Lenovo ThinkSystem DE2000H Hybrid Storage Array
Product Guide

Lenovo ThinkSystem DE2000H is a low-cost, hybrid entry-level storage system that is designed to provide performance, simplicity, capacity, security, and high availability for small to large businesses. It delivers enterprise-class storage management capabilities with a wide choice of host connectivity options, flexible drive configurations, and enhanced data management features. The ThinkSystem DE2000H is a perfect fit for small offices and remote and branch offices of large enterprises that run a wide range of workloads, including big data and analytics, video surveillance, technical computing, backup and recovery, and other storage I/O-intensive applications.

ThinkSystem DE2000H models are available in a 2U rack form-factor with 24 small form-factor (2.5-inch SFF) drives (2U24 SFF) or 12 large form-factor (3.5-inch LFF) drives (2U12 LFF) and include two controllers, each with up to 32 GB memory for a system total of 64 GB. Host interface cards provide 12 Gb SAS, 10/25 Gb iSCSI, or 8/16/32 Gb FC connections.

The ThinkSystem DE2000H Storage Array scales up to 96 drives with the attachment of Lenovo ThinkSystem DE120S 2U12 and DE240S 2U24 SFF Expansion Enclosures. It also offers flexible drive configurations with the choice of 2.5-inch (SFF) and 3.5-inch (LFF) form factors, 10 K rpm SAS and 7.2 K rpm NL SAS hard disk drives (HDDs), and SAS solid-state drives (SSDs).



Figure 1. Lenovo ThinkSystem DE2000H 2U24 SFF (top) and 2U12 LFF (bottom) enclosures

Did you know?

The ThinkSystem DE2000H scales up to 1.47 PB of raw storage capacity.

The ThinkSystem DE2000H offers block storage connectivity with support for 10/25 Gb iSCSI SFP28, 8/16/32 Gb FC, or 12 Gb SAS, or 1/10 Gb iSCSI RJ-45 technologies.

Key features

The ThinkSystem DE2000H offers the following key features and benefits:

- Low-cost, entry-level hybrid storage with dual active/active controller configurations with 8 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 host connectivity to match diverse client needs with support for 1/10 Gb iSCSI or 4/8/16 Gb FC, and 12 Gb SAS, 10/25 Gb iSCSI, or 8/16/32 Gb FC 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 or up to 12x 3.5-inch large form factor (LFF) drives in the 2U12 LFF enclosures.
- Scalability to up to 96 SFF or 48 LFF drives with the attachment of up to three expansion enclosures (ThinkSystem DE240S 2U24 SFF, or DE120S 2U12 LFF, or a combination of the DE240S and DE120S) 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).
- Optional licensed functions, including higher number of snapshots for greater scalability and 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, proactive maintenance, and non-disruptive firmware upgrades.

The ThinkSystem DE2000H supports the complete range of data storage requirements, from highly used applications to high-capacity, low usage applications.

The following drives are supported in the 2U24 SFF enclosures:

- Capacity-optimized SSDs (1 drive write per day [DWD]): 3.84 TB, 7.68 TB, and 15.36 TB
- Performance-optimized, enterprise class HDDs: 1.2 TB and 1.8 TB 10K rpm
- Performance-optimized, enterprise class self-encrypting FIPS HDDs: 1.8 TB 10K rpm

The following drives are supported in the 2U12 LFF enclosures:

- High-capacity, archival-class nearline HDDs: 4 TB, 8 TB, 10 TB, 12 TB, 18 TB and 22 TB 7.2K rpm
- High-capacity, archival-class nearline self-encrypting FIPS HDDs: 10 TB 7.2K rpm

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.

Up to three 2U expansion enclosures (ThinkSystem DE240S 2U24 SFF, or ThinkSystem DE120S 2U12 LFF, or a combination of the ThinkSystem DE240S and DE120S) are supported by a single ThinkSystem DE2000H system. Customers can intermix 2U24 SFF and 2U12 LFF expansion enclosures behind a 2U24 SFF or 2U12 LFF controller enclosure. This configuration delivers the added flexibility to mix 3.5-inch and 2.5-inch drives within a single system.

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

The ThinkSystem DE2000H offers 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, 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 ThinkSystem DE2000H and DE240S 2U SFF enclosures.

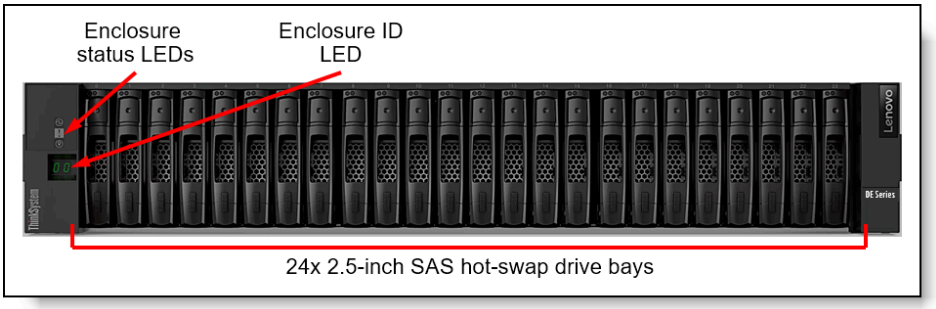


Figure 2. ThinkSystem DE2000H and DE240S 2U SFF enclosures front view

The front of the ThinkSystem DE2000H and DE240S 2U SFF enclosures includes the following components:

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

The following figure shows the front of the ThinkSystem DE2000H and DE120S 2U LFF enclosures.

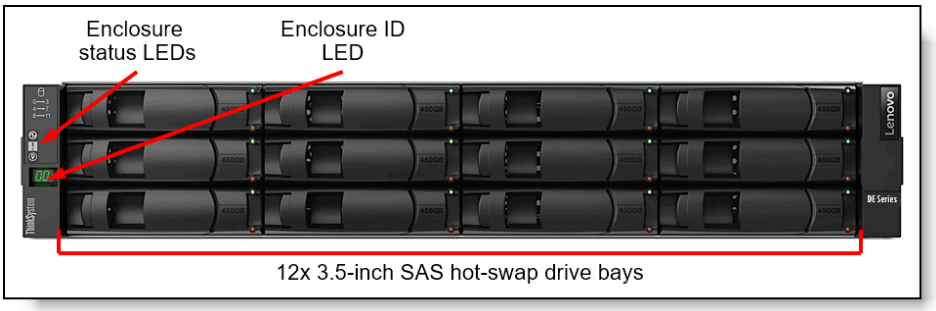


Figure 3. ThinkSystem DE2000H and DE120S 2U LFF enclosures front view

The front of the ThinkSystem DE2000H and DE120S 2U LFF enclosures includes the following components:

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

The following figure shows the rear of the ThinkSystem DE2000H 2U controller enclosure with two Gen2 controllers installed.

