONIE) | 7Z210O21WW |
| 100 Gb Ethernet (4x 10 GbE breakout connectivity out of a QSFP28 port; NAS and iSCSI) | |
| Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front) | 7159D1X |
| Lenovo ThinkSystem NE10032O RackSwitch (Rear to Front, ONIE) | 7Z210O11WW |

For more information, see the list of Product Guides in the Top-of-rack Switches category:
http://lenovopress.com/servers/options/switches#rt=product-guide

The following table lists currently available embedded Ethernet switches and pass-thru modules for Flex System that can be used with the ThinkSystem DM3000H Unified Hybrid Storage Array in IT solutions.

Table 22. Embedded Ethernet switches for Flex System

| Description | Part number |
|---|---|
| 1 Gb Ethernet (1 GbE connectivity; NAS and iSCSI) | |
| Lenovo Flex System EN2092 1Gb Ethernet Scalable Switch | 49Y4294 |
| 10 Gb Ethernet (10 GbE connectivity; NAS and iSCSI) | |
| Lenovo Flex System Fabric EN4093R 10Gb Scalable Switch | 00FM514 |
| Lenovo Flex System SI4091 10Gb System Interconnect Module | 00FE327 |
| Lenovo Flex System Fabric SI4093 System Interconnect Module | 00FM518 |
| 25 Gb Ethernet (10 GbE connectivity out of an SFP28 port; NAS and iSCSI) | |
| Lenovo ThinkSystem NE2552E Flex Switch | 4SG7A08868 |
| Pass-thru modules (10 GbE connectivity [require a compatible external switch]; NAS and iSCSI) | |
| Lenovo Flex System EN4091 10Gb Ethernet Pass-thru | 88Y6043 |

For more information, see the list of Product Guides in the Blade Network Modules category: http://lenovopress.com/servers/blades/networkmodule#rt=product-guide

## Fibre Channel SAN switches

The following table lists currently available rack-mount Fibre Channel SAN switches that are offered by Lenovo that can be used with the ThinkSystem DM3000H Unified Hybrid Storage Array in IT solutions.

Table 23. Rack-mount Fibre Channel SAN switches

| Description | Part number |
|---|---|
| 16 Gb FC | |
| Lenovo ThinkSystem DB610S, 8 ports licensed, 8x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW | 6559F2A |
| Lenovo ThinkSystem DB610S, ENT., 24 ports licensed, 24x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW | 6559F1A |
| Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW | 6415J1A |
| Lenovo B6505, 12 ports licensed, 12x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW | 3873ER1 |
| Lenovo B6510, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW | 3873IR1 |
| Lenovo B6510, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit, 3Yr FW | 3873BR3 |
| 32 Gb FC | |
| Lenovo ThinkSystem DB610S, 8 ports licensed, No SFPs, 1 PS, Rail Kit, 1Yr FW | 6559F3A |
| Lenovo ThinkSystem DB610S, 8 ports licensed, No SFPs, 1 PS, Rail Kit, 3Yr FW | 6559D3Y |
| Lenovo ThinkSystem DB620S, 24 ports licensed, No SFPs, 2 PS, Rail Kit, 1Yr FW | 6415G3A |
| Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW | 6415H11 |
| Lenovo ThinkSystem DB620S, ENT., 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW | 6415H2A |
| Lenovo ThinkSystem DB630S, 48 ports licensed, No SFPs, 2 PS, Rail Kit, 1Yr FW | 7D1SA001WW |
| Lenovo ThinkSystem DB630S, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW | 7D1SA002WW |
| Lenovo ThinkSystem DB630S, ENT., 96 ports licensed, 96x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW | 7D1SA003WW |
| Lenovo ThinkSystem DB400D 32Gb FC Director, ENT., 4 Blade slots, 8U, 1Yr FW | 6684D2A |
| Lenovo ThinkSystem DB400D 32Gb FC Director, ENT., 4 Blade slots, 8U, 3Yr FW | 6684B2A |
| Lenovo ThinkSystem DB800D 32Gb FC Director, ENT., 8 Blade slots, 14U, 1Yr FW | 6682D1A |

For more information, see the list of Product Guides in the Rack SAN Switches category:
http://lenovopress.com/storage/switches/rack#rt=product-guide

The following table lists currently available embedded Fibre Channel SAN switches for Flex System that can be used with the ThinkSystem DM3000H Unified Hybrid Storage Array in IT solutions.

