Lenovo ThinkSystem DE6600F and DE6600H Storage Arrays
Product Guide

Lenovo ThinkSystem DE6600F and DE6600H are industry-leading end to end NVMe Storage solutions designed to provide high performance, simplicity, capacity, security, and high availability for midrange to highend block NVMe large segment.

The DE6600F and DE6600H deliver enterprise-class storage management capabilities in performance-optimized systems with a wide choice of host connectivity options, flexible drive configurations, and enhanced data management features. The DE6600F all-flash and DE6600H hybrid arrays deliver superior price for performance with sub-100 microsecond response for your most-demanding enterprise applications. For target markets such as: Artificial Intelligence, Big Data Analysts, Oracle/SQL databases, high-performance computing (HPC) and real-time analytics.

DE6600F and DE6600H models are available in a 2U rack form-factor with 24 small form-factor (2.5-inch SFF) NVMe drives and include two controllers, each with 32 GB or 128 GB system memory for a system total of 64 GB or 256 GB. Host interface cards provide 10/25Gb iSCSI, 16/32Gb FC/NVMe-FC, 100Gb IB/NVMe-RoCE host connections and 12Gb SAS expansions.

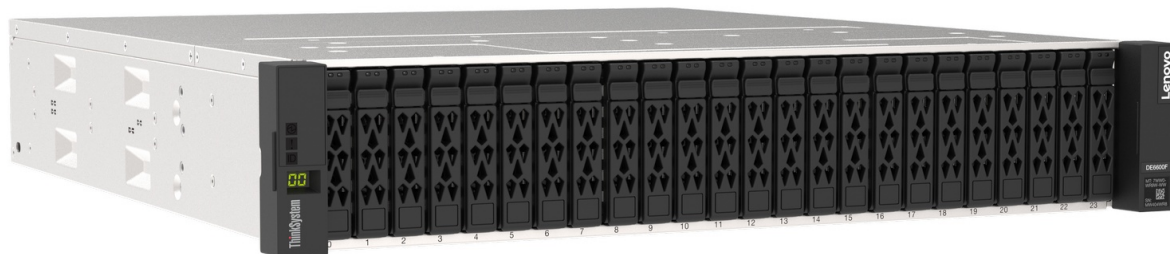The Lenovo DE6600F 2U24 SFF enclosure is shown in the following figure. DE6600H looks just like it.

Figure 1. Lenovo DE6600F enclosure controller

Did you know?

The DE6600F and DE6600H are the new NVME offerings under the Lenovo enterprise flash storage systems. With unmatched value on performance and price.

A single DE6600F or DE6600H scales up to 367TB (NVMe) of raw storage capacity, expandable to 1.798 PiB all-SSD for an all-flash system and expandable to 7.741 PiB for a hybrid system.

The DE6600F and DE6600H are entry all-flash and hybrid systems ideal for midsized businesses and remote offices that stream media and run-data analytics.

The DE6600F and DE6600H support multiple storage connectivity protocols with a choice of iSCSI, Fibre Channel, NVMe over Fibre Channel, or NVMe over RoCE.

Key features

The ThinkSystem DE6600F and DE6600H offer the following key features and benefits:

- Scalable, high performance mid-range all-flash and hybrid storage with dual active/active controller configurations with 32 GB or 128 GB system memory per controller for high availability and performance.
- Faster application response times with support for NVMe over Fabrics.
- 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 10/25Gb iSCSI, 16/32Gb FC/NVMe-FC, 100Gb IB/NVMe-RoCE host connectivity.
- The dual controller enclosure scales up to 367TB (NVMe).
- SAS expansion connectivity to expand scalability and capacity.
- 12 Gb SAS drive-side connectivity with support for up to 24x 2.5-inch small form factor (SFF) drives in the 2U24 SFF expansion enclosure, up to 12x 3.5-inch large form factor (LFF) drives in the 2U12 LFF expansion enclosure, or up to 60x 3.5-inch LFF drives in the 4U60 LFF expansion enclosure.
- For "All-Flash" a maximum scalability to up 120 SFF drives by attaching up to four ThinkSystem DE240S 2U24 SFF expansion enclosures.
- For "Hybrid" a maximum scalability to up 444 drives by attaching up to seven ThinkSystem DE600S 4U60 LFF expansion enclosures to satisfy growing needs.
- Rich set of standard storage management functions available at no extra cost, including Dynamic Disk Pools, snapshots, volume copy and encryption.
- Optional licensed functions, including higher number of drives and snapshots for greater scalability 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 DE6600F and DE6600H support the complete range of data storage requirements, from highly used applications to high-capacity, low usage applications.

The DE6600F and DE6600H 2U24 SFF expansion enclosure and expansion enclosures offer a variety of drives. Refer to the drives section for a list of supported drives. All drives are dual-port and hot-swappable. For the DE6600F system HDD Intermix (within enclosure) is not supported. For the DE6600H system HDD Intermix (within enclosure) is supported which provides the flexibility to address performance and capacity needs within a single enclosure.

Customers can intermix 2U24 SFF, 2U12 LFF, and 4U60 LFF expansion enclosures behind a 2U24 SFF 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 DE6600F and DE6600H 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

Note: HDD SAS 10k rpm are not supported for the ThinkSystem DE6600F and DE6600H.

Comparing the DE6600F and DE6600H to the previous generation

This section compares the Lenovo ThinkSystem DE6600F and DE6600H to the DE6400, as well as the previous generation DE6000.

Table 1. Comparing the DE6600F to the DE6400F and the previous generation DE6000F

Feature	DE6000F	DE6400F	DE6600F	Benefits
Segment	Entry midrange AFA	Midrange NVMe	High-end NVMe	- The new DE All-Flash solutions are Lenovo's first NVMe offering for the DE Series. They provide faster connection, throughput, and extreme performance for business-critical and high-performance workloads like database, analytics, and technical computing.
Controller	SAS base	NVMe base	NVMe base	- Seamless transition to next generation NVMe.
Expansions	DE240S SAS	DE240S SAS	DE240S SAS	- Mid-range NVMe All Flash Array.
IOPS	Up to 1M IOPS	Up to 670K IOPS	Up to 2M IOPS	- To support business-critical workloads and applications such as Database and Analytics - Extreme Performance with affordable pricing. - 2X better Performance & Latency.

Feature	DE6000F	DE6400F	DE6600F	Benefits
Networking	Flexible IO (100 Gb NVMe/IB)	Flexible IO (100 Gb NVMe/IB)	Flexible IO (100 Gb NVMe/IB)	• Investment protection (NVMe/IB,NVMe/RoCE, and NVMe/FC) to meet future demands without forklift upgrades. • iSCSI options for compatibility with existing SAN infrastructure.
Scale up	Up to 120 drives (4xDE240S SAS SSD+ 1 enclosure controller SAS SSD)	Up to 120 drives (4xDE240S SAS SSD+ 1 enclosure controller SAS SSD)	Up to 120 drives (4xDE240S SAS SSD+ 1 enclosure controller SAS SSD)	• Entry and Mid range SAN Block All Flash storage portfolio.

Table 2. Comparing the DE6600H to the DE6400H and the previous generation DE6000H

Feature	DE6000H	DE6400H	DE6600H	Benefits
Segment	Entry midrange AFA	Midrange NVMe	High-end NVMe	• The new Lenovo's first NVMe offering for the DE Series. They provide faster connection, throughput, and extreme performance for business-critical and high-performance workloads like database, analytics, and technical computing.
Controller	SAS base	NVMe base	NVMe base	• Seamless transition to next generation NVMe.
Expansions	DE240S SAS DE120S SAS DE600S SAS	DE240S SAS DE120S SAS DE600S SAS	DE240S SAS DE120S SAS DE600S SAS	• Mid-range NVMe hybrid Array. • Increase density.
IOPS	Up to 1M IOPS	Up to 670K IOPS	Up to 2M IOPS	• To support business-critical workloads and applications such as Database and Analytics • Extreme Performance with affordable pricing. • 2X better Performance & Latency.

