Lenovo ThinkSystem DE4800H and DE4800F Storage Arrays

Product Guide

Lenovo ThinkSystem DE4800H and DE4800F are a new generation of hybrid and all flash mid-range storage systems that are designed to provide high performance, simplicity, capacity, security, scalable, and high availability for medium to large businesses. The ThinkSystem DE4800H and DE4800F deliver enterprise-class storage management capabilities in a performance-optimized system with a wide IO flexibility of host connectivity options, flexible drive configurations, and enhanced data management features. The ThinkSystem DE4800H and DE4800F are a perfect fit for a wide range of enterprise workloads, including big data and analytics, video surveillance, technical computing, backup and recovery, and other storage I/O-intensive applications.

The Lenovo ThinkSystem DE4800H 2U24 enclosure is shown in the following figure.

Figure 1. Lenovo ThinkSystem DE4800H 2U24 enclosure

3D Tour for DE Hybrid | 3D Tour for DE All Flash

Did you know?

Lenovo ThinkSystem DE4800H and DE4800F are well positioned for those customers looking for enhancements in the following areas.

Increased Bandwidth: "Multiple ports allow for higher aggregate data transfer rates" and "Reducing the risk of bottlenecks and improving overall system performance".

Efficient Caching: "Faster memory speed to maximize performance" and "More memory enables more effective caching strategies, where frequently accessed data is kept in fast-access memory, thus speeding up data retrieval times".

Networking flexibility: "Optimize for various workloads and performance requirements by mixing multiple connectivity types (e.g., Fibre Channel, iSCSI)".

Key features

The Lenovo ThinkSystem DE4800H scales up to 300 HDD or 120 SSDs.

The Lenovo ThinkSystem DE4800F scales up to 120 SSDs.

The ThinkSystem DE4800H and DE4800F offer the following key features and benefits:

- Scalable, high performance mid-range hybrid storage with dual active/active controller configurations with 32 GB or 64 GB system memory per controller for high availability and performance.
- Improved performance and data protection with Dynamic Disk Pools (DDP) technology, as well as support for traditional RAID 0, 1, 3, 5, 6, and 10.
- Flexible storage protocols to match diverse client needs with support for 12 Gb SAS, 10/25 Gb iSCSI, or 16/32 Gb FC host connectivity.
- 12 Gb SAS drive-side connectivity with support for up to 24x 2.5-inch small form factor (SFF) drives in the 2U24 SFF enclosures, up to 12x 3.5-inch large form factor (LFF) drives in the 2U12 LFF enclosures, or up to 60x 3.5-inch LFF drives in the 4U60 LFF enclosures. See the Drives section for details.
- Base scalability with the optional upgrade to increase the number of drives by attaching ThinkSystem DE240S 2U24 SFF, DE120S 2U12 LFF, and DE600S 4U60 LFF expansion enclosures to satisfy growing needs for storage capacity and performance.
- Rich set of standard storage management functions available at no extra cost, including Dynamic Disk Pools, SSD read cache, snapshots, volume copy, thin provisioning, and encryption (requires optional FIPS drives).
- Snapshots for greater scalability and synchronous or asynchronous mirroring for continuous data availability.
- Intuitive, web-based GUI for easy system setup and management.
- Designed for 99.9999% availability with redundant hot-swap components, including controllers and I/O modules, power supplies, cooling modules (4U60 LFF enclosures only), proactive maintenance, and non-disruptive firmware upgrades.

The ThinkSystem DE4800H and DE4800F support the complete range of data storage requirements, from highly used applications to high-capacity, low usage applications.

The ThinkSystem DE4800H and DE4800F offer high levels of system and data availability with the following technologies:

- Dual-active controller modules with automatic load balancing and failover
- Mirrored data cache with flash backup (battery-backed destaging to flash)
- Dual-port SAS HDDs and SSDs with automatic drive failure detection and rebuild with global hot spares
- Redundant, hot-swappable and customer replaceable hardware components, including SFP/SFP+ transceivers, controller and I/O modules, power supplies, cooling modules (4U60 LFF only), and drives
- Automated path failover support for the data path between the host and the drives with multipathing software
- Non-disruptive controller and drive firmware upgrades

Components and connectors

The following figure shows the front of the Lenovo ThinkSystem DE4800H 2U12 LFF enclosure.

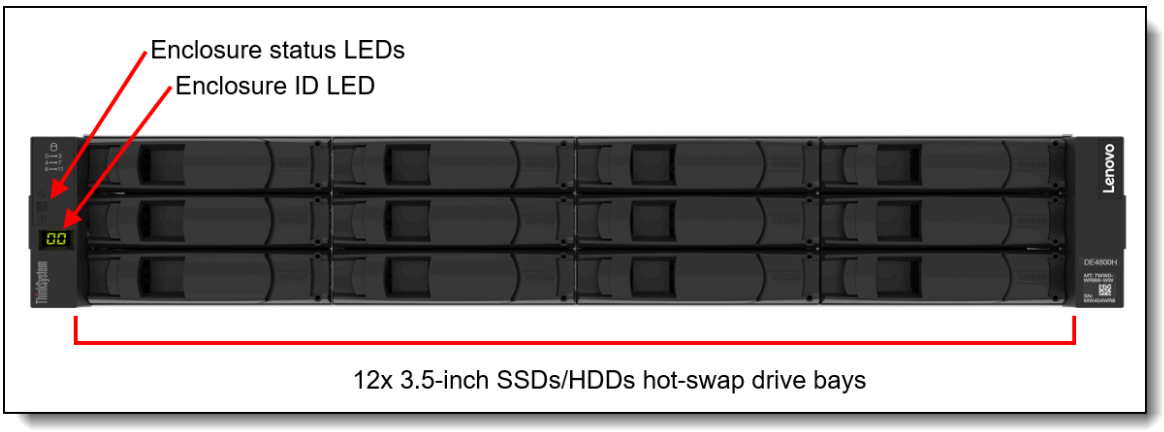

Figure 2. ThinkSystem DE4800H 2U12 LFF enclosure front view

The following figure shows the front of the ThinkSystem DE4800H 2U24 SFF enclosure.

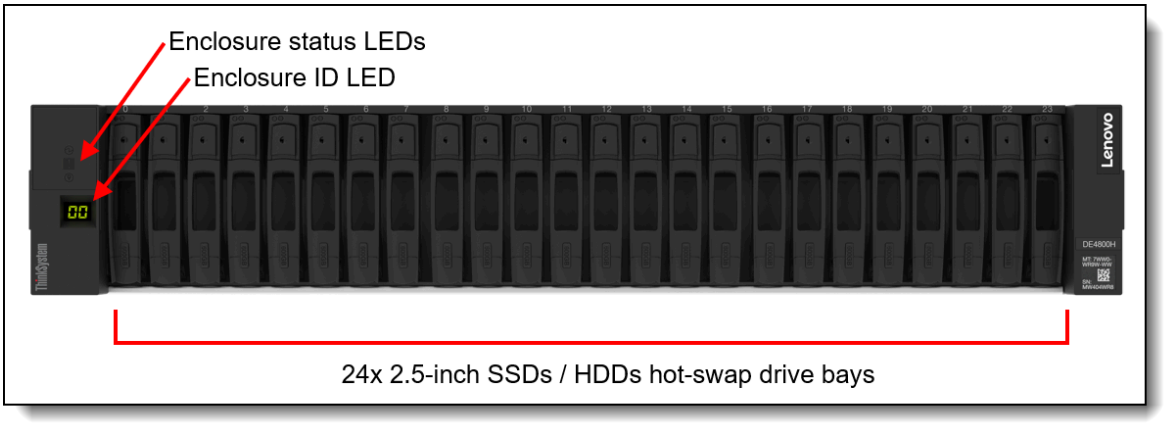

Figure 3. ThinkSystem DE4800H 2U24 SFF enclosure front view

The following figure shows the front of the ThinkSystem DE4800H 4U60 LFF enclosure.

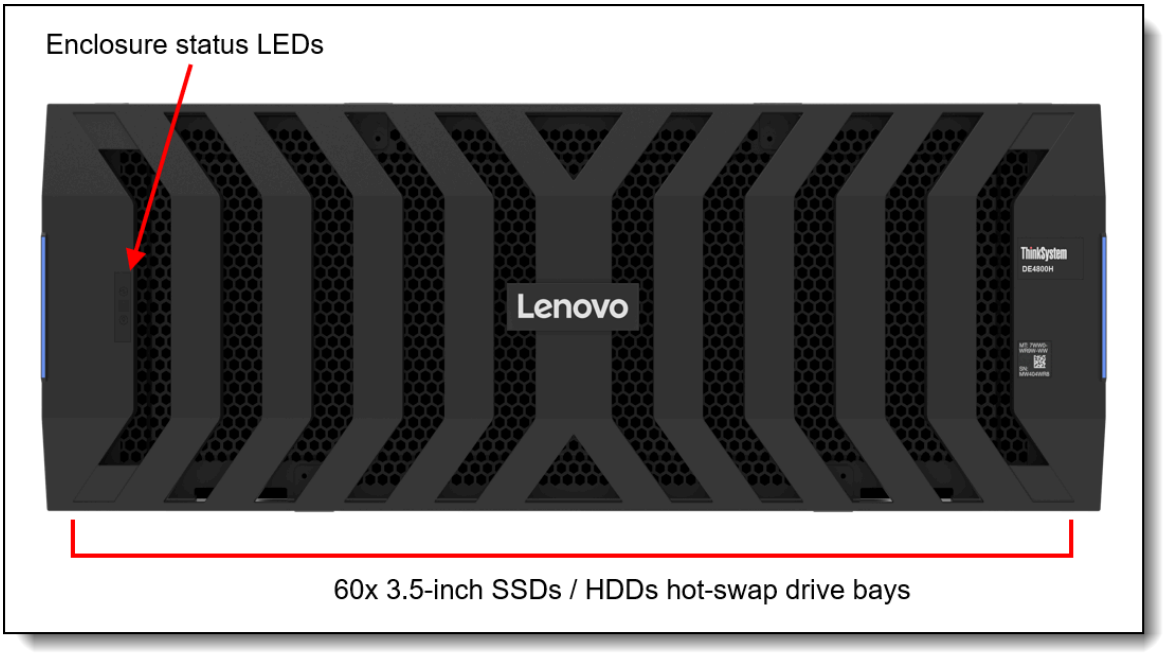

Figure 4. ThinkSystem DE4800H 4U60 LFF enclosure front view

The following figure shows the rear of the ThinkSystem DE4800H and DE4800F enclosure.

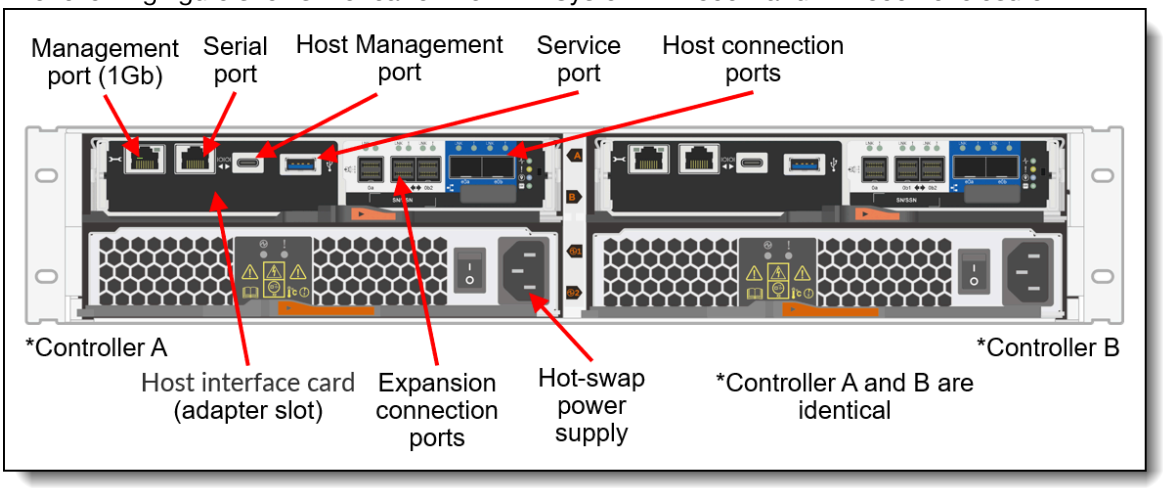

Figure 5. ThinkSystem DE4800H and DE4800F enclosure rear view

Each DE4800H / DE4800F controller includes the following components:

- Two redundant hot-swap controllers, **each controller** with the following ports:
  - One slot for the host interface card (a host interface card is required)
    Note: The DE4800H and DE4800F controllers support base ports
    - Lenovo ThinkSystem DE4200/DE4800 32Gb FC,4-ports
    - Lenovo ThinkSystem DE4200/DE4800 10Gb Base-T iSCSI 4-ports
    - Lenovo ThinkSystem DE4200/DE4800 12Gb SAS 4-ports
  - Two 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644) for connections to the expansion enclosures.
    Note: The 12 Gb SAS x4 expansion port next to two expansion ports is not available for use.
  - One RJ-45 10/100/1000 Mb Ethernet port for out-of-band management.
  - One serial console ports (RJ-45 and USB-C) for another means to configure the system.
  - One USB-C host manangement port
  - One USB service port (not enable/ inactive)
  - Two onboard 10/25 Gb iSCSI for host connection
- Two redundant hot-swap 913 W AC (100 - 240 V) power supplies (IEC 320-C14 power connector) with integrated cooling fans.