Table 24. Embedded FC SAN switches for Flex System

| Description | Part number |
|---|---|
| 16 Gb FC | |
| Lenovo Flex System FC5022 16Gb SAN Scalable Switch | 88Y6374 |
| Lenovo Flex System FC5022 24-port 16Gb SAN Scalable Switch (includes two 16 Gb SFPs) | 00Y3324 |
| Lenovo Flex System FC5022 24-port 16Gb ESB SAN Scalable Switch | 90Y9356 |

For more information, see the list of Product Guides in the Blade Storage Modules category:
http://lenovopress.com/servers/blades/storagemodule#rt=product-guide

## Operating systems

The ThinkSystem DM3000H supports host attachments to the Lenovo servers running the following operating systems:

- Microsoft:
    - Microsoft Windows Server 2019
    - Microsoft Windows Server 2016
    - Microsoft Windows Server 2012 R2
- Red Hat:
    - Red Hat Enterprise Linux 8
    - Red Hat Enterprise Linux 7 Update 6
    - Red Hat Enterprise Linux 7 Update 5
    - Red Hat Enterprise Linux 6 Update 10
    - Red Hat Enterprise Linux 6 Update 9
    - Red Hat Enterprise Linux 6 Update 8
- SUSE:
    - SUSE Linux Enterprise Server 15 SP1
    - SUSE Linux Enterprise Server 15
    - SUSE Linux Enterprise Server 12 SP4
    - SUSE Linux Enterprise Server 12 SP3
    - SUSE Linux Enterprise Server 12 SP2
    - SUSE Linux Enterprise Server 11 SP4
    - SUSE Linux Enterprise Server 11 SP3
- VMware:
    - VMware vSphere 6.7 Update 2
    - VMware vSphere 6.7 Update 1
    - VMware vSphere 6.7
    - VMware vSphere 6.5 Update 2
    - VMware vSphere 6.5 Update 1
    - VMware vSphere 6.0 Update 3
    - VMware vSphere 6.0 Update 2
    - VMware vSphere 6.0 Update 1

## Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used with the ThinkSystem DM3000H Unified Hybrid Storage Array in IT solutions.

Table 25. Rack cabinets

| Description | Part number |
|---|---|
| 25U S2 Standard Rack (1000 mm deep; 2 sidewall compartments) | 93072RX |
| 25U Static S2 Standard Rack (1000 mm deep; 2 sidewall compartments) | 93072PX |
| 42U S2 Standard Rack (1000 mm deep; 6 sidewall compartments) | 93074RX |
| 42U 1100mm Enterprise V2 Dynamic Rack (6 sidewall compartments) | 93634PX |
| 42U 1100mm Enterprise V2 Dynamic Expansion Rack (6 sidewall compartments) | 93634EX |
| 42U 1200mm Deep Dynamic Rack (6 sidewall compartments) | 93604PX |
| 42U 1200mm Deep Static Rack (6 sidewall compartments) | 93614PX |
| 42U Enterprise Rack (1105 mm deep; 4 sidewall compartments) | 93084PX |
| 42U Enterprise Expansion Rack (1105 mm deep; 4 sidewall compartments) | 93084EX |

For more information, see the list of Product Guides in the Rack cabinets category:
http://lenovopress.com/servers/options/racks#rt=product-guide

## Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo that can be used for distributing electrical power to the ThinkSystem DM3000H Unified Hybrid Storage Array and other IT infrastructure building blocks mounted in a rack cabinet.

