

## Lenovo ThinkSystem DE4000F All Flash Storage Array Product Guide

Lenovo ThinkSystem DE4000F is a scalable, all flash entry-level storage system that is designed to provide performance, simplicity, capacity, security, and high availability for medium 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 DE4000F is a perfect fit for a wide range of enterprise workloads, including big data and analytics, video surveillance, technical computing, and other storage I/O-intensive applications.

ThinkSystem DE4000F models are available in a 2U rack form-factor with 24 small form-factor (2.5-inch SFF) drives (2U24 SFF) and include two controllers, each with 32 GB cache for a system total of 64 GB. Universal 1/10 Gb iSCSI or 4/8/16 Gb Fibre Channel (FC) ports provide base host connectivity, and the host interface cards provide additional 1/10 Gb iSCSI or 4/8/16 Gb FC, 12 Gb SAS, 10/25 Gb iSCSI, or 8/16/32 Gb FC connections.

The ThinkSystem DE4000F Storage Array scales up to 120 solid-state drives (SSDs) with the attachment of Lenovo ThinkSystem DE240S 2U24 SFF Expansion Enclosures.

The Lenovo ThinkSystem DE4000F 2U24 SFF enclosure is shown in the following figure.



Figure 1. Lenovo ThinkSystem DE4000F 2U24 SFF enclosure

### Did you know?

The ThinkSystem DE4000F scales up to 1.84 PB of raw storage capacity.

The ThinkSystem DE4000F offers block storage connectivity 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 at the same time.

For the ThinkSystem DE4000F, customers can change the host port protocol from FC to iSCSI or from iSCSI to FC for the SFP+ host ports built into the controller (base host ports), or the universal SFP+ host ports on the host interface card (HIC ports), or for all SFP+ base and universal HIC ports.

## Key features

The ThinkSystem DE4000F offers the following key features and benefits:

- All-flash array capabilities to meet 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.
- Scalable entry-level storage with dual active/active controller configurations with 32 GB cache 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 at the same time.
- 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.
- Scalability to up to 120 SFF drives with the attachment of up to four ThinkSystem DE240S 2U24 SFF expansion enclosures to satisfy growing needs for storage capacity and performance.
- Rich set of storage management functions comes with the system, including Dynamic Disk Pools, snapshots, volume copy, thin provisioning, and asynchronous mirroring.
- Optional synchronous mirroring licensed function 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 following solid-state 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
- High performance SSDs (3 DWD): 800 GB, 1.6 TB
- High performance self-encrypting FIPS SSDs (3 DWD): 1.6 TB

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 four ThinkSystem DE240S 2U24 SFF expansion enclosures are supported by a single ThinkSystem DE4000F 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 DE4000F 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 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 DE4000F and DE240S 2U SFF enclosures.

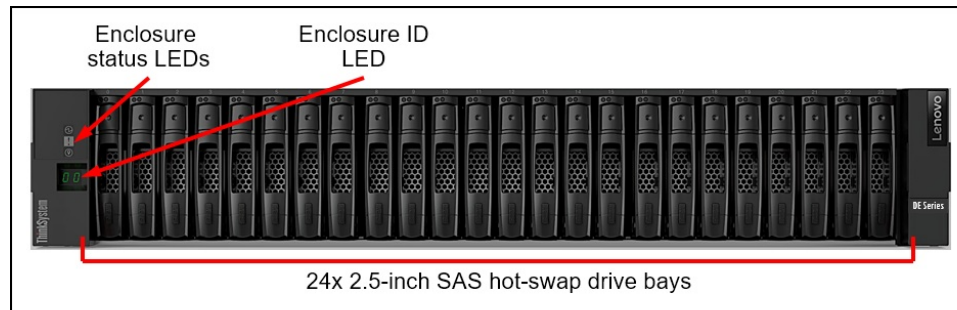


Figure 2. ThinkSystem DE4000F and DE240S 2U SFF enclosures front view

The front of the ThinkSystem DE4000F 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 rear of the ThinkSystem DE4000F 2U controller enclosure.

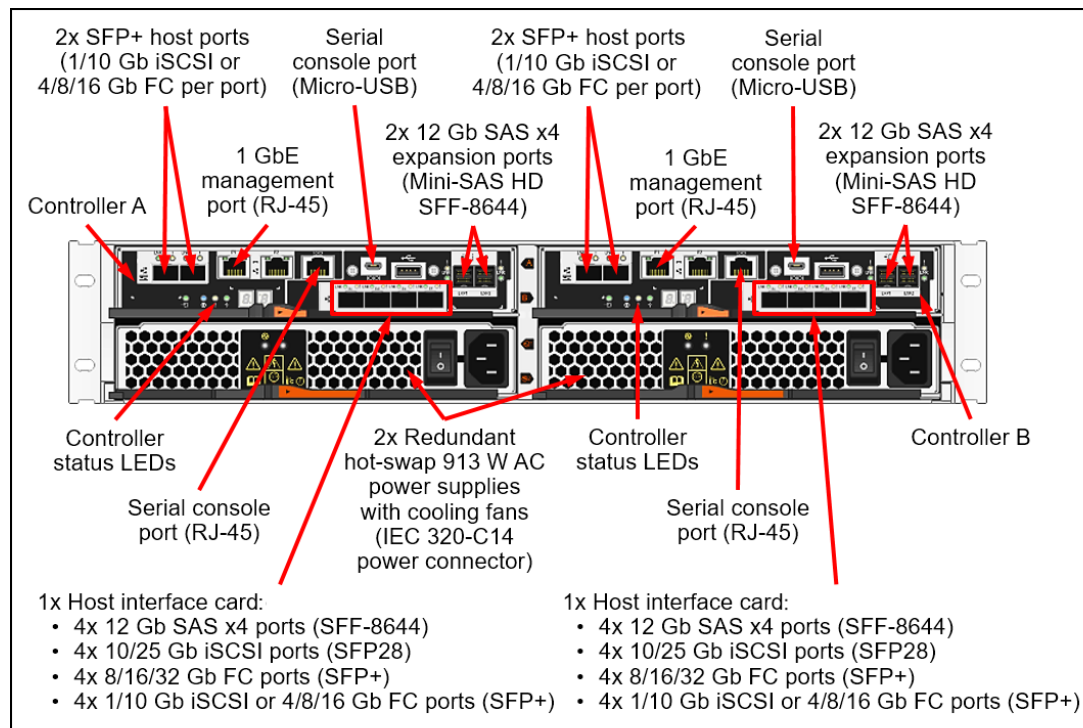


Figure 3. ThinkSystem DE4000F 2U controller enclosure rear view

The rear of the ThinkSystem DE4000F 2U controller enclosure includes the following components:

- Two redundant hot-swap controllers, each with the following ports:
  - Two SFP+ base host ports for 1/10 Gb iSCSI or 4/8/16 Gb FC connectivity.
  - One slot for the host interface card (a host interface card is required):
    - Four 12 Gb SAS x4 host ports (Mini-SAS HD SFF-8644).
    - Four 10/25 Gb iSCSI host ports (SFP28).
    - Four 8/16/32 Gb FC host ports (SFP+).
    - Four 1/10 Gb iSCSI or 4/8/16 Gb FC host ports (SFP+).
  - 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 2U expansion enclosure.

