Lenovo ThinkSystem DG7000
Product Guide

Lenovo ThinkSystem DG7000 is a scalable, unified, all flash storage system that is designed to provide high performance, simplicity, capacity, security, and high availability for large enterprises. Powered by the ONTAP software, ThinkSystem DG7000 delivers enterprise-class storage management capabilities with a wide choice of host connectivity options, flexible drive configurations, and enhanced data management features, including end-to-end QLC AFA. Based on industry standard NVMe technology the DG7000 is a perfect fit for a wide range of enterprise workloads, including big data and analytics, artificial intelligence, engineering and design, hybrid clouds, and other storage I/O-intensive applications.

The ThinkSystem DG7000 4U controller enclosure is shown in the following figure.

Figure 1. Lenovo ThinkSystem DG7000

Up to 12 DG7000 Storage Arrays can be combined into a clustered system in a NAS environment, or up to 6 DG7000 Storage Arrays can be combined into a clustered system in a SAN environment.

Did you know?

The ThinkSystem DG7000 offers end-to-end QLC (quad-level cell) Flash drive storage solution.

QLC increases flash storage density and reduces costs because it stores four bits per cell compared to Triple-level cell (TLC) drives which store three bits per cell.

QLC is ideal for replacing hard drive technology because it offers better performance, comparable cost, and better TCO due to increased density and lower power consumption.

Key features

A single ThinkSystem DG7000 Storage Array consists of the 4U rack-mount controller enclosure and one or more expansion enclosures. The controller enclosure includes two controllers, 256 GB RAM (128 GB RAM per controller), and 32 GB battery-backed NVRAM (16 GB NVRAM per controller). 25 GbE SFP28 NAS/iSCSI or 4/8/16 Gb Fibre Channel (FC) ports on the controller's mezzanine cards provide base host connectivity, with adapter card options for additional 1/10 GbE, 25 GbE, or 40/100 GbE NAS/iSCSI, 8/16/32 Gb FC, or 32 Gb NVMe/FC connections. The attachment of the Lenovo ThinkSystem DG240N 2U24 NVMe Expansion Enclosures to the controller enclosure provides scalability up to 96 QLC NVMe.

The Lenovo ThinkSystem DG7000 offers the following key features and benefits:

- All-flash array capabilities with end-to-end NVMe to meet the demand for higher storage performance at lower latency and provide higher IOPs and bandwidth with lower power usage and total cost of ownership than hybrid or HDD-based solutions.
- Scalability to up to 96 QLC NVMe solid-state drives with the attachment of the ThinkSystem DG240N 2U24 SFF expansion enclosures to satisfy growing needs for storage performance and capacity.
- Scalable, all flash storage with dual active/active controller configurations for high availability and performance.
- Improved performance and data protection with RAID-DP and RAID-TEC, as well as support for traditional RAID 4.
- Flexible host connectivity to match diverse customer needs with support for unified NAS and SAN storage protocols, including 1/10 GbE, 25 GbE, and 40/100 GbE NAS and iSCSI, 8/16/32 Gb Fibre Channel, and 32 Gb NVMe over Fibre Channel (NVMe/FC) connectivity.
- Rich set of standard storage management functions available at no extra cost, including snapshots, volume copy, quality of service, thin provisioning, compression, deduplication, encryption, disk-based backup, application- and virtual machine-aware backup, quick data recovery, clustering, synchronous replication, and asynchronous replication.
- Optional licensed object tiering to public or private clouds (FabricPool).
- Scale-out clustering of up to 12 ThinkSystem DG Series and DM Series storage systems for NAS connectivity or up to six DG Series and DM Series storage systems for SAN connectivity.
- 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, system fans (4U controller enclosures), and non-disruptive firmware upgrades.

The Lenovo ThinkSystem DG7000 supports the 2.5-inch QLC NVMe SSDs and all drives are dual-port and hot-swappable. The DG7000 supports attachment of four DG240N 2U24 SFF expansion enclosure and drives are designed to be added dynamically, which helps to respond to ever-growing capacity demands quickly and seamlessly.

The Lenovo ThinkSystem DG7000 offers high levels of system and data availability with the following technologies:

- Dual-active controllers (high availability pair) with automatic load balancing and failover
- Mirrored, battery-backed controller NVRAM. NVRAM is battery-backed memory used to protect inbound writes as they arrive. This fact allows write operations to be safely acknowledged without having to wait for a disk operation to complete, greatly reducing write latency.
- Automatic drive failure detection and rebuild
- Redundant, hot-swappable and customer replaceable hardware components, including SFP+/QSFP+ transceivers, controller and I/O modules, power supplies, system fans (4U controller enclosure), and drives
- Automated failover for the data path between the host and the drives with multipathing
- Non-disruptive controller and drive firmware upgrades

- Scale-out clustering

Components and connectors

The following figure shows the front of the ThinkSystem DG7000 4U controller enclosure without a front bezel.

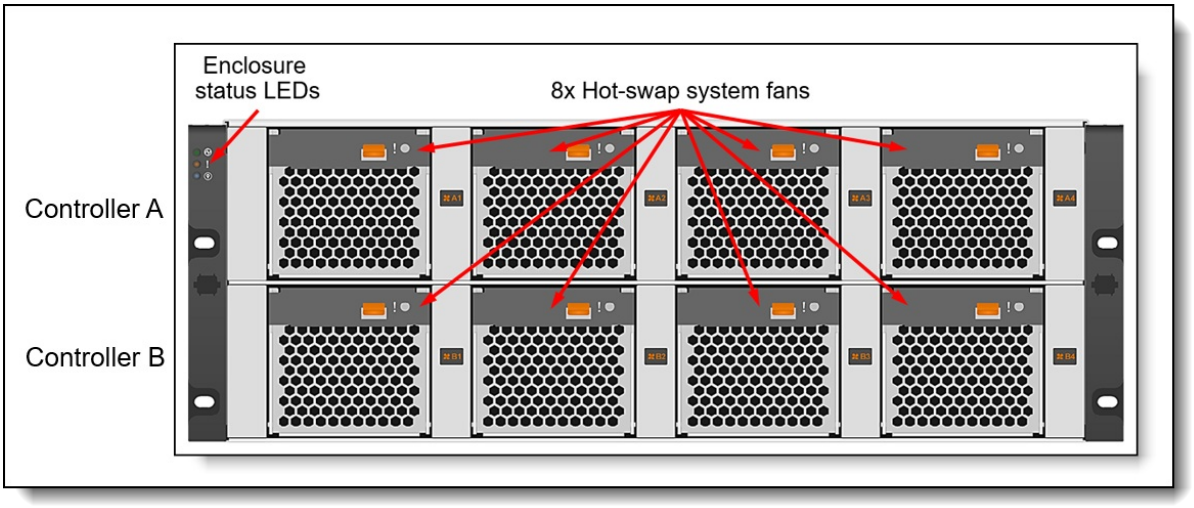

Figure 2. ThinkSystem DG7000 4U controller enclosure front view

The front of the ThinkSystem DG7000 controller enclosure includes the following components:

- 8x Redundant hot-swap system fans.
- Enclosure status LEDs.