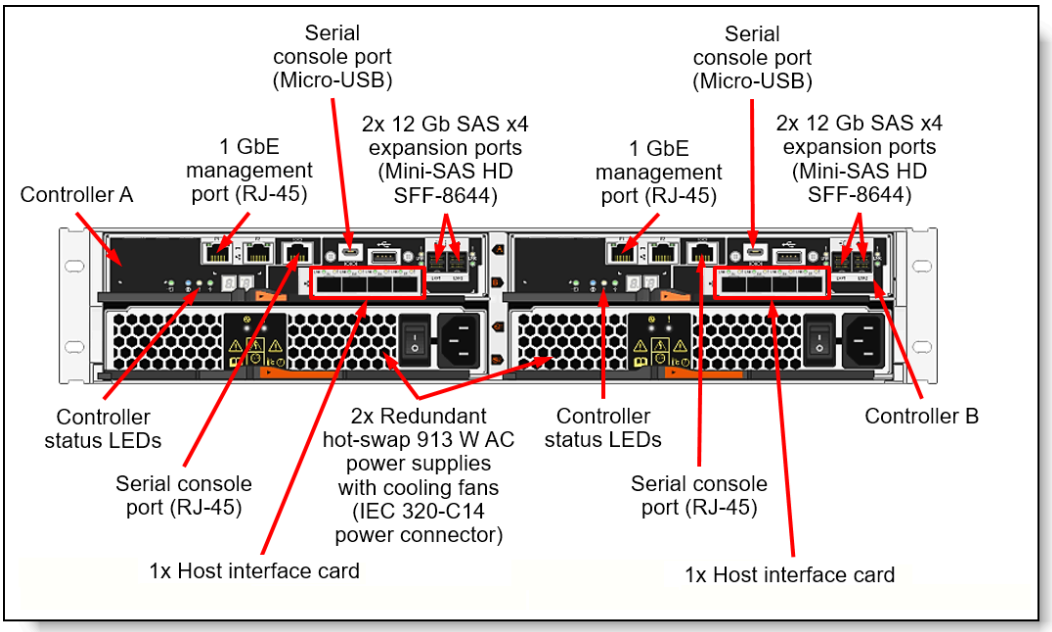


Figure 4. Rear view ThinkSystem DE2000H 2U controller enclosure with two Gen2 controllers installed

The rear of the ThinkSystem DE2000H 2U controller enclosure includes the following components:

- Two redundant hot-swap controllers, each with the following ports:
  - One slot for a host interface card
    Note: The DE2000H Gen2 controllers no longer offers base ports
  - Two 12 Gb SAS x4 expansion ports (Mini-SAS HD SFF-8644) for connections to the expansion enclosures.
  - One RJ-45 10/100/1000 Mb Ethernet port for out-of-band management.
    Note: The Ethernet port (P2) next to the GbE management port is not available for use.
  - Two serial console ports (RJ-45 and Micro-USB) for another means to configure the system.
  - One USB Type A port (reserved for factory use)
- Two redundant hot-swap 913 W (100 - 240 V) AC power supplies (IEC 320-C14 power connector) with integrated cooling fans.

The following figure shows the rear of the ThinkSystem DE240S or DE120S 2U expansion enclosure.

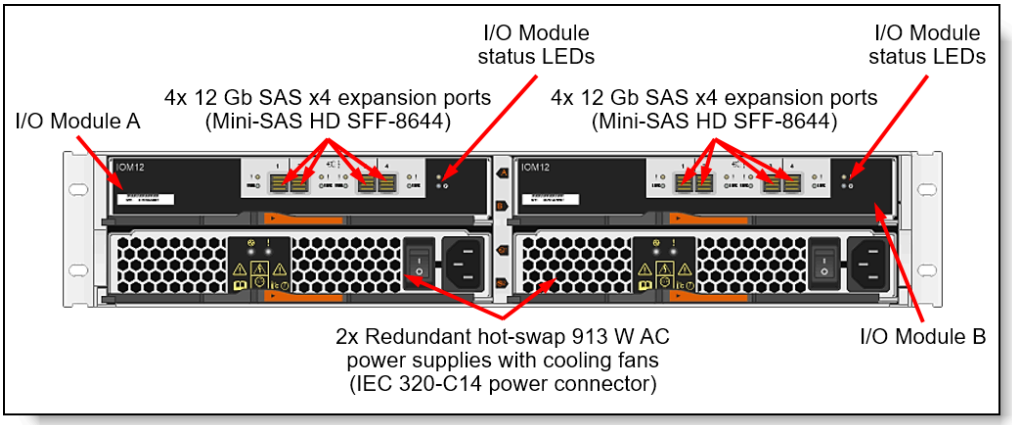


Figure 5. ThinkSystem DE240S or DE120S 2U expansion enclosure rear view

The rear of the ThinkSystem DE240S or DE120S 2U expansion enclosure includes the following components:

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

System specifications

The following table lists the ThinkSystem DE2000H 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 DE2000H that can be found at:
http://datacentersupport.lenovo.com

Table 1. ThinkSystem DE2000H system specifications

Attribute	Specification
Form factor	• DE2000H 2U24 SFF controller enclosure (Machine Type 7Y71): 2U rack mount. • DE2000H 2U12 LFF controller enclosure (Machine Type 7Y70): 2U rack mount. • DE240S 2U24 SFF expansion enclosure (Machine Type 7Y68): 2U rack mount. • DE120S 2U12 LFF expansion enclosure (Machine Type 7Y63): 2U 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. • RAID 3 can be configured only through the Storage Manager Command Line (SMcli). • RAID 6, minimum six drives are required (five drives with one hot spare) for system functionality and data storage.
Controller system memory	Up to 64 GB per system (32 GB per controller). Cache mirroring between the controllers. Flash-backed cache protection (includes battery for destaging to flash).
Expansion enclosure support	• DE2000H 2U24 SFF controller: 3x DE120S or 3x DE240S • DE2000H 2U12 LFF controller: 3x DE120S or 3x DE240S • Expansion enclosures may be mixed up to a maximum of 3 expansion enclosures
Drive bays	Up to 4 enclosures per system (Controller unit with up to 3 expansion units): • Up to 48 LFF hot-swap drive bays (Up to 4x 2U12 LFF enclosures) • Up to 96 SFF hot-swap drive bays (Up to 4x 2U24 SFF enclosures) Intermix of 2U24 SFF and 2U12 LFF enclosures is supported.
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	• 2x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two controllers in the controller enclosure for the attachment of the expansion enclosures. • 4x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two I/O modules in the expansion enclosure for the attachment to the controller enclosure and daisy chaining of the expansion enclosures.