Feature	DE6000H	DE6400H	DE6600H	Benefits
Networking	Flexible IO (100 Gb NVMe/IB)	Flexible IO (100 Gb NVMe/IB)	Flexible IO (100 Gb NVMe/IB)	- Investment protection (NVMe/IB,NVMe/RoCE, and NVMe/FC) to meet future demands without forklift upgrades. - iSCSI options for compatibility with existing SAN infrastructure.
Scale up	Up to 480 drives (3xDE240S SAS SSD+ 1 enclosure controller SAS 4U60)	Up to 264 drives (4xDE600S SAS + 1 enclosure controller NVMe)	Up to 444 drives (7xDE600S SAS + 1 enclosure controller NVMe)	Entry and Mid range SAN Block hybrid storage portfolio.

Components and connectors

The following figure shows the front of the DE6600F enclosure controller and DE6600H looks just like it with DE6600H label.
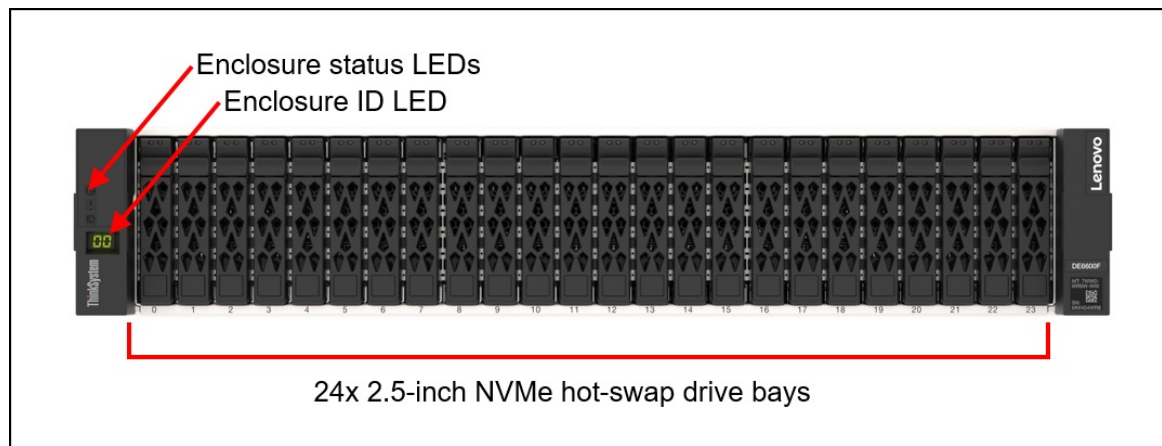

Figure 2. DE6600F enclosure controller front view.

The following figure shows the rear of the ThinkSystem DE6600F and DE6600H 2U SFF controller enclosure.
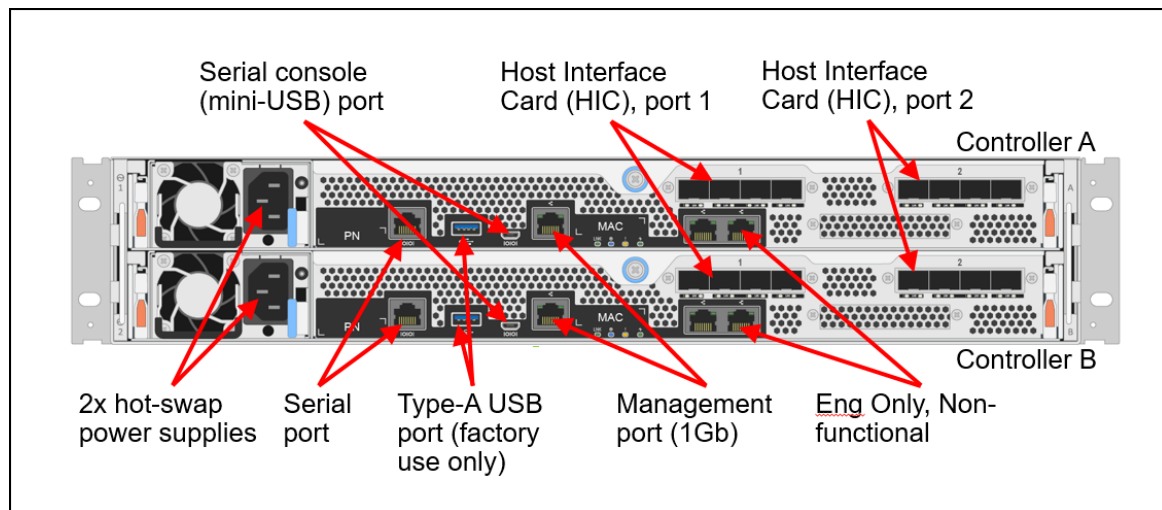
Figure 3. ThinkSystem DE6600F and DE6600H 2U SFF controller enclosure rear view

The rear of the ThinkSystem DE6600F and DE6600H 2U SFF controller enclosure includes the following components:

- Two controllers. Each controller with the following ports:
    - One Serial (RS-232) port.
      Note: The DE6600F and DE6600H controllers no longer offers base ports
    - One service (USB) (Not functional) port.
    - One serial console (mini-USB) port.
    - One management (1GbE) port.
    - Eng only (Not functional) ports.
    - Bay 1/port 1 for HIC host connections (FC, iSCSI, IB) and optional SAS expansion card.
    - Bay 2/port 2 for HIC host connections (FC, iSCSI, IB)
- Two redundant hot-swap 1181W AC (220V) power supplies (IEC 320-C14 power connector).
- PSU and system fans are installed in the controller enclosure (not chassis).

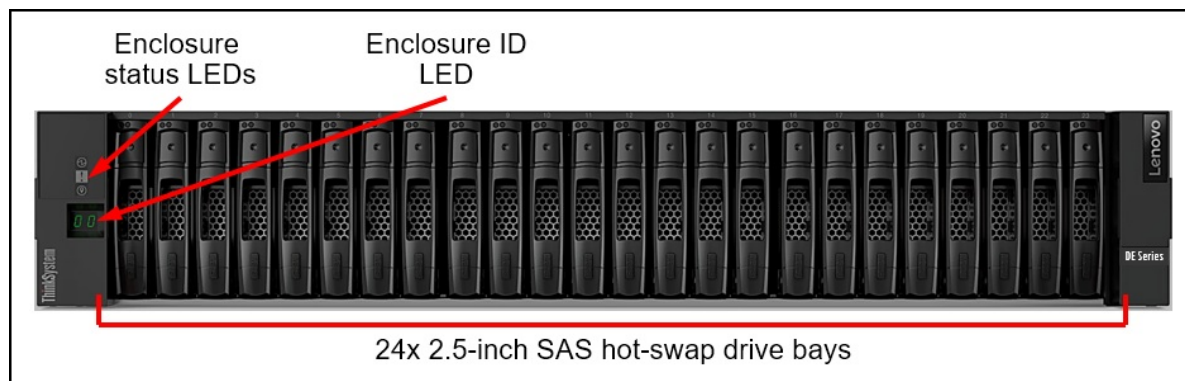The following figure shows the front of the DE240S 2U SFF expansion enclosure.

Figure 4. DE240S 2U SFF expansion enclosure front view.

The front of the DE240S 2U SFF expansion enclosure includes the following components:

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

- Enclosure ID LED

The following figure shows the front of the ThinkSystem DE120S 2U LFF expansion enclosure.
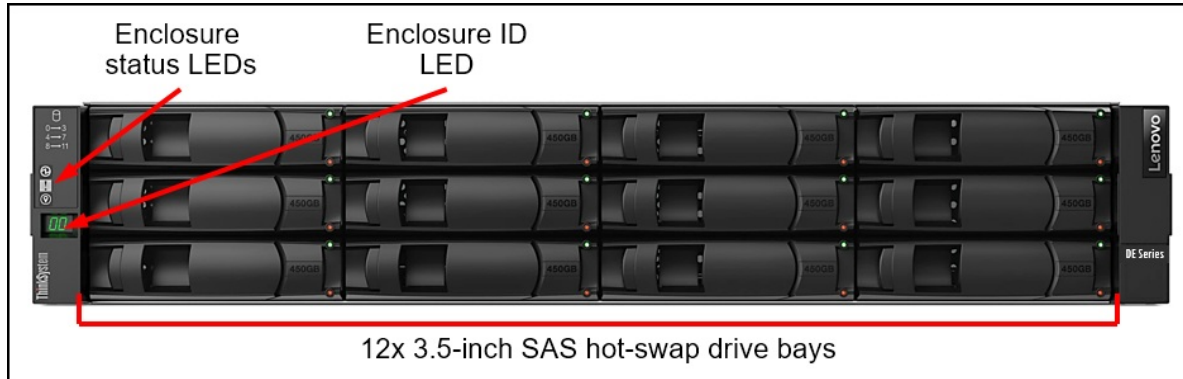

Figure 5. ThinkSystem DE120S 2U LFF expansion enclosure front view.