The following figure shows the rear of the ThinkSystem DE240S and DE120S 2U expansion enclosures.

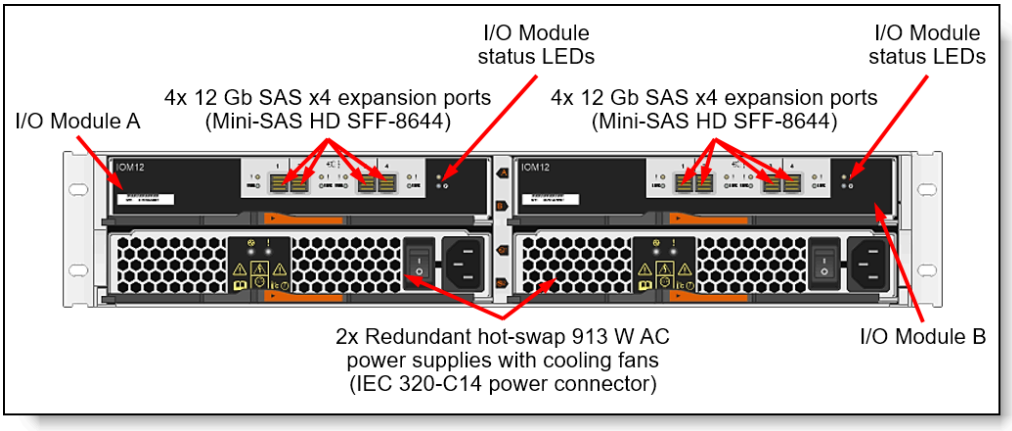

Figure 6. ThinkSystem DE240S and DE120S 2U expansion enclosures rear view

The rear of the ThinkSystem DE240S and DE120S 2U expansion enclosures 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 AC (100 - 240 V) power supplies (IEC 320-C14 power connector) with integrated cooling fans.

The following figure shows the front of the ThinkSystem DE4800H and DE600S 4U LFF enclosures without the front bezel.

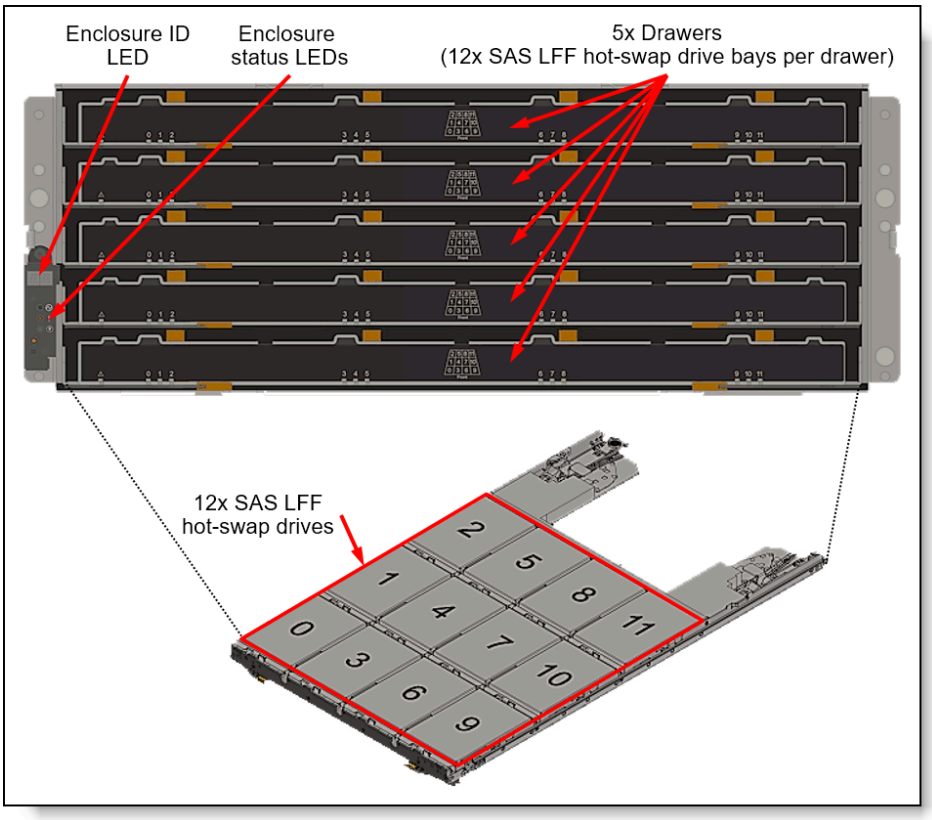

Figure 7. ThinkSystem DE4800H 4U60 and DE600S 4U LFF enclosures front view (without the front bezel)

The front of the ThinkSystem DE4800H 4U60 and DE600S 4U LFF enclosures 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 DE4800H 4U60 LFF controller enclosure.

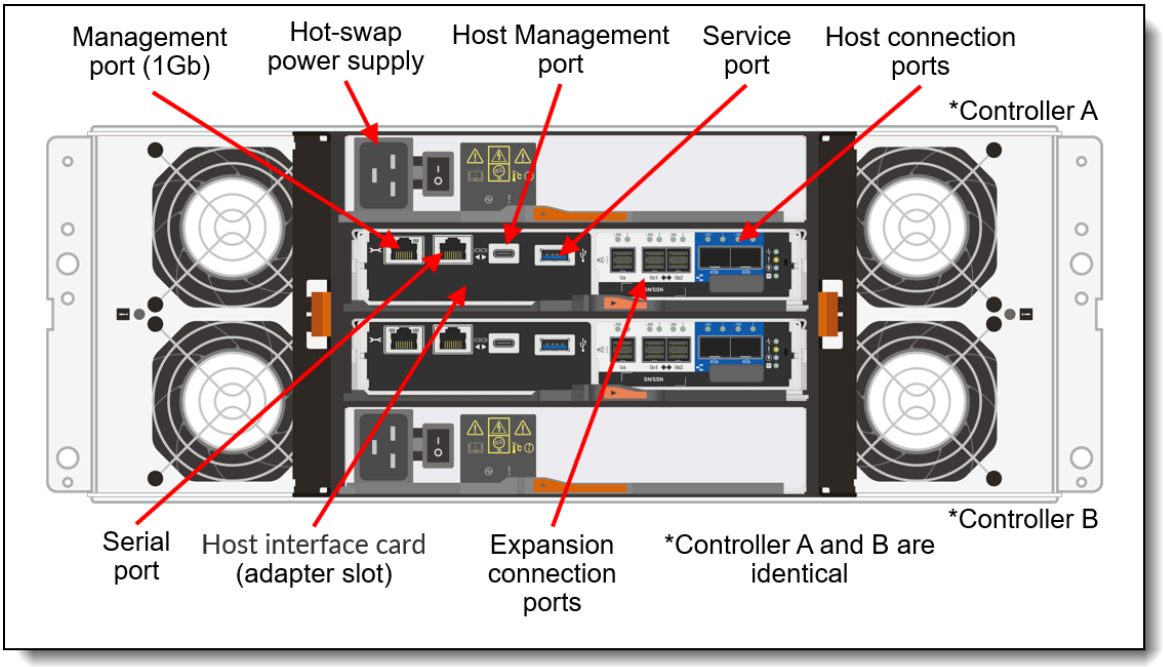

Figure 8. ThinkSystem DE4800H 4U60 LFF enclosure rear view

The rear of the ThinkSystem DE4800H 4U60 LFF controller includes the following components:

- Two redundant hot-swap controllers, **each controller** with the following ports:
  - One slot for the host interface card (a host interface card is required)
    Note: The DE4800H and DE4800F controllers support base ports
    - Lenovo ThinkSystem DE4200/DE4800 32Gb FC,4-ports
    - Lenovo ThinkSystem DE4200/DE4800 10Gb Base-T iSCSI 4-ports
    - Lenovo ThinkSystem DE4200/DE4800 12Gb SAS 4-ports
  - Two 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644) for connections to the expansion enclosures.
    Note: The 12 Gb SAS x4 expansion port next to two expansion ports is not available for use.
  - One RJ-45 10/100/1000 Mb Ethernet port for out-of-band management.
  - One serial console ports (RJ-45 and USB-C) for another means to configure the system.
  - One USB-C Host management port
  - One USB service port (not enable/ inactive)
  - Two onboard 10/25 Gb iSCSI for host connection
- Two redundant hot-swap 2325 W AC (200 - 240 V) 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.

The following figure shows the rear of the ThinkSystem DE600S 4U LFF expansion enclosure.

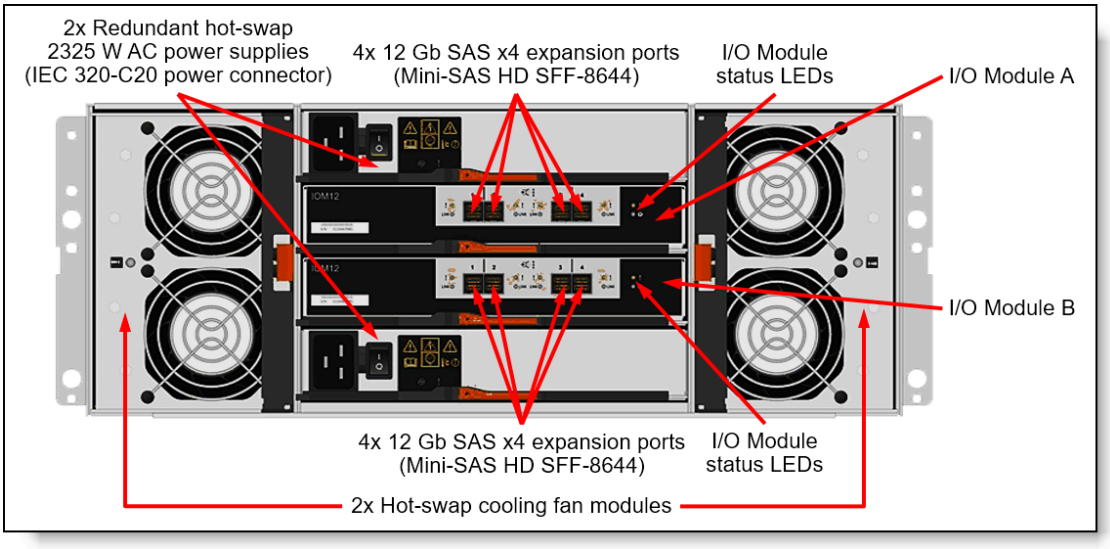

Figure 9. ThinkSystem DE600S 4U LFF expansion enclosure rear view

The rear of the ThinkSystem DE600S 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 AC (200 - 240 V) 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.

System specifications

The following table lists the Lenovo ThinkSystem DE4800H and DE4800F storage system specifications.

Note: The supported hardware options, software features, and interoperability listed in this product guide are based on the software version 11.60. 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 Lenovo ThinkSystem DE4800H and DE4800F that can be found at: http://datacentersupport.lenovo.com

Table 1. ThinkSystem DE4800H and DE4800F systems specifications

Attribute	Specification
Form factor	• Lenovo ThinkSystem DE4800H Hybrid SAS 2U12 (Machine Type 7DCB): 2U rack mount. • Lenovo ThinkSystem DE4800H Hybrid SAS 2U24 (Machine Type 7DCR): 2U rack mount • Lenovo ThinkSystem DE4800H Hybrid SAS 4U60 (Machine Type 7DCS): 4U rack mount • Lenovo ThinkSystem DE4800F All Flash SAS 2U24 (Machine Type 7DCC): 2U rack mount • DE120S 2U12 LFF expansion enclosure (Machine Type 7Y63): 2U rack mount • DE240S 2U24 SFF expansion enclosure (Machine Type 7Y68): 2U rack mount. • DE600S 4U60 LFF expansion enclosure (Machine Type 7Y69): 4U rack mount.
Controller configuration	Dual active-active controller configuration with automatic load balancing.
RAID levels	RAID 0, 1, 3, 5, 6, and 10; Dynamic Disk Pools. **Note:** RAID 3 can be configured only through the CLI.
Controller system memory	DE4800H: 64 GB or 128 GB per system (32 GB or 64 GB per controller). DE4800F: 128G per system (64 GB per controller). Cache mirroring between the controllers. Flash-backed cache protection (includes battery for destaging to flash).
Expansion enclosure support	DE4800H storage system: • DE4800H 2U12 LFF controller: 7x DE120S, 3x DE240S or 3x DE600S • DE4800H 2U24 SFF controller: 3x DE120S, 3x DE240S or 2x DE600S • DE4800H 4U60 LFF controller: 3x DE120S, 3x DE240S or 2x DE600S DE4800F storage system: • DE4800F 2U24 SFF controller: 4x DE240S

Drive bays	DE4800H storage system:
	• Model 1: DE4800H 2U12 LFF (7DCB)
	  ◦ 12 LFF drive bays in the the main (base) unit enclosure
	• Model 2: DE4800H Hybrid SAS 2U24 (7DCR)
	  ◦ 24 SFF drive bays in the the main (base) unit enclosure
	• Model 3: DE4800H Hybrid SAS 4U60 (7DCS)
	  ◦ 60 LFF drive bays in the the main (base) unit enclosure
	• Expansion enclosures supported: 2U12 LFF, 2U24 SFF, 4U60 LFF
	DE4800F storage system:
	• Model 1: DE4800F All Flash SAS 2U24 (7DCC)
	  ◦ 24 SFF drives in the main (base) unit enclosure
	• Expansion enclosure supported: 2U24 SFF
	See Drives specifications for details.