The following figures show the rear of the ThinkSystem DG7000 4U controller enclosure.

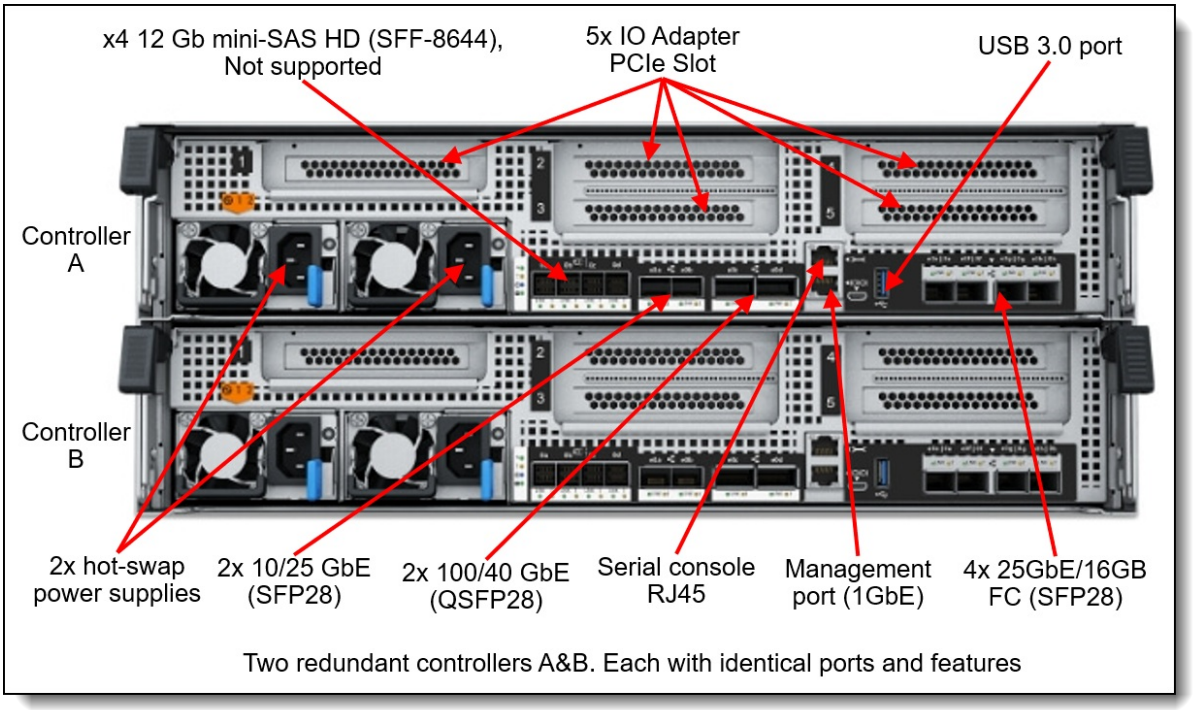

Figure 3. ThinkSystem DG7000 4U controller enclosure rear view: Ports

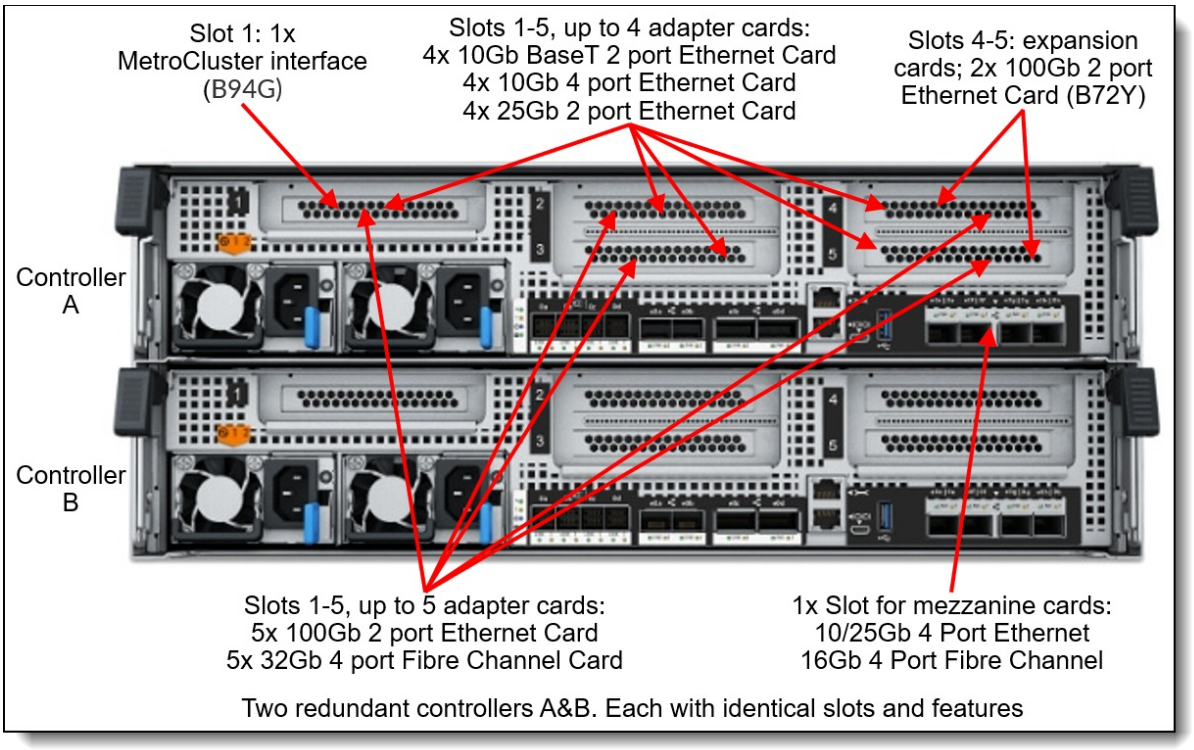

Figure 4. ThinkSystem DG7000 4U controller enclosure rear view: Slots

The rear of the ThinkSystem DG7000 4U controller enclosure includes the following components:

- Two redundant hot-swap controllers, each with the following ports:
  - Two 25 GbE SFP28 ports for direct-attach HA pair interconnect.
  - Two 40/100 GbE QSFP28 onboard ports for connections to the NVMe expansion enclosures.
  - A mezzanine slot for one of the following mezzanine cards (a mezzanine card is required):
    - 10/25Gb 4 Port Ethernet Mez Card (NAS or iSCSI).
    - 16Gb 4 Port Fibre Channel Mez Card (FC only).
  - Four slots for the following optional adapter cards (ports per adapter card):
    - Host ports:
      - 10Gb BaseT 2 port Ethernet Card
      - 10Gb 4 port Ethernet Card
      - 25Gb 2 port Ethernet Card
  - Five slots for the following optional adapter cards (ports per adapter card):
    - Host ports:
      - 100Gb 2 port Ethernet Card
      - 32Gb 4 port Fibre Channel Card
    - Expansion ports:
      - 100Gb 2 port Ethernet Card (QSFP28 RoCE). (Slots 4, 5)
    - MetroCluster ports:
      - 100Gb iWARP 2 Port Ethernet Card (QSFP28). (Slot 1)
  - One RJ-45 10/100/1000 Mb Ethernet port for out-of-band management.
  - Two serial console ports (RJ-45 and Micro-USB) for another means to configure the system.
  - One USB Type A port (read-only) for software updates.
- Four redundant hot-swap 1600 W (100 - 240 V) AC power supplies (IEC 320-C14 power connector) with integrated cooling fans.
- Controller status LEDs.