Attribute	Specification
Drives	2U24 SFF drives: • 10K rpm SAS HDDs • 10K rpm SAS FIPS HDDs • SAS SSDs (1 DWD) • SAS SSDs (3 DWD) • SAS FIPS SSDs (3 DWD) 2U12 LFF drives: • 7.2K rpm NL SAS HDDs • 7.2K rpm NL SAS FIPS HDDs • SAS SSDs (3 DWD) • SAS FIPS SSDs (3 DWD)
Storage capacity	All SFF drives: Up to 1.47 PB (96x 15.36 TB SFF SSDs) All LFF drives: Up to 864 TB (48x 18TB LFF HDDs)
Host connectivity	Host connectivity ports provided using host interface cards (HICs) (per controller enclosure with two controllers): • 4x 12 Gb SAS host ports (Mini-SAS HD, SFF-8644) (2 ports per controller) • 8x 12 Gb SAS host ports (Mini-SAS HD, SFF-8644) (4 ports per controller) • 8x 10/25 Gb iSCSI SFP28 host ports (DAC or SW fiber optics [LC]) (4 ports per controller) • 8x 8/16/32 Gb FC SFP+ host ports (SW fiber optics [LC]) (4 ports per controller) • 4x 1/10 Gb iSCSI RJ-45 host ports (2 ports per controller) **Note**: The DE2000H controller no longer offers base ports. Host connectivity is provided via the HICs. • Supported protocols: FC: 32 Gbps, 16 Gbps, 8 Gbps, 4 Gbps
Host operating systems	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware vSphere
Standard software features	Dynamic Disk Pools, SSD read cache, snapshots (up to 128 targets), volume copy, thin provisioning (DDP only), encryption (requires optional FIPS drives), and data assurance.
Optional software features	Snapshots (up to 512 targets), asynchronous mirroring.
Performance*	• Up to 100 000 random read IOPS (4 KB blocks). • Up to 35 000 random write IOPS (4 KB blocks). • Up to 3 GBps sequential read throughput (64 KB blocks). • Up to 0.9 GBps sequential write throughput (64 KB blocks).

Configuration maximums**	• Maximum storage capacity: 1.47 PB
	• Maximum number of logical volumes: 512
	• 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: 96
	  ◦ RAID 3, 5, 6: 30
	• Maximum number of DDP arrays: 20
	• Maximum number of drives in a DDP array: 96 (11 drives minimum)
	• Maximum SSD read cache size: 4 TB
	• Maximum number of hosts: 256
	• Maximum number of snapshots: 512 (requires an optional license)
	• Maximum number of mirroring pairs: 32 (requires an optional license)

Cooling	Redundant cooling with the fans that are built into power supplies.
Power supply	Two redundant hot-swap 913 W (100 - 240 V) Platinum AC power supplies.
Hot-swap parts	Controllers, I/O modules, drives, power supplies, and SFP+ transceivers.

Attribute	Specification
Management ports	• 1x 1 GbE port (UTP, RJ-45) per controller for out-of-band management. • 2x Serial console ports (RJ-45 and Micro-USB) for system configuration. • In-band management via I/O path.
Management interfaces	System Manager web-based GUI; SAN Manager standalone GUI; SSH CLI; Serial console CLI; SNMP, email, and syslog alerts; optional Lenovo XClarity.
Security features	Secure Socket Layer (SSL), Secure Shell (SSH), user level security, role-based access control (RBAC), LDAP authentication.
Warranty and support	Three-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	2U24 SFF enclosure: • Height: 85 mm (3.4 in.) • Width: 449 mm (17.7 in.) • Depth: 553 mm (21.8 in.) 2U12 LFF enclosure: • Height: 85 mm (3.4 in.) • Width: 447 mm (17.6 in.) • Depth: 483 mm (19.0 in.)
Weight	• DE2000H 2U24 SFF controller enclosure (7Y71): 24.59 kg (54.2 lb) • DE2000H 2U12 LFF controller enclosure (7Y70): 28.78 kg (63.4 lb) • DE240S 2U24 SFF expansion enclosure (7Y68): 27.44 kg (60.5 lb) • DE120S 2U12 LFF expansion enclosure (7Y63): 27.12 kg (59.8 lb)

* Estimated performance based on internal measurements.
** For a detailed list of configuration limits and restrictions for a specific version of the software, refer to the Lenovo Data Center Support website:
http://datacentersupport.lenovo.com

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

The following table lists the Configure-to-Order (CTO) base models for the ThinkSystem DE2000H.

Table 2. ThinkSystem DE2000H CTO base models

Machine Type/Model	Base feature	Description	Top Choice Express
7Y70CTO2WW	BEY6	Lenovo ThinkSystem Storage 2U12 Chassis (with Gen2 controllers and 2x PSUs)	Not TCE
7Y71CTO2WW	BEY7	Lenovo ThinkSystem Storage 2U24 Chassis (with Gen2 controllers and 2x PSUs)	Not TCE

The following table lists the preconfigured models wih Gen 2 controllers, available by market.

Table 3. Preconfigured models

Model	Market availability	Controller	Topseller
DE2000H - 2U12 - 2x Gen2 Controllers			
7Y70A00YWW	All markets	8GB controller	No
7Y70A00YBR	Brazil	8GB controller	No
7Y70100BBR	Brazil	8GB controller	Yes
7Y70A00YJP	Japan	8GB controller	No
7Y70A00YLA	Latin America markets	8GB controller	No
7Y70100CLA	Latin America markets	8GB controller	No
7Y70100DLA	Latin America markets	8GB controller	No
7Y70A013LA	Latin America markets	8GB controller	Yes
7Y70A012LA	Latin America markets	8GB controller	Yes
7Y701008NA	North America markets	8GB controller	No
7Y70A00YCN	PRC	8GB controller	No
DE2000H - 2U24 - 2x Gen2 Controllers			
7Y71A00QWW	All markets	8GB controller	No
7Y71A00QBR	Brazil	8GB controller	No
7Y71100DBR	Brazil	8GB controller	Yes
7Y71A00QJP	Japan	8GB controller	No
7Y71A00QLA	Latin America markets	8GB controller	No
7Y71100ELA	Latin America markets	8GB controller	No
7Y71A00TLA	Latin America markets	8GB controller	No
7Y71100CNA	North America markets	8GB controller	No
7Y71A00QCN	PRC	8GB controller	No

Configuration notes:

- Gen2 controllers do not include base ports. HICs must be ordered for host connectivity.
- For preconfigured models, two DE2000 Gen2 controllers (feature code BQ9Y) are included in the model configuration.

- For CTO models, two DE2000 Gen2 controllers (feature code BQ9Y) are selected by default in the configurator, and the selection cannot be changed.