The front of the ThinkSystem DE120S 2U LFF expansion enclosure includes the following components:

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

The following figure shows the rear of the ThinkSystem 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.

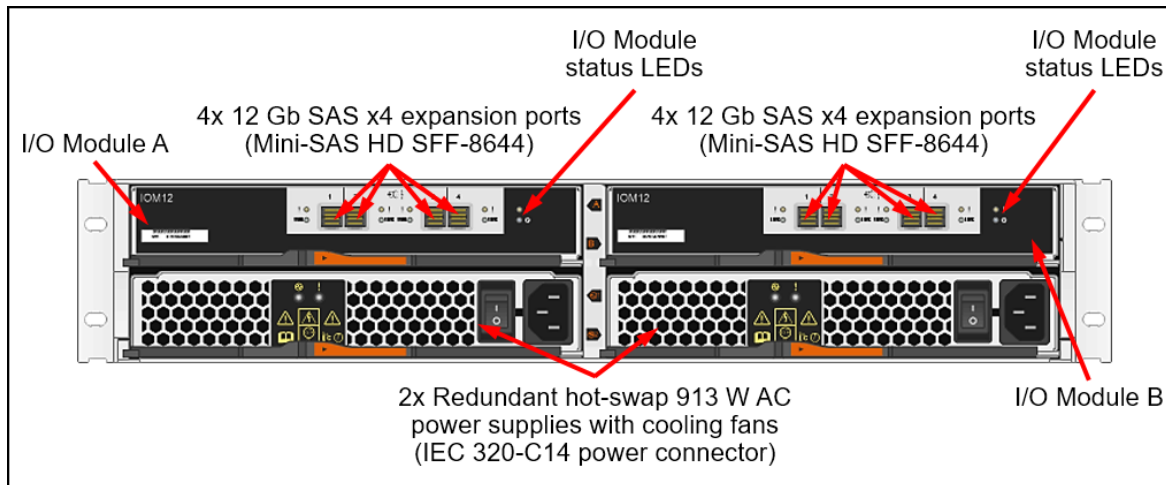The following figure shows the rear of the ThinkSystem DE600S 4U LFF expansion enclosure.
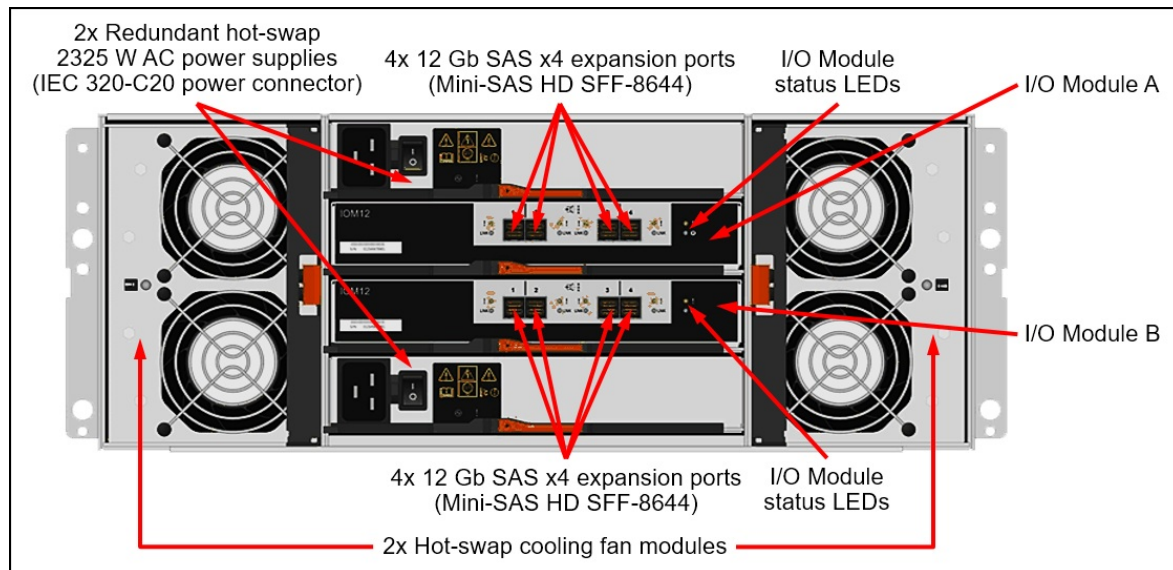
Figure 7. ThinkSystem DE600S 4U LFF expansion enclosure rear view

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 DE6600F and DE6600H storage system specifications.

Note: The supported hardware options, software features, and interoperability listed in this product guide are based on the Lenovo SAN OS 11.80. 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 that can be found at:
http://datacentersupport.lenovo.com

Table 3. System specifications

Attribute	DE6600F (All-flash)	DE6600H (Hybrid)
Machine type	Controller enclosure: 7DB7 Expansion enclosures: • DE240S: 7Y68	Controller enclosure: 7DB7 Expansion enclosures: • DE240S: 7Y68 • DE120S: 7Y63 • DE600S: 7Y69
Form factor	Controller enclosure: 2U rack mount Expansion enclosure: • DE240S: 2U rack mount	Controller enclosure: 2U rack mount Expansion enclosure: • DE240S: 2U rack mount • DE120S: 2U rack mount • DE600S: 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 Storage Manager Command Line (SMcli).	
Controller system memory	64 GB or 256 GB per system (32 GB or 128 GB per controller). Cache mirroring between the controllers. Flash-backed cache protection (includes battery for destaging to flash).	
Expansion enclosure support	• 4x DE240S (SAS SSD only)	• 7x DE120S • 4x DE240S • 7x DE600S • Expansion enclosures intermix up to a maximum of 7 expansion enclosures
Drive bays	• Up to 120 drives (24x NVMe drives in DE6600F controller enclosure + 96 SFF SSD hot-swap drive bays (4x DE240S SFF expansion enclosures). • DE240S SAS SSD only supported.	• Up to 444 drives (24 x NVMe drives in DE6600H controller enclosure + 420 LFF hot-swap drive bays (7x 4U60 LFF expansion enclosures).

Attribute	DE6600F (All-flash)	DE6600H (Hybrid)
Drive technology	Controller enclosure • NVMe only Expansion enclosures: • NL SAS HDDs (DE6600H only), 12 Gb SAS SSDs and FIPS SSDs drives are supported. • A maximum of 120 SAS SSDs is supported. • Intermix of drives is supported within a system. • 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. • No intermix with NVMe and SAS SSD in volume group or disk pool. • There is no support for expansion to a second enclosure containing NVMe drives.	
Drive expansion connectivity	• 8x 12 Gb SAS host ports (Mini-SAS HD, SFF-8644) (4 ports per controller) for expansion scale-up, daisy chaining of the expansion enclosures. • 2 x SAS expansion cards are required and must be installed in port1 only of the DE6600 enclosure controller. One in controller A, one in controller B.	
Drives	Controller enclosure: 2U24 SFF drives: • NVMe DE240S Expansion enclosure: 2U24 SFF drives**: • SAS SSDs (1 DWD) • SAS SSDs (3 DWD) • SAS FIPS SSDs (3 DWD)	Controller enclosure: 2U24 SFF drives: • NVMe DE240S Expansion enclosure: 2U24 SFF drives**: • SAS SSDs (1 DWD) • SAS SSDs (3 DWD) • SAS FIPS SSDs (3 DWD) DE120S Expansion enclosure: 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) DE600S Expansion enclosure: 4U60 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	• Controller enclosure (367.2TB) + 4 x DE240S (1474.5TB) = 1841.5 TB • Scale up requires installation of a SAS expander card into slot 1	• Controller enclosure (367.2TB) + 7 x DE600S (7560TB) = 7927.2 TB • Scale up requires installation of a SAS expander card into slot 1
Storage protocols	SAN (Block access): FC, iSCSI, iSER/IB, NVMe/FC, NVMe/IB, NVMe/RoCE, and SRP/IB.	
Host connectivity	Host connectivity ports provided using host interface cards (HICs). A controller enclosure has two controllers. Supported HICs are: • 8x 10/25 Gb iSCSI SFP28 host ports (DAC or SW fiber optics, LC) (4 ports per controller) • 8x 16/32 Gb FC SFP+ host ports (SW fiber optics, LC) (4 ports per controller) • 2x 40/100 Gb NVMe/RoCE QSFP28 host ports (DAC cable or SW fiber optics, MPO) (1 port per controller, supported in bay 2/ port 2 only) **Note:** The controllers no longer offers base ports. Host connectivity is provided with a pair of HICs.	