The following figure shows the front of the ThinkSystem DG240N 2U SFF NVMe expansion enclosure.

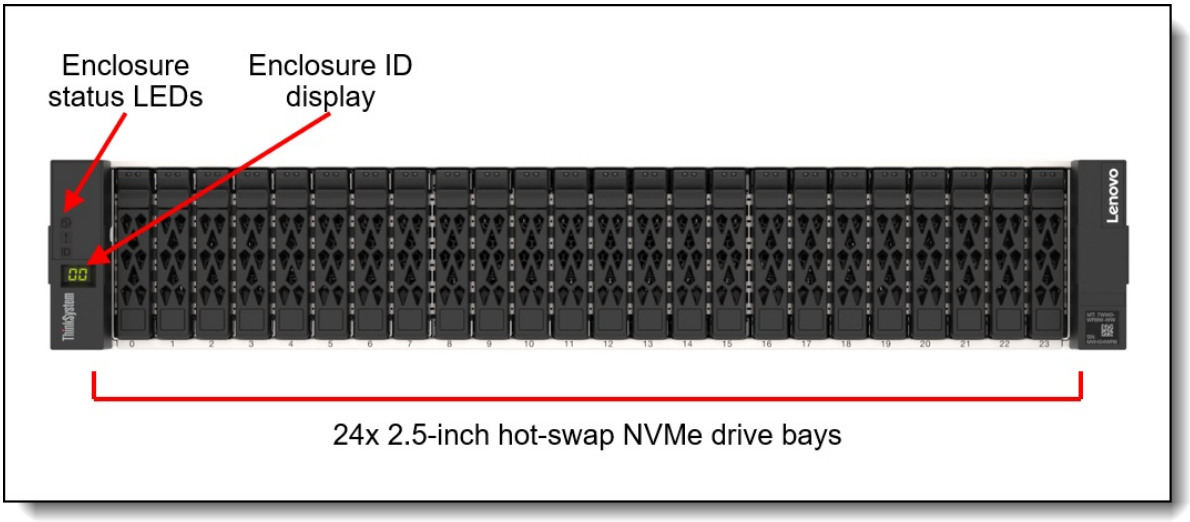

Figure 5. ThinkSystem DG240N 2U SFF NVMe expansion enclosure front view

The front of the ThinkSystem DG240N 2U SFF NVMe expansion enclosure includes the following components:

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

- Enclosure ID LED.

The following figure shows the rear of the ThinkSystem DG240N 2U SFF NVMe expansion enclosure.

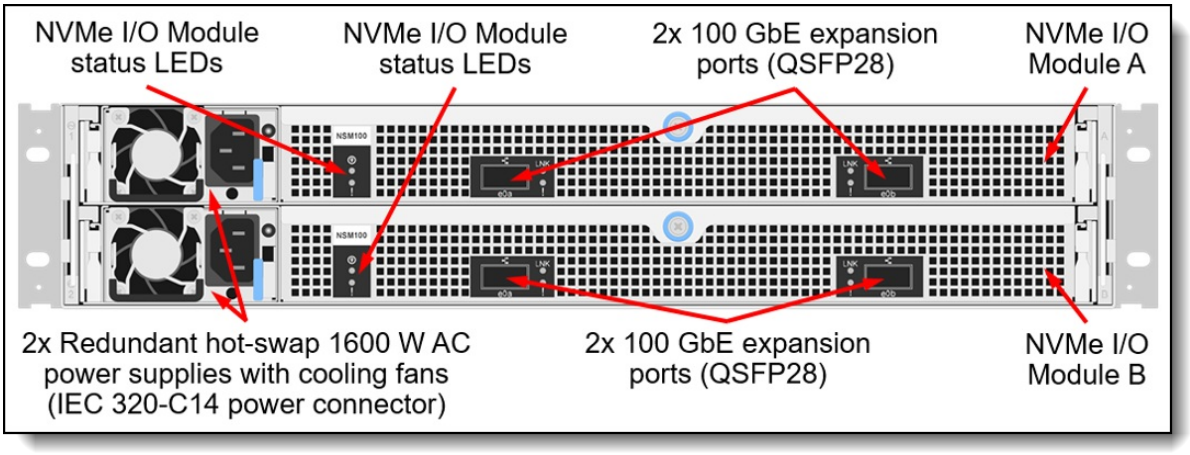

Figure 6. ThinkSystem DG240N 2U SFF NVMe expansion enclosure rear view

The rear of the ThinkSystem DG240N 2U SFF NVMe expansion enclosure includes the following components:

- Two redundant hot-swap NVMe I/O Modules; each NVMe I/O Module provides two 100 GbE QSFP28 expansion ports for connections to the controller enclosures.
- Two redundant hot-swap 1600 W (100 - 240 V) AC power supplies (IEC 320-C14 power connector) with integrated cooling fans.
- NVMe I/O Module status LEDs.

System specifications

The following table lists the Lenovo ThinkSystem DG7000 storage system specifications.

Note: The supported hardware options, software features, and interoperability listed in this product guide are based on the ONTAP software version 9.12.1 P4 or later. For details about specific software releases that introduced support for certain hardware options and software features, refer to the Change History for the particular software release for the Lenovo ThinkSystem DG7000 that can be found at: http://datacentersupport.lenovo.com

Table 1. ThinkSystem DG7000 system specifications

Attribute	Specification
Form factor	• DG7000 controller enclosure (machine type 7DE5): 4U rack mount. • DG240N 2U24 SFF expansion enclosure (machine type 7Y62): 2U rack mount.
Controller configuration	Dual active-active controller configuration (HA pair). Up to 6 HA pairs can be combined into a single SAN cluster, or up to 12 HA pairs can be combined into a single NAS cluster.
HA pair interconnect ports	4x 25 GbE SFP28 onboard ports (DAC cables) (2 ports per controller).
Cluster interconnect ports	4x 100 GbE QSFP28 ports (DAC cable or SW fiber optic cable, MPO) (2 ports per controller using onboard 100GbE QSFP28 ports).
MetroCluster connectivity	• MetroCluster IP: 4x 100 GbE QSFP28 ports (SW fiber optic cable, MPO) (2 ports per controller on the optional 100 GbE iWARP adapter cards). (requires ONTAP 9.12.1P4 or later)