Attribute	Specification
Drive technology	• 12 Gb SAS and NL SAS HDDs and FIPS HDDs, 12 Gb SAS SSDs and FIPS SSDs. • Intermix of HDDs and SSDs is supported within a system. • Intermix of HDDs and SSDs is *not* supported within a volume group or disk pool. • Intermix of FIPS drives and non-FIPS drives is supported within a system. • Intermix of FIPS drives and non-FIPS drives is *not* supported within a volume group or disk pool.
Drive expansion connectivity	• On board, per controller: 2x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports for the attachment to expansion enclosures. • On board, for enclosure: 4x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports for the attachment to expansion enclosures.
Drives	2U24 SFF drives: • 10K rpm SAS HDDs • 10K rpm SAS FIPS HDDs • SAS SSDs (1 DWD) 2U12 LFF drives: • 7.2K rpm SAS HDDs • 7.2K rpm SAS FIPS HDDs 4U60 LFF drives: • 7.2K rpm SAS HDDs • 7.2K rpm SAS FIPS HDDs • SAS SSDs (1 DWD)
Storage capacity	• Base configuration (DE4800H 4U60 + 4x DE600S enclosures): 7.2 PB (300x 24 TB SAS HDDs). • Base configuration (DE4800F 2U24 + 4x DE240S enclosures): 1.84 PB (120x 15.36 TB SSDs).
Storage protocols	SAN (Block access): SAS, iSCSI, FC.
Host connectivity	Base ports (enclosure with two controllers): • 4x 10/25 Gb iSCSI (DAC or SW fiber optics, LC) **Note:** 25 Gbps transceivers are not auto-negotiating down to 10 Gbps Host connectivity ports provided using host interface cards (HICs). Listed below are ports per enclosure. Enclosure supports two controllers: • 8x 12 Gb SAS host ports (Mini-SAS HD, SFF-8644) (4 ports per controller) • 8x 10 Gb BaseT host ports (RJ45 Cat5/6 copper cables) (4 ports per controller) • 8x 16/32 Gb FC SFP+ host ports (SW fiber optics, LC) (4 ports per controller) **Note:** There are base ports (onboard 10/25 Gb iSCSI) available. A configuration with base ports only and no HICs is supported. Or leveraging both or either for host connectivity are supported.
Host operating systems	Microsoft Windows Server; Red Hat Enterprise Linux (RHEL); SUSE Linux Enterprise Server (SLES); VMware vSphere. **Note:** Reference LSIC for specific Operating System details.
Standard software features	Dynamic Disk Pools, SSD read cache, snapshots (up to 512 snapshots max), volume copy, thin provisioning (DDP only), encryption (requires optional FIPS drives), and data assurance.
Optional software features	Snapshots (up to 512 max), synchronous mirroring, and asynchronous mirroring.
Performance*	• Up to 900 000 random read IOPS (4 KB blocks) • Up to 135 000 random write IOPS (4 KB blocks) • Sequential read throughput up to 12 GBps • Sequential write throughput up to 9.4 GBps • Full Stripe Write Acceleration (FSWA) up to 10.8 GBps

Attribute	Specification		

Configuration maximums**	• Maximum storage capacity: 3.84 PB (base) / 7.2 PB
	• Maximum number of logical volumes: 2048
	• Maximum logical volume size: 4 PB
	• Maximum thin-provisioned logical volume size (DDP only): 256 TB
	• Maximum number of drives in a RAID volume group:
	  ◦ RAID 0, 1/10: 240 (base) / 300
	  ◦ RAID 3, 5, 6: 30
	• Maximum number of DDP arrays: 20
	• Maximum number of drives; 300
	• Maximum SSD read cache size: 5 TB
	• Maximum number of hosts: 512
	• Maximum number of snapshots: base: 256 and 512 optional FoD upgrade
	• Maximum number of mirroring pairs: 128 (requires an optional license)		

Cooling	Redundant cooling with two cooling modules (4U60 LFF) or with the fans that are built into power supplies (2U24 SFF).		
Power supply	Two redundant hot-swap 913 W (100 - 240 V) (2U24 enclosures) or 2325 W (200 - 240 V) (4U60 enclosures) Platinum AC power supplies.		
Hot-swap parts	Controllers, I/O modules, drives, power supplies, cooling modules (4U60 LFF only), and SFP+/SFP28 transceivers.		
Management ports	• 1x 1 GbE port (UTP, RJ-45) per controller for out-of-band management. • 2x Serial console ports (RJ-45 and USB-C) for system configuration. • In-band management via I/O path.		
Management interfaces	System Manager web-based GUI; SAN Manager standalone GUI; Serial console CLI, SNMP, email, and syslog alerts; optional Lenovo XClarity.		
Security features	Secure Socket Layer (SSL), user level security, role-based access control (RBAC), LDAP authentication.		
Warranty and support	Three-year customer-replaceable unit and onsite limited warranty with 9x5 next business day (NBD) parts delivered. Also available are 9x5 NBD onsite response, 24x7 coverage with 2-hour or 4-hour onsite response, or 6-hour or 24-hour committed repair (select areas), YourDrive YourData, Premier Support, and 1-year or 2-year post-warranty extensions.		
Software maintenance	Included in the base warranty and any Lenovo warranty extensions.		
Dimensions	2U12 LFF enclosure: • Height: 87 mm (3.4 in.) • Width: 447 mm (17.6 in.) • Depth: 536 mm (21.2 in.)	2U24 SFF enclosure: • Height: 85 mm (3.4 in.) • Width: 447 mm (17.6 in.) • Depth: 511 mm (20.1 in.)	4U60 LFF enclosure: • Height: 174 mm (6.9 in.) • Width: 449 mm (17.7 in.) • Depth: 922 mm (36.3 in.)
Weight	• DE4800H 2U12 LFF controller enclosure (7DCB): 25.07 kg (55.3 lb) • DE4800H 2U24 SFF controller enclosure (7DCR): 25.07 kg (55.3 lb) • DE4800H 4U60 LFF controller enclosure (7DCS): 108.49 kg (239.2 lb) • DE4800F 2U24 SFF controller enclosure (7DCC): 25.07 kg (55.3 lb • DE120S 2U12 LFF expansion enclosure (7Y63): 27.12 kg (59.8 lb) • DE240S 2U24 SFF expansion enclosure (7Y68): 27.44 kg (60.5 lb) • DE600S 4U60 LFF expansion enclosure (7Y69): 112.2 kg (247.4 lb)		

* Estimated performance based on internal measurements.
** For more specific configuration performance please use Lenovo sizing tool or contact Lenovo representative: https://storagesizing.tools.lenovo.com/

Top Choice

Lenovo offers the “quick-ship” program **Top Choice Express (TCE)** to make it easy for our customers to get quick delivery of our products. With TCE, a Configure-to-Order (CTO) model contains a "best of" subset of components, which allows for customization while maintaining significantly faster lead times than standard CTO.

Top Choice Express (TCE) is the way to get custom configurations as quickly as possible. It allows DCSC configurator users to configure systems in **CTO Mode**, selecting the required hardware components while still benefiting from faster turnaround than traditional CTO. These configurations are built and fully integrated by Lenovo Manufacturing, with simple configuration steps, instant pricing, and quicker delivery.

To see which components are TCE, check the TCE column in the various component tables in this product guide. Green cells mean that the component is enabled for ordering with Top Choice Express in all regions world-wide. Orange cells with the ℹ symbol mean that the component is enable for Top Choice Express in only some regions. Mouse over or tap on the cell to see which regions have it enabled for TCE.

Notes:

- Top Choice Express is for configure-to-order builds only, not for standalone option part numbers.
- Ship dates are estimates only; actual ship times may vary based on platform and component availability, order processing, logistics, and external factors beyond Lenovo’s control. Lenovo is not liable for delays.

Controller enclosures

ThinkSystem DE4800H controller enclosure models are available in a 2U or 4U rack mount.

- DE4800H Hybrid SAS 2U12
- DE4800H Hybrid SAS 2U24
- Hybrid SAS 4U60
    - DE4800H models include two controllers, each with 32 GB or 64 GB system memory for a system total of 64G GB or 128 GB.
    - Base ports 10/25 Gb iSCSI, optional for host connectivity 16/32 Gb Fibre Channel (FC), 10 Gb BaseT and 12 Gb SAS.

ThinkSystem DE4800F controller enclosure model is available in a 2U rack mount.

- All Flash SAS 2U24
    - DE4800F model includes two controllers each with 64 GB system memory for a system total of 128 GB.
    - Base ports 10/25 Gb iSCSI, optional for host connectivity 16/32 Gb Fibre Channel (FC), 10 Gb BaseT and 12 Gb SAS.

The following table lists the CTO base models for the Lenovo ThinkSystem DE4800H and DE4800F.

Table 2. Lenovo ThinkSystem DE4800H and DE4800F CTO base models

Machine Type/Model	Base feature	Description	Top Choice Express
7DCBCTO1WW	BEY6	Lenovo ThinkSystem DE4800H Hybrid SAS 2U12	TCE
7DCRCTO1WW	BEY7	Lenovo ThinkSystem DE4800H Hybrid SAS 2U24	TCE
7DCSCTO1WW	BQ9W	Lenovo ThinkSystem DE4800H Hybrid SAS 4U60	-
7DCCCTO1WW	BEY7	Lenovo ThinkSystem DE4800F All Flash SAS 2U24	TCE

The models of the ThinkSystem DE4800H ship with the following items:

- One chassis with the following components:
    - Two controllers
    - Two power supplies
    - Two cooling modules (4U60 LFF only)
    - Two host interface cards
- Rack Mount Kit
- 2 m USB Cable (USB Type A to USB-C)
- Quick Installation Guide
- Electronic Publications Flyer
- CTO models: Customer-configured power cables

The following table lists the specifications for the ThinkSystem DE4800H and DE4800F

Table 3. Controller enclosure specifications

Product Name	DE4800H LFF (7DCB)	DE4800H SFF (7DCR)	DE4800H LFF (7DCS)	DE4800F SFF (7DCC)
Controller (per system)	2	2	2	2
Standard cache (per system)	64 GB	64 GB	64 GB	128 GB
Maximum cache (per system)	128 GB	128 GB	128 GB	128 GB

Product Name	DE4800H LFF (7DCB)	DE4800H SFF (7DCR)	DE4800H LFF (7DCS)	DE4800F SFF (7DCC)
Standard Host port type	32Gb FC	32Gb FC	32Gb FC	32Gb FC
Standard Host Port Quantity (per system)	12	12	12	12
Optional Host Ports(must select one)	N/A*	N/A*	N/A*	N/A*
12 Gb SAS (Port quantity per system)	8	8	8	8
8 Gb FC (Port quantity per system)	0	0	0	0
16 Gb FC (Port quantity per system)	0	0	0	0
32 Gb FC (Port quantity per system)	8	8	8	8
10 Gb Ethernet Cu (iSCSI) (Port quantity per system)	8 **	8 **	8 **	8 **
10 Gb Ethernet (iSCSI) (Port quantity per system	4***	4***	4***	4***
25Gb Ethernet (iSCSI) (Port quantity per system)	4***	4***	4***	4***
100Gb Ethernet (RoCE) (Port quantity per system)	0	0	0	0
Management Port Type	RJ45	RJ45	RJ45	RJ45
Management Port Quantity	2	2	2	2
Expansion Port Type	x4 SAS	x4 SAS	x4 SAS	x4 SAS
Standard Expansion Port Quantity (per system)	4	4	4	4
Maximum expansion enclosures per control enclosure	7, 3, 3	3, 3, 2	3, 3, 2	4
Supported Expansion Enclosures	7Y63, 7Y68, 7Y69	7Y63, 7Y68, 7Y69	7Y63, 7Y68, 7Y69	7Y68

* iSCSI only
** 10Gb Base-T iSCSI 4 ports HIC
*** 4 onboard ports can be either 10G or 25G

Controllers

The Lenovo ThinkSystem DE4800H enclosures ship with two DE4800 controllers, and each controller provides 32 GB or 64 GB system memory for a system total of 64 GB or 128 GB, respectively.

The Lenovo ThinkSystem DE4800F enclosures ship with two DE4800 controllers, and each controller provides 64 GB system memory for a system total of 128 GB, respectively.

A controller provides interfaces for host connectivity, management, and internal drives, and it runs storage management software.

The ThinkSystem DE4800H and DE4800F controllers ship with two universal ports (two ports per controller) for 10 / 25 Gb iSCSI host connectivity.