Attribute	DE6600F (All-flash)	DE6600H (Hybrid)
Host operating systems	Microsoft Windows Server, Red Hat Enterprise Linux (RHEL), SUSE Linux Enterprise Server (SLES), VMware vSphere. Reference LSIC for details.	
Performance (NVMe drives only)*	- Up to 2,000 000 random read IOPS (4 KB blocks). - Up to 340 000 random write IOPS (4 KB blocks). - Up to 44 GBps sequential read throughput. - Up to 12.5 GBps sequential write throughput. - Up to 24 GBps Full Stripe Write Acceleration (FSWA)	
Configuration maximums	- Maximum hosts/partitions: 512 - Maximum volumes per partition: 256 - Maximum volumes per system: 2048 - Maximum logical volume: 4PB - RAID capacity: 24 drives - Disks per volume group: 24 - RAID volumes per volume group: 256 - Disk pools per system: 20 - Volumes per disk pool: 2048	
Cooling	Controller enclosure: Five cooling fans per enclosure controller. DE600S expansion: Redundant cooling with two cooling modules DE120S, DE240S: Fans that are built into power supplies	
Power supply	Two redundant hot-swap 1181 W (220 V) 2U24 controller enclosure. Each expansion enclosure also supports 2 power supply.	
Hot-swap parts	Controllers, I/O modules, drives, power supplies and SFP+/SFP28/QSFP28 transceivers.	
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.	
Management interfaces	System Manager web-based GUI; SAN Manager standalone GUI; SSH CLI for service only; SMcli; SNMP, email, and syslog alerts; XClarity integration supporting storage alerts.	
Security features	Secure Socket Layer (SSL), Secure Shell (SSH) for service only, 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.	
Dimension (controller enclosure)	2U24 SFF enclosure: Height: 87 mm, Width: 447 mm, Depth: 543 mm (3.4 x 17.6 x 21.4 inches)	
Dimension (expansion enclosure)	2U24 SFF enclosure: Height: 85 mm, Width: 449 mm, Depth: 552 mm (3.3 x 17.7 x 21.8 inches) 2U12 LFF enclosure: Height: 85 mm, Width: 447 mm, Depth: 483 mm (3.3 x 17.6 x 19.0 inches) 4U60 LFF enclosure: Height: 176 mm, Width: 449 mm, Depth: 922 mm (6.9 x 17.7 x 36.3 inches)	
Weight	- DE6600F and DE6600H 2U24 SFF controller enclosure (7DB7): 25.07 kg (55.3 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) - DE600S 4U60 LFF expansion enclosure (7Y69): 112.2 kg (247.4 lb)	

* Estimated performance based on internal measurements
** There is no support for 10k SAS drives.

Controller enclosures

The following table lists the CTO base models for the ThinkSystem DE6600F and DE6600H.

Table 4. ThinkSystem DE6600F and DE6600H CTO base models

Machine Type/Model	Base feature	Description
7DB7CTO1WW	7DB7	Lenovo ThinkSystem DE6600 All Flash NVMe 2U24
7DB7CTO2WW	7DB7	Lenovo ThinkSystem DE6600 Hybrid NVMe 2U24

Configuration notes:

- Note: No mixing of host protocols

The models of the ThinkSystem DE6600F and DE6600H 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)
- Two power cables:
  - Relationship models listed in this section:
    - 2U24 SFF: 1.5 m, 10A/100-250V, C13 to IEC 320-C14 rack power cables
  - CTO models: Customer-configured power cables

Controllers

The ThinkSystem DE6600F and DE6600H enclosures ship with two controllers, and each controller provides 32 GB or 128 GB system memory for a system total of 64 GB or 256 GB respectively. A *controller* provides interfaces for host connectivity, management, and internal drives, and it runs storage management software.

- Each controller has two bays or ports for host interface card (HIC).

- Each controller supports 1 x (optional) SAS expansion card in bay1/port1 (mini-SAS HD SFF-8644 connectors) for the attachment of the ThinkSystem DE Series expansion units. 4 ports per controller.

The following host interfaces can be added to the ThinkSystem DE6600F and DE6600H controller enclosures with HICs:

- 8x 10/25 GbE SFP28 ports (4 ports per HIC) for 10/25 Gb iSCSI connectivity (require optical transceivers or DAC cables that should be purchased for the HICs).

- 8x 16/32 Gb FC SFP+ ports (4 ports per HIC) for FC or NVMe/FC connectivity (require optical transceivers that should be purchased for the HICs).

- 2x 100Gb NVMe-IB/RoCE, SRP, QSFP28 ports (2 ports per HIC in port 2 only) for NVMe/RoCE connectivity (require optical transceivers or DAC cables that should be purchased for the HIC).

Configuration notes:

- Both controllers must have the same system memory: 32 GB or 128 GB.

- Two or four host interface cards are required for selection in bay 1/port 1 and bay 2/port 2 (per controller).

- No mixing of host protocols

- Both controllers must have the same type of the host interface card installed (16/32 Gb FC SFP+, 10/25 Gb iSCSI SFP28, or 100 GbE NVMe/RoCE QSFP28), and both cards must have SFP+/SFP28/QSFP28 media of the same type (either optical transceivers or DAC cables, but not both types).

The following table lists the DE6600F and DE6600H controllers and supported connectivity options.

Table 5. DE6600F and DE6600H controllers and connectivity options

Part number	Feature code	Description	Maximum quantity per enclosure
Controllers			
None*	7DB7	Lenovo ThinkSystem DE6600 Controller 32GB or 128 GB	2
SAS expansion card			
4C57A72918	BHL2	Lenovo ThinkSystem DE6400/6600 HIC, 12Gb SAS EXP,4-ports	2
Host interface cards			
4C57A85945	BT4B	Lenovo ThinkSystem DE 6400/6600 HIC, 10/25GbE iSCSI,4-ports	4
4C57A14374	B6WA	Lenovo ThinkSystem DE6400/6600 HIC, 16/32Gb NVMe Over FC,4-ports	4
4XC7A85322	BS3G	Lenovo ThinkSystem DE6400/6600 HIC, 100Gb NVMe Over ROCE,2-Ports	2**
CTO only	BUY7†	Lenovo ThinkSystem DE6600 HIC, 200Gb NVMe Over ROCE/IB,2-Ports	2***
Transceiver options			
4M17A13527	B4B2	Lenovo 10Gb iSCSI/16Gb FC Universal SFP+ Module	16
4M17A13529	B4B4	Lenovo 10/25GbE iSCSI SFP28 Module (for 10/25 Gb iSCSI HIC ports)	16
4M17A13528	B4B3	Lenovo 32Gb FC SFP+ Transceiver (for 32 Gb FC HIC ports)	16
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	16
4Z57A10846	B2PA	Lenovo 1m LC-LC OM4 MMF Cable	16
4Z57A10847	B2PB	Lenovo 3m LC-LC OM4 MMF Cable	16
4Z57A10848	B2PC	Lenovo 5m LC-LC OM4 MMF Cable	16
4Z57A10849	B2PD	Lenovo 10m LC-LC OM4 MMF Cable	16
4Z57A10850	B2PE	Lenovo 15m LC-LC OM4 MMF Cable	16
4Z57A10851	B2PF	Lenovo 25m LC-LC OM4 MMF Cable	16
4Z57A10852	B2PG	Lenovo 30m LC-LC OM4 MMF Cable	16
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	16
00MN502	ASR6	Lenovo 1m LC-LC OM3 MMF Cable	16
00MN505	ASR7	Lenovo 3m LC-LC OM3 MMF Cable	16
00MN508	ASR8	Lenovo 5m LC-LC OM3 MMF Cable	16
00MN511	ASR9	Lenovo 10m LC-LC OM3 MMF Cable	16
00MN514	ASRA	Lenovo 15m LC-LC OM3 MMF Cable	16
00MN517	ASRB	Lenovo 25m LC-LC OM3 MMF Cable	16
00MN520	ASRC	Lenovo 30m LC-LC OM3 MMF Cable	16
DAC cables for iSCSI HIC ports			
00D6288	A3RG	0.5m Passive DAC SFP+ Cable	16
90Y9427	A1PH	1m Passive DAC SFP+ Cable	16
00AY764	A51N	1.5m Passive DAC SFP+ Cable	16
00AY765	A51P	2m Passive DAC SFP+ Cable	16
90Y9430	A1PJ	3m Passive DAC SFP+ Cable	16