The models of the ThinkSystem DE2000H ship with the following items:

- One chassis with the following components:
  - Two controllers
  - Two power supplies
  - Two host interface cards
- Rack Mount Kit
- 2 m USB Cable (USB Type A to Micro-USB)
- Quick Installation Guide
- Electronic Publications Flyer
- Two power cables:
  - Models listed in Tables 2, 3, and 4: 1.5 m, 10A/100-250V, C13 to C14 rack power cables
  - CTO models: Customer-configured power cables

Note: Some models of the ThinkSystem DE2000H ship with SFP+ transceivers and cables. For models that ship without SFP+ transceivers, DAC cables, SAS cables, or RJ-45 UTP cables, the supported transceivers and cables should be purchased for the system (see Controllers for details).

Controllers

The ThinkSystem DE2000H controller enclosures ship with two DE2000 controllers. A *controller* provides interfaces for host connectivity, management, and internal drives, and it runs storage management software. Each DE2000 controller ships with up to 32 GB memory for a system total of 64 GB.

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

Note: The DE2000H Gen2 controller does not include any base ports. You will need to select HICs for host connectivity.

The following host interfaces can be added to the ThinkSystem DE2000H controller enclosures with optional HICs:

- 4x 12 Gb SAS x4 host ports (Mini-SAS HD SFF-8644) (2 ports per HIC)
- 8x 12 Gb SAS host ports (Mini-SAS HD, SFF-8644) (4 ports per HIC)
- 8x 10/25 Gb iSCSI SFP28 host ports (DAC or SW fiber optics [LC]) (4 ports per HIC)
- 8x 8/16/32 Gb FC SFP+ host ports (SW fiber optics [LC]) (4 ports per HIC)
- 4x 1/10 Gb iSCSI RJ-45 ports (2 ports per HIC) for iSCSI connectivity

Each DE2000 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 type of the host interface card installed

The following table lists the DE2000H controller and supported connectivity options.

Table 4. DE2000H controller and connectivity options

Part number	Feature code	Description	Top Choice Express	Maximum quantity per controller enclosure
Controllers				
CTO only*	BQ9Y	Lenovo ThinkSystem DE2000 Controller 8GB Gen2	Not TCE	2
Host interface cards (HICs)				
4C57A14376	B4B1	Lenovo ThinkSystem DE2000/DE4000 HIC 10GBASE-T 2-Ports	Not TCE	2
4C57A14377	B4AN	Lenovo ThinkSystem DE2000 HIC 12Gb SAS 2-Ports	Not TCE	2
4C57A14367	B4B8	Lenovo ThinkSystem DE2000/4000 HIC, 12Gb SAS,4-ports	Not TCE	2
4C57A14369	B4BA	Lenovo ThinkSystem DE2000/4000 HIC, 10/25GbE iSCSI,4-ports	Not TCE	2
4C57A14366	B4B7	Lenovo Thinksystem DE2000/4000 HIC, 16G FC/10GbE,4-ports	Not TCE	2
4C57A14368	B4B9	Lenovo ThinkSystem DE2000/4000 HIC, 32Gb FC,4-ports	Not TCE	2
SFP+ options for 10 Gb iSCSI / 16 Gb FC host interface card / 32 Gb FC host interface card				
4XF7A14917	B4K7	1G RJ45 iSCSI SFP+ Module 1 pack	Not TCE	8
4M17A13527	B4B2	Lenovo 10Gb iSCSI/16Gb FC Universal SFP+ Module	Not TCE	8
SFP28 options for 10/25 Gb iSCSI host interface card				
4M17A13529	B4B4	Lenovo 10/25GbE iSCSI SFP28 Module	Not TCE	8
SFP+ options for 32 Gb FC host interface card				
4M17A13528	B4B3	Lenovo 32Gb FC SFP+ Transceiver	Not TCE	8
OM4 cable options 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	4
4Z57A10846	B2PA	Lenovo 1m LC-LC OM4 MMF Cable	Not TCE	4
4Z57A10847	B2PB	Lenovo 3m LC-LC OM4 MMF Cable	Not TCE	4
4Z57A10848	B2PC	Lenovo 5m LC-LC OM4 MMF Cable	Not TCE	4
4Z57A10849	B2PD	Lenovo 10m LC-LC OM4 MMF Cable	Not TCE	4
4Z57A10850	B2PE	Lenovo 15m LC-LC OM4 MMF Cable	Not TCE	4
4Z57A10851	B2PF	Lenovo 25m LC-LC OM4 MMF Cable	Not TCE	4
4Z57A10852	B2PG	Lenovo 30m LC-LC OM4 MMF Cable	Not TCE	4
OM3 cable options 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	Not TCE	4
00MN502	ASR6	Lenovo 1m LC-LC OM3 MMF Cable	Not TCE	4
00MN505	ASR7	Lenovo 3m LC-LC OM3 MMF Cable	Not TCE	4
00MN508	ASR8	Lenovo 5m LC-LC OM3 MMF Cable	Not TCE	4
00MN511	ASR9	Lenovo 10m LC-LC OM3 MMF Cable	Not TCE	4
00MN514	ASRA	Lenovo 15m LC-LC OM3 MMF Cable	Not TCE	4
00MN517	ASRB	Lenovo 25m LC-LC OM3 MMF Cable	Not TCE	4
00MN520	ASRC	Lenovo 30m LC-LC OM3 MMF Cable	Not TCE	4
DAC cable options for 10 Gb iSCSI SFP+ host connectivity (iSCSI HICs)				
00D6288	A3RG	0.5m Passive DAC SFP+ Cable	Not TCE	4
90Y9427	A1PH	1m Passive DAC SFP+ Cable	Not TCE	4

Part number	Feature code	Description	Top Choice Express	Maximum quantity per controller enclosure
00AY764	A51N	1.5m Passive DAC SFP+ Cable	Not TCE	4
00AY765	A51P	2m Passive DAC SFP+ Cable	Not TCE	4
90Y9430	A1PJ	3m Passive DAC SFP+ Cable	Not TCE	4
90Y9433	A1PK	5m Passive DAC SFP+ Cable	Not TCE	4
00D6151	A3RH	7m Passive DAC SFP+ Cable	Not TCE	4
DAC cable options for 25 Gb iSCSI SFP28 host connectivity (iSCSI HICs)				
7Z57A03557	AV1W	Lenovo 1m Passive 25G SFP28 DAC Cable	Not TCE	8
7Z57A03558	AV1X	Lenovo 3m Passive 25G SFP28 DAC Cable	Not TCE	8
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	Not TCE	4
00YL848	AU17	External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable	Not TCE	4
00YL849	AU18	External MiniSAS HD 8644/MiniSAS HD 8644 2M Cable	Not TCE	4
00YL850	AU19	External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable	Not TCE	4
UTP Category 6 cables for 1/10 Gb iSCSI RJ-45 connectivity and 1 GbE management ports				
00WE123	AVFW	0.75m Green Cat6 Cable	Not TCE	6
00WE127	AVFX	1.0m Green Cat6 Cable	Not TCE	6
00WE131	AVFY	1.25m Green Cat6 Cable	Not TCE	6
00WE135	AVFZ	1.5m Green Cat6 Cable	Not TCE	6
00WE139	AVG0	3m Green Cat6 Cable	Not TCE	6
90Y3718	A1MT	10m Green Cat6 Cable	Not TCE	6
90Y3727	A1MW	25m Green Cat6 Cable	Not TCE	6

* Factory-installed only.