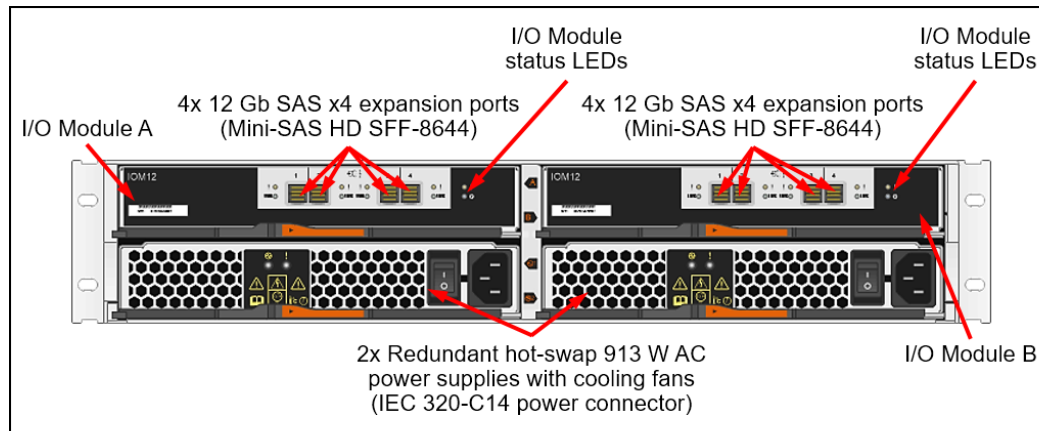


Figure 4. ThinkSystem DE240S 2U expansion enclosure rear view

The rear of the ThinkSystem DE240S 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 DE4000F 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 DE4000F that can be found at:

<http://datacentersupport.lenovo.com>

Table 1. ThinkSystem DE4000F system specifications

| Attribute                    | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Form factor                  | <ul style="list-style-type: none"> <li>DE4000F 2U24 SFF controller enclosure (Machine Type 7Y76): 2U rack mount.</li> <li>DE240S 2U24 SFF expansion enclosure (Machine Type 7Y68): 2U rack mount.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Controller configuration     | Dual active-active controller configuration with automatic load balancing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| RAID levels                  | RAID 0, 1, 3, 5, 6, and 10; Dynamic Disk Pools.<br><b>Note:</b> RAID 3 can be configured only through the CLI.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Controller cache             | 64 GB per system (32 GB per controller). Cache mirroring between the controllers. Flash-backed cache protection (includes battery for destaging to flash).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Drive bays                   | Up to 120 hot-swap drive bays with up to five 2U24 SFF enclosures per system (Controller unit with up to four expansion units).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Drive technology             | <ul style="list-style-type: none"> <li>12 Gb SAS SSDs and FIPS SSDs.</li> <li>Intermix of FIPS drives and non-FIPS drives is supported within a system.</li> <li>Intermix of FIPS drives and non-FIPS drives is <i>not</i> supported within a volume group or disk pool.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Drive expansion connectivity | <ul style="list-style-type: none"> <li>2x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two controllers in the controller enclosure for the attachment of the expansion enclosures.</li> <li>4x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two I/O modules in the expansion enclosure for the attachment to the controller enclosure and daisy chaining of the expansion enclosures.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Drives                       | SFF drives: <ul style="list-style-type: none"> <li>3.84 TB, 7.68 TB, and 15.36 TB SAS SSDs (1 DWD)</li> <li>800 GB, 1.6 TB SAS SSDs (3 DWD)</li> <li>1.6 TB SAS FIPS SSDs (3 DWD)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Storage capacity             | Up to 1.84 PB (120x 15.36 TB SAS SSDs).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Host connectivity            | Base ports (per controller enclosure with two controllers): <ul style="list-style-type: none"> <li>4x 1/10 Gb iSCSI (RJ-45 [1 Gb iSCSI only], DAC, or SW fiber optics [LC]) or 4/8/16 Gb FC (SW fiber optics [LC]) SFP+ host ports (2 ports per controller)</li> </ul> Additional ports on host interface cards (per controller enclosure with two controllers): <ul style="list-style-type: none"> <li>8x 12 Gb SAS host ports (Mini-SAS HD, SFF-8644) (4 ports per controller)</li> <li>8x 10/25 Gb iSCSI SFP28 host ports (DAC or SW fiber optics [LC]) (4 ports per controller)</li> <li>8x 8/16/32 Gb FC SFP+ host ports (SW fiber optics [LC]) (4 ports per controller)</li> <li>8x 1/10 Gb iSCSI (RJ-45 [1 Gb iSCSI only], DAC, or SW fiber optics [LC]) or 4/8/16 Gb FC (SW fiber optics [LC]) SFP+ host ports (4 ports per controller)</li> </ul> <b>Note:</b> Two host interface cards are required for selection (one per controller). |