Each controller has one expansion slot for a host interface card (HIC).

The following host interfaces can be added to the ThinkSystem DE4800 controller enclosures with HICs:

- 8x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) ports (4 ports per HIC) for SAS connectivity.
- 8x 16/32 Gb FC SFP+ ports (4 ports per HIC) for FC connectivity (require optical transceivers that should be purchased for the HICs).
- 8x 10 Gb BaseT iSCSI ports (4 ports per HIC) for connectivity (require RJ-45 Cat5/6 cables).

Each DE4800 controller also provide two 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644

connectors) for the attachment of the ThinkSystem DE Series expansion units.

Configuration notes:

- Both controllers must have the same system memory: 32 GB or 64 GB.
- Two host interface cards are required for selection (one per controller).
- All base ports in the system require optical transceivers and or DAC cables.
- Both controllers must have the same type of the host interface card installed (12 Gb SAS SFF-8644, 32 Gb FC SFP+, 1/10 Gb BaseT iSCSI (copper RJ-45).

The following table lists the DE4800 controllers and supported connectivity options.

Table 4. DE48000 controllers and connectivity options

Part number	Feature code	Description	Top Choice Express	Maximum quantity per controller enclosure
Controllers				
None*	C3HZ	Lenovo ThinkSystem DE4800 Controller 32G	TCE	2
None*	C3HY	Lenovo ThinkSystem DE4800 Controller 64G	TCE	2
Host interface cards				
4C57A95287	BWTF	Lenovo ThinkSystem DM3010/DE4200/DE4800 HIC, 16/32Gb FC,4-Ports	TCE	2
4C57A95288	BWTH	Lenovo ThinkSystem DM3010/DE4200/DE4800 HIC, 10GBaseT, 4-Ports	TCE	2
4XC7A87081	C3HQ	Lenovo ThinkSystem DE4200/4800 HIC, 12Gb SAS,4-Ports	TCE	2
Transceiver options				
4M17A13529	B4B4	Lenovo 10/25GbE iSCSI SFP28 Module	TCE	4
4M17A13528	B4B3	Lenovo 32Gb FC SFP+ Transceiver	TCE	8
OM4 cables for 16/32 Gb FC and 10/25 Gb iSCSI SW SFP+/SFP28 optical transceivers				
4Z57A10845	B2P9	Lenovo 0.5m LC-LC OM4 MMF Cable	Not TCE	12
4Z57A10846	B2PA	Lenovo 1m LC-LC OM4 MMF Cable	TCE	12
4Z57A10847	B2PB	Lenovo 3m LC-LC OM4 MMF Cable	TCE	12
4Z57A10848	B2PC	Lenovo 5m LC-LC OM4 MMF Cable	TCE	12
4Z57A10849	B2PD	Lenovo 10m LC-LC OM4 MMF Cable	TCE	12
4Z57A10850	B2PE	Lenovo 15m LC-LC OM4 MMF Cable	Not TCE	12
4Z57A10851	B2PF	Lenovo 25m LC-LC OM4 MMF Cable	Not TCE	12
4Z57A10852	B2PG	Lenovo 30m LC-LC OM4 MMF Cable	Not TCE	12
OM3 cables for 16/32 Gb FC and 10/25 Gb iSCSI SW SFP+/SFP28 optical transceivers				
00MN499	ASR5	Lenovo 0.5m LC-LC OM3 MMF Cable	TCE	12
00MN502	ASR6	Lenovo 1m LC-LC OM3 MMF Cable	Not TCE	12
00MN505	ASR7	Lenovo 3m LC-LC OM3 MMF Cable	TCE ⓘ	12
00MN508	ASR8	Lenovo 5m LC-LC OM3 MMF Cable	TCE ⓘ	12
00MN511	ASR9	Lenovo 10m LC-LC OM3 MMF Cable	TCE	12
00MN514	ASRA	Lenovo 15m LC-LC OM3 MMF Cable	Not TCE	12
00MN517	ASRB	Lenovo 25m LC-LC OM3 MMF Cable	Not TCE	12
00MN520	ASRC	Lenovo 30m LC-LC OM3 MMF Cable	Not TCE	12

Part number	Feature code	Description	Top Choice Express	Maximum quantity per controller enclosure
DAC cables for 10 Gb iSCSI SFP+ base ports and iSCSI HIC ports				
00D6288	A3RG	0.5m Passive DAC SFP+ Cable	TCE	12
90Y9427	A1PH	1m Passive DAC SFP+ Cable	TCE	12
00AY764	A51N	1.5m Passive DAC SFP+ Cable	Not TCE	12
00AY765	A51P	2m Passive DAC SFP+ Cable	TCE	12
90Y9430	A1PJ	3m Passive DAC SFP+ Cable	TCE	12
90Y9433	A1PK	5m Passive DAC SFP+ Cable	TCE	12
00D6151	A3RH	7m Passive DAC SFP+ Cable	Not TCE	12
DAC cables for 25 Gb iSCSI SFP28 HIC ports				
7Z57A03557	AV1W	Lenovo 1m Passive 25G SFP28 DAC Cable	TCE	4
7Z57A03558	AV1X	Lenovo 3m Passive 25G SFP28 DAC Cable	TCE	4
SAS host connectivity cables: Mini-SAS HD (controller) to Mini-SAS HD (host)				
00YL847	AU16	External MiniSAS HD 8644/MiniSAS HD 8644 0.5M Cable	TCE ℹ	8
00YL848	AU17	External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable	TCE	8
00YL849	AU18	External MiniSAS HD 8644/MiniSAS HD 8644 2M Cable	TCE ℹ	8
00YL850	AU19	External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable	TCE	8
1 GbE management ports				
00WE123	AVFW	0.75m Green Cat6 Cable	Not TCE	10
00WE127	AVFX	1.0m Green Cat6 Cable	TCE ℹ	10
00WE131	AVFY	1.25m Green Cat6 Cable	Not TCE	10
00WE135	AVFZ	1.5m Green Cat6 Cable	Not TCE	10
00WE139	AVG0	3m Green Cat6 Cable	TCE	10
90Y3718	A1MT	10m Green Cat6 Cable	TCE	10
90Y3727	A1MW	25m Green Cat6 Cable	Not TCE	10

* Factory-installed only.

Expansion enclosures

In the base configuration, the ThinkSystem DE4800H supports attachment of up to 3 ThinkSystem DE240S 2U24 SFF, or up to 7 ThinkSystem DE120S 2U12 LFF, or up to 3 ThinkSystem DE600S LFF expansion enclosures for a total of up to 300 drives per system.

In the base configuration, the ThinkSystem DE4800F supports attachment of up to four ThinkSystem DE240S 2U24 SFF for a total of up to 120 drives per system.

Intermix of 2U24 SFF, 2U12 LFF, and 4U60 LFF expansion enclosures behind a 2U24 SFF or 4U60 LFF controller enclosure is supported up to the maximum number of enclosures and drives supported per system. The expansion enclosures can be added to the system non-disruptively.

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

Table 5. ThinkSystem DE240S, DE120S, and DE600S CTO base models

Machine Type/Model	Description	Feature code			
		Top Choice Express	European Union	Other markets	Top Choice Express
7Y63CTO1WW	Lenovo ThinkSystem DE 120S 2U12 LFF Expansion Enclosure	BEY6	TCE	B38M	TCE
7Y68CTO1WW	Lenovo ThinkSystem DE 240S 2U24 SFF Expansion Enclosure	BEY7	TCE	B38L	TCE
7Y69CTO2WW	Lenovo ThinkSystem DE600S 4U60 LFF Expansion Enclosure Gen 2	BQ9W	-	BQ9W	-

Configuration notes

- For CTO models, two I/O expansion modules are selected by default in the configurator, and the selection cannot be changed
  - DE 120S/ DE 240S - feature code B4BS
  - DE600S - feature code BQ9X

The models of the ThinkSystem DE240S, DE120S, and DE600S ship with the following items:

- One chassis with the following components:
  - Two I/O modules
  - Two power supplies
  - Two cooling modules (4U60 LFF only)
- Four 1 m MiniSAS HD 8644/MiniSAS HD 8644 cables (Models listed in Table 7)
- Rack Mount Kit
- *Quick Installation Guide*
- *Electronic Publications Flyer*
- CTO models: Customer-configured power cables

High level connectivity topology for the DE4800H 4U60 is shown in the following figure.

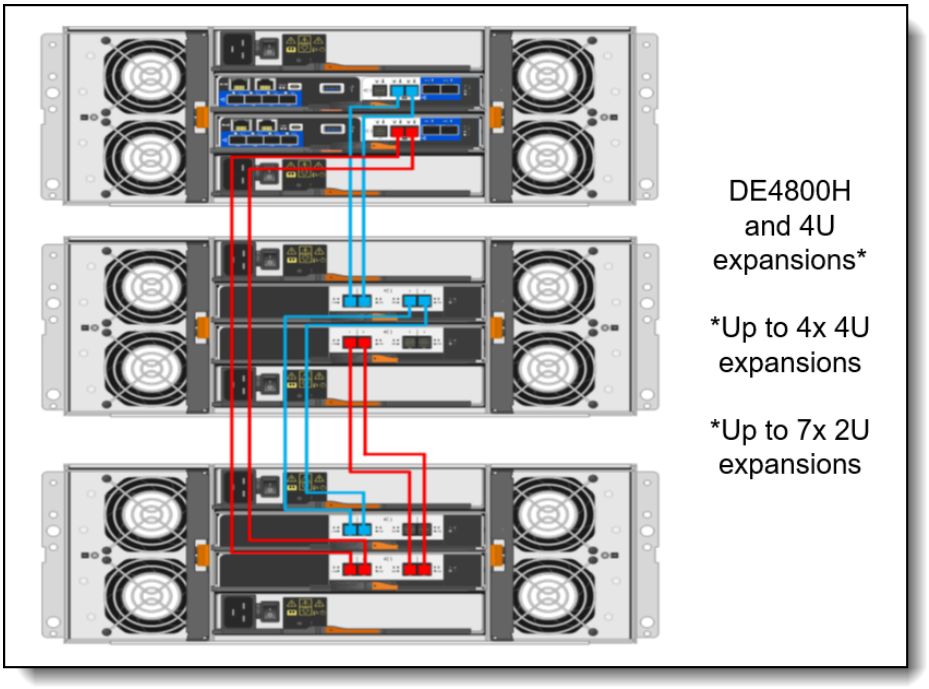

Figure 10. DE4800H 4U60 connectivity topology

High level connectivity topology for the DE4800H 2U24 is shown in the following figure.

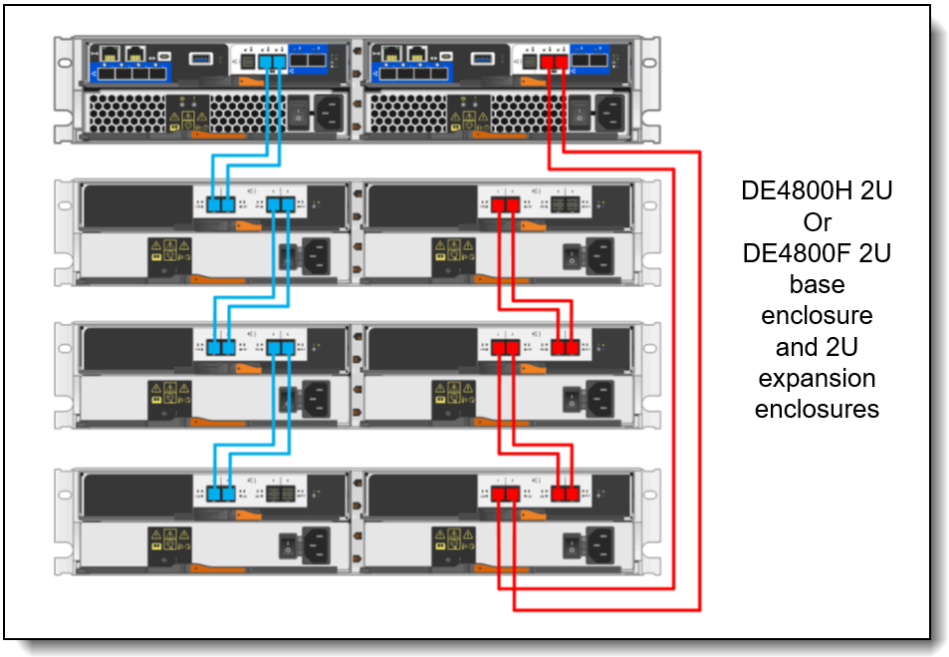

Figure 11. DE4800H 2U24 connectivity topology

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

Table 6. Expansion unit connectivity options

Part number	Feature code	Description	Top Choice Express	Maximum quantity per expansion
SAS connectivity cables				
00YL847	C3HZ	External MiniSAS HD 8644/MiniSAS HD 8644 0.5M Cable	TCE	4
00YL848	C3HY	External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable	TCE	4
00YL849	AU18	External MiniSAS HD 8644/MiniSAS HD 8644 2M Cable	TCE	4
00YL850	AU19	External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable	TCE	4

Configuration notes:

- Four SAS cables are needed per each expansion enclosure (two SAS cables per I/O Module) for connections to the controller enclosure and for daisy chaining of the expansion enclosures.
- The length of the SAS cables that connect a 2U24 or 2U12 enclosure to an adjacent 4U60 enclosure should be at least 1 meter.