Part number	Feature code	Description	Maximum quantity per enclosure
90Y9433	A1PK	5m Passive DAC SFP+ Cable	16
00D6151	A3RH	7m Passive DAC SFP+ Cable	16
DAC cables for 25 Gb iSCSI SFP28 HIC ports			
7Z57A03557	AV1W	Lenovo 1m Passive 25G SFP28 DAC Cable	16
7Z57A03558	AV1X	Lenovo 3m Passive 25G SFP28 DAC Cable	16
7Z57A03559	AV1Y	Lenovo 5m Passive 25G SFP28 DAC Cable	16
DAC cables for 100 Gb NVMe/RoCE QSFP28 HIC ports			
7Z57A03561	AV1Z	Lenovo 1m Passive 100G QSFP28 DAC Cable	4
7Z57A03562	AV20	Lenovo 3m Passive 100G QSFP28 DAC Cable	4
7Z57A03563	AV21	Lenovo 5m Passive 100G QSFP28 DAC Cable	4
DAC cables for 200 Gb QSFP56 Ethernet			
4X97A11113	BF6W	Lenovo 1m Passive 200G QSFP56 Ethernet DAC Cable	4
SAS host connectivity cables: Mini-SAS HD (controller) to Mini-SAS HD (host)			
00YL847	AU16	0.5m External MiniSAS HD 8644/MiniSAS HD 8644 Cable	8
00YL848	AU17	1m External MiniSAS HD 8644/MiniSAS HD 8644 Cable	8
00YL849	AU18	2m External MiniSAS HD 8644/MiniSAS HD 8644 Cable	8
00YL850	AU19	3m External MiniSAS HD 8644/MiniSAS HD 8644 Cable	8
1 GbE management ports			
00WE123	AVFW	0.75m Green Cat6 Cable	2
00WE127	AVFX	1.0m Green Cat6 Cable	2
00WE131	AVFY	1.25m Green Cat6 Cable	2
00WE135	AVFZ	1.5m Green Cat6 Cable	2
00WE139	AVG0	3m Green Cat6 Cable	2
90Y3718	A1MT	10m Green Cat6 Cable	2
90Y3727	A1MW	25m Green Cat6 Cable	2

* Factory-installed only.
** For current Lenovo SAN OS 11.80 – max qty 2 - in bay2/port2 only.
*** No field upgrade available.
† There is no support for HIC (BUY7) in the DE6600H controller.

Expansion enclosures

In the base configuration, the ThinkSystem DE6600F and DE6600H supports attachment of up to four expansions: 4xDE600S 4U60 LFF, or 4xDE240S 2U24 SFF, or 4xDE120S 2U12 LFF. These expansions can be mixed up to the aforementioned maximums.

Maximum drives:

- All Flash- 120 (1 x DE6600F controller NVMe + 4xDE240S SAS, SSD)
- Hybrid- 444 (1 x DE6600H controller NVMe + 7xDE600S SAS, SSD)

Note: DE120S and DE600S are not supported with All Flash controller.

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

Table 6. ThinkSystem DE240S, DE120S, and DE600S CTO base models

Description	Machine Type/Model	Feature code		
		European Union	Other markets	World Wide
Lenovo ThinkSystem Storage DE240S 2U24 Chassis (with 2x PSUs)	7Y68CTO1WW	BEY7	B38L	-
Lenovo ThinkSystem Storage DE120S 2U12 Chassis (with 2x PSUs)	7Y63CTO1WW	BEY6	B38M	-
Lenovo ThinkSystem Storage DE600S 4U60 Chassis (with 2x PSUs)	7Y69CTO2WW	-	-	BQ9W

Configuration notes:

- For CTO models, two I/O expansion modules are selected by default in the configurator, and the selection cannot be changed.

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 Tables 6 and 7)
- Rack Mount Kit
- *Quick Installation Guide*
- *Electronic Publications Flyer*
- Two power cables:
  - CTO models: Customer-configured power cables

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 DE6600F and DE6600H 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.
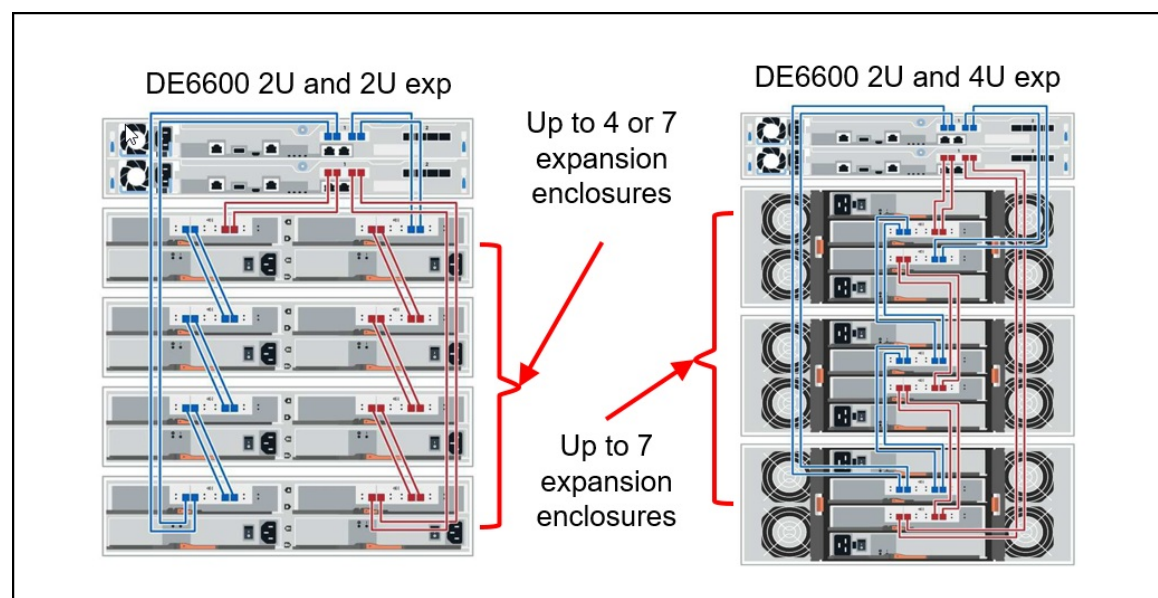
Figure 8. ThinkSystem DE6600F and DE6600H expansion enclosure connectivity topology

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

Table 7. Expansion unit connectivity options

Description	Part number	Feature code	Quantity per one expansion enclosure
External MiniSAS HD 8644/MiniSAS HD 8644 0.5M Cable	00YL847	AU16	8
External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable	00YL848	AU17	8
External MiniSAS HD 8644/MiniSAS HD 8644 2M Cable	00YL849	AU18	8
External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable	00YL850	AU19	8

Configuration notes:

- Eight 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

The ThinkSystem DE6600F and DE6600H controller enclosure support up to 24 NVMe drives.