| Attribute                  | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host operating systems     | Microsoft Windows Server 2012 R2, 2016, and 2019; Red Hat Enterprise Linux (RHEL) 6, 7, and 8; SUSE Linux Enterprise Server (SLES) 11, 12, and 15; VMware vSphere 6.5, 6.7, and 7.0.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Standard software features | Dynamic Disk Pools, snapshots (up to 512 targets), volume copy, thin provisioning (DDP only), data assurance, and asynchronous mirroring.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Optional software features | Synchronous mirroring.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Performance*               | <ul style="list-style-type: none"> <li>Up to 300 000 random read IOPS (4 KB blocks).</li> <li>Up to 109 000 random write IOPS (4 KB blocks).</li> <li>Up to 9.2 GBps sequential read throughput (64 KB blocks).</li> <li>Up to 2.7 GBps sequential write throughput (64 KB blocks).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                      |
| Configuration maximums**   | <ul style="list-style-type: none"> <li>Maximum storage capacity: 1.84 PB</li> <li>Maximum number of logical volumes: 512</li> <li>Maximum logical volume size: 2 PB</li> <li>Maximum thin-provisioned logical volume size (DDP only): 256 TB</li> <li>Maximum number of drives in a RAID volume group: <ul style="list-style-type: none"> <li>RAID 0, 1/10: 120</li> <li>RAID 3, 5, 6: 30</li> </ul> </li> <li>Maximum number of DDP arrays: 20</li> <li>Maximum number of drives in a DDP array: 120 (11 drives minimum)</li> <li>Maximum number of hosts: 256</li> <li>Maximum number of snapshots: 512</li> <li>Maximum number of mirroring pairs: 32</li> </ul> |
| 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+/SFP28 transceivers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Management ports           | <ul style="list-style-type: none"> <li>1x 1 GbE port (UTP, RJ-45) per controller for out-of-band management.</li> <li>2x Serial console ports (RJ-45 and Micro-USB) for system configuration.</li> <li>In-band management via I/O path.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Management interfaces      | System Manager web-based GUI; SAN Manager standalone GUI; SSH CLI; Serial console CLI; SMI-S Provider; 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                 | <ul style="list-style-type: none"> <li>Height: 85 mm (3.4 in.)</li> <li>Width: 449 mm (17.7 in.)</li> <li>Depth: 553 mm (21.8 in.)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Weight                     | 27.6 kg (60.8 lb) (Fully configured)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

\* Estimated performance based on internal measurements.

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

<http://datacentersupport.lenovo.com>

## Controller enclosures

The following table lists the relationship models of the ThinkSystem DE4000F All Flash Storage Array.

Table 2. ThinkSystem DE4000F relationship models

| Description                                                                                                                                    | Part number |                |                         |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------|-------------------------|
|                                                                                                                                                | Japan       | European Union | Other markets worldwide |
| Lenovo ThinkSystem DE4000F SAS All Flash Array SFF (64 GB cache, 4x 16 Gb FC base ports [no SFPs], 8x 12 Gb SAS HIC ports)                     | 7Y76A008JP  | 7Y76A00BEA     | 7Y76A005WW              |
| Lenovo ThinkSystem DE4000F FC All Flash Array SFF (64 GB cache, 4x 16 Gb FC base ports [no SFPs], 8x 16 Gb FC HIC ports [no SFPs])             | 7Y76A009JP  | 7Y76A00CEA     | 7Y76A006WW              |
| Lenovo ThinkSystem DE4000F iSCSI All Flash Array SFF (64 GB cache, 4x 10 Gb iSCSI base ports [no SFPs], 8x 10/25 Gb iSCSI HIC ports [no SFPs]) | 7Y76A00AJP  | 7Y76A00DEA     | 7Y76A007WW              |

The following table lists the CTO base models for the ThinkSystem DE4000F.

Table 3. ThinkSystem DE4000F CTO base models

| Description                                            | Machine Type/Model | Feature code |
|--------------------------------------------------------|--------------------|--------------|
| Lenovo ThinkSystem Storage 2U24 Chassis (with 2x PSUs) | 7Y76CTO1WW         | B38L         |

### Configuration notes:

- For Relationship models, two DE4000 controllers (feature code B4BB) are included in the model configuration.
- For CTO models, two DE4000 controllers (feature code B4BB) are selected by default in the configurator, and the selection cannot be changed.

The models of the ThinkSystem DE4000F 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:
  - Relationship models listed in this section: 1.5 m, 10A/100-250V, C13 to IEC 320-C14 rack power cables
  - CTO models: Customer-configured power cables

**Note:** The Relationship models of the ThinkSystem DE4000F listed in this section ship without SFP+/SFP28 optical transceivers or DAC cables; they should be purchased for the system (see [Controllers](#) for details).

## Controllers

The ThinkSystem DE4000F controller enclosures ship with two DE4000 controllers. A *controller* provides interfaces for host connectivity, management, and internal drives, and it runs storage management software. Each DE4000 controller ships with 32 GB cache for a system total of 64 GB.

The ThinkSystem DE4000F controller enclosures ship with four universal ports (two ports per controller) for 1/10 Gb iSCSI or 4/8/16 Gb FC host connectivity. Each controller also has one expansion slot for a host interface card (HIC).

The following host interfaces can be added to the ThinkSystem DE4000F controller enclosures with HICs:

- 8x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) ports (4 ports per HIC) for SAS connectivity
- 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 1/10 Gb iSCSI or 4/8/16 Gb FC SFP+ ports (4 ports per HIC) for iSCSI or FC connectivity (require transceivers or DAC cables [10 Gb iSCSI only] that should be purchased for the HICs)
- 8x 8/16/32 Gb FC SFP+ ports (4 ports per HIC) for FC connectivity (require optical transceivers that should be purchased for the HICs)

Each DE4000 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 cache size, 32 GB.
- Two host interface cards are required for selection (one per controller).
- All four SFP+ base ports in the system must have the same connectivity type (either iSCSI or FC, but not both types) and the same type of SFP+ media (either optical transceivers or DAC cables, but not both types).
- Both controllers must have the same type of the host interface card installed (12 Gb SAS SFF-8644, 10 Gb iSCSI / 16 Gb FC SFP+, 10/25 Gb iSCSI SFP28, or 32 Gb FC SFP+), and both cards must have SFP+/SFP28 media of the same type (either optical transceivers or DAC cables, but not both types).

The following table lists the supported host port configurations for the ThinkSystem DE4000F controller enclosures (each row in the table represents a supported combination of the host ports).

Table 4. ThinkSystem DE4000F host port configurations

| Port type and total number of ports  |                                         |                        |                      |
|--------------------------------------|-----------------------------------------|------------------------|----------------------|
| 12 Gb SAS (SFF-8644)                 | 1/10 Gb iSCSI (SFP+) or 16 Gb FC (SFP+) | 10/25 Gb iSCSI (SFP28) | 32 Gb FC (SFP+)      |
| Base ports with additional HIC ports |                                         |                        |                      |
| -                                    | 12 (6 per controller)                   | -                      | -                    |
| 8 (4 per controller)                 | 4 (2 per controller)                    | -                      | -                    |
| -                                    | 4 (2 per controller)                    | 8 (4 per controller)   | -                    |
| -                                    | 4 (2 per controller)                    | -                      | 8 (4 per controller) |



The following table lists the DE4000F controller and supported connectivity options.