Attribute	Specification
RAID levels	RAID-4, RAID-DP, RAID-TEC. **Note:** RAID-4 can be configured only through the CLI.
Controller memory	256 GB RAM per system (128 GB per controller). 32 GB battery-backed NVRAM per system (16 GB per controller) mirrored between the controllers.
Drive bays	Up to 96 NVMe QLC drives using SN2100 switches as Storage scale out.
Drive technology	Industry standard NVMe technology, QLC NVME SSDs
Drive expansion connectivity	• 2x 100 GbE QSFP28 Using 100GbE RoCE adapter in slots 4 or 5. • 2x 100 GbE QSFP28 expansion ports on each of two NVMe I/O modules in the NVMe expansion enclosure for the attachment to the controller enclosure.
Drives	15.36 TB QLC NVMe SSDs (0.2 DWPD)
Storage capacity	Up to 1.47 PB (96x 15.36 TB SSDs)
Storage protocols	• NAS (File access): NFS and CIFS/SMB. • SAN (Block access): iSCSI, FC, NVMe/FC.
Host connectivity	Base ports on the mezzanine cards (two controllers): • 8x 25 GbE SFP28 (DAC cable or SW fiber optic cable, LC) (4 ports per controller); or • 8x 16 Gb FC SFP+ (SW fiber optic cable, LC) (4 ports per controller). Base ports (two controllers): • 4x 10/25GbE (SFP28) • 4x 100/40 GbE (QSFP28) Optional additional ports on up to four adapter cards (per controller): • 4x 10Gb BaseT 2 port Ethernet Card • 4x 10Gb 4 port Ethernet Card • 4x 25Gb 2 port Ethernet Card Optional additional ports on up to five adapter cards (per controller): • 5x 100Gb 2 port Ethernet Card • 5x 32Gb 4 port Fibre Channel Card **Note:** ONTAP does not support host direct attach for FC protocol.
Host operating systems	Windows Server 2019, Windows Server 2022, RedHat, SuSE and VMware.
Performance*	Up to 650 000 random read IOPS (8 KB blocks).

Attribute	Specification

Configuration maximums**	• Maximum raw storage capacity: 1.47 PB
	• Maximum aggregate size: 800 TB
	• Maximum number of FlexVol volumes per HA pair: 5000
	• Maximum volume size: 300 TB
	• Maximum number of LUNs per controller: 8192
	• Maximum number of LUNs per FlexVol volume: 512
	• Maximum LUN size: 128 TB
	• Maximum number of drives in a RAID group (data + parity drives):
	  ◦ RAID 4: 14 (13 + 1 SAS SSDs or NVMe SSDs)
	  ◦ RAID-DP: 28 (26 + 2 SAS SSDs or NVMe SSDs)
	  ◦ RAID-TEC: 29 (26 + 3 SAS SSDs or NVMe SSDs)
	• Maximum number of initiators per HA pair: 8192
	Maximum number of snapshots per FlexVol volume: 1023

Cooling	Redundant cooling: • DG7000 4U: Eight hot-swap system fans. • DG240N 2U24 SFF: Fans that are built into I/O modules and power supplies.
Power supply	Four 1600 W (100 - 240 V) (DG7000 4U controller enclosure), or two 1600 W (100 - 240 V) (DG240N 2U24 SFF expansion enclosure), redundant hot-swap Platinum AC power supplies.
Hot-swap parts	Controllers, I/O modules, drives, system fans (DG7000 4U only), power supplies, and SFP+/SFP28/QSFP+/QSFP28 transceivers and DAC cables.
Management ports	• 1x 1 GbE port (UTP, RJ-45) per controller for out-of-band management. • 2x Serial console ports (RJ-45 and Micro-USB) for system configuration. • 1x USB Type A port (read-only) for software updates.
Management interfaces	ThinkSystem Storage Manager web-based GUI; SSH CLI; Serial console CLI; SNMP, email, and syslog alerts.
Security features	Secure Socket Layer (SSL), Secure Shell (SSH), user level security, role-based access control (RBAC), LDAP authentication.
Warranty and support	Three- or five-year customer-replaceable unit and onsite limited warranty with selectable service levels: 9x5 coverage with next business day (NBD) parts delivered (base warranty), 9x5 coverage with NBD onsite response (Foundation Service), 24x7 coverage with 4-hour onsite response (Essential Service), or 24x7 coverage with 2-hour onsite response or 6-hour committed repair (select areas) (Advanced Service). Premier Support is also available. Software support is included in the base warranty or Foundation, Essential, or Advanced Service for the duration of the warranty period.
Dimensions	4U controller enclosure: • Height: 175 mm (6.9 in.) • Width: 447 mm (17.6 in.) • Depth: 828 mm (32.6 in.) 2U24 SFF NVMe expansion enclosure: • Height: 87 mm (3.4 in.) • Width: 447 mm (17.6 in.) • Depth: 543 mm (21.4 in.)
Weight	• Controller enclosure (fully configured): 49.2 kg (108.5 lb) • 2U24 SFF NVMe expansion enclosure (fully configured): 30.2 kg (66.7 lb)

* Estimated theoretical performance based on the capacity planning for specific configurations and workloads.
** 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

Factory-integrated models of the Lenovo ThinkSystem DG7000 are configured by using the Lenovo Data Center Solution Configurator (DCSC):
http://dcsc.lenovo.com

The following table lists the CTO base models for the Lenovo ThinkSystem DG7000.

Table 2. ThinkSystem DG7000 CTO base models

Description	Machine Type/Model	Feature code
Lenovo ThinkSystem DG7000	7DE5CTO1WW	B94E

Configuration note: Two DG7000 controllers (feature code B94T) are pre-selected in the configurator.

The models of the ThinkSystem DG7000 ship with the following items:

- One chassis with the following components:
  - Two controllers
  - Four power supplies
- Rack Mount Kit
- 2 m USB Cable (USB Type A to Micro-USB)
- *Electronic Publications Flyer*
- Four customer-configured power cables

Controllers

The Lenovo ThinkSystem DG7000 controller enclosure ships with two DG7000 controllers. A *controller* provides interfaces for host connectivity, management, and internal drives in supported expansion enclosures, and it runs ONTAP storage management software. Each ThinkSystem DG7000 controller enclosure provides 256 GB RAM and 32 GB battery-backed NVRAM (128 GB RAM and 16 GB NVRAM per controller).

The ThinkSystem DG7000 controller enclosures ship with four HA interconnect 25 GbE SFP28 ports (two ports per controller) to cable a directly-connected dual-controller HA pair, and four cluster interconnect 100 GbE QSFP28 ports using the onboard 100GbE QSFP ports on each controller (two per conteoller) to cable a directly connected (one HA pair) or switched (multiple HA pairs) cluster. Up to six HA pairs can be combined into a single SAN cluster or up to 12 HA pairs can be combined into a single NAS cluster.

The ThinkSystem DG7000 controller enclosure provides four QSFP28 ports for 100 GbE NVMe expansion connectivity using the 100GbE RoCE adapter installed in slot 4 or 5, and it also has two mezzanine slots (one slot per controller) for mezzanine cards and eight available expansion slots (four slots per controller) for adapter cards.