Expansion enclosures

The ThinkSystem DE2000H supports attachment of up to three 2U expansion enclosures (ThinkSystem DE240S 2U24 SFF, ThinkSystem DE120S 2U12 LFF, or a combination of the ThinkSystem DE240S and DE120S). Intermix of 2U24 SFF and 2U12 LFF expansion enclosures behind a 2U24 SFF or 2U12 LFF controller enclosure is supported. The expansion enclosures can be added to the system non-disruptively.

The following table lists the relationship models of the supported ThinkSystem DE Series expansion enclosures.

Table 5. ThinkSystem DE240S and DE120S relationship models

	Part number		
Description	**Worldwide**	**European Union**	**Japan**
Lenovo ThinkSystem DE240S 2U24 SFF Expansion Enclosure	7Y68A000WW	7Y68A004EA	7Y681001JP
Lenovo ThinkSystem DE120S 2U12 LFF Expansion Enclosure	7Y63A000WW	7Y63A003EA	7Y631000JP

The following table lists the TopSeller models of the supported ThinkSystem DE Series expansion enclosures.

Table 6. ThinkSystem DE240S and DE120S TopSeller models: Brazil and Latin America

	Part number	
Description	**Latin America**	**Brazil**
Lenovo ThinkSystem DE240S 2U24 SFF Expansion Enclosure (TopSeller)	7Y681002LA	7Y681002BR
Lenovo ThinkSystem DE120S 2U12 LFF Expansion Enclosure (TopSeller)	7Y631001LA	7Y631001BR

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

Table 7. ThinkSystem DE240S and DE120S CTO base models

		Feature code	
Description	**Machine Type/Model**	**European Union**	**Other markets**
Lenovo ThinkSystem Storage 2U24 Chassis (with 2x PSUs)	7Y68CTO1WW	BEY7	B38L
Lenovo ThinkSystem Storage 2U12 Chassis (with 2x PSUs)	7Y63CTO1WW	BEY6	B38M

Configuration notes:

- For Relationship and TopSeller models, two I/O expansion modules (feature code B4BS) are included in the model configuration.
- For CTO models, two I/O expansion modules (feature code B4BS) are selected by default in the configurator, and the selection cannot be changed.

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

- One chassis with the following components:
  - Two I/O modules
  - Two power supplies
- Four 1 m MiniSAS HD 8644/MiniSAS HD 8644 cables (Models listed in Tables 8 and 9)
- Rack Mount Kit
- *Quick Installation Guide*
- *Electronic Publications Flyer*
- Two power cables:
  - Models listed in Tables 8 and 9: 1.5 m, 10A/100-250V, C13 to C14 rack power cables
  - CTO models: Customer-configured power cables

Note: The Relationship and TopSeller models of the ThinkSystem DE240S and DE120S listed in this section ship with four 1 m SAS cables; additional SAS cables that are listed in this section can be purchased for the system, if needed.

Each ThinkSystem DE Series expansion enclosure ships with two SAS I/O expansion modules. Each *I/O expansion module* provides four external 12 Gb SAS x4 ports (Mini-SAS HD SFF-8644 connectors labelled Port 1-4) that are used for connections to the ThinkSystem DE2000H and for daisy chaining the expansion enclosures between each other.

Two expansion ports on the Controller A are connected to the Ports 1 and 2 on the I/O Module A in the first expansion enclosure in the chain, and the Ports 3 and 4 on the I/O Module A in the first expansion enclosure are connected to the Ports 1 and 2 on the I/O Module A in the adjacent expansion enclosure, and so on.

Two expansion ports on the Controller B are connected to the Ports 1 and 2 on the I/O Module B in the last expansion enclosure in the chain, and the Ports 3 and 4 on the I/O Module B in the expansion enclosure are connected to the Ports 1 and 2 on the I/O Module B in the adjacent expansion enclosure, and so on.

The connectivity topology for the DE Series expansion enclosures is shown in the following figure.

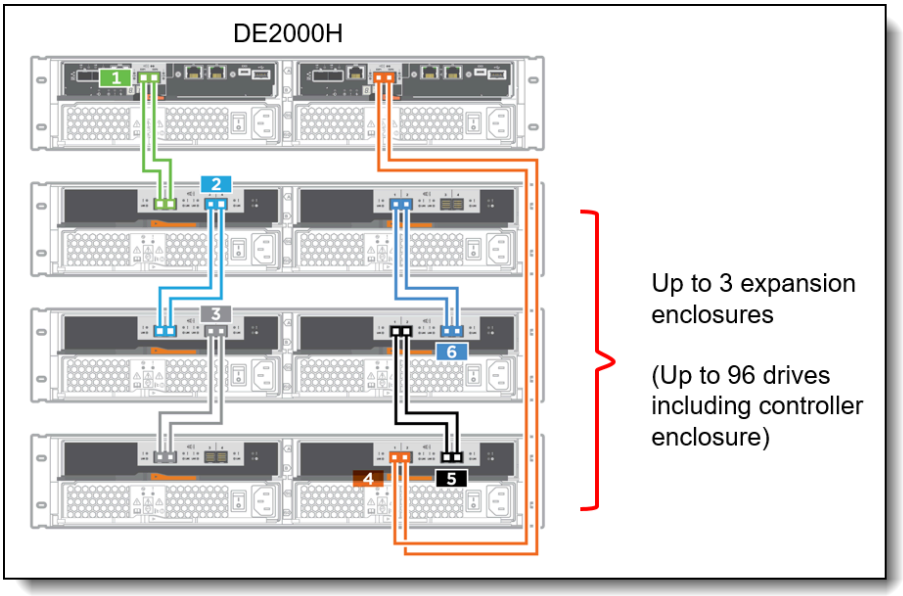


Figure 6. DE Series expansion enclosure connectivity topology

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

Table 8. Expansion unit connectivity options

Part number	Feature code	Description	Top Choice Express	Quantity per one expansion enclosure
00YL847	AU16	External MiniSAS HD 8644/MiniSAS HD 8644 0.5M Cable	Not TCE	4
00YL848	AU17	External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable	Not TCE	4
00YL849	AU18	External MiniSAS HD 8644/MiniSAS HD 8644 2M Cable	Not TCE	4
00YL850	AU19	External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable	Not TCE	4

Configuration notes:

- The Relationship and TopSeller models of the ThinkSystem DE240S and DE120S listed in this section ship with four 1 m SAS cables.
- 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.