Expansion enclosure support is as follows:

- The DE240S 2U24 SFF expansion enclosure supports 24 SFF drives.
- The DE120S 2U12 LFF expansion enclosure supports 12 LFF drives.
- The DE600S 4U60 LFF expansion enclosure supports 60 LFF drives.

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

The following table lists supported drive options for the ThinkSystem DE6600F and DE6600H controller enclosure.

Table 8. DE6600 2U24 SFF controller enclosure drive options

Part number	Feature code	Description	Maximum quantity per 2U24 SFF enclosure
Single 1DWD 2.5" NVME SED			
4XB7A38085	B6WC	Lenovo ThinkSystem DE 1.9TB 1DWD 2.5" NVME SED 2U24	24
4XB7A38087	B6WE	Lenovo ThinkSystem DE 3.8TB 1DWD 2.5" NVME SED 2U24	24
4XB7A38093	B6WL	Lenovo ThinkSystem DE 7.6TB 1DWD 2.5" NVME SED 2U24	24
4XB7A38095	B6WN	Lenovo ThinkSystem DE 15.3TB 1DWD 2.5" NVME SED 2U24	24
Single 1DWD 2.5" NVME SED FIPS			
4XB7A38089	B6WG	Lenovo ThinkSystem DE 3.8TB 1DWD 2.5" NVME SED FIPS 2U24	24
Six drive packs 2.5" NVME SED			
4XB7A38086	B6WD	Lenovo ThinkSystem DE 11.4TB Pack (6x 1.9TB NVME SED)	4
4XB7A38094	B6WM	Lenovo ThinkSystem DE 45.6TB Pack (6x 7.6TB NVME SED)	4
4XB7A38096	B6WP	Lenovo ThinkSystem DE 91.8TB Pack (6x 15.3TB NVME SED)	4
4XB7A38088	B6WF	Lenovo ThinkSystem DE 22.8TB Pack (6x 3.8TB NVME SED)	4
Six drive packs 2.5" NVME SED FIPS			
4XB7A38090	B6WH	Lenovo ThinkSystem DE 22.8TB Pack (6x 3.8TB NVME SED FIPS)	4

The following table lists supported drive options for the DE240S 2U24 SFF expansion enclosure.

Table 9. Drive options for the DE240S 2U24 SFF expansion enclosure.

Part number	Feature code	Description	Maximum quantity per 2U24 SFF enclosure
2.5-inch 12 Gbps SAS hot-swap SSDs (1 DWPD)			
4XB7A74948	BKUQ	Lenovo ThinkSystem DE Series 960GB 1DWD 2.5" SSD 2U24	24
4XB7A74951	BKUT	Lenovo ThinkSystem DE Series 1.92TB 1DWD 2.5" SSD 2U24	24
4XB7A74955	BKUK	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U24	24
4XB7A14176	B4RY	Lenovo ThinkSystem DE Series 7.68TB 1DWD 2.5" SSD 2U24	24
4XB7A14110	B4CD	Lenovo ThinkSystem DE Series 15.36TB 1DWD 2.5" SSD 2U24	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	24
FIPS SSDs			
4XB7A88471	BWCL	Lenovo ThinkSystem DE6000F 46TB FIPS Pack (12x 3.84TB FIPS SSDs)	2
4XB7A88470	BWCK	Lenovo ThinkSystem DE Series 46TB FIPS Pack (12x 3.84TB FIPS SSDs)	2

The following table lists supported drive pack options for the DE240S 2U24 SFF expansion enclosure.

Table 10. DE240S 2U24 SFF expansion enclosure drive pack options.

Part number	Feature code	Description	Maximum quantity per 2U24 SFF enclosure
2.5-inch 12 Gbps SAS hot-swap SSDs			
4XB7A74950	BKUS	Lenovo ThinkSystem DE6000F 11.52TB Pack (12x 960GB SSD)	2
4XB7A74949	BKUR	Lenovo ThinkSystem DE Series 11.52TB Pack (12x 960GB SSD)	2
4XB7A74953	BKUV	Lenovo ThinkSystem DE6000F 23.04TB Pack (12x 1.92TB SSD)	2
4XB7A74952	BKUU	Lenovo ThinkSystem DE Series 23.04TB Pack (12x 1.92TB SSD)	2
4XB7A74956	BKUL	Lenovo ThinkSystem DE Series 46.08TB Pack (12x 3.84TB SSD)	2
4XB7A74957	BKUM	Lenovo ThinkSystem DE6000F 46.08TB Pack (12x 3.84TB SSD)	2
4XB7A14238	B4RW	Lenovo ThinkSystem DE Series 92TB SSD Pack (12x 7.68TB SSD)	2
4XB7A14239	B4S0	Lenovo ThinkSystem DE6000F 92TB SSD Pack (12x 7.68TB SSD)	2
FIPS SSDs			
4XB7A88471	BWCL	Lenovo ThinkSystem DE6000F 46TB FIPS Pack (12x 3.84TB FIPS SSDs)	2
4XB7A88470	BWCK	Lenovo ThinkSystem DE Series 46TB FIPS Pack (12x 3.84TB FIPS SSDs)	2

The following table lists supported drive options for the DE120S 2U12 LFF expansion enclosure.

Table 11. Drive options for the DE120S 2U12 LFF expansion enclosure.

Part number	Feature code	Description	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	12
4XB7A14101	B4C5	Lenovo ThinkSystem DE Series 8TB 7.2K 3.5" HDD 2U12	12
4XB7A14104	B4C8	Lenovo ThinkSystem DE Series 12TB 7.2K 3.5" HDD 2U12	12
4XB7A74942	BHDP	Lenovo ThinkSystem DE Series 18TB 7.2K 3.5" HDD 2U12	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 FIPS 2U12	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	12

The following table lists supported drive options for the DE600S 4U60 LFF expansion enclosure.

Table 12. Drive options for the DE600S 4U60 LFF expansion enclosure.

Part number	Feature code	Description	Maximum quantity per 4U60 LFF enclosure
3.5-inch 12 Gbps NL SAS hot-swap HDDs			
4XB7A14124	B4GG	Lenovo ThinkSystem DE Series 4TB 7.2K 3.5" HDD 4U60	60
4XB7A14125	B4GH	Lenovo ThinkSystem DE Series 8TB 7.2K 3.5" HDD 4U60	60
4XB7A14128	B4GL	Lenovo ThinkSystem DE Series 12TB 7.2K 3.5" HDD 4U60	60
4XB7A74943	BHDQ	Lenovo ThinkSystem DE Series 18TB 7.2K 3.5" HDD 4U60	60
4XB7A88038	BW1Y	Lenovo ThinkSystem DE Series 22TB 7.2K 3.5" HDD 4U60	60
3.5-inch 12 Gbps NL SAS hot-swap FIPS HDDs (SED HDDs)			
4XB7A14127	B4GK	Lenovo ThinkSystem DE Series 10TB 7.2K 3.5" HDD FIPS 4U60	60
3.5-inch 12 Gbps SAS hot-swap SSDs (1 DWPD) (2.5" drive in a 3.5" tray)			
4XB7A86719	BUC8	Lenovo Lenovo ThinkSystem DE Series 1.92TB 1DWD SAS SSD 4U60	60
3.5-inch 12 Gbps SAS hot-swap FIPS SSDs (SED SSDs) (1 DWPD) (2.5" drive in a 3.5" tray)			
4XB7A88506	BWCM	Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD FIPS 4U60	60

The following table lists supported drive pack options for the DE600S 4U60 LFF Expansion Enclosure.