Two controllers are required for selection and must have the same HIC adapters installed. The use of a DG240N expansion enclosure requires a 100GbE HIC for connectivity installed in port 4 or 5 in each controller.

The ThinkSystem DG7000 controller enclosure provides a choice of the following interfaces on the mezzanine cards for base host connectivity (ports per mezzanine card):

- 4x 25 GbE SFP28 ports for NAS or iSCSI connectivity (require optical transceivers or DAC cables that should be purchased for the mezzanine card).
- 4x 16 Gb FC SFP+ ports for FC connectivity (require SFP+ SW optical transceivers that should be

purchased for the mezzanine card).

The following interfaces can be added to the ThinkSystem DG7000 controller enclosures with optional adapter cards (ports per adapter card):

- Host interfaces
  - 2x 1/10 GbE RJ-45 ports for NAS or iSCSI connectivity (require RJ-45 UTP Category 6 cables that should be purchased for the adapter card).
  - 4x 10 GbE SFP+ ports for NAS or iSCSI connectivity (require DAC cables that should be purchased for the adapter card).
  - 2x 25 GbE SFP28 ports for NAS or iSCSI connectivity (require optical transceivers or DAC cables that should be purchased for the adapter card).
  - 2x 40/100 GbE QSFP28 ports for NAS or iSCSI connectivity (require optical transceivers or DAC cables that should be purchased for the adapter card).
  - 4x 16 Gb FC SFP+ ports for FC connectivity, or NVMe/FC with 32 Gb ports (SW SFP+ transceivers with LC connectors included).
- Expansion interfaces:
  - 2x 100 GbE RoCE QSFP28 ports for NVMe/RoCE expansion connectivity.
- MetroCluster interfaces:
  - 2x 40/100 GbE iWARP QSFP28 ports for MetroCluster IP connectivity (require optical transceivers that should be purchased for the adapter card).
  - 2x 16 Gb FC SFP+ ports for MetroCluster FC connectivity (require SFP+ SW optical transceivers that should be purchased for the adapter card) (planned for the future).

Configuration notes:

- A pair of the mezzanine cards is required for selection.
- The optional adapter cards should be installed in pairs: Up to four pairs of the adapter cards are supported per controller enclosure (up to four adapter cards per controller), including a combination of the adapter card pairs.
- Both controllers must have matching configurations of the mezzanine ports (type and physical connections) and adapter cards (type, quantity, slot location, and physical connections).
- The optional adapter cards should be installed in the controller's expansion slots in the following order: Slot 2, Slot 4, Slot 1, Slot 5.
  Note: In the configurations with two DG240N expansion enclosures, a pair of additional 100 GbE RoCE adapter cards is required for dual HA direct connectivity to the expansion enclosures, and these cards must be installed in the Slot 5 of the DG7000 controllers.

The following table lists the controller for the Lenovo ThinkSystem DG7000 and supported connectivity options.

Table 3. DG7000 controller and connectivity options

Description	Part number	Feature code	Maximum quantity per controller enclosure
Controllers			
Lenovo ThinkSystem DM7100/DG7000 NVMe Controller with Platinum PSU	None*	B94T	2
Mezzanine cards: Base host interfaces			
Lenovo ThinkSystem Storage 10/25Gb 4 Port Ethernet Mez Card	4XC7A60826	B94J	2
Lenovo ThinkSystem Storage 16Gb 4 Port Fibre Channel Mez Card	4XC7A60827	B94K	2

Description	Part number	Feature code	Maximum quantity per controller enclosure
Adapter cards: Additional host interfaces			
Lenovo ThinkSystem Storage 10Gb BaseT 2 port Ethernet Card	4XC7A60794	B94F	8
Lenovo ThinkSystem Storage 10Gb 4 port Ethernet Card	4XC7A38329	B730	8
Lenovo ThinkSystem Storage 10/25Gb 2 port Ethernet Card**†	4XC7A38328	B72Z	8
Lenovo ThinkSystem Storage 32Gb 4 port Fibre Channel Card	4XC7A38326	B72X	10
Adapter card: Additional expansion interface			
Lenovo ThinkSystem Storage 100Gb 2 port Ethernet Card**	4XC7A38327	B72Y	10
Adapter card: MetroCluster interface (gen 3)			
Lenovo Thinksystem Storage 100Gb iWARP 2 Port Ethernet Card	4XC7A60795	B94G	2
SFP+ transceivers for 10Gb 4 port Ethernet Card (4XC7A38329)			
10Gb Ethernet, SFP+, Intel Transceiver	4TC7A69991	BQAS	32
SFP+ transceivers for 16 Gb FC mezzanine cards			
16G Fibre Channel SFP+ Module 1 pack	4XF7A14920	B4KA	8
SFP+ and SFP28 transceivers for 25 GbE mezzanine cards and 25 GbE adapter cards †			
10G SW Optical iSCSI SFP+ Module 1 pack	4XF7A14919	B4K9	24
25Gb SR SFP28 transceiver			
Lenovo 25G SR SFP28 Amphenol Ethernet Transceiver	4TC7A94751	C4K4	28
40Gb SR SFP28 ethernet transceivers			
40G Ethernet SR Transceiver	4TC7A81809	BQBL	20
QSFP+/QSFP28 transceivers for 100 GbE adapter cards			
Lenovo 100Gb SR4 QSFP28 Ethernet Transceiver	4M27A67042	BFH1	24
OM4 cables for 100 GbE QSFP28 transceivers			
Lenovo 5m MPO-MPO OM4 MMF Cable	7Z57A03567	AV25	24
Lenovo 7m MPO-MPO OM4 MMF Cable	7Z57A03568	AV26	24
Lenovo 10m MPO-MPO OM4 MMF Cable	7Z57A03569	AV27	24
Lenovo 15m MPO-MPO OM4 MMF Cable	7Z57A03570	AV28	24
Lenovo 20m MPO-MPO OM4 MMF Cable	7Z57A03571	AV29	24
Lenovo 30m MPO-MPO OM4 MMF Cable	7Z57A03572	AV2A	24
OM4 cables for 16/32 Gb FC and 25 GbE SFP28 optical transceivers			
Lenovo 0.5m LC-LC OM4 MMF Cable	4Z57A10845	B2P9	52
Lenovo 1m LC-LC OM4 MMF Cable	4Z57A10846	B2PA	52
Lenovo 3m LC-LC OM4 MMF Cable	4Z57A10847	B2PB	52
Lenovo 5m LC-LC OM4 MMF Cable	4Z57A10848	B2PC	52
Lenovo 10m LC-LC OM4 MMF Cable	4Z57A10849	B2PD	52
Lenovo 15m LC-LC OM4 MMF Cable	4Z57A10850	B2PE	52
Lenovo 25m LC-LC OM4 MMF Cable	4Z57A10851	B2PF	52
Lenovo 30m LC-LC OM4 MMF Cable	4Z57A10852	B2PG	52
OM3 cables for 16/32 Gb FC and 25 GbE SFP28 optical transceivers			
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5	52