Drives

The ThinkSystem DE Series 2U24 SFF enclosures support up to 24 SFF hot-swap drives, and the 2U12 LFF enclosures support up to 12 LFF hot-swap drives.

The following table lists supported drive options for the 2U24 SFF controller and expansion enclosures.

Table 9. 2U24 SFF drive options

Part number	Feature code	Description	Top Choice Express	Maximum quantity per 2U24 SFF enclosure
2.5-inch 12 Gbps SAS hot-swap HDDs				
4XB7A88046	BW12	Lenovo ThinkSystem DE Series 2.4TB 10K 2.5" HDD 2U24	Not TCE	24
2.5-inch 12 Gbps SAS hot-swap FIPS HDDs (SED HDDs)				
4XB7A88048	BW13	Lenovo ThinkSystem DE Series 2.4TB 10K 2.5" HDD FIPS 2U24	Not TCE	24
2.5-inch 12 Gbps SAS hot-swap (SED SSDs) (1 Drive Writes per Day)				
4XB7A88466	BW2B	Lenovo ThinkSystem DE Series 15.36TB 1DWD 2.5" SSD SED 2U24	Not TCE	24
2.5-inch 12 Gbps SAS hot-swap SSDs (1 DWPD and 3 DWPD)				
4XB7A74948	BKUQ	Lenovo ThinkSystem DE Series 960GB 1DWD 2.5" SSD 2U24	Not TCE	24
4XB7A74951	BKUT	Lenovo ThinkSystem DE Series 1.92TB 1DWD 2.5" SSD 2U24	Not TCE	24
4XB7A74955	BKUK	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U24	Not TCE	24
4XB7A14176	B4RY	Lenovo DE Series 7.68TB 1DWD 2.5" SSD 2U24	Not TCE	24
4XB7A14110	B4CD	Lenovo ThinkSystem DE Series 15.36TB 1DWD 2.5" SSD 2U24	Not TCE	24
2.5-inch 12 Gbps SAS hot-swap FIPS SSDs (1 DWPD)				
4XB7A88469	BWCJ	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD FIPS 2U24	Not TCE	24

The following table lists supported drive options for the 2U12 LFF controller and expansion enclosures.

Table 11. 2U12 LFF drive options

Part number	Feature code	Description	Top Choice Express	Maximum quantity per 2U12 LFF enclosure
3.5-inch 12 Gbps NL SAS hot-swap HDDs				
4XB7A14099	B4C3	Lenovo ThinkSystem DE Series 4TB 7.2K 3.5" HDD 2U12	Not TCE	12
4XB7A14102	B4C6	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD 2U12	Not TCE	12
4XB7B03838	C7XS	Lenovo ThinkSystem DE Series 24TB 7.2K 3.5" HDD 2U12	Not TCE	12
4XB7B13111	CE5B	Lenovo ThinkSystem DE Series 24TB 7.2K 3.5" SED HDD 2U12	Not TCE	12
3.5-inch 12 Gbps NL SAS hot-swap FIPS HDDs (SED HDDs)				
4XB7A14103	B4C7	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD SED FIPS 2U12	Not TCE	12
3.5-inch 12 Gbps SAS hot-swap SSDs (1 DWPD and 3 DWPD) (2.5" drive in a 3.5" tray)				
4XB7A74946	BKUN	Lenovo ThinkSystem DE Series 960GB 1DWD 2.5" SSD 2U12 (2.5" drive in a 3.5" tray)	Not TCE	12
4XB7A74947	BKUP	Lenovo ThinkSystem DE Series 1.92TB 1DWD 2.5" SSD 2U12 (2.5" drive in a 3.5" tray)	Not TCE	12
4XB7A74954	BKUJ	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U12 (2.5" drive in a 3.5" tray)	Not TCE	12
3.5-inch 12 Gbps SAS hot-swap FIPS SSDs (1 DWPD) (2.5" drive in a 3.5" tray)				
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

Configuration notes:

- Intermix of FIPS drives and non-FIPS drives is supported within a 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 ThinkSystem DE2000H:

- **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.
- **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 128 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 ThinkSystem DE2000H capabilities can be expanded with optional licensed functions. Optional licensed functions include:

- **Snapshots upgrade**: Increase the supported number of snapshot targets to 512.
- **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 iSCSI or Fibre Channel communication links at set intervals (both storage systems must have licenses for asynchronous mirroring).

Note: The asynchronous mirroring feature of the ThinkSystem DE2000H interoperate with other ThinkSystem DE Series storage arrays.

The following table lists the Feature on Demand (FoD) upgrades for the ThinkSystem DE2000H to enable optional software features. Each optional DE2000H function is licensed on a per-system basis and covers both controller enclosure and all attached expansion enclosures.

Table 12. Optional software features

Part number	Feature code	Description	Top Choice Express
4ZN7A14703	B4AP	Lenovo ThinkSystem DE2000H Snapshot Upgrade 512	Not TCE
4ZN7A14705	B4AQ	Lenovo ThinkSystem DE2000H Asynchronous Mirroring	Not TCE

Software maintenance is included in the ThinkSystem DE2000H 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 DE2000H 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.

The following table lists the SAN Manager Async and Sync supported features

Table 13. Async and Sync features

DE Series	Async (iSCSI)	Async (FC)	Sync (FC)
ThinkSystem DE2000	Yes	Yes	No

Power supplies and cables

The ThinkSystem DE Series 2U24 SFF and 2U12 LFF enclosures ship with two redundant hot-swap 913 W (100 - 240 V) Platinum AC power supplies, each with an IEC 320-C14 connector. The Relationship and TopSeller models of the ThinkSystem DE2000H 2U24 SFF and 2U12 LFF, DE240S 2U24 SFF, and DE120S LFF enclosures listed in Controller enclosures and Expansion enclosures ship with two 1.5 m, 10A/100-250V, C13 to IEC 320-C14 rack power cables.

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 and 2U12 LFF enclosures (two power cords per enclosure).