Table 5. DE4000F controller and connectivity options

| Description                                                                                    | Part number | Feature code | Maximum quantity per controller enclosure |
|------------------------------------------------------------------------------------------------|-------------|--------------|-------------------------------------------|
| <b>Controllers</b>                                                                             |             |              |                                           |
| Lenovo ThinkSystem DE4000 Controller 32GB                                                      | None*       | B88D         | 2                                         |
| <b>Host interface cards</b>                                                                    |             |              |                                           |
| Lenovo ThinkSystem DE4000 HIC, 12Gb SAS, 4 ports                                               | 4C57A14367  | B4B8         | 2                                         |
| Lenovo ThinkSystem DE4000 HIC, 10/25GbE iSCSI, 4 ports                                         | 4C57A14369  | B4BA         | 2                                         |
| Lenovo ThinkSystem DE4000 HIC, 16Gb FC/10GbE, 4 ports                                          | 4C57A14366  | B4B7         | 2                                         |
| Lenovo ThinkSystem DE4000 HIC, 32Gb FC, 4 ports                                                | 4C57A14368  | B4B9         | 2                                         |
| <b>SFP+ options for base ports and 10 Gb iSCSI / 16 Gb FC host interface card</b>              |             |              |                                           |
| 1Gb RJ-45 iSCSI SFP+ Module (1-pack)                                                           | 4XF7A14917  | B4K7         | 12                                        |
| Lenovo 10Gb iSCSI/16Gb FC Universal SFP+ Module                                                | 4M17A13527  | B4B2         | 12                                        |
| <b>SFP28 options for 10/25 Gb iSCSI host interface card</b>                                    |             |              |                                           |
| Lenovo 10/25GbE iSCSI SFP28 Module                                                             | 4M17A13529  | B4B4         | 8                                         |
| <b>SFP+ options for 32 Gb FC host interface card</b>                                           |             |              |                                           |
| Lenovo 32Gb FC SFP+ Transceiver                                                                | 4M17A13528  | B4B3         | 8                                         |
| <b>OM4 cable options for 16/32 Gb FC and 10/25 Gb iSCSI SW SFP+/SFP28 optical transceivers</b> |             |              |                                           |
| Lenovo 0.5m LC-LC OM4 MMF Cable                                                                | 4Z57A10845  | B2P9         | 12                                        |
| Lenovo 1m LC-LC OM4 MMF Cable                                                                  | 4Z57A10846  | B2PA         | 12                                        |
| Lenovo 3m LC-LC OM4 MMF Cable                                                                  | 4Z57A10847  | B2PB         | 12                                        |
| Lenovo 5m LC-LC OM4 MMF Cable                                                                  | 4Z57A10848  | B2PC         | 12                                        |
| Lenovo 10m LC-LC OM4 MMF Cable                                                                 | 4Z57A10849  | B2PD         | 12                                        |
| Lenovo 15m LC-LC OM4 MMF Cable                                                                 | 4Z57A10850  | B2PE         | 12                                        |
| Lenovo 25m LC-LC OM4 MMF Cable                                                                 | 4Z57A10851  | B2PF         | 12                                        |
| Lenovo 30m LC-LC OM4 MMF Cable                                                                 | 4Z57A10852  | B2PG         | 12                                        |
| <b>OM3 cable options for 16/32 Gb FC and 10/25 Gb iSCSI SW SFP+/SFP28 optical transceivers</b> |             |              |                                           |
| Lenovo 0.5m LC-LC OM3 MMF Cable                                                                | 00MN499     | ASR5         | 12                                        |
| Lenovo 1m LC-LC OM3 MMF Cable                                                                  | 00MN502     | ASR6         | 12                                        |
| Lenovo 3m LC-LC OM3 MMF Cable                                                                  | 00MN505     | ASR7         | 12                                        |
| Lenovo 5m LC-LC OM3 MMF Cable                                                                  | 00MN508     | ASR8         | 12                                        |
| Lenovo 10m LC-LC OM3 MMF Cable                                                                 | 00MN511     | ASR9         | 12                                        |
| Lenovo 15m LC-LC OM3 MMF Cable                                                                 | 00MN514     | ASRA         | 12                                        |
| Lenovo 25m LC-LC OM3 MMF Cable                                                                 | 00MN517     | ASRB         | 12                                        |
| Lenovo 30m LC-LC OM3 MMF Cable                                                                 | 00MN520     | ASRC         | 12                                        |
| <b>DAC cable options for 10 Gb iSCSI SFP+ host connectivity (base ports and iSCSI HICs)</b>    |             |              |                                           |
| 0.5m Passive DAC SFP+ Cable                                                                    | 00D6288     | A3RG         | 12                                        |
| 1m Passive DAC SFP+ Cable                                                                      | 90Y9427     | A1PH         | 12                                        |
| 1.5m Passive DAC SFP+ Cable                                                                    | 00AY764     | A51N         | 12                                        |

| Description                                                                  | Part number | Feature code | Maximum quantity per controller enclosure |
|------------------------------------------------------------------------------|-------------|--------------|-------------------------------------------|
| 2m Passive DAC SFP+ Cable                                                    | 00AY765     | A51P         | 12                                        |
| 3m Passive DAC SFP+ Cable                                                    | 90Y9430     | A1PJ         | 12                                        |
| 5m Passive DAC SFP+ Cable                                                    | 90Y9433     | A1PK         | 12                                        |
| 7m Passive DAC SFP+ Cable                                                    | 00D6151     | A3RH         | 12                                        |
| DAC cable options for 25 Gb iSCSI SFP28 host connectivity (iSCSI HICs)       |             |              |                                           |
| Lenovo 1m Passive 25G SFP28 DAC Cable                                        | 7Z57A03557  | AV1W         | 8                                         |
| SAS host connectivity cables: Mini-SAS HD (controller) to Mini-SAS HD (host) |             |              |                                           |
| 0.5m External MiniSAS HD 8644/MiniSAS HD 8644 Cable                          | 00YL847     | AU16         | 8                                         |
| 1m External MiniSAS HD 8644/MiniSAS HD 8644 Cable                            | 00YL848     | AU17         | 8                                         |
| 2m External MiniSAS HD 8644/MiniSAS HD 8644 Cable                            | 00YL849     | AU18         | 8                                         |
| 3m External MiniSAS HD 8644/MiniSAS HD 8644 Cable                            | 00YL850     | AU19         | 8                                         |
| 1 GbE management ports                                                       |             |              |                                           |
| 0.75m Green Cat6 Cable                                                       | 00WE123     | AVFW         | 2                                         |
| 1.0m Green Cat6 Cable                                                        | 00WE127     | AVFX         | 2                                         |
| 1.25m Green Cat6 Cable                                                       | 00WE131     | AVFY         | 2                                         |
| 1.5m Green Cat6 Cable                                                        | 00WE135     | AVFZ         | 2                                         |
| 3m Green Cat6 Cable                                                          | 00WE139     | AVG0         | 2                                         |
| 10m Green Cat6 Cable                                                         | 90Y3718     | A1MT         | 2                                         |
| 25m Green Cat6 Cable                                                         | 90Y3727     | A1MW         | 2                                         |

\* Factory-installed only.