Description	Part number	Feature code	Maximum quantity per controller enclosure
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6	52
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7	52
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8	52
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9	52
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA	52
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB	52
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC	52
SFP+ DAC cables for 10 GbE SFP+ adapter cards			
0.5m Passive DAC SFP+ Cable	00D6288	A3RG	40
1m Passive DAC SFP+ Cable	90Y9427	A1PH	40
1.5m Passive DAC SFP+ Cable	00AY764	A51N	40
2m Passive DAC SFP+ Cable	00AY765	A51P	40
3m Passive DAC SFP+ Cable	90Y9430	A1PJ	40
5m Passive DAC SFP+ Cable	90Y9433	A1PK	40
SFP28 DAC cables for 25 GbE onboard ports, mezzanine cards, and adapter cards			
Lenovo 1m Passive 25G SFP28 DAC Cable	7Z57A03557	AV1W	28
Lenovo 3m Passive 25G SFP28 DAC Cable	7Z57A03558	AV1X	28
Lenovo 5m Passive 25G SFP28 DAC Cable	7Z57A03559	AV1Y	28
100G QSFP28 to 4x25G SFP28 Breakout DAC Cables			
Lenovo 1m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable	7Z57A03564	AV22	6
Lenovo 3m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable	7Z57A03565	AV23	6
Lenovo 5m 100G QSFP28 to 4x25G SFP28 Breakout DAC Cable	7Z57A03566	AV24	6
QSFP+ DAC cables for 100 GbE adapter cards (operating at 40 Gbps)			
Lenovo 1m Passive QSFP+ DAC Cable	49Y7890	A1DP	20
Lenovo 3m Passive QSFP+ DAC Cable	49Y7891	A1DQ	20
Lenovo 5m Passive QSFP+ DAC Cable	00D5810	A2X8	20
QSFP28 DAC cables for 100 GbE adapter cards (operating at 100 Gbps)			
Lenovo 1m Passive 100G QSFP28 DAC Cable	7Z57A03561	AV1Z	24
Lenovo 3m Passive 100G QSFP28 DAC Cable	7Z57A03562	AV20	24
Lenovo 5m Passive 100G QSFP28 DAC Cable	7Z57A03563	AV21	24
UTP Category 6 cables for 1/10 GbE RJ-45 adapter cards and 1 GbE RJ-45 management ports			
0.75m Green Cat6 Cable	00WE123	AVFW	18
1.0m Green Cat6 Cable	00WE127	AVFX	18
1.25m Green Cat6 Cable	00WE131	AVFY	18
1.5m Green Cat6 Cable	00WE135	AVFZ	18
3m Green Cat6 Cable	00WE139	AVG0	18

* Factory-installed only.

** RoCE QSFP28

† For 25G leverage: 4M27A67041 Lenovo 25Gb SR SFP28 Ethernet Transceiver

Expansion enclosures

The ThinkSystem DG7000 controller enclosure supports attachment of up to four ThinkSystem DG240N 2U24 SFF NVMe expansion enclosures. The expansion enclosures can be added to the system non-disruptively.

Note: The addition of the second DG240N NVMe expansion enclosure to the storage arrays that were previously configured with one DG240N NVMe expansion enclosure requires planned system downtime.

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

Table 4. CTO base models for the ThinkSystem DG Series expansion enclosures

Description	Machine Type/Model	Feature code
ThinkSystem DG240N 2U24 NVMe Expansion Enclosure (3-year warranty)	7Y62CTO2WW	B6W6

Configuration notes:

- Two NVMe I/O expansion modules (feature code B73A) are pre-selected in the configurator for the DG240N 2U24 SFF expansion enclosures.

The model of the ThinkSystem DG240N 2U24 SFF expansion enclosures ship with the following items:

- One chassis with the following components:
  - Two I/O modules (NVMe)
  - Two power supplies
- Rack Mount Kit
- *Electronic Publications Flyer*
- Two customer-configured power cables

The following expansion connectivity topologies are supported:

- NVMe expansion connectivity

NVMe expansion topology

Each ThinkSystem DG240N expansion enclosure ships with two NVMe I/O expansion modules. Each *NVMe I/O expansion module* provides two external 100 GbE QSFP28 ports (labelled Ports A and B) that are used for direct-attach connections to the ThinkSystem DG7000 controller enclosures.

The ThinkSystem DG7000 controller enclosure supports direct attachment of up to two DG240N NVMe expansion enclosures for a total of up to 48 NVMe drives. You must add a 2-Port 100GbE QSPF28 adapter to connect the DG240N expansion. For two NVMe expansion enclosures, an additional 2-port 100 GbE QSFP28 adapter card is required for the DG7000 controller.

The example expansion connectivity topologies for one and two enclosures with dual-path HA (high availability) are shown in the following figures.