Table 13. DE600S 4U60 LFF expansion enclosure drive pack options

Part number	Feature code	Description	Maximum quantity per 4U60 LFF enclosure
3.5-inch 12 Gbps NL SAS hot-swap HDDs			
4XB7A74945	BHDS	Lenovo ThinkSystem DE6000H/DE6400H/DE6600H 360TB HDD Pack (20x 18TB HDDs)	3
4XB7A88043	BW1L	Lenovo ThinkSystem DE6000H/DE6400H/DE6600H 440TB HDD Pack (20x 22TB HDDs)	3
3.5-inch 12 Gbps SAS hot-swap SSD packs (1 DWPD) (2.5" drive in a 3.5" tray)			
4XB7A86721	BUCA	Lenovo ThinkSystem DE6000H/DE6400H/DE6600H 38.4TB Pack (20x 1.92TB SAS SSDs) (2.5" drive in a 3.5" tray)	3
FIPS SSDs			
4XB7A88508	BWCP	Lenovo ThinkSystem DE6000H 76.8TB FIPS Pack (20x 3.84TB FIPS 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

Configuration notes:
- For an all-flash configuration (DE6600F enclosure controller and DE240S expansion controllers) SSDs only (no HDD drives support). Such configuration supports a maximum of 120 SSDs.
- For hybrid configuration (DE6600H enclosure controller and expansion controllers (DE120S/DE240S/DE600S)) NL-SAS and SSDs drives are supported.
- 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.

Software

The following functions are included with every ThinkSystem DE6600F and DE6600H:

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

Software maintenance is included in the ThinkSystem DE6600F and DE6600H 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).

The following additional features in SAN OS 11.80 are supported with every ThinkSystem DE6600F and DE6600H:

- Increase SSD Read Cache maximum (60% increase from 5TB to 8TB)
    - Increase max from 5 to 8 TB (based on two 3.8TB) at a minimum on all platforms.
- Strengthen digital signature method for SAN OS package
    - All downloadable firmware is bundled in the same format (an RCB file).
- Support SSD Read Cache
    - With HDD expansion, allow SSD read cache to be configured.
    - Using the NVMe drives as the SSD read cache for HDDs in the SAS expansion.
- iSCSi/FC async remote mirroring
    - Support ARVM on DE6400/DE6600, both NVMe and SAS based volumes.
    - Basic target is another DE6400 or DE6600 system. Include mirroring SAS expansion drives to existing DE SAS drives.
    - Like block size mirrors to like block size. i.e.NVMe 4Kn volumes mirror only to another 4Kn volume, and 512e to 512e.
    - iSCSi/FC is the only host connection.
- Optimization of DDP Error overhead calculation algorithm
    - Cap the number of error overhead stripes to 300 from the percentage-based calculation we do today.

Management

The DE6600F and DE6600H 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 (200 - 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 14. Power cables for DE Series 2U24 SFF and 2U12 LFF enclosures

Description	Part number	Feature code
Rack power cables		
1.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	00Y3043	A4VP
1.0m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08367	B0N5
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
1.5m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08368	B0N6
2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08365	B0N4
2.0m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08369	6570
2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08366	6311
2.8m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08370	6400
2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	39Y7938	6204
4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7932	6263
4.3m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08371	6583
Line cords		
Argentina 2.8m, 10A/250V, C13 to IRAM 2073 Line Cord	39Y7930	6222
Argentina 4.3m, 10A/250V, C13 to IRAM 2073 Line Cord	81Y2384	6492
Australia/New Zealand 2.8m, 10A/250V, C13 to AS/NZS 3112 Line Cord	39Y7924	6211
Australia/New Zealand 4.3m, 10A/250V, C13 to AS/NZS 3112 Line Cord	81Y2383	6574
Brazil 2.8m, 10A/250V, C13 to NBR 14136 Line Cord	69Y1988	6532

Description	Part number	Feature code
Brazil 4.3m, 10A/250V, C13 to NBR14136 Line Cord	81Y2387	6404
China 2.8m, 10A/250V, C13 to GB 2099.1 Line Cord	39Y7928	6210
China 4.3m, 10A/250V, C13 to GB 2099.1 Line Cord	81Y2378	6580
Denmark 2.8m, 10A/250V, C13 to DK2-5a Line Cord	39Y7918	6213
Denmark 4.3m, 10A/250V, C13 to DK2-5a Line Cord	81Y2382	6575
Europe 2.8m, 10A/250V, C13 to CEE7-VII Line Cord	39Y7917	6212
Europe 4.3m, 10A/250V, C13 to CEE7-VII Line Cord	81Y2376	6572
India 2.8m, 10A/250V, C13 to IS 6538 Line Cord	39Y7927	6269
India 4.3m, 10A/250V, C13 to IS 6538 Line Cord	81Y2386	6567
Israel 2.8m, 10A/250V, C13 to SI 32 Line Cord	39Y7920	6218
Israel 4.3m, 10A/250V, C13 to SI 32 Line Cord	81Y2381	6579
Italy 2.8m, 10A/250V, C13 to CEI 23-16 Line Cord	39Y7921	6217
Italy 4.3m, 10A/250V, C13 to CEI 23-16 Line Cord	81Y2380	6493
Japan 2.8m, 12A/125V, C13 to JIS C-8303 Line cord	46M2593	A1RE
Japan 2.8m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08357	6533
Japan 4.3m, 12A/125V, C13 to JIS C-8303 Line Cord	39Y7926	6335
Japan 4.3m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08362	6495
Korea 2.8m, 12A/250V, C13 to KS C8305 Line Cord	39Y7925	6219
Korea 4.3m, 12A/250V, C13 to KS C8305 Line Cord	81Y2385	6494
South Africa 2.8m, 10A/250V, C13 to SABS 164 Line Cord	39Y7922	6214
South Africa 4.3m, 10A/250V, C13 to SABS 164 Line Cord	81Y2379	6576
Switzerland 2.8m, 10A/250V, C13 to SEV 1011-S24507 Line Cord	39Y7919	6216
Switzerland 4.3m, 10A/250V, C13 to SEV 1011-S24507 Line Cord	81Y2390	6578
Taiwan 2.8m, 10A/125V, C13 to CNS 10917-3 Line Cord	23R7158	6386
Taiwan 2.8m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2375	6317
Taiwan 2.8m, 15A/125V, C13 to CNS 10917-3 Line Cord	81Y2374	6402
Taiwan 4.3m, 10A/125V, C13 to CNS 10917-3 Line Cord	4L67A08363	AX8B
Taiwan 4.3m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2389	6531
Taiwan 4.3m, 15A/125V, C13 to CNS 10917-3 Line Cord	81Y2388	6530
United Kingdom 2.8m, 10A/250V, C13 to BS 1363/A Line Cord	39Y7923	6215
United Kingdom 4.3m, 10A/250V, C13 to BS 1363/A Line Cord	81Y2377	6577
United States 2.8m, 10A/125V, C13 to NEMA 5-15P Line Cord	90Y3016	6313
United States 2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord	46M2592	A1RF
United States 2.8m, 13A/125V, C13 to NEMA 5-15P Line Cord	00WH545	6401
United States 4.3m, 10A/125V, C13 to NEMA 5-15P Line Cord	4L67A08359	6370
United States 4.3m, 10A/250V, C13 to NEMA 6-15P Line Cord	4L67A08361	6373
United States 4.3m, 13A/125V, C13 to NEMA 5-15P Line Cord	4L67A08360	AX8A

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

Table 15. Power cables for DE Series 4U60 enclosures

Description	Part number	Feature code
Rack power cables		
2.0m, 16A/100-250V, C19 to IEC 320-C20 Rack Power Cable	None*	B4L2
2.5m, 16A/100-250V, C19 to IEC 320-C20 Rack Power Cable	39Y7916	6252
Line cords		
Argentina 4.3m, 16A/250V, C19 to IRAM 2073 Line Cord	40K9777	6276
Australia/New Zealand 4.3m, 15A/250V, C19 to AS/NZS 3112 Line Cord	40K9773	6284
Brazil 4.3m, 16A/250V, C19 to NBR 14136 Line Cord	40K9775	6277
China 4.3m, 16A/250V, C19 to GB2099.1 Line Cord	40K9774	6288
Denmark/Switzerland 4.3m, 16A/250V, C19 to IEC 309 P+N+G Line Cord	40K9769	6283
Europe 4.3m, 16A/250V, C19 to CEE7-VII Line Cord	40K9766	6279
India 4.3m, 16A/250V, C19 to IS6538 Line Cord	40K9776	6285
Israel 4.3m, 16A/250V, C19 to SI 32 Line Cord	40K9771	6282
Italy 4.3m, 16A/250V, C19 to CEI 23-16 Line Cord	40K9768	6281
Japan 4.3m, 15A/200V, C19 to JIS C-8303 Line Cord	41Y9233	6291
Korea 4.3m, 15A/250V, C19 to KSC 8305 Line Cord	41Y9231	6289
South Africa 4.3m, 16A/250V, C19 to SABS 164 Line Cord	40K9770	6280
Switzerland 4.3m, 16A/250V, C19 to SEV 1011 Line Cord	81Y2391	6549
Taiwan 4.3m, 16A/250V, C19 to CNS 10917-3 Line Cord	41Y9230	6287
United Kingdom 4.3m, 13A/250V, C19 to BS 1363/A Line Cord	40K9767	6278
United States 4.3m, 15A/250V, C19 to NEMA 6-15P Line Cord	00D7197	A1NV
United States 4.3m, 18A/250V, C19 to NEMA L6-20P Line Cord	40K9772	6275

* CTO only.