Table 14. Power cables for DE Series 2U24 SFF and 2U12 LFF enclosures

Part number	Feature code	Description	Top Choice Express
Rack power cables			
00Y3043	A4VP	1.0m, 10A/100-250V, C13 to C14 Jumper Cord	Not TCE
4L67A08367	B0N5	1.0m, 13A/100-250V, C13 to C14 Jumper Cord	Not TCE
39Y7937	6201	1.5m, 10A/100-250V, C13 to C14 Jumper Cord	Not TCE
4L67A08368	B0N6	1.5m, 13A/100-250V, C13 to C14 Jumper Cord	Not TCE
4L67A08365	B0N4	2.0m, 10A/100-250V, C13 to C14 Jumper Cord	Not TCE
4L67A08369	6570	2.0m, 13A/100-250V, C13 to C14 Jumper Cord	Not TCE
4L67A08366	6311	2.8m, 10A/100-250V, C13 to C14 Jumper Cord	Not TCE
4L67A08370	6400	2.8m, 13A/100-250V, C13 to C14 Jumper Cord	Not TCE
39Y7938	6204	2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	Not TCE

Part number	Feature code	Description	Top Choice Express
39Y7932	6263	4.3m, 10A/100-250V, C13 to C14 Jumper Cord	Not TCE
4L67A08371	6583	4.3m, 13A/100-250V, C13 to C14 Rack Power Cable	Not TCE
Line cords			
39Y7930	6222	2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord	Not TCE
81Y2384	6492	4.3m,10A/250V, C13/IRAM 2073 (Argentina) Line Cord	Not TCE
39Y7924	6211	Australia/NZ 10A line C13 to SAA-AS C112 (2.8M)	Not TCE
81Y2383	6574	4.3m,10A/250V, C13/AS/NZS 3112/2000 (Australia) Line Cord	Not TCE
69Y1988	6532	2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord	Not TCE
81Y2387	6404	4.3m,10A/250V, C13/NBR 14136 (Brazil) Line Cord	Not 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)	Not 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	Not TCE
81Y2386	6567	4.3m, 10A/250V, C13 to IS 6538 (India) Line Cord	Not TCE
39Y7920	6218	Israel 10A line C13 to SI 32 (2.8M)	Not TCE
81Y2381	6579	4.3m,10A/250V, C13/SI 32 (Israel) Line Cord	Not TCE
39Y7921	6217	Italy 10A line C13 to CEE 7/7 (2.8M)	Not TCE
81Y2380	6493	4.3m,10A/250V, C13/CEI 23-16 (IT) Line cord	Not TCE
46M2593	A1RE	Japan 12A/125V C13 to JIS C-8303 2.8m line cord	Not TCE
39Y7926	6335	4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord	Not 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)	Not TCE
81Y2385	6494	4.3m, 12A/250V C13/KSC 8305 (Korea) Line Cord	Not TCE
39Y7922	6214	South Africa 10A line C13 to SABS 164/1 (2.8M)	Not TCE
81Y2379	6576	4.3m,10A/250V, C13/SANS 164-1 (South Africa) Line Cord	Not TCE
39Y7919	6216	Switzerland 10A line C13 to SEV 1011 (2.8M)	Not 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)	Not TCE
81Y2375	6317	Taiwan 10A/250V C13/CNS 10917 2.8m line cord	Not TCE
81Y2374	6402	2.8m, 13A/125V, C13 to CNS 60799 (Taiwan) Line Cord	Not TCE
4L67A08363	AX8B	4.3m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord	Not TCE
81Y2389	6531	4.3m, 10A/250V, C13/CNS 10917 (Taiwan) Line Cord	Not TCE
81Y2388	6530	Taiwan 13A/125V C13/CNS 10917 4.3m line cord	Not TCE
39Y7923	6215	United Kingdom 10A line C13 to BS 1363 (2.8M)	Not TCE
81Y2377	6577	4.3m,10A/230V, C13 to BS 1363/A (UK) Line Cord	Not TCE
90Y3016	6313	2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord	Not TCE
46M2592	A1RF	10A/250V C13 to NEMA 6-15P 2.8m line cord	Not TCE
00WH545	6401	2.8m, 13A/120V, C13 to NEMA 5-15P (US) Line Cord	Not TCE
4L67A08359	6370	4.3M, 10A/125V, C13 to NEMA 5-15P (US) Line Cord	Not TCE

Part number	Feature code	Description	Top Choice Express
4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord	Not TCE
4L67A08360	AX8A	4.3m, 13A/125V, C13 to NEMA 5-15P (US) Line Cord	Not TCE

Rack installation

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

Table 15. 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 16. 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

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

Table 17. Rack mount kit features and specifications summary

	Screw-in fixed rail with adjustable depth		
Attribute	**2U12**	**2U24/4U60**	**2U24 SIR**
Feature code	B38X	B38Y	B6TH
Enclosure support	DE2000H 2U LFF DE120S	DE2000H 2U SFF DE240S	DE2000H 2U SFF DE240S
Rail type	Fixed (static) with adjustable depth	Fixed (static) with adjustable depth	Fixed (static) with adjustable depth
Tool-less installation	No	No	No
In-rack maintenance	Yes*	Yes*	Yes*
Ship-in-rack (SIR) support	Yes	No	Yes
1U PDU support	Yes	Yes	Yes
0U PDU support	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
Mounting holes	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.)
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.)

* 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.

^ 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 2U24 SFF enclosures (7Y71) have the following dimensions:

- Height: 85 mm (3.4 in.)
- Width: 449 mm (17.7 in.)
- Depth: 553 mm (21.8 in.)

The ThinkSystem DE Series 2U12 LFF (7Y70) enclosures have the following dimensions:

- Height: 85 mm (3.4 in.)
- Width: 447 mm (17.6 in.)
- Depth: 483 mm (19.0 in.)

Weights (fully configured):

- DE2000H 2U24 SFF controller enclosure (7Y71): 24.59 kg (54.2 lb)
- DE2000H 2U12 LFF controller enclosure (7Y70): 28.78 kg (63.4 lb)
- DE240S 2U24 SFF expansion enclosure (7Y68): 27.44 kg (60.5 lb)
- DE120S 2U12 LFF expansion enclosure (7Y63): 27.12 kg (59.8 lb)

Operating environment

The ThinkSystem DE Series 2U24 SFF and 2U12 LFF enclosures are supported in the following environment:

- Air temperature:
  - Operating:
    - DE2000H and DE240S 2U24 SFF: 5 °C - 45 °C (41 °F - 113 °F)
    - DE2000H and 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
  - 200 to 240 V AC (nominal); 50 Hz / 60 Hz
- Acoustical noise emission:
  - DE2000H 2U24 SFF and DE120S 2U12 LFF: 6.8 bels
  - DE2000H 2U12 LFF and DE240S 2U24 SFF: 6.6 bels

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

Table 18. Enclosure power load, inlet current, and heat output

Enclosure	Source voltage (nominal)	Maximum power load	Current per inlet	Heat output
DE2000H 2U24 SFF	100 - 127 V AC	667 W	7.03 A	2276 BTU/hour
	200 - 240 V AC	578 W	3.05 A	1973 BTU/hour
DE2000H 2U12 LFF	100 - 127 V AC	570 W	6 A	1945 BTU/hour
	200 - 240 V AC	508 W	2.68 A	1734 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

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 Infrastructure 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 Implementation Services
- Infrastructure Deployment 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.