## Expansion enclosures

The ThinkSystem DE4000F supports attachment of up to three ThinkSystem DE240S 2U24 SFF expansion enclosures. The expansion enclosures can be added to the system non-disruptively.

The following table lists the relationship models of the supported ThinkSystem DE240S expansion enclosures.

Table 6. ThinkSystem DE240S relationship models

| Description                                            | Part number    |            |                         |
|--------------------------------------------------------|----------------|------------|-------------------------|
|                                                        | European Union | Japan      | Other markets worldwide |
| Lenovo ThinkSystem DE240S 2U24 SFF Expansion Enclosure | 7Y68A004EA     | 7Y681001JP | 7Y68A000WW              |

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

Table 7. ThinkSystem DE240S TopSeller models: Brazil and Latin America

| Description                                                        | Part number   |            |
|--------------------------------------------------------------------|---------------|------------|
|                                                                    | Latin America | Brazil     |
| Lenovo ThinkSystem DE240S 2U24 SFF Expansion Enclosure (TopSeller) | 7Y681002LA    | 7Y681002BR |

The following table lists the CTO base models for the ThinkSystem DE240S expansion enclosures.

Table 8. ThinkSystem DE240S CTO base models

| Description                                            | Machine Type/Model | Feature code |
|--------------------------------------------------------|--------------------|--------------|
| Lenovo ThinkSystem Storage 2U24 Chassis (with 2x PSUs) | 7Y68CTO1WW         | B38L         |

**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 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 6 and 7)
- Rack Mount Kit
- *Quick Installation Guide*
- *Electronic Publications Flyer*
- Two power cables:
  - Models listed in Tables 6 and 7: 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 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 DE4000F 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.

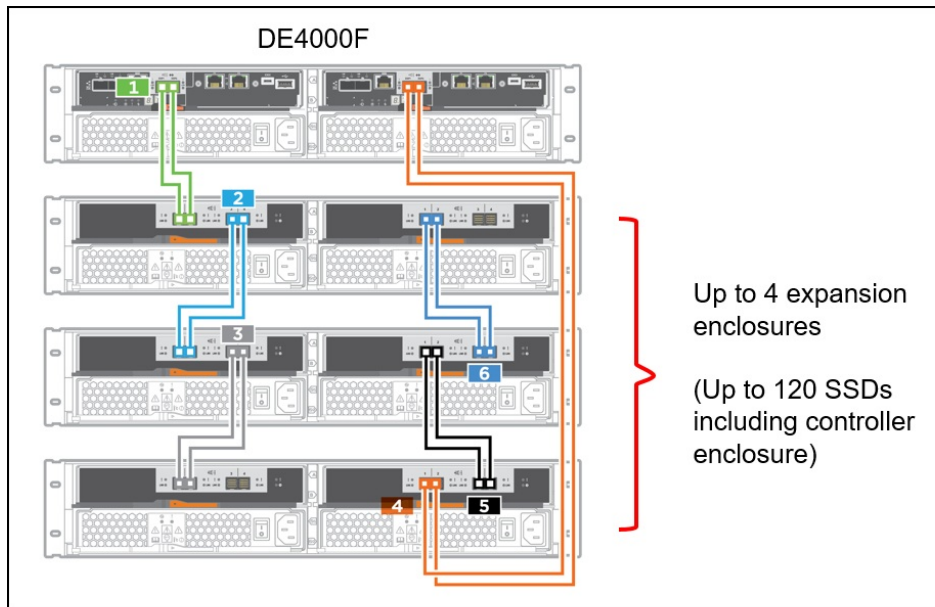


Figure 5. DE Series expansion enclosure connectivity topology

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

Table 9. 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         | 4                                    |
| External MiniSAS HD 8644/MiniSAS HD 8644 1M Cable   | 00YL848     | AU17         | 4                                    |
| External MiniSAS HD 8644/MiniSAS HD 8644 2M Cable   | 00YL849     | AU18         | 4                                    |
| External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable   | 00YL850     | AU19         | 4                                    |

**Configuration notes:**

- The Relationship and TopSeller models of the ThinkSystem DE240S 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. The following tables list supported drive options for the 2U24 SFF controller and expansion enclosures.

Table 10. 2U24 SFF drive options

| Description                                                                 | Part number | Feature code | Maximum quantity per 2U24 SFF enclosure |
|-----------------------------------------------------------------------------|-------------|--------------|-----------------------------------------|
| 2.5-inch 12 Gbps SAS hot-swap SSDs (1 Drive Write per Day)                  |             |              |                                         |
| Lenovo ThinkSystem DE Series 3.84TB 1DWD 2.5" SSD 2U24                      | 4XB7A14173  | B4RX         | 24                                      |
| Lenovo ThinkSystem DE Series 7.68TB 1DWD 2.5" SSD 2U24                      | 4XB7A14176  | B4RY         | 24                                      |
| Lenovo ThinkSystem DE Series 15.36TB 1DWD 2.5" SSD 2U24                     | 4XB7A14110  | B4CD         | 24                                      |
| 2.5-inch 12 Gbps SAS hot-swap SSDs (3 Drive Writes per Day)                 |             |              |                                         |
| Lenovo ThinkSystem DE Series 800GB 3DWD 2.5" SSD 2U24                       | 4XB7A14105  | B4BT         | 24                                      |
| Lenovo ThinkSystem DE Series 1.6TB 3DWD 2.5" SSD 2U24                       | 4XB7A14106  | B4BU         | 24                                      |
| 2.5-inch 12 Gbps SAS hot-swap FIPS SSDs (SED SSDs) (3 Drive Writes per Day) |             |              |                                         |
| Lenovo ThinkSystem DE Series 1.6TB 3DWD 2.5" SSD FIPS 2U24                  | 4XB7A14107  | B4BV         | 24                                      |