Drives

All drives are dual-port and hot-swappable. Drives of the same form factor can be intermixed within the appropriate enclosure, which provides the flexibility to address performance and capacity needs within a single 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 following table lists the specifications for drives in the DE4800H and DE4800F storage systems

Table 7. Drives specifications

Product Name	DE4800H LFF (7DCB)	DE4800H SFF (7DCR)	DE4800H LFF (7DCS)	DE4800F SFF (7DCC)
HDD Bay Type	3.5"	2.5"	3.5"	2.5"
HDD Type	SAS, SSD*	SAS, SSD*	SAS, SSD*	SSD
HDD Bay Quantity	12	24	60	24
Hot-Swap HDD Bays (Y/N)	Y	Y	Y	Y
Solid State Disk (SSD) Support	Y	Y	Y	Y
HDD Intermix (within enclosure)	Y	Y	Y	N
Maximum HDDs per System (System = Controller plus expansion enclosures)	300**	300**	300**	120

*10K support, max 192 drives
** Up to 120 SSD only

The following tables list the drive options for internal storage for each base enclosure and expansions.

The Lenovo ThinkSystem DE4800H Hybrid enclosures:

- DE4800H Hybrid SAS 2U12
- DE4800H Hybrid SAS 2U24
- DE4800H Hybrid SAS 4U60

The Lenovo ThinkSystem DE4800F All Flash enclosures::

- DE4800F All Flash SAS 2U24

ThinkSystem Expansion enclosures:

- ThinkSystem DE120S 2U12 Exp
- ThinkSystem DE240S 2U24 Exp
- Thinksystem DE600S 4U60 Exp v2

Table 8. 7DCBCTO1WW - DE4800H Hybrid SAS 2U12

Part number	Feature code	Description	Top Choice Express	Max Qty
LFF drive options				
4XB7A74947	BKUP	Lenovo ThinkSystem DE Series 1.92TB 1DWD 2.5" SSD 2U12 (2.5" drive in a 3.5" tray)	TCE	12
4XB7A74954	BKUJ	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U12 (2.5" drive in a 3.5" tray)	TCE	12
4XB7A88501	BWCI	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD FIPS 2U12 (2.5" drive in a 3.5" tray)	Not TCE	12
4XB7A14099	B4C3	Lenovo ThinkSystem DE Series 4TB 7.2K 3.5" HDD 2U12	TCE	12
4XB7A14102	B4C6	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD 2U12	TCE	12
4XB7A14103	B4C7	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD SED FIPS 2U12	Not TCE	12
4XB7B15111	CGH2	Lenovo ThinkSystem DE Series 18TB 7.2K 3.5" HDD 2U12	Not TCE	12
4XB7B03838	C7XS	Lenovo ThinkSystem DE Series 24TB 7.2K 3.5" HDD 2U12	TCE	12

Table 9. 7DCRCTO1WW - DE4800H Hybrid SAS 2U24

Part number	Feature code	Description	Top Choice Express	Max Qty
SFF drive options				
4XB7A74951	BKUT	Lenovo ThinkSystem DE Series 1.92TB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A88046	BW12	Lenovo ThinkSystem DE Series 2.4TB 10K 2.5" HDD 2U24	TCE	24
4XB7A88048	BW13	Lenovo ThinkSystem DE Series 2.4TB 10K 2.5" HDD FIPS 2U24	TCE	24
4XB7A74955	BKUK	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A88469	BWCJ	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD FIPS 2U24	Not TCE	24
4XB7A14176	B4RY	Lenovo DE Series 7.68TB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A88466	BW2B	Lenovo ThinkSystem DE Series 15.36TB 1DWD 2.5" SSD SED 2U24	Not TCE	24

Table 10. 7DCSCTO1WW - DE4800H Hybrid SAS 4U60

Part number	Feature code	Description	Top Choice Express	Max Qty
LFF drive options				
4XB7A86719	BUC8	Lenovo ThinkSystem DE Series 1.92TB 1DWD SAS SSD 4U60 (2.5" drive in a 3.5" tray)	-	60
4XB7A88506	BWCM	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD FIPS 4U60 (2.5" drive in a 3.5" tray)	-	60
4XB7A14124	B4GG	Lenovo ThinkSystem DE Series 4TB 7.2K 3.5" HDD 4U60	-	60
4XB7A14126	B4GJ	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD 4U60	-	60
4XB7A14127	B4GK	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD SED FIPS 4U60	-	60
4XB7B15112	CGH3	Lenovo ThinkSystem DE Series 18TB 7.2K 3.5" HDD 4U60	-	60
4XB7B03894	C7XT	Lenovo ThinkSystem DE Series 24TB 7.2K 3.5" HDD 4U60	-	60
Drive pack options				
4XB7A86720	BUC9	Lenovo ThinkSystem DE Series 38.4TB Pack (20x 1.92TB SAS SSDs) (2.5" drive in a 3.5" tray)	-	3
4XB7A88507	BWCN	Lenovo ThinkSystem DE Series 76.8TB FIPS Pack (20x 3.84TB FIPS SSDs) (2.5" drive in a 3.5" tray)	-	3
4XB7A14163	B4GN	Lenovo ThinkSystem DE Series 80TB HDD Pack (20x 4TB HDD)	-	3
4XB7A14167	B4GQ	Lenovo ThinkSystem DE Series 200TB HDD Pack (20x 10TB HDD)	-	3
4XB7A14169	B4GR	Lenovo ThinkSystem DE Series 200TB HDD SED FIPS Pack (20x 10TB HDD)	-	3
4XB7B15113	CGH4	Lenovo ThinkSystem DE Series 360TB HDD Pack (20x 18TB HDDs)	-	3
4XB7B03895	C7XU	Lenovo ThinkSystem DE Series 480TB HDD Pack (20x 24TB HDDs)	-	3

Table 11. 7DCCCTO1WW - DE4800F All Flash SAS 2U24

Part number	Feature code	Description	Top Choice Express	Max Qty
SFF drive options				
4XB7A74951	BKUT	Lenovo ThinkSystem DE Series 1.92TB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A74955	BKUK	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A88469	BWCJ	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD FIPS 2U24	Not TCE	24
4XB7A14176	B4RY	Lenovo DE Series 7.68TB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A88466	BW2B	Lenovo ThinkSystem DE Series 15.36TB 1DWD 2.5" SSD SED 2U24	Not TCE	24

Table 12. 7Y63CTO1WW - ThinkSystem DE120S 2U12 Expansion

Part number	Feature code	Description	Top Choice Express	Max Qty
LFF drive options				
4XB7A74946	BKUN	Lenovo ThinkSystem DE Series 960GB 1DWD 2.5" SSD 2U12 (2.5" drive in a 3.5" tray)	TCE	12
4XB7A74947	BKUP	Lenovo ThinkSystem DE Series 1.92TB 1DWD 2.5" SSD 2U12 (2.5" drive in a 3.5" tray)	TCE	12
4XB7A74954	BKUJ	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U12 (2.5" drive in a 3.5" tray)	TCE	12

Part number	Feature code	Description	Top Choice Express	Max Qty
4XB7A88501	BWCI	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD FIPS 2U12 (2.5" drive in a 3.5" tray)	Not TCE	12
4XB7A14099	B4C3	Lenovo ThinkSystem DE Series 4TB 7.2K 3.5" HDD 2U12	TCE	12
4XB7A14102	B4C6	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD 2U12	TCE	12
4XB7A14103	B4C7	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD SED FIPS 2U12	Not TCE	12
4XB7B15111	CGH2	Lenovo ThinkSystem DE Series 18TB 7.2K 3.5" HDD 2U12	Not TCE	12
4XB7B03838	C7XS	Lenovo ThinkSystem DE Series 24TB 7.2K 3.5" HDD 2U12	TCE	12

Table 13. 7Y68CTO1WW - ThinkSystem DE240S 2U24 Expansion

Part number	Feature code	Description	Top Choice Express	Max Qty
SFF drive options				
4XB7A74948	BKUQ	Lenovo ThinkSystem DE Series 960GB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A14114	B4C0	Lenovo ThinkSystem DE Series 1.8TB 10K 2.5" HDD SED FIPS 2U24	Not TCE	24
4XB7A88046	BW12	Lenovo ThinkSystem DE Series 2.4TB 10K 2.5" HDD 2U24	TCE	24
4XB7A88048	BW13	Lenovo ThinkSystem DE Series 2.4TB 10K 2.5" HDD FIPS 2U24	TCE	24
4XB7A74955	BKUK	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A14176	B4RY	Lenovo DE Series 7.68TB 1DWD 2.5" SSD 2U24	TCE	24
4XB7A14110	B4CD	Lenovo ThinkSystem DE Series 15.36TB 1DWD 2.5" SSD 2U24	Not TCE	24
4XB7A88466	BW2B	Lenovo ThinkSystem DE Series 15.36TB 1DWD 2.5" SSD SED 2U24	Not TCE	24

Table 14. 7Y69CTO2WW - Thinksystem DE600S 4U60 Expansion v2

Part number	Feature code	Description	Top Choice Express	Max Qty
LFF drive options				
4XB7A86719	BUC8	Lenovo ThinkSystem DE Series 1.92TB 1DWD SAS SSD 4U60 (2.5" drive in a 3.5" tray)	-	60
4XB7A88506	BWCM	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD FIPS 4U60 (2.5" drive in a 3.5" tray)	-	60
4XB7A14124	B4GG	Lenovo ThinkSystem DE Series 4TB 7.2K 3.5" HDD 4U60	-	60
4XB7A14126	B4GJ	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD 4U60	-	60
4XB7A14127	B4GK	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD SED FIPS 4U60	-	60
4XB7B15112	CGH3	Lenovo ThinkSystem DE Series 18TB 7.2K 3.5" HDD 4U60	-	60
4XB7B03894	C7XT	Lenovo ThinkSystem DE Series 24TB 7.2K 3.5" HDD 4U60	-	60
Drive pack options				
4XB7A86720	BUC9	Lenovo ThinkSystem DE Series 38.4TB Pack (20x 1.92TB SAS SSDs) (2.5" drive in a 3.5" tray)	-	3
4XB7A88507	BWCN	Lenovo ThinkSystem DE Series 76.8TB FIPS Pack (20x 3.84TB FIPS SSDs) (2.5" drive in a 3.5" tray)	-	3
4XB7A14163	B4GN	Lenovo ThinkSystem DE Series 80TB HDD Pack (20x 4TB HDD)	-	3

Part number	Feature code	Description	Top Choice Express	Max Qty
4XB7A14167	B4GQ	Lenovo ThinkSystem DE Series 200TB HDD Pack (20x 10TB HDD)	-	3
4XB7A14169	B4GR	Lenovo ThinkSystem DE Series 200TB HDD SED FIPS Pack (20x 10TB HDD)	-	3
4XB7B15113	CGH4	Lenovo ThinkSystem DE Series 360TB HDD Pack (20x 18TB HDDs)	-	3
4XB7B03895	C7XU	Lenovo ThinkSystem DE Series 480TB HDD Pack (20x 24TB HDDs)	-	3

Shipping requirement: 2U12 and 2U24 enclosures can be shipped with all drive bays populated, however the 4U60 enclosures must be shipped with drives removed.

Configuration notes:

- For hybrid (HDDs and SSDs) and all flash (SSDs only) storage configurations, a single ThinkSystem DE4800H storage system can support a maximum of 120 SSDs.
- A minimum of 20 drives is required for each 4U60 LFF enclosure (the front row of each drawer must be populated with four drives).
- Intermix of FIPS drives and non-FIPS drives is supported within the system.
- FIPS drives are not available in the following countries:
  - Belarus
  - Kazakhstan
  - People's Republic of China
  - Russia

Software

The following functions are included with every Lenovo ThinkSystem DE4800H and DE4800F:

- **RAID levels 0, 1, 3, 5, 6, and 10**: Provide the flexibility to choose the level of performance and data protection required.
- **Dynamic Disk Pools (DDP) technology**: Helps improve performance and availability with significantly faster rebuild time and reduced exposure to multiple drive failures by allowing data and built-in spare capacity to be distributed across all physical drives in the storage pool.
- **All Flash Array (AFA) capability**: Meets the demand for higher speed storage and provide higher IOPS and bandwidth with lower power usage and total cost of ownership than hybrid or HDD-based solutions.
- **SSD Read Cache**: Helps accelerate performance of read-centric workloads.
- **Thin provisioning**: Optimizes efficiency of Dynamic Disk Pools 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.
- **Snapshots**: Enables creation of copies of data for backup, parallel processing, testing, and development, and have the copies available almost immediately (up to 512 snapshot targets per system).
- **Encryption:** Provides encryption for data at rest for enhanced data security with the optional FIPS 140-2 Level 2 drives and embedded key management (AES-256) or an external key management server.
- **Automatic load balancing:** Provides automated I/O workload balancing of I/O traffic from the hosts across both controllers.
- **Data assurance:** Ensures industry-standard T10-PI end-to-end data integrity in the storage system (from the host ports to the drives).