Table 26. Power distribution units

| Description | Part number |
|---|---|
| 0U Basic PDUs | |
| 0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord | 00YJ776 |
| 0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord | 00YJ777 |
| 0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord | 00YJ778 |
| 0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord | 00YJ779 |
| Switched and Monitored PDUs | |
| 0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord | 00YJ781 |
| 0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord | 00YJ780 |
| 0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord | 00YJ782 |
| 0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord | 00YJ783 |
| 1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord) | 46M4002 |
| 1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord | 46M4003 |
| 1U 12 C13 Switched and Monitored DPI PDU (without line cord) | 46M4004 |
| 1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord | 46M4005 |
| Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets) | |
| Ultra Density Enterprise C19/C13 PDU Module (without line cord) | 71762NX |
| Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord | 71763NU |

| Description | Part number |
|---|---|
| C13 Enterprise PDUs (12x IEC 320 C13 outlets) | |
| DPI C13 Enterprise PDU+ (without line cord) | 39M2816 |
| DPI Single Phase C13 Enterprise PDU (without line cord) | 39Y8941 |
| C19 Enterprise PDUs (6x IEC 320 C19 outlets) | |
| DPI Single Phase C19 Enterprise PDU (without line cord) | 39Y8948 |
| DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord | 39Y8923 |
| Front-end PDUs (3x IEC 320 C19 outlets) | |
| DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord | 39Y8938 |
| DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord | 39Y8939 |
| DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8934 |
| DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8940 |
| DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord | 39Y8935 |
| Universal PDUs (7x IEC 320 C13 outlets) | |
| DPI Universal 7 C13 PDU (with 2 m IEC 320-C19 to C20 rack power cord) | 00YE443 |
| NEMA PDUs (6x NEMA 5-15R outlets) | |
| DPI 100-127V PDU with fixed NEMA L5-15P line cord | 39Y8905 |
| Line cords for PDUs that ship without a line cord | |
| DPI 30a Line Cord (NEMA L6-30P) | 40K9614 |
| DPI 32a Line Cord (IEC 309 P+N+G) | 40K9612 |
| DPI 32a Line Cord (IEC 309 3P+N+G) | 40K9611 |
| DPI 60a Cord (IEC 309 2P+G) | 40K9615 |
| DPI 63a Cord (IEC 309 P+N+G) | 40K9613 |
| DPI Australian/NZ 3112 Line Cord (32A) | 40K9617 |
| DPI Korean 8305 Line Cord (30A) | 40K9618 |

For more information, see the list of Product Guides in the PDU category:
http://lenovopress.com/servers/options/pdu#rt=product-guide

## Uninterruptible power supply units

The following table list the uninterruptible power supply (UPS) units that are currently offered by Lenovo that can be used with the ThinkSystem DM3000H Unified Hybrid Storage Array in IT solutions.

Table 27. Uninterruptible power supply units

| Description | Part number |
|---|---|
| Worldwide models | |
| RT1.5kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA 5-15R 12A outlets) | 55941AX |
| RT1.5kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A outlets) | 55941KX |
| RT2.2kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA 5-20R 16A outlets) | 55942AX |
| RT2.2kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets) | 55942KX |
| RT3kVA 2U Rack or Tower UPS (100-125VAC) (6x NEMA5-20R 16A, 1x NEMA L5-30R 24A outlets) | 55943AX |
| RT3kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets) | 55943KX |
| RT5kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets) | 55945KX |
| RT6kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets) | 55946KX |
| RT8kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets) | 55948KX |
| RT11kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets) | 55949KX |
| RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets) | 55948PX |
| RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets) | 55949PX |
| ASEAN, HTK, INDIA, and PRC models | |
| ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 & 2x GB 10A, 1x C19 16A outlets) | 55943KT |
| ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 & 2x GB 10A, 1x C19 16A outlets) | 55943LT |
| ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output) | 55946KT |
| ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output) | 5594XKT |

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category:
http://lenovopress.com/servers/options/ups#rt=product-guide

## Lenovo Financial Services

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## Related publications and links

For more information, see the following resources:

- Lenovo Data Center SAN Storage product page
  http://www.lenovo.com/us/en/c/storage-area-network
- Lenovo Data Center Solution Configurator
  http://dcsc.lenovo.com
- ThinkSystem DM Series documentation
  http://thinksystem.lenovofiles.com/help/topic/ontap_software/overview.html
- Lenovo Data Center Support - ThinkSystem DM3000H
  http://datacentersupport.lenovo.com/us/en/products/storage/lenovo-storage/thinksystem-dm3000h

## Related product families

Product families related to this document are the following:

- DM Series Storage
- Lenovo Storage
- External Storage

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