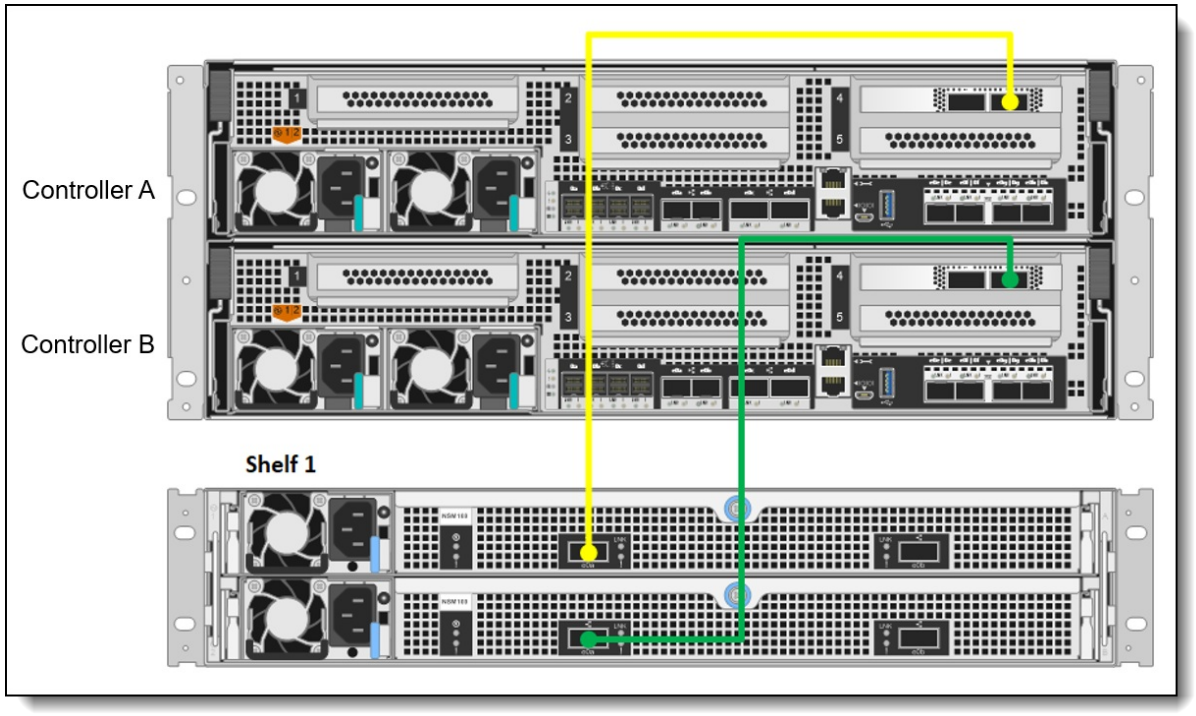

Figure 7. DG7000 NVMe expansion connectivity topology: One enclosure

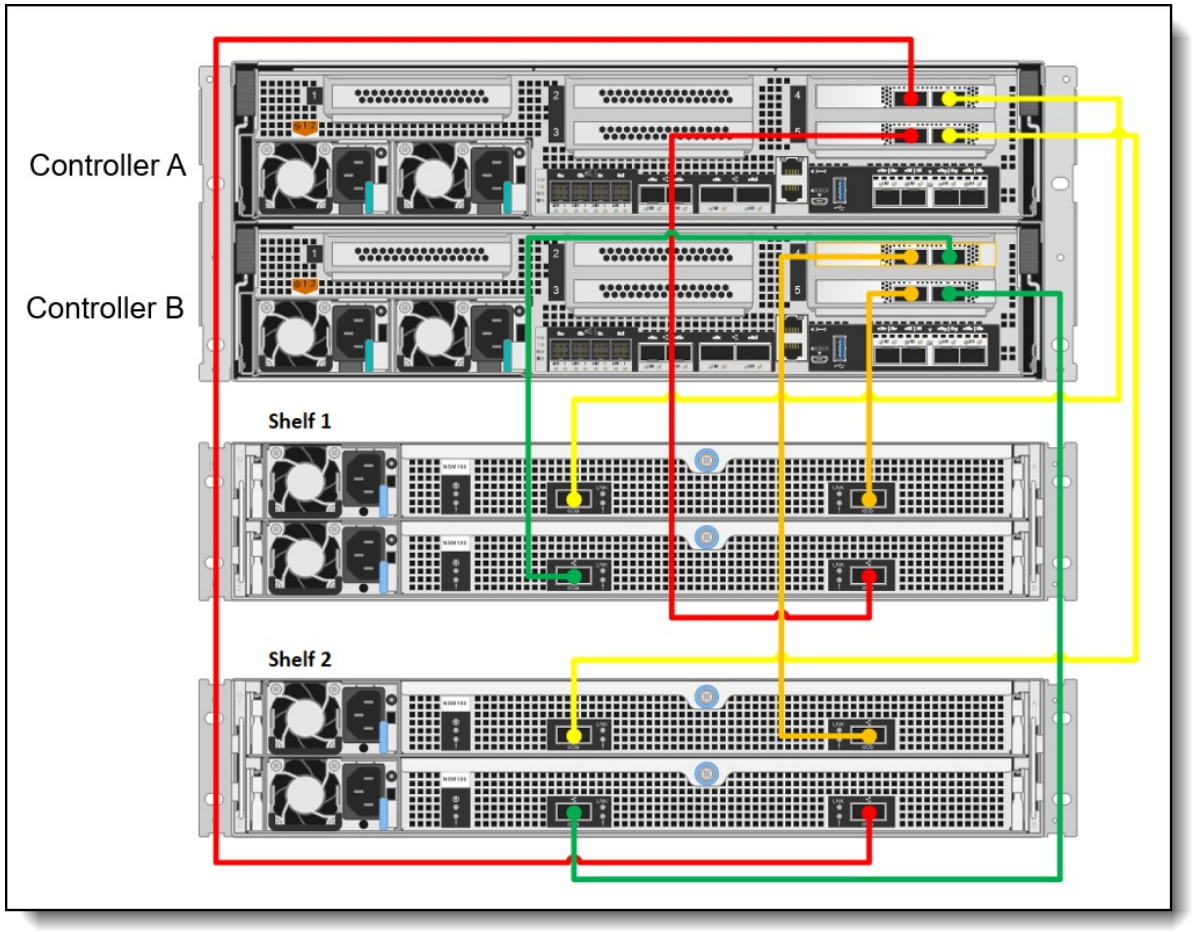

Figure 8. DG7000 NVMe expansion connectivity topology: Two enclosures

NVMe expansion cabling rules:

- On the Controller A, the Port 1 on the 100 GbE adapter card 1 (slot 4) is connected to the Port A on the NVMe I/O Module A in the second expansion enclosure, and the Port 2 on the 100 GbE adapter card is connected to the Port B in the NVMe I/O Module B in the first expansion enclosure.
- On the Controller B, the Port 1 on the 100 GbE adapter card 1 (slot 4) is connected to the Port A on the NVMe I/O Module B in the second expansion enclosure, and the Port 2 on the 100 GbE adapter card is connected to the Port B in the NVMe I/O Module A in the first expansion enclosure
- On the Controller A, the Port 1 on the 100 GbE adapter card 2 (slot 5) is connected to the Port A on the NVMe I/O Module A in the second expansion enclosure, and the Port 2 on the 100 GbE adapter card is connected to the Port B in the NVMe I/O Module B in the first expansion enclosure.
- On the Controller B, the Port 1 on the 100 GbE adapter card 2 (slot 5) is connected to the Port A on the NVMe I/O Module B in the second expansion enclosure, and the Port 2 on the 100 GbE adapter card is connected to the Port B in the NVMe I/O Module A in the first expansion enclosure.

The following is a high level topology with two switched DG240N expansion enclosures

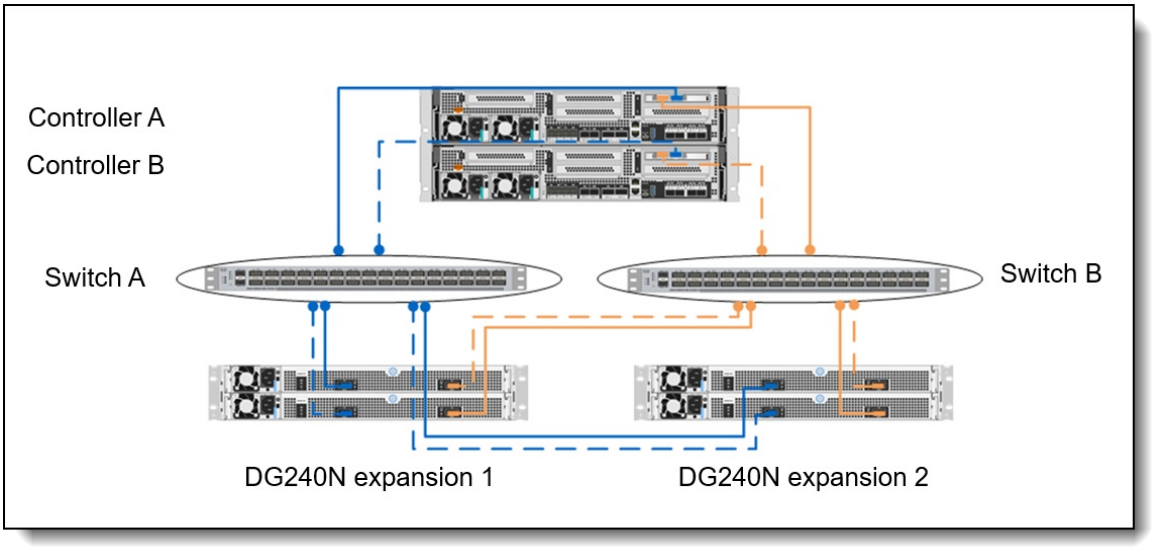

Figure 9. DG7000 NVMe expansion connectivity topology with two switched DG240N expansion enclosures (shelves)