- **Dynamic volume and capacity expansion:** Allows the capacity of a volume to be expanded by adding new physical drives or making use of unused space on existing drives.

The Lenovo ThinkSystem DE4800H and DE4800F capabilities can be expanded with optional licensed functions. Optional licensed functions include:

- **Snapshots upgrade**: Increase the supported number of snapshots up to 512.
- **Scalability to 300 drives (future planned: 480 drives):** Increases the number of supported 4U60 LFF expansion enclosures to 4 for up to 300 LFF drives per system (future planned 7x 4U60 expansions, up to 480 LFF drives per system).
- **Synchronous mirroring:** Provides storage system-based online, real-time data replication between the storage systems containing primary (local) and secondary (remote) volumes by using synchronous data transfers over Fibre Channel communication links (both storage systems must have licenses for synchronous mirroring).
- **Asynchronous mirroring:** Provides storage system-based data replication between the storage systems containing primary (local) and secondary (remote) volumes by using asynchronous data transfers over Fibre Channel communication links at set intervals (both storage systems must have licenses for asynchronous mirroring).

Note: The synchronous and asynchronous mirroring features of the ThinkSystem DE4800H and DE4800F interoperate with other ThinkSystem DE Series storage arrays.

- DE4800 supports asynchronous and synchronous replication exclusively in FC mode please ensure adhere to the FC configuration to enable support between different DE arrays.
- We cannot directly replicate NVMe to SAS-based volumes due to the different structures and the major bottleneck is DE48 does not support NVMe/FC but only FCP. DE64/66 NVMe volumes would need to go to another NVMe-capable system.

The following table lists the Feature on Demand (FoD) upgrades for the ThinkSystem DE4800H and DE4800F to enable optional software features. Each optional DE4800H and DE4800F function is licensed on a per-system basis and covers both controller enclosure and all attached expansion enclosures.

Table 15. DE4800H optional software features

Part number	Feature code	Description	Top Choice Express
CTO only	C663	Lenovo ThinkSystem DE4800H Base Bundle	TCE
4L47A95690	C3HP	Lenovo Thinksystem DE4800H Asynchronous Mirroring	TCE
4L47A95689	C3HN	Lenovo Thinksystem DE4800H Snapshot Upgrade 512	TCE
4L47A95691	C3J7	Lenovo Thinksystem DE4800 Synchronous Mirroring	TCE

Table 16. DE4800F optional software features

Part number	Feature code	Description	Top Choice Express
CTO only*	C664	Lenovo ThinkSystem DE4800F Premium Bundle	TCE
4L47A95691	C3J7	Lenovo Thinksystem DE4800 Synchronous Mirroring	TCE

* C664 comes bundled with (Base + Async mirroring + Snapshot upgrade 512)

The following tables list the drive options for internal storage for each base enclosure and expansions.

Software maintenance is included in the ThinkSystem DE4800H and DE4800F base warranty and optional warranty extensions, which provides 3-year software support with the option to extend it up to 5 years in 1-year or 2-year increments (see Warranty and support for details).

Management

The DE4800H and DE4800F supports the following management interfaces:

- ThinkSystem System Manager, a web-based interface via HTTPS for single-system management, that runs on the storage system itself and requires only a supported browser, so there is no need for a separate console or plug-in. For more information, see the System Manager Online Help.
- ThinkSystem SAN Manager, a host-installed GUI-based application, for centralized management of multiple storage systems. For more information, see the SAN Manager Online Help.
- ThinkSystem DE Series Storage Plugin for vCenter. For more information, see the DE Series vCenter Plugin Online Help.
- Command line interface (CLI) via SSH or through serial console. For more information, see the CLI Online Help.
- Syslog, SNMP, and e-mail notifications.
- Optional Lenovo XClarity Administrator support for discovery, inventory, and monitoring.

Power supplies and cables

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

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

The CTO models require the selection of two power cables.

The following table lists the rack power cable and line cord options that can be ordered for the DE Series 2U24 SFF enclosures (two power cords per enclosure).

Table 17. 7Y63CTO1WW & 7Y68CTO1WW - Power cables for DE Series 2U12 LFF and 2U24 SFF aenclosures

Part number	Feature code	Description	Top Choice Express
Rack power cables			
00Y3043	A4VP	1.0m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08367	B0N5	1.0m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
39Y7937	6201	1.5m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08368	B0N6	1.5m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08365	B0N4	2.0m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08369	6570	2.0m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08366	6311	2.8m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08370	6400	2.8m, 13A/100-250V, C13 to C14 Jumper Cord	TCE
39Y7938	6204	2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	TCE
39Y7932	6263	4.3m, 10A/100-250V, C13 to C14 Jumper Cord	TCE
4L67A08371	6583	4.3m, 13A/100-250V, C13 to C14 Rack Power Cable	TCE
Line cords			
39Y7930	6222	2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord	TCE
81Y2384	6492	4.3m,10A/250V, C13/IRAM 2073 (Argentina) Line Cord	TCE
39Y7924	6211	Australia/NZ 10A line C13 to SAA-AS C112 (2.8M)	TCE
81Y2383	6574	4.3m,10A/250V, C13/AS/NZS 3112/2000 (Australia) Line Cord	TCE
69Y1988	6532	2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord	TCE
81Y2387	6404	4.3m,10A/250V, C13/NBR 14136 (Brazil) Line Cord	TCE
39Y7928	6210	2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord	Not TCE
81Y2378	6580	4.3m,10A/250V, C13/GB2099.1 (China) Line Cord	Not TCE
39Y7918	6213	Line cord - 2.8m, 10A/250V, C13 to DK2-5a (Denmark)	Not TCE
81Y2382	6575	4.3m,10A/250V, C13/SB107-2-DI (Denmark) Line Cord	Not TCE
39Y7917	6212	European 10A line C13 to CEE 7/7 (2.8M)	TCE
81Y2376	6572	4.3m,10A/230V, C13 to CEE7-VII (Europe) Line Cord	Not TCE
39Y7927	6269	2.8m, 6A Line C13 to Fig 68 (India) Line Cord	TCE
81Y2386	6567	4.3m, 10A/250V, C13 to IS 6538 (India) Line Cord	TCE
39Y7920	6218	Israel 10A line C13 to SI 32 (2.8M)	TCE
81Y2381	6579	4.3m,10A/250V, C13/SI 32 (Israel) Line Cord	Not TCE

Part number	Feature code	Description	Top Choice Express
39Y7921	6217	Italy 10A line C13 to CEE 7/7 (2.8M)	TCE
81Y2380	6493	4.3m,10A/250V, C13/CEI 23-16 (IT) Line cord	TCE
46M2593	A1RE	Japan 12A/125V C13 to JIS C-8303 2.8m line cord	TCE
39Y7926	6335	4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord	TCE
4L67A08362	6495	4.3m, 12A/200V, C13 to JIS C-8303 (Japan) Line Cord	Not TCE
39Y7925	6219	Korea 7A line C13 to KETI 15A/250V (2.8M)	TCE
81Y2385	6494	4.3m, 12A/250V C13/KSC 8305 (Korea) Line Cord	TCE
39Y7922	6214	South Africa 10A line C13 to SABS 164/1 (2.8M)	TCE
81Y2379	6576	4.3m,10A/250V, C13/SANS 164-1 (South Africa) Line Cord	TCE
39Y7919	6216	Switzerland 10A line C13 to SEV 1011 (2.8M)	TCE
81Y2390	6578	4.3m,10A/250V, C13/SEV 1011 (Switzerland)Line Cord	Not TCE
23R7158	6386	Line cord - 2.8m, 10A/125V, C13 to CNS 10917-3 (Taiwan)	TCE
81Y2375	6317	Taiwan 10A/250V C13/CNS 10917 2.8m line cord	TCE
81Y2374	6402	2.8m, 13A/125V, C13 to CNS 60799 (Taiwan) Line Cord	TCE
4L67A08363	AX8B	4.3m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord	TCE
81Y2389	6531	4.3m, 10A/250V, C13/CNS 10917 (Taiwan) Line Cord	TCE
81Y2388	6530	Taiwan 13A/125V C13/CNS 10917 4.3m line cord	TCE
39Y7923	6215	United Kingdom 10A line C13 to BS 1363 (2.8M)	TCE
81Y2377	6577	4.3m,10A/230V, C13 to BS 1363/A (UK) Line Cord	TCE
90Y3016	6313	2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord	TCE
46M2592	A1RF	10A/250V C13 to NEMA 6-15P 2.8m line cord	TCE
00WH545	6401	2.8m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord	TCE
4L67A08359	6370	4.3M, 10A/125V, C13 to NEMA 5-15P (US) Line Cord	TCE
4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord	TCE
4L67A08360	AX8A	4.3m, 13A/125V, C13 to NEMA 5-15P (US) Line Cord	TCE

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

Table 18. 7Y69CTO2WW - Power cables for DE Series 4U60 enclosures

Part number	Feature code	Description	Top Choice Express
Rack power cables			
4L67A86680	B4L2	2.0m, 16A/100-250V, C19 to C20 Jumper Cord	-
39Y7916	6252	2.5m, 16A/100-240V, C19 to IEC 320-C20 Rack Power Cable	-
Line cords			
40K9777	6276	C19 4.3 meter Line Cord - Argentina	-
40K9773	6284	C19 4.3 meter Line Cord - Australia/NZ	-
40K9775	6277	C19 4.3 meter Line Cord - Brazil	-
40K9774	6288	C19 4.3 meter Line Cord - China	-
40K9769	6283	C19 4.3 meter Line Cord - Dmk/Swiss	-
40K9766	6279	C19 4.3 meter Line Cord - Europe	-
40K9776	6285	C19 4.3 meter Line Cord - India	-

Part number	Feature code	Description	Top Choice Express
40K9771	6282	C19 4.3 meter Line Cord - Israel	-
40K9768	6281	C19 4.3 meter Line Cord - Italy	-
41Y9233	6291	Japan 15A/200V C19/JIS C-8303 4.3m line cord	-
41Y9231	6289	4.3m, 15A/250V, C19 to KSC 8305 (S. Korea) Line Cord	-
40K9770	6280	C19 4.3 meter Line Cord - S Africa	-
40K9767	6278	C19 4.3 meter Line Cord - UK	-
00D7197	A1NV	4.3m, 15A/250V, C19 to NEMA 6-15P (US) Line Cord	-
40K9772	6275	C19 4.3m cord - NEMA L6-20P	-

Rack installation

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

Table 19. 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 DE 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 20. 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 21. Rack mount kit features and specifications summary

	Screw-in fixed rail with adjustable depth			
Attribute	**2U12**	**2U24/4U60**	**2U24 SIR**	**4U SIR**
Feature code	B38X	B38Y	B6TH	B742
Enclosure support	DE120S	DE4800H 2U DE4800H 4U‡ DE240S DE600S‡	DE4800H 2U DE240S	DE4800H 4U‡ DE600S‡
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 rack cabinet must be at least 1100 mm (43.31 in.) deep for 4U60 enclosures.
* 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 DE Series 2U12 LFF (7DCB / 7Y63) enclosures have the following dimensions:

- Height: 87 mm (3.4 in.)
- Width: 447 mm (17.6 in.)
- Depth: 536 mm (21.1 in.)

The ThinkSystem DE Series 2U24 SFF (7DCR / 7DCC / 7Y68) enclosures have the following dimensions:

- Height: 85 mm (3.3 in.)
- Width: 447 mm (17.6 in.)
- Depth: 511 mm (20.1 in.)

The ThinkSystem DE Series 4U60 LFF (7DCS / 7Y69) enclosures have the following dimensions:

- Height: 174 mm (6.9 in.)
- Width: 449 mm (17.7 in.)
- Depth: 922 mm (36.3 in.)

Weights of enclosures (fully configured):

- DE4800H 2U12 LFF controller enclosure (7DCB): 25.07 kg (55.3 lb)
- DE4800H 2U24 SFF controller enclosure (7DCR): 25.07 kg (55.3 lb)
- DE4800H 4U60 LFF controller enclosure (7DCS): 108.49 kg (239.2 lb)
- DE4800F 2U24 SFF controller enclosure (7DCC): 25.07 kg (55.3 lb
- DE120S 2U12 LFF expansion enclosure (7Y63): 27.12 kg (59.8 lb)
- DE240S 2U24 SFF expansion enclosure (7Y68): 24.59 kg (54.2 lb)
- DE600S 4U60 LFF expansion enclosure (7Y69): 112.2 kg (247.4 lb)

Operating environment

The ThinkSystem DE Series 2U24 SFF and 4U60 LFF enclosures are supported in the following environment:

- Air temperature:
  - Operating:
    - DE4800H / DE4800F and DE240S 2U24 SFF: 5 °C - 45 °C (41 °F - 113 °F)
    - DE4800H and DE600S 4U60 LFF: 10 °C - 40 °C (50 °F - 104 °F)
    - DE120S 2U12 LFF: 10 °C - 40 °C (50 °F - 104 °F)
  - Non-operating: -10 °C - +50 °C (14 °F - 122 °F)
  - Maximum altitude: 3050 m (10,000 ft)
- Relative humidity:
  - Operating: 8% - 90% (non-condensing)
  - Non-operating: 10% - 90% (non-condensing)
- Electrical power:
  - 100 to 127 V AC (nominal); 50 Hz / 60 Hz (except 4U60 LFF enclosures)
  - 200 to 240 V AC (nominal); 50 Hz / 60 Hz
- Acoustical noise emission:
  - DE4800H/F 2U24 SFF, DE4800H 4U60 and DE600S 4U60 SFF: 7.2 bels
  - DE240S 2U24 SFF and DE120S 2U12 LFF: 6.6 bels

The following table lists the maximum enclosure power load, inlet current, and heat output based on the source voltage.