Table 11. 2U24 SFF drive pack options

| Description                                                                 | Part number | Feature code | Maximum quantity per 2U24 SFF enclosure |
|-----------------------------------------------------------------------------|-------------|--------------|-----------------------------------------|
| 2.5-inch 12 Gbps SAS hot-swap SSDs (1 Drive Write per Day)                  |             |              |                                         |
| Lenovo ThinkSystem DE4000F 46.08TB SSD Pack (12x 3.84TB SSDs)               | 4XB7A14174  | B4RV         | 2                                       |
| Lenovo ThinkSystem DE4000F 92.16TB SSD Pack (12x 7.68TB SSDs)               | 4XB7A14238  | B4RW         | 2                                       |
| 2.5-inch 12 Gbps SAS hot-swap SSDs (3 Drive Writes per Day)                 |             |              |                                         |
| Lenovo ThinkSystem DE4000F 9.6TB SSD Pack (12x 800GB SSDs)                  | 4XB7A14157  | B4D5         | 2                                       |
| Lenovo ThinkSystem DE4000F 19.2TB SSD Pack (12x 1.6TB SSDs)                 | 4XB7A14240  | B4SA         | 2                                       |
| 2.5-inch 12 Gbps SAS hot-swap FIPS SSDs (SED SSDs) (3 Drive Writes per Day) |             |              |                                         |
| Lenovo ThinkSystem DE4000F 19.2TB FIPS Pack (12x 1.6TB FIPS SSDs)           | 4XB7A14159  | B4D7         | 2                                       |

### Configuration notes:

- Intermix of FIPS drives and non-FIPS drives is supported within the system.
- FIPS drives are not available in the following countries:
  - Belarus
  - Kazakhstan
  - People's Republic of China
  - Russia

## Software

The following functions are included with every ThinkSystem DE4000F:

- **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.
- **Thin provisioning**: Optimizes efficiency of Dynamic Disk Pools by allocating storage space based on the minimum space required by each application at any given time, so that applications consume only the space they are actually using, not the total space that has been allocated to them, which allows customers to purchase storage they need today and add more as application requirements grow.
- **Snapshots**: Enables creation of copies of data for backup, parallel processing, testing, and development, and have the copies available almost immediately (up to 512 snapshot targets per system).
- **Encryption**: Provides encryption for data at rest for enhanced data security with the optional FIPS 140-2 Level 2 drives and embedded key management (AES-256) or an external key management server.
- **Automatic load balancing**: Provides automated I/O workload balancing of I/O traffic from the hosts across both controllers.
- **Data assurance**: Ensures industry-standard T10-PI end-to-end data integrity in the storage system (from the host ports to the drives).
- **Dynamic volume and capacity expansion**: Allows the capacity of a volume to be expanded by adding new physical drives or making use of unused space on existing drives.
- **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).

The ThinkSystem DE4000F capabilities can be expanded with the optional synchronous mirroring licensed function. **Synchronous mirroring** provides storage system-based online, real-time data replication between the storage systems containing primary (local) and secondary (remote) volumes by using synchronous data transfers over Fibre Channel communication links (both storage systems must have licenses for synchronous mirroring).

**Note:** The synchronous and asynchronous mirroring features of the ThinkSystem DE4000F interoperate with other ThinkSystem DE Series storage arrays.

The following table lists the Feature on Demand (FoD) upgrades for the ThinkSystem DE4000F to enable optional software features. Each optional DE4000F function is licensed on a per-system basis and covers both controller enclosure and all attached expansion enclosures.

Table 12. Optional software features

| Description                                     | Part number | Feature code |
|-------------------------------------------------|-------------|--------------|
| Lenovo ThinkSystem DE4000 Synchronous Mirroring | 4ZN7A16002  | B598         |

Software maintenance is included in the ThinkSystem DE4000F 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 ThinkSystem DE4000F supports the following management interfaces:

- Lenovo 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 (Microsoft Internet Explorer, Google Chrome, or Mozilla Firefox), so there is no need for a separate console or plug-in.
- Lenovo SAN Manager, a host-installed GUI-based application, for centralized management of multiple storage systems.
- Command line interface (CLI) via SSH or through serial console.
- Syslog, SNMP, and e-mail notifications.
- Optional Lenovo XClarity for discovery, inventory, and monitoring.

## Power supplies and cables

The ThinkSystem DE Series 2U24 SFF 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 models of the ThinkSystem DE4000F 2U24 SFF and DE240S 2U24 SFF 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 enclosures (two power cords per enclosure).

Table 13. Power cables for DE Series 2U24 SFF enclosures

| Description                                                        | Part number | Feature code |
|--------------------------------------------------------------------|-------------|--------------|
| <b>Rack power cables</b>                                           |             |              |
| 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         |
| <b>Line cords</b>                                                  |             |              |
| 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         |

| <b>Description</b>                                           | <b>Part number</b> | <b>Feature code</b> |
|--------------------------------------------------------------|--------------------|---------------------|
| Brazil 2.8m, 10A/250V, C13 to NBR 14136 Line Cord            | 69Y1988            | 6532                |
| Brazil 4.3m, 10A/250V, C13 to NBR14136 Line Cord             | 81Y2387            | 6404                |
| China 2.8m, 10A/250V, C13 to GB 2099.1 Line Cord             | 39Y7928            | 6210                |
| China 4.3m, 10A/250V, C13 to GB 2099.1 Line Cord             | 81Y2378            | 6580                |
| Denmark 2.8m, 10A/250V, C13 to DK2-5a Line Cord              | 39Y7918            | 6213                |
| Denmark 4.3m, 10A/250V, C13 to DK2-5a Line Cord              | 81Y2382            | 6575                |
| Europe 2.8m, 10A/250V, C13 to CEE7-VII Line Cord             | 39Y7917            | 6212                |
| Europe 4.3m, 10A/250V, C13 to CEE7-VII Line Cord             | 81Y2376            | 6572                |
| India 2.8m, 10A/250V, C13 to IS 6538 Line Cord               | 39Y7927            | 6269                |
| India 4.3m, 10A/250V, C13 to IS 6538 Line Cord               | 81Y2386            | 6567                |
| Israel 2.8m, 10A/250V, C13 to SI 32 Line Cord                | 39Y7920            | 6218                |
| 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                |



## Rack installation

The individually shipped ThinkSystem DE Series 2U24 enclosures ship with the ThinkSystem Storage Rack Mount Kit 2U24/4U60 listed in the following table.