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 16. 4-post rack mount kits

Description	Feature code	Quantity
Lenovo ThinkSystem Storage Rack Mount Kit 2U12	B38X	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 17. 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
DE 4U Adjustable Rail Kit (SIR)	B742	1

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

Table 18. Rack mount kit features and specifications summary

Attribute	Screw-in fixed rail with adjustable depth			
	2U12	2U24/4U60	2U24 SIR	4U SIR
Feature code	B38X	B38Y	B6TH	B742
Enclosure support	DE120S	DE6600F and DE6600H 2U DE240S DE600S‡	DE6600F and DE6600H 2U DE240S	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 DE6600F and DE6600H 2U24 SFF enclosure:

- Height: 87 mm (3.4 in.)
- Width: 447 mm (17.6 in.)
- Depth: 543 mm (21.4 in.)

The ThinkSystem DE Series 2U24 SFF enclosures have the following dimensions:

- Height: 85 mm (3.3 in.)
- Width: 449 mm (17.7 in.)
- Depth: 553 mm (21.8 in.)

The ThinkSystem DE Series 2U12 LFF enclosures have the following dimensions:

- Height: 85 mm (3.3 in.)
- Width: 447 mm (17.6 in.)
- Depth: 483 mm (19.0 in.)

The ThinkSystem DE Series 4U60 LFF 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):

- DE6600F and DE6600H 2U24 SFF controller enclosure (7DB7): 25.07 kg (55.3 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)
- 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:
        - DE240S 2U24 SFF: 5 °C - 45 °C (41 °F - 113 °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:
    - 200 to 240 V AC (nominal); 50 Hz / 60 Hz
- Acoustical noise emission:
    - 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 19. Enclosure power load, inlet current, and heat output

Enclosure	Source voltage (nominal)	Maximum power load	Current per inlet	Heat output
DE6600F and DE6600H 2U24 SFF	200 - 220 V AC	1150 W	5.48 A	4030 BTU/hour
DE240S 2U24 SFF	200 - 240 V AC	382 W	2.02 A	1304 BTU/hour
DE120S 2U12 LFF	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 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 DE6600F and DE6600H Hybrid Storage Array supports attachment to Lenovo ThinkSystem, System x, and Flex System hosts by using SAS, iSCSI, Fibre Channel, NVMe over Fibre Channel (NVMe/FC), or NVMe over RoCE (RDMA over Converged Ethernet) (NVMe/RoCE) 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/rack#rt=product-guide

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. **How to Order DM and DE Services Through DCSC**
   2025-02-07 | 15 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

   Published: 2025-02-07
   Length: 15 minutes

   > **Start the training:**
   > Employee link: Grow@Lenovo
   > Partner link: Lenovo Partner Learning

   Course code: DSVC134r4

2. **Partner Technical Webinar - Cost Effective Storage Solutions**
   2025-01-14 | 60 minutes | Employees and Partners

   In this 60-minute replay, Lenovo Storage Architect, Dan Beins presented Lenovo's strategy, capabilities, and portfolio for Data Management. Dan did a super job going beyond the product feature / function and talking about where our products bring value to our customer's Data Management.

   Published: 2025-01-14
   Length: 60 minutes

   > **Start the training:**
   > Employee link: Grow@Lenovo
   > Partner link: Lenovo Partner Learning

   Course code: 011025

3. **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

   Published: 2024-10-15
   Length: 30 minutes

   > **Start the training:**
   > Employee link: Grow@Lenovo
   > Partner link: Lenovo Partner Learning

   Course code: DDMT100r2

4. **Lenovo Data Center Product Portfolio**
2024-05-29 | 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.

Published: 2024-05-29
Length: 20 minutes

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

Course code: SXXW1110r7

5. **VTT Data Management How to sell storage - April 2024**
2024-04-10 | 60 minutes | Employees Only

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?

Published: 2024-04-10
Length: 60 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DVDAT209

6. **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.

Published: 2024-03-25
Length: 40 minutes

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

Course code: DSOLO200

7. **ThinkSystem DE Series Portfolio Overview**
   2024-03-14 | 30 minutes | Employees and Partners

   This course builds on the Data Management Overview (DSTOO201) course by introducing you to the DE Series Portfolio.

   Course Objectives:
   By the end of 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
   • Use the qualifying questions to identify customer needs during conversations

   Published: 2024-03-14
   Length: 30 minutes

   > **Start the training:**
   > Employee link: Grow@Lenovo
   > Partner link: Lenovo Partner Learning

   Course code: DDEO201

8. **Data management Overview**
   2024-03-14 | 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 management portfolio
   3. Find out how data drives business value

   Published: 2024-03-14
   Length: 25 minutes

   > **Start the training:**
   > Employee link: Grow@Lenovo
   > Partner link: Lenovo Partner Learning

   Course code: DSTOO201

9. **Family Portfolio: Storage**
   2024-02-02 | 15 minutes | Employees and Partners

   This course covers products in the Lenovo storage portfolio, from storage servers to direct-access storage through storage systems.
   After completing this course about the Storage family, the learner will be able to identify products within the family, describe the features of this product family, and recognize when a specific product should be selected.

   Published: 2024-02-02
   Length: 15 minutes

   > **Start the training:**
   > Employee link: Grow@Lenovo
   > Partner link: Lenovo Partner Learning

   Course code: SXSW1201r16

10. **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

Published: 2024-02-01
Length: 12 minutes

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

Course code: DDET200r2

11. **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.

Published: 2023-10-03
Length: 10 minutes

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

Course code: DSTOO200

12. **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%.

Published: 2023-10-02
Length: 30 minutes

Start the training:
Partner link: Lenovo Partner Learning

Course code: DDMT101

13. **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.

Published: 2023-09-28
Length: 10 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DDET207

14. **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

Published: 2023-09-28
Length: 23 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DDET202

15. **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

Published: 2023-09-28
Length: 15 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DDET203

16. **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.

    Published: 2023-09-27
    Length: 20 minutes

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

    Course code: DSTOO100

17. **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.

    Published: 2023-09-21
    Length: 28 minutes

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

    Course code: DDET204

18. **VTT: SAP HANA Transition and Refresh Opportunity - July 2023**
    2023-07-14 | 60 minutes | Employees Only

    In this session, we cover:
    - What Next for SAP Clients?
    - Lenovo Opportunity
    - Lenovo Portfolio for SAP Solutions
    - RISE with SAP

    Published: 2023-07-14
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo

    Course code: DVDAT202

19. **Lenovo ThinkSystem DM and DE Series Overview**
    2023-02-15 | 25 minutes | Employees and Partners

    This course focuses on enabling you to identify current business and technology challenges for your customers and position the ThinkSystem DM and DE series products, based on the needs of your customers.
    The main objectives are:
    • Identify current business and technology challenges for your customers
    • Position the Lenovo ThinkSystem DM and DE Series products based on the needs of your customers

    Published: 2023-02-15
    Length: 25 minutes

    > **Start the training:**
    > Employee link: Grow@Lenovo
    > Partner link: Lenovo Partner Learning

    Course code: DDMO101r5

20. **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

    Published: 2022-09-15
    Length: 15 minutes

    > **Start the training:**
    > Employee link: Grow@Lenovo
    > Partner link: Lenovo Partner Learning

    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 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
- External Storage
- Lenovo SAN Storage

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