Table 22. Enclosure power load, inlet current, and heat output

Enclosure	Source voltage (nominal)	Maximum power load	Current per inlet	Heat output
DE4800H/F 2U24 SFF	100 - 127 V AC	409 W	5.35 A	1733 BTU/hour
	200 - 240 V AC	534 W	2.43 A	1821 BTU/hour
DE4800H 4U60 LFF	200 - 240 V AC	1541 W	16.22 A	5258 BTU/hour
DE240S 2U24 SFF	100 - 127 V AC	389 W	4.1 A	1328 BTU/hour
	200 - 240 V AC	382 W	2.02 A	1304 BTU/hour
DE120S 2U12 LFF	100 - 127 V AC	306 W	3.3 A	1045 BTU/hour
	200 - 240 V AC	300 W	1.58 A	1024 BTU/hour
DE600S 4U60 LFF	200 - 240 V AC	1446 W	7.62 A	4934 BTU/hour

Warranty and support

The ThinkSystem DE Series enclosures have a three-year customer-replaceable unit (CRU) and onsite limited (for field-replaceable units [FRUs] only) warranty with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered.

Lenovo's additional 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 Upgrades (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.
    - 1-year or 2-year post-warranty extensions.
    - **Foundation Service:** 9x5 service coverage with next business day onsite response, with optional YourDrive YourData.
    - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select regions), with optional YourDrive YourData.
    - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select regions), with optional YourDrive YourData.
- **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.
- **YourDrive YourData**
  Lenovo's YourDrive YourData service is a multi-drive retention offering that ensures that customer's data is always under their control, regardless of the number of drives that are installed in their Lenovo system. In the unlikely event of a drive failure, customers retain possession of their drive while Lenovo replaces the failed drive part. Customer's data stays safely on customer premises, in their hands. The YourDrive YourData service can be purchased in convenient bundles with Foundation, Essential, or Advanced Service upgrades and extensions.

- **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 Infrastructure Solutions Group (ISG) 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 Data Center Services empower you at every stage of your IT lifecycle. From expert advisory and strategic planning to seamless deployment and ongoing support, we ensure your infrastructure is built for success. Our comprehensive services accelerate time to value, minimize downtime, and free your IT staff to focus on driving innovation and business growth.

Note: Some service options may not be available in all markets or regions. For more information, go to https://lenovolocator.com/. For information about Lenovo service upgrade offerings that are available in your region, contact your local Lenovo sales representative or business partner.

In this section:

- Lenovo Advisory Services
- Lenovo Plan & Design Services
- Lenovo Deployment, Migration, and Configuration Services
- Lenovo Support Services
- Lenovo Managed Services

- Lenovo Sustainability Services

Lenovo Advisory Services

Lenovo Advisory Services simplify the planning process, enabling customers to build future-proofed strategies in as little as six weeks. Consultants provide guidance on projects including VM migration, storage, backup and recovery, and cost management to accelerate time to value, improve cost efficiency, and build a flexibly scalable foundation.

- **Assessment Services**

  An Assessment helps solve your IT challenges through an onsite, multi-day session with a Lenovo technology expert. We perform 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 like yours, no matter how large or small, get a better return on your IT investment and overcome challenges in the ever-changing technology landscape.

- **Design Services**

  Professional Services consultants perform infrastructure design and implementation planning to support your 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.

Lenovo Plan & Design Services

Unlock faster time to market with our tailored, strategic design workshops to align solution approaches with your business goals and technical requirements. Leverage our deep solution expertise and end-to-end delivery partnership to meet your goals efficiently and effectively.

Lenovo Deployment, Migration, and Configuration Services

Optimize your IT operations by shifting labor-intensive functions to Lenovo's skilled technicians for seamless on-site or remote deployment, configuration, and migration. Enjoy peace of mind, faster time to value, and comprehensive knowledge sharing with your IT staff, backed by our best-practice methodology.

- **Deployment Services for Storage and ThinkAgile**

  A comprehensive range of remote and onsite options tailored specifically for your business needs to ensure your storage and ThinkAgile hardware are fully operational from the start.

- **Hardware Installation Services**

  A full-range, comprehensive setup for your hardware, including unpacking, inspecting, and positioning components to ensure your equipment is operational and error-free for the most seamless and efficient installation experience, so you can quickly benefit from your investments.

- **DM/DG File Migration Services**

  Take the burden of file migration from your IT’s shoulders. Our experts will align your requirements and business objectives to the migration plans while coordinating with your team to plan and safely execute the data migration to your storage platforms.

- **DM/DG/DE Health Check Services**

  Our experts perform proactive checks of your Firmware and system health to ensure your machines are operating at peak and optimal efficiency to maximize up-time, avoid system failures, ensure the security of IT solutions and simplify maintenance.

- **Factory Integrated Services**

  A suite of value-added offerings provided during the manufacturing phase of a server or storage system that reduces time to value. These services aim at improving your hardware deployment experience and enhance the quality of a standard configuration before it arrives at your facility.

Lenovo Support Services

In addition to response time options for hardware parts, repairs, and labor, Lenovo offers a wide array of additional support services to ensure your business is positioned for success and longevity. Our goal is to reduce your capital outlays, mitigate your IT risks, and accelerate your time to productivity.

- **Premier Support for Data Centers**

  Your direct line to the solution that promises the best, most comprehensive level of support to help you fully unlock the potential of your data center.

- **Premier Support Plus (PSP) for Servers 24x7 4-Hour Response**

  Helping customers reduce unplanned downtime by moving from reactive support to proactive and preventative care

- **Premier Enhanced Storage Support (PESS)**

  Gain all the benefits of Premier Support for Data Centers, adding dedicated storage specialists and resources to elevate your storage support experience to the next level.

- **Committed Service Repair (CSR)**

  Our commitment to ensuring the fastest, most seamless resolution times for mission-critical systems that require immediate attention to ensure minimal downtime and risk for your business. This service is only available for machines under the Premier 4-Hour Response SLA.

- **Multivendor Support Services (MVS)**

  Your single point of accountability for resolution support across vast range of leading Server, Storage, and Networking OEMs, allowing you to manage all your supported infrastructure devices seamlessly from a single source.

- **Keep Your Drive (KYD)**

  Protect sensitive data and maintain compliance with corporate retention and disposal policies to ensure your data is always under your control, regardless of the number of drives that are installed in your Lenovo server.

- **Technical Account Manager (TAM)**

  Your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time, ensuring smooth operations and optimized performance as your business grows.

- **Enterprise Software Support (ESS)**

  Gain comprehensive, single-source, and global support for a wide range of server operating systems and Microsoft server applications.

For more information, consult the brochure Lenovo Operational Support Services for Data Centers.

Lenovo Managed Services

Achieve peak efficiency, high security, and minimal disruption with Lenovo's always-on Managed Services. Our real-time monitoring, 24x7 incident response, and problem resolution ensure your infrastructure operates seamlessly. With quarterly health checks for ongoing optimization and innovation, Lenovo's remote active monitoring boosts end-user experience and productivity by keeping your data center's hardware performing at its best.

Lenovo Managed Services provides continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of your 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 & OS device driver levels, and software as needed. We'll also maintain records of latest patches, critical updates, and firmware levels, to ensure you systems are providing business value through optimized performance.

Lenovo Sustainability Services

- **Asset Recovery Services**

  Lenovo Asset Recovery Services (ARS) provides a secure, seamless solution for managing end-of-life IT assets, ensuring data is safely sanitized while contributing to a more circular IT lifecycle. By maximizing the reuse or responsible recycling of devices, ARS helps businesses meet sustainability goals while recovering potential value from their retired equipment. For more information, see the Asset Recovery Services offering page.

- **CO2 Offset Services**

  Lenovo's CO2 Offset Services offer a simple and transparent way for businesses to take tangible action on their IT footprint. By integrating CO2 offsets directly into device purchases, customers can easily support verified climate projects and track their contributions, making meaningful progress toward their sustainability goals without added complexity.

- **Lenovo Certified Refurbished**

  Lenovo Certified Refurbished offers a cost-effective way to support IT circularity without compromising on quality and performance. Each device undergoes rigorous testing and certification, ensuring reliable performance and extending its lifecycle. With Lenovo's trusted certification, you gain peace of mind while making a more sustainable IT choice.

Regulatory compliance

The ThinkSystem DE Series enclosures conform to the following regulations:

- United States: FCC Part 15, Class A; UL 60950-1 and 62368-1
- Canada: ICES-003, Class A; CAN/CSA-C22.2 60950-1 and 62368-1
- Argentina: IEC60950-1
- Mexico NOM
- European Union: CE Mark (EN55032 Class A, EN55024, IEC/EN60950-1 and 62368-1); ROHS Directive 2011/65/EU
- Russia, Kazakhstan, Belarus: EAC
- China: CCC GB 4943.1, GB 17625.1, GB 9254 Class A; CELP; CECP
- India: BIS
- 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 DE4800H and DE4800F Hybrid and all-flash Storage Array supports attachment to Lenovo ThinkSystem, hosts by using SAS, iSCSI, Fibre Channel, storage connectivity protocols.

For end-to-end storage configuration support, refer to the Lenovo Storage Interoperation Center (LSIC): https://datacentersupport.lenovo.com/us/en/lsic

Use the LSIC to select the known components of your configuration and then get a list all other supported combinations, with details about supported hardware, firmware, operating systems, and drivers, plus any additional configuration notes. View results on screen or export them to Excel.

Fibre Channel SAN switches

Lenovo offers the ThinkSystem DB Series of Fibre Channel SAN switches for high-performance storage expansion. See the DB Series product guides for models and configuration options:

- ThinkSystem DB Series SAN Switches: https://lenovopress.com/storage/switches#rt=product-guide

Rack cabinets

The following table lists the supported rack cabinets.

Table 23. Rack cabinets (D)

Model	Description
7D6DA007WW	ThinkSystem 42U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6DA008WW	ThinkSystem 42U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA009WW	ThinkSystem 48U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA00AWW	ThinkSystem 48U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
93074RX	42U Standard Rack (1000mm)
93604PX	42U 1200mm Deep Dynamic Rack
93614PX	42U 1200mm Deep Static Rack
93634PX	42U 1100mm Dynamic Rack
93634EX	42U 1100mm Dynamic Expansion Rack

For specifications about these racks, see the Lenovo Rack Cabinet Reference, available from: https://lenovopress.com/lp1287-lenovo-rack-cabinet-reference

For more information, see the list of Product Guides in the Rack cabinets category: https://lenovopress.com/servers/options/racks

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo.

Table 24. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
4PU7A93176	C0QH	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93177	C0QJ	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
0U Switched and Monitored PDUs															
4PU7B08148	CD15	0U 3 C13 and 18 C19 Monitored 48A 3 Phase WYE PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7B08149	CD16	0U 3 C13 and 18 C19 Monitored 63A 3 Phase WYE PDU	N	N	N	Y	N	N	Y	N	N	N	N	N	N
4PU7A93181	C0QN	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 60A 3 Phase Delta PDU	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
4PU7A93178	C0QK	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93182	C0QP	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93180	C0QM	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93179	C0QL	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 30A 1 Phase PDU	N	Y	N	N	N	N	N	Y	N	Y	Y	Y	N
1U Basic PDUs															
4PU7B12339	CE6L	1U Basic 16A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
1U Switched and Monitored PDUs															
4PU7A90809	C0DE	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A90810	C0DD	1U 18 C19/C13 Switched and monitored 80A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A90811	C0DC	1U 12 C19/C13 Switched and monitored 32A 3P WYE PDU V2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A90812	C0DB	1U 12 C19/C13 Switched and monitored 60A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
Line cords for 1U PDUs that ship without a line cord															
40K9611	6504	4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
40K9615	6501	4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N

For more information, see the Lenovo Press documents in the PDU category:
https://lenovopress.com/servers/options/pdu

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo.

Table 25. Uninterruptible power supply units

Part number	Description
Rack-mounted or tower UPS units - 200-240VAC	
7DD5A002WW	RT1.5kVA 2U Rack or Tower UPS-G2 (200-240VAC)
7DD5A005WW	RT3kVA 2U Rack or Tower UPS-G2 (200-240VAC)

For more information, see the list of Product Guides in the UPS category:
https://lenovopress.com/servers/options/ups

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Ask your Lenovo Financial Services representative about this promotion and how to submit a credit application. For the majority of credit applicants, we have enough information to deliver an instant decision and send a notification within minutes.