Table 14. 4-post rack mount kit

| Description                                         | Feature code | Quantity |
|-----------------------------------------------------|--------------|----------|
| 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 15. 4-post SIR rack mount kits

| Description                                                         | Feature code | Quantity |
|---------------------------------------------------------------------|--------------|----------|
| Lenovo ThinkSystem Storage SIR Rack Mount Kit (for 2U24 enclosures) | B6TH         | 1        |

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

Table 16. Rack mount kit features and specifications summary

| Attribute                                                     | Screw-in fixed rail with adjustable depth       |                                                 |
|---------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
|                                                               | 2U24/4U60                                       | 2U24 SIR                                        |
| Feature code                                                  | B38Y                                            | B6TH                                            |
| Enclosure support                                             | DE4000F<br>DE240S                               | DE4000F<br>DE240S                               |
| Rail type                                                     | Fixed (static) with adjustable depth            | Fixed (static) with adjustable depth            |
| Tool-less installation                                        | No                                              | No                                              |
| In-rack maintenance                                           | Yes*                                            | Yes*                                            |
| Ship-in-rack (SIR) support                                    | No                                              | Yes                                             |
| 1U PDU support                                                | Yes                                             | Yes                                             |
| 0U PDU support                                                | Limited**                                       | Limited**                                       |
| Rack type                                                     | IBM or Lenovo 4-post,<br>IEC standard-compliant | IBM or Lenovo 4-post,<br>IEC standard-compliant |
| Mounting holes                                                | 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.)             |
| Distance between front and rear mounting flanges <sup>^</sup> | 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 2U24 enclosures.

<sup>^</sup> 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 have the following dimensions and weight (approximate):

- Height: 85 mm (3.4 in.)
- Width: 449 mm (17.7 in.)
- Depth: 553 mm (21.8 in.)
- Weight (fully configured): 27.6 kg (60.8 lb)

## Operating environment

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

- Air temperature:
  - Operating: 5 °C - 45 °C (41 °F - 113 °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:
  - DE4000F 2U24 SFF: 6.8 bels
  - 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 17. Enclosure power load, inlet current, and heat output

| Enclosure        | Source voltage (nominal) | Maximum power load | Current per inlet | Heat output   |
|------------------|--------------------------|--------------------|-------------------|---------------|
| DE4000F 2U24 SFF | 100 - 127 V AC           | 606 W              | 6.38 A            | 2068 BTU/hour |
|                  | 200 - 240 V AC           | 583 W              | 3.07 A            | 1990 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 |

## 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 Data Center Group (DCG) Servers and System Storage  
<http://pcsupport.lenovo.com/us/en/solutions/ht503310>
- Lenovo Data Center Services Agreement  
<http://support.lenovo.com/us/en/solutions/ht116628>

## Services

Lenovo Services is a dedicated partner to your success. Our goal is to reduce your capital outlays, mitigate your IT risks, and accelerate your time to productivity.

**Note:** Some service options may not be available in all countries. For more information, go to <https://www.lenovo.com/systems/services>. For information about Lenovo service upgrade offerings that are available in your region, contact your local Lenovo sales representative or business partner.

Here's a more in-depth look at what we can do for you:

- **Asset Recovery Services**

Asset Recovery Services (ARS) helps customers recover the maximum value from their end-of-life equipment in a cost-effective and secure way. On top of simplifying the transition from old to new equipment, ARS mitigates environmental and data security risks associated with data center equipment disposal. Lenovo ARS is a cash-back solution for equipment based on its remaining market value, yielding maximum value from aging assets and lowering total cost of ownership for your customers. For more information, see the ARS page, <https://lenovopress.com/lp1266-reduce-e-waste-and-grow-your-bottom-line-with-lenovo-ars>.

- **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.

- **Basic Hardware Installation**

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

- **Deployment Services**

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

- **Integration, Migration, and Expansion Services**

Move existing physical & virtual workloads easily, or determine technical requirements to support increased workloads while maximizing performance. Includes tuning, validation, and documenting ongoing run processes. Leverage migration assessment planning documents to perform necessary migrations.

## 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 DE4000F All Flash Storage Array supports attachment to Lenovo ThinkSystem, System x, and Flex System hosts by using SAS, iSCSI, or Fibre Channel storage connectivity protocols.

The following sections list adapters and Ethernet LAN and FC SAN switches that are currently offered by Lenovo that can be used with the ThinkSystem DE4000F All Flash Storage Array in IT solutions:

- [Adapters](#)
- [Ethernet LAN switches](#)
- [Fibre Channel SAN switches](#)

**Note:** Tables that are provided in these sections are for ordering reference purposes only.

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

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.

## Adapters

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

- [SAS connectivity](#)
- [iSCSI connectivity](#)
- [Fibre Channel connectivity](#)

## SAS connectivity

The following table lists currently available SAS adapters for Lenovo servers that are compatible with the ThinkSystem DE4000F SAS storage (direct attach). Other SAS HBAs also might be supported (see the Interoperability Matrix for details).

Table 18. SAS adapters

| Description                           | Part number |
|---------------------------------------|-------------|
| ThinkSystem SAS HBAs                  |             |
| ThinkSystem 430-8e SAS/SATA 12Gb HBA  | 7Y37A01090  |
| ThinkSystem 430-16e SAS/SATA 12Gb HBA | 7Y37A01091  |
| System x SAS HBAs                     |             |
| N2225 SAS/SATA HBA (12Gb)             | 00AE912     |
| N2226 SAS/SATA HBA (12Gb)             | 00AE916     |

## iSCSI connectivity

The ThinkSystem DE4000F supports iSCSI attachments via standard 1 Gb, 10 Gb, or 25 Gb Ethernet connections (direct attach or switch-based). Any compatible Ethernet switch, including Lenovo ThinkSystem and RackSwitch Ethernet switches and embedded Flex System Ethernet I/O modules, can be used to provide iSCSI connectivity for the ThinkSystem DE4000F storage.

With software iSCSI initiators, any supported 1 Gb, 10 Gb, or 25 Gb Ethernet adapter for Lenovo servers is compatible with the ThinkSystem DE4000F iSCSI storage.

## Fibre Channel connectivity

The ThinkSystem DE4000F supports direct FC attachments and FC switch-based attachments. Lenovo B Series and DB Series FC SAN switches and directors can be used to provide FC connectivity.

Currently available FC adapters for Lenovo servers that are compatible with the ThinkSystem DE4000F FC storage are listed in the following table. Other FC HBAs also might be supported (see the Interoperability Matrix for details).