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

Table 5. NVMe expansion enclosure connectivity options

Description	Part number	Feature code	Maximum quantity per one expansion enclosure
Lenovo 1m Passive 100G QSFP28 DAC Cable	7Z57A03561	AV1Z	4
Lenovo 3m Passive 100G QSFP28 DAC Cable	7Z57A03562	AV20	4
Lenovo 5m Passive 100G QSFP28 DAC Cable	7Z57A03563	AV21	4

Configuration note: Four 100G QSFP28 DAC cables are needed per expansion enclosure for directly connecting the expansion enclosure to the controller enclosure.

Drives

The ThinkSystem DG7000 has no internal drives, however thru the supported DG240N expansion enclosures up to 24 SFF hot-swap drives, in packs of 2 drives are supported in each DG240N enclosure.

The following table lists supported drive packs for the controller and expansion enclosures.

Configuration notes:

- When ordering the systems, select the drives that match the ONTAP offering and bundle you are installing on the DM controller. Drive feature codes are specific to either the Unified Complete or Unified Essentials bundle. See the Software section for details.
- Drives are sold in packs. Supported quantities are as follows:
  - The DG240N 2U24 SFF expansion enclosure supports 8, 10, 12 etc up to 24 drives NVMe drives.
  - A minimum of 4 drive packs is required.
- For factory-installed drive packs, all drives in the enclosure must be of the same type and capacity.
- In DCSC, use "guided mode" to configure controller and add expansion/s accordingly. DCSC will auto display supported drives based on selected software bundle: unified complete or unified essential.

Field upgrades: Drive packs for field upgrades can be ordered via the CTO base 7D4FCTO5WW (BXFR), ThinkSystem DG Drive Pack Upgrades for DG5000/DG7000. These are for use in existing expansion enclosures that have not been fully populated with the factory-installed drive packs

Note that the feature code varies, based on the software license Unified Essentials or Unified Complete with Unified.

Table 6. DG240N enclosure drive pack options

Part number	Feature code	Description	SED support	Maximum quantity per 2U enclosure
QLC NVMe SSD				
CTO only	BXG9*	Lenovo ThinkSystem 30.7TB (2x 15.36TB QLC NVMe SSD) Drive Pack for DG7000 - Unified Essential Bundle	Support	12
CTO only	BXGA*	Lenovo ThinkSystem 30.7TB (2x 15.36TB QLC NVMe SSD) Drive Pack for DG7000 - Unified Complete Bundle	Support	12
CTO only	C1M1*	Lenovo ThinkSystem 61.4TB (2x 30.72TB QLC NVMe SSD) Drive Pack for DG7000 - Unified Essential Bundle	Support	12
CTO only	C1M0*	Lenovo ThinkSystem 61.4TB (2x 30.72TB QLC NVMe SSD) Drive Pack for DG7000 - Unified Complete Bundle	Support	12
CTO only	BXJK**	Lenovo ThinkSystem 30.7TB (2x 15.36TB QLC NVMe SSD) Drive Pack for DG7000	Support	12
CTO only	C1LN**	Lenovo ThinkSystem 61.4TB (2x 30.72TB QLC NVMe SSD) Drive Pack for DG7000	Support	12

*Drive packs for field upgrades can be ordered via the CTO base 7D4FCTO5WW (BXFR). A minimum of 1 drive packs is required. No mixing. Only available when DG7000 (FC BXFR) is selected.
**For Brazil geography

Software

In this section:

ONTAP software unifies data management across flash, disk, and cloud to simplify the Lenovo DG/DM storage environment. It builds the foundation for a Data Fabric, making it easy to move the data where it is needed across flash, disk, and cloud resources.

Feature bundles

Controller software for the DG7000 is available in the following bundles of features:

Table 7. Software features and specifications summary

Attribute	Unified Essential	Unified Complete
Controller software feature code	BWU9	BWU8
RAID-4, RAID-DP, and RAID-TEC data protection	Included	Included
SAN (Block access): iSCSI, FC, NVMe/FC	Included	Included
NAS (File access): NFS, CIFS/SMB	Included	Included
All Flash Array (AFA) capability	Included	Included
Thin provisioning	Included	Included
Compression	Included	Included
Compaction	Included	Included
Deduplication	Included	Included
Snapshots	Included	Included
Encryption*	Included*	Included*
Balanced placement	Included	Included
Dynamic capacity expansion	Included	Included
Adaptive Quality of Service	Included	Included
SnapRestore	Included	Included
FlexClone	Included	Included
FlexVol	Included	Included
FlexCache	Included	Included
SnapMirror asynchronous replication	No	Included
SyncMirror data protection	Included	Included
Trusted Platform Module (TPM) support	Included**	Included**
MetroCluster IP	Included	Included
NVMe over FC Protocol	Included	Included
NVMe over TCP Protocol	Included	Included
SnapMirror Business Continuity (SMBC)	No	Included
SnapMirror synchronous replication	No	Included
FlexGroup	Included	Included
SnapVault disk-based storage backup	No	Included
SnapCenter	No	Included
ONTAP S3	Included	Included

Attribute	Unified Essential	Unified Complete
Autonomous Anti-ransomware Protection	No	Included
Multitenant Key Management	No	Included
SnapLock	No	Included
SnapMirror Cloud	No	Included
SnapMirror S3	No	Included
FarbricPool	Optional	Optional

* Requires the encryption version of ONTAP. See the ONTAP software section
** Not available in PRC

The features are summarized as follows:

- **RAID-4, RAID-DP, and RAID-TEC data protection** : Provides the flexibility to choose the level of data protection required and helps improve performance and availability with built-in spare capacity and by distributing data across all physical drives in the aggregate, sustaining to up to one (RAID-4), two (RAID-DP), or three (RAID-TEC) concurrent drive failures.
- **Thin provisioning**: Optimizes efficiency by allocating storage space based on the minimum space required by each application at any given time, so that applications consume only the space they are actually using, not the total space that has been allocated to them, which allows customers to purchase storage they need today and add more as application requirements grow.
- **Compression:** Provides transparent inline and