Lenovo Implementation 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.

Infrastructure Configuration Services

- **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.

Infrastructure Deployment Services

Lenovo Infrastructure Deployment Services help you move from hardware delivery toward production with the planning, installation, configuration, integration, validation, documentation, and operational handoff support your project requires. Choose from clearly defined Premier Deploy for Infrastructure options, Specialized Deployment Services, or Hardware Installation Services based on your platform, project complexity, internal IT capabilities, and desired level of assurance.

For more information, consult our Lenovo Infrastructure Deployment Services Catalog.

- **Premier Deploy for Infrastructure**

  Clearly defined deployment options for eligible ThinkSystem servers, ThinkSystem storage arrays, and ThinkAgile solutions.

  Table 19. Premier Deploy for Infrastructure

	Standard Deploy	**Premier Deploy**	**Premier Deploy Plus**
Choose when:	You need straightforward physical hardware installation and customer acceptance.	You need operating system installation and/or system configuration, integration and validation.	You need extended post-deployment assurance and visibility after implementation.
You gain:	An installed, accepted, and documented hardware foundation.	A validated, integrated environment ready to move into production.	Added assurance as your team transitions into ongoing operations.

  For more information, see the Premier Deploy for Infrastructure 1-pager.

- **Specialized Deployment Services**

  Focused deployment expertise for specific technologies or project requirements when Premier Deploy for Infrastructure is not supported or is not the right fit for your project. Services can support ThinkSystem storage arrays, ThinkAgile solutions, HPC, liquid cooling, and private cloud environments through activities such as readiness planning, configuration, integration, validation, documentation, knowledge transfer, and operational handoff, as applicable. Availability and scope vary by platform, project requirements, geography, and service scope.

- **Hardware Installation Services**

  Expert physical installation for eligible hardware outside the Premier Deploy for Infrastructure scope, or for projects that require installation only.

- **Hardware Installation Plus**

  Extends Hardware Installation Services with:

  - RAID configuration
  - Supported operating system installation
  - Driver-level verification

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 Infrastructure**

  Helps you build business resilience with expert-led support, responsive issue resolution, and coordinated troubleshooting across supported Lenovo server and storage environments. Direct access to Lenovo expertise and accountable end-to-end case ownership help reduce disruption and simplify ongoing infrastructure operations.

- **Premier Support Plus for Infrastructure**

  Gain all the benefits of Premier Support for Infrastructure, with proactive and predictive support capabilities, designated account oversight, preventative maintenance guidance, and Keep Your Drive to help identify potential issues earlier, plan service more effectively, and maintain control of sensitive data.

- **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 a 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 our Lenovo Operational Support Services for Data Centers Services Brochure.

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.

- **Managed Services**

  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 the latest patches, critical updates, and firmware levels, to ensure your systems are providing business value through optimized performance.

Lenovo Sustainability Services

Lenovo Sustainability Services helps you address sustainability priorities across the IT lifecycle, from offsetting emissions associated with device purchases and extending equipment life to securely managing assets at end of life. Together, these services support more circular IT practices while helping you protect data, manage costs, and recover value from technology investments.

- **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 Simplify IT Asset Recovery 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 DE2000H Hybrid Storage Array supports attachment to Lenovo ThinkSystem, System x, and Flex System hosts by using SAS, iSCSI, or 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 20. 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 21. 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	C0DA	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	C0D9	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
0U Monitored PDUs															
4PU7B08150	CD17	0U 3 C13 and 18 C19 Monitored 80A 3 Phase WYE PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
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	Y	N	N	N	N	N
4PU7B08151	CD18	0U 21 Saf-D-Grid 300 Monitored 80A 3 Phase WYE High Voltage PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
0U Switched and Monitored PDUs															
4PU7A93181	C0D5	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 60A 3 Phase Delta PDU v2	N	Y	N	N	Y	N	N	Y	N	Y	N	Y	N

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
4PU7A93178	C0D8	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	C0CS	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	C0D6	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93179	C0D7	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 30A 1 Phase PDU v2	N	Y	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7B08152	CD19	0U 21 Saf-D-Grid 300 Switched and Monitored 80A 3 Phase WYE High Voltage PDU	N	N	N	N	N	N	N	N	N	N	N	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															
4PU7B13376	CJVY	1U 18 C19/C13 Switched and Monitored 48A 3 Phase WYE PDU v3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
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	Y	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
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 22. 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

Lenovo Financial Services

Why wait to obtain the technology you need now? No payments for 90 days and predictable, low monthly payments make it easy to budget for your Lenovo solution.

- **Flexible**

  Our in-depth knowledge of the products, services and various market segments allows us to offer greater flexibility in structures, documentation and end of lease options.

- **100% Solution Financing**

  Financing your entire solution including hardware, software, and services, ensures more predictability in your project planning with fixed, manageable payments and low monthly payments.

- **Device as a Service (DaaS)**

  Leverage latest technology to advance your business. Customized solutions aligned to your needs. Flexibility to add equipment to support growth. Protect your technology with Lenovo's Premier Support service.

- **24/7 Asset management**

  Manage your financed solutions with electronic access to your lease documents, payment histories, invoices and asset information.

- **Fair Market Value (FMV) and $1 Purchase Option Leases**

  Maximize your purchasing power with our lowest cost option. An FMV lease offers lower monthly payments than loans or lease-to-own financing. Think of an FMV lease as a rental. You have the flexibility at the end of the lease term to return the equipment, continue leasing it, or purchase it for the fair market value. In a $1 Out Purchase Option lease, you own the equipment. It is a good option when you are confident you will use the equipment for an extended period beyond the finance term. Both lease types have merits depending on your needs. We can help you determine which option will best meet your technological and budgetary goals.

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. **Partner Technical Webinar - Storage Battlecards and TCE Update**
   2026-08-18 | 35 minutes | Employees and Partners

   Storage Battlecards, Storage Promotion and TCE Updates

   Published: 2026-08-18
   Length: 35 minutes

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

   Course code: AUG1426
2. **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
3. **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

4. **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
5. **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
6. **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

7. **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

8. **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

9. **Lenovo ThinkSystem DE Series Technical Positioning**
   2025-11-18 | 15 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:
   • Position the DE Series within Lenovo’s storage portfolio
   • Match models to specific customer requirements
   • Understand DE Series architecture and management tools

   Tags: Storage Management, Storage Systems, Storage Technology

   Published: 2025-11-18
   Length: 15 minutes

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

   Course code: DDEP201

10. **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

11. **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

12. **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

13. **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

14. **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

15. **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

16. **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

17. **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

18. **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

19. **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

20. **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

21. **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

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. **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

24. **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

25. **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

26. **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

27. **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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