Table 19. Fibre Channel adapters

| Description                                                                   | Part number |
|-------------------------------------------------------------------------------|-------------|
| ThinkSystem HBAs: 32 Gb FC                                                    |             |
| ThinkSystem Emulex LPe35000 32Gb 1-port PCIe Fibre Channel Adapter            | 4XC7A08250  |
| ThinkSystem Emulex LPe35002 32Gb 2-port PCIe Fibre Channel Adapter            | 4XC7A08251  |
| ThinkSystem Emulex LPe32000-M6-LP PCIe 32Gb 1-Port SFP+ Fibre Channel Adapter | 7ZT7A00517  |
| ThinkSystem Emulex LPe32002-M6-LP PCIe 32Gb 2-Port SFP+ Fibre Channel Adapter | 7ZT7A00519  |
| ThinkSystem QLogic QLE2740 PCIe 32Gb 1-Port SFP+ Fibre Channel Adapter        | 7ZT7A00516  |
| ThinkSystem QLogic QLE2742 PCIe 32Gb 2-Port SFP+ Fibre Channel Adapter        | 7ZT7A00518  |
| System x HBAs: 16 Gb FC                                                       |             |
| Emulex 16Gb Gen6 FC Single-port HBA (LPe31000)                                | 01CV830     |
| Emulex 16Gb Gen6 FC Dual-port HBA (LPe31002)                                  | 01CV840     |
| Emulex 16Gb FC Single-port HBA (LPe16000)                                     | 81Y1655     |
| Emulex 16Gb FC Dual-port HBA (LPe16002)                                       | 81Y1662     |
| QLogic 16Gb Enhanced Gen5 FC Single-port HBA (QLE2690)                        | 01CV750     |

| Description                                                           | Part number |
|-----------------------------------------------------------------------|-------------|
| QLogic 16Gb Enhanced Gen5 FC Dual-port HBA (QLE2692)                  | 01CV760     |
| QLogic 16Gb FC Single-port HBA (QLE2660)                              | 00Y3337     |
| QLogic 16Gb FC Dual-port HBA (QLE2662)                                | 00Y3341     |
| Flex System HBAs: 16 Gb FC                                            |             |
| ThinkSystem Emulex LPm16002B-L Mezz 16Gb 2-Port Fibre Channel Adapter | 7ZT7A00521  |
| ThinkSystem Emulex LPm16004B-L Mezz 16Gb 4-Port Fibre Channel Adapter | 7ZT7A00522  |
| ThinkSystem QLogic QML2692 Mezz 16Gb 2-Port Fibre Channel Adapter     | 7ZT7A00520  |

## Ethernet LAN switches

The following table lists currently available embedded Ethernet switches and pass-thru modules for Flex System that can be used with the ThinkSystem DE4000F All Flash Storage Array in IT solutions.

Table 21. Embedded Ethernet switches for Flex System

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

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

## Fibre Channel SAN switches

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

- ThinkSystem DB Series SAN Switches and Directors:  
<https://lenovopress.com/storage/switches/rack#rt=product-guide>



## Rack cabinets

The following table lists the supported rack cabinets.

Table 22. Rack cabinets

| Part number | Description                       |
|-------------|-----------------------------------|
| 93072RX     | 25U Standard Rack                 |
| 93072PX     | 25U Static S2 Standard Rack       |
| 93634PX     | 42U 1100mm Dynamic Rack           |
| 93634EX     | 42U 1100mm Dynamic Expansion Rack |
| 93604PX     | 42U 1200mm Deep Dynamic Rack      |
| 93614PX     | 42U 1200mm Deep Static Rack       |
| 93084EX     | 42U Enterprise Expansion Rack     |
| 93084PX     | 42U Enterprise Rack               |
| 93074RX     | 42U Standard 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 23. Power distribution units

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

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

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 24. Uninterruptible power supply units

| Part number | Description                                                                                    |
|-------------|------------------------------------------------------------------------------------------------|
| 55941AX     | RT1.5kVA 2U Rack or Tower UPS (100-125VAC)                                                     |
| 55941KX     | RT1.5kVA 2U Rack or Tower UPS (200-240VAC)                                                     |
| 55942AX     | RT2.2kVA 2U Rack or Tower UPS (100-125VAC)                                                     |
| 55942KX     | RT2.2kVA 2U Rack or Tower UPS (200-240VAC)                                                     |
| 55943AX     | RT3kVA 2U Rack or Tower UPS (100-125VAC)                                                       |
| 55943KX     | RT3kVA 2U Rack or Tower UPS (200-240VAC)                                                       |
| 55945KX     | RT5kVA 3U Rack or Tower UPS (200-240VAC)                                                       |
| 55946KX     | RT6kVA 3U Rack or Tower UPS (200-240VAC)                                                       |
| 55948KX     | RT8kVA 6U Rack or Tower UPS (200-240VAC)                                                       |
| 55949KX     | RT11kVA 6U Rack or Tower UPS (200-240VAC)                                                      |
| 55948PX     | RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)                                             |
| 55949PX     | RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)                                            |
| 55943KT†    | ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)    |
| 55943LT†    | ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets) |
| 55946KT†    | ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)          |
| 5594XKT†    | ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)         |

† Only available in China and countries in the Asia Pacific region.

For more information, see the list of Product Guides in the UPS category:

<https://lenovopress.com/servers/options/ups>

## Lenovo Financial Services

Lenovo Financial Services reinforces Lenovo's commitment to deliver pioneering products and services that are recognized for their quality, excellence, and trustworthiness. Lenovo Financial Services offers financing solutions and services that complement your technology solution anywhere in the world.

We are dedicated to delivering a positive finance experience for customers like you who want to maximize your purchase power by obtaining the technology you need today, protect against technology obsolescence, and preserve your capital for other uses.

We work with businesses, non-profit organizations, governments and educational institutions to finance their entire technology solution. We focus on making it easy to do business with us. Our highly experienced team of finance professionals operates in a work culture that emphasizes the importance of providing outstanding customer service. Our systems, processes and flexible policies support our goal of providing customers with a positive experience.

We finance your entire solution. Unlike others, we allow you to bundle everything you need from hardware and software to service contracts, installation costs, training fees, and sales tax. If you decide weeks or months later to add to your solution, we can consolidate everything into a single invoice.

Our Premier Client services provide large accounts with special handling services to ensure these complex transactions are serviced properly. As a premier client, you have a dedicated finance specialist who manages your account through its life, from first invoice through asset return or purchase. This specialist develops an in-depth understanding of your invoice and payment requirements. For you, this dedication provides a high-quality, easy, and positive financing experience.

For your region specific offers please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website:

<https://www.lenovo.com/us/en/landingpage/lenovo-financial-services/>

## Related publications and links

For more information, see the following resources:

- Lenovo SAN Storage product page  
<http://www.lenovo.com/us/en/c/storage-area-network>
- ThinkSystem DE Series product page  
<https://www.lenovo.com/us/en/data-center/storage/storage-area-network/c/thinksystem-de-series>
- ThinkSystem DE All Flash Array interactive 3D Tour  
<https://lenovopress.com/lp0956-thinksystem-de-all-flash-interactive-3d-tour>
- ThinkSystem DE All-Flash Array datasheet  
<https://lenovopress.com/ds0051-lenovo-thinksystem-de-series-all-flash-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:

- [Lenovo Storage](#)
- [DE Series Storage](#)
- [External Storage](#)

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