Seller training courses

The following sales training courses are offered for employees and partners (login required). Courses are listed in date order.

1. **Data Storage Solutions Primer**
   2026-07-30 | 45 minutes | Employees Only

   This course is part of the Lenovo ISG (Infrastructure Solutions Group) Primer Series - a learning program designed to help Client Managers build foundational knowledge, strengthen customer conversations, and recognize opportunities with greater confidence.

   By the end of this course, you will be able to:

   - Understand how storage connects to modern IT and business outcomes
   - Explain the importance of storage in data-centric environments
   - Identify opportunities and align storage solutions to customer needs

   Last Update: July 30, 2026

   Published: 2026-07-30
   Length: 45 minutes

   Start the training:
   Employee link: Grow@Lenovo

   Course code: DSTOO104

2. **Lenovoデータセンターセールス認定試験学習ガイド**
   2026-07-13 | 10 minutes | Employees and Partners

   このガイドには、データセンターセールスの実技試験および認定試験の準備と登録に役立つ情報が含まれています。

   Tags: Data Center

   Published: 2026-07-13
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: LENU-122C-SG-AJP

3. **Guide d'étude pour l'examen de certification des ventes de Lenovo Data Center**
   2026-07-13 | 10 minutes | Employees and Partners

   Ce guide contient des informations destinées à aider les candidats à se préparer et à s'inscrire aux examens pratiques et de certification en vente de centres de données.

   Tags: Cloud

   Published: 2026-07-13
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: LENU-122C-SG-FR
4. **Guide d'étude pour l'examen de certification technique Lenovo Data Center**
   2026-07-13 | 10 minutes | Employees and Partners

   Ce guide contient des informations pour aider les candidats à se préparer et à s'inscrire aux examens pratiques et de certification Data Center Technical.

   Tags: Data Center

   Published: 2026-07-13
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: LENU-322C-SG-FR
5. **Lenovoデータセンター技術認定試験学習ガイド（LENU-322C-SG-AJP)**
   2026-07-13 | 10 minutes | Employees and Partners

   このガイドには、受験者がLenovoデータセンター技術実技試験および認定試験の準備と登録を行う際に役立つ情報が含まれています。

   Tags: Data Center

   Published: 2026-07-13
   Length: 10 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: LENU-322C-SG-AJP

6. **Partner Technical Webinar - Storage 101**
   2026-04-30 | 60 minutes | Employees and Partners

   In this 60 minute replay, Dan Beins, Lenovo Storage Architect, took us “back to basics” with a Storage Portfolio Overview 101.

   Published: 2026-04-30
   Length: 60 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: APR2426

7. **Family Portfolio: Storage**
   2026-02-13 | 50 minutes | Employees and Partners

   This course covers the Lenovo storage portfolio, from tape drives used for backups and archiving all the way through high-performance storage systems. After completing this course about the Storage family, the learner will be able to identify products and features within the family, describe the features of this Product Family, and recognize when a specific product should be selected.

   Tags: Storage, ThinkSystem

   Published: 2026-02-13
   Length: 50 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: SXSW1201r18

8. **How to Order DM and DE Services Through DCSC**
   2025-08-28 | 35 minutes | Employees and Partners

   The goal of this training is to provide Lenovo sellers and business partners with an overview of the available services for ThinkSystem DM and DE.

   Learning Objectives:

   - Review what is included in each service
   - Describe the benefits of each service
   - Demonstrate how to order
   - Discover where to go for more details

   Tags: Services

   Published: 2025-08-28
   Length: 35 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: DSVC134r4

9. **Partner Technical Webinar - Commvault**
   2025-08-11 | 60 minutes | Employees and Partners

   In this 60-minute replay, Commvault provided an in-depth look into Hyperscale X, Bundles, IntelliSnap and licensing.

   Tags: Data Management

   Published: 2025-08-11
   Length: 60 minutes

   Start the training:
   Employee link: Grow@Lenovo
   Partner link: Lenovo 360 Learning Center

   Course code: AUG0825
10. **ThinkSystem DE Series Portfolio Overview**
    2025-06-20 | 30 minutes | Employees and Partners

    This course builds on the Data Storage Solutions Overview (DSTOO102) course by introducing you to the DE Series Portfolio. After completing this course, you will be able to position the Lenovo ThinkSystem DE Series products and features based on the needs of your customers, correlate the Lenovo ThinkSystem DE Series Portfolio with Lenovo's comprehensive Data Management Portfolio, and use the qualifying questions to identify customer needs during conversations.

    Tags: Data Management, Storage, ThinkSystem

    Published: 2025-06-20
    Length: 30 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DDEO101
11. **Data Storage Solutions Overview**
    2025-06-18 | 25 minutes | Employees and Partners

    After completing this course you will be able to:
    1. Know more about the data management trends and challenges
    2. Understand the data storage solutions portfolio
    3. Find out how data drives business value

    Tags: Storage

    Published: 2025-06-18
    Length: 25 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DSTOO102

12. **Lenovo Data Center Product Portfolio**
    2025-06-11 | 20 minutes | Employees and Partners

    This course introduces the Lenovo data center portfolio, and covers servers, storage, storage networking, and software-defined infrastructure products. After completing this course about Lenovo data center products, you will be able to identify product types within each data center family, describe Lenovo innovations that this product family or category uses, and recognize when a specific product should be selected.

    Course objectives:
    1.Identify product types within each data center family
    2.Describe the features of the product family or category
    3.Recognize when a specific product should be selected

    Tags: Advanced DataCenter, DataCenter Products, Server, ThinkAgile, ThinkEdge, ThinkSystem

    Published: 2025-06-11
    Length: 20 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: SXXW1110r8

13. **ThinkSystem DE Series: Hardware Specifications**
    2024-12-30 | 25 minutes | Employees and Partners

    This course also explores the unique data management features of the ThinkSystem SAN Manager. Course DDET200 Positioning ThinkSystem DE Series is recommended prior to this course.
    By the end of this course, you should be able to:
    • Identify the controller and expansion models of the Lenovo DE Series portfolio
    • Explain the connectivity options, expansion paths, and cabling for the DE Series storage system
    • Describe the data management features of Lenovo ThinkSystem SAN Manager

    Tags: Data Management, Storage, Technical Sales, ThinkSystem

    Published: 2024-12-30
    Length: 25 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DDET201r3

14. **ThinkSystem DM and DE Series Technical Overview**
    2024-10-15 | 30 minutes | Employees and Partners

    This course provides a technical overview of the ThinkSystem DM and DE series products. Course DDMO101 – Lenovo ThinkSystem DM & DE Series Overview is recommended prior to this course. By the end of this course, you should be able to:
    - Describe the Lenovo portfolio for the DM and DE storage systems
    - Explain features of the DM series ONTAP software
    - Explain features of the ThinkSystem SAN Manager

    Tags: Data Management, Storage

    Published: 2024-10-15
    Length: 30 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DDMT100r2

15. **VTT Data Management How to sell storage - April 2024**
    2024-04-10 | 60 minutes | Employees and Partners

    In this course, you will know:

    - Why do we sell storage?
    - What are the basics you need to get an opportunity rolling?
    - Why Lenovo for Storage?
    - What is happening in the market today?
    - How to determine traction?

    Tags: Data Management, Storage

    Published: 2024-04-10
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DVDAT209

16. **Lenovo Data Backup and Recovery Solution Overview**
    2024-03-25 | 40 minutes | Employees and Partners

    The goal of this course is to give Lenovo sellers and business partners an overview of the Data Backup and Recovery solution. This course includes general information about backup, archive, disaster, nomenclature and key terms for back and recovery, and Lenovo features and alliance partners software.

    Tags: Data Management

    Published: 2024-03-25
    Length: 40 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DSOLO200

17. **Positioning ThinkSystem DE Series**
    2024-02-01 | 12 minutes | Employees and Partners

    This course provides details on how to position DE series storage systems. Course DDMO101 – Lenovo ThinkSystem DM & DE Series Overview is a prerequisite.

    This course focuses on enabling you to:
    • Describe the features and business value of DE Series products
    • Identify customer problems that DE Series products can solve
    • Position the appropriate DE Series product for each customer

    Tags: Storage, ThinkSystem

    Published: 2024-02-01
    Length: 12 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DDET200r2

18. **Using VEEAM with ThinkSystem DE Series**
    2023-10-03 | 10 minutes | Employees and Partners

    In this course you will learn about VEEAM Availability Suite for ThinkSystem DE Series. By the end of this course, you will identify the advantages of using Veeam Availability Suite and Lenovo DE Series, describe the Veeam Cloud Connect Backup with Lenovo DE Series, and explain how to use Veeam's capabilities to provide deduplication and Compression with DE Series. Last updated on September, 29th, 2023.

    Tags: ThinkSystem

    Published: 2023-10-03
    Length: 10 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DSTOO200

19. **Assessment for Lenovo ThinkSystem DM and DE Series Technical Overview 100**
    2023-10-02 | 30 minutes | Partners Only

    This is the online assessment for the virtual-live course Lenovo ThinkSystem DM and DE Series Technical Overview 100 (DDMT100).

    Your objective for this assessment is to complete the 15-question quiz with the minimum passing score of 80%.

    Tags: Technical Sales

    Published: 2023-10-02
    Length: 30 minutes

    Start the training:
    Partner link: Lenovo 360 Learning Center

    Course code: DDMT101

20. **ThinkSystem DE Series: Technical Overview Assessment 200**
    2023-09-28 | 10 minutes | Employees and Partners

    This document contains assessment questions that focus on ThinkSystem DE Series technology. The questions are based on the Lenovo ThinkSystem DE Series Technical Overview curriculum.

    Tags: Sales, Storage, Technical Sales, ThinkSystem

    Published: 2023-09-28
    Length: 10 minutes

    Start the training:
    Employee link: Grow@Lenovo
    Partner link: Lenovo 360 Learning Center

    Course code: DDET207

21. **ThinkSystem DE Series: Storage System Configuration**
2023-09-28 | 23 minutes | Employees and Partners

This course describes the differences between the Volume Groups and Dynamic Disk Pools technologies, as well as the benefits and tradeoffs of using each. Course DDET201 ThinkSystem DE Series: Hardware Specifications is a prerequisite.

Upon completion of this training, you will be able to:
• Distinguish volume groups from dynamic disk pools
• Determine when to use volume groups and when to use Dynamic Disk Pools (DDP) technology
• Describe DDP technology and its benefits
• Describe volume groups and their benefits
• Explain how the thin-provisioning feature provides value

Tags: Data Management, Storage, Technical Sales, ThinkSystem

Published: 2023-09-28
Length: 23 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: DDET202

22. **ThinkSystem DE Series: SSD Cache**
2023-09-28 | 15 minutes | Employees and Partners

This course describes the SSD Cache feature and how SSD Cache helps to optimize read operations. Course DDET202 ThinkSystem DE Series: Storage System Configuration is a prerequisite.

Upon completion of this training, you will be able to:
• Describe the SSD Cache feature
• Explain how SSD Cache helps you optimize solid-state disk (SSD) read cache in a DE Series storage system

Tags: Data Management, Storage, Technical Sales, ThinkSystem

Published: 2023-09-28
Length: 15 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: DDET203

23. **VEEAM Solutions Sales Training**
2023-09-27 | 20 minutes | Employees and Partners

In this course you will learn about Hyper-availability for the Always-On Enterprise.

By the end of this training, you should be able to:

Identify and explain the core products and solutions offered by Veeam.
Explain the key benefits and value propositions of integrating Veeam solutions with Lenovo products.

Tags: Sales

Published: 2023-09-27
Length: 20 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: DSTOO100

24. **ThinkSystem DE Series: Disaster Recovery**
2023-09-21 | 28 minutes | Employees and Partners

This course describes technologies for disaster recovery and how DE series features can contribute in substantial ways to any disaster-recovery plan for storage.

Tags: ThinkSystem

Published: 2023-09-21
Length: 28 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: DDET204

25. **Selling ThinkSystem DE Series**
2022-09-15 | 15 minutes | Employees and Partners

This course discusses common selling scenarios that describe where and how to sell Thinksystem DE series storage systems.
This course focuses on enabling you to:
•Discuss storage configurations and the advantages of each configuration
•Review use cases to identify what customers need from storage systems
•Suggest storage configurations that meet customer needs

Tags: Sales, Storage, Technical Sales, ThinkSystem

Published: 2022-09-15
Length: 15 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo 360 Learning Center

Course code: DDET206r2

Related publications and links

For more information, see the following resources:

- Lenovo SAN Storage product page
  https://www.lenovo.com/us/en/c/data-center/storage/storage-area-network
- ThinkSystem DE Hybrid Storage interactive 3D Tour
  https://lenovopress.com/lp0957-thinksystem-de-hybrid-interactive-3d-tour
- ThinkSystem DE Hybrid Storage datasheet
  https://lenovopress.com/ds0049-lenovo-thinksystem-de-series-hybrid-array
- Lenovo Data Center Solution Configurator
  http://dcsc.lenovo.com
- Lenovo Data Center Support
  http://datacentersupport.lenovo.com

Related product families

Product families related to this document are the following:

- DE Series Storage
- Lenovo SAN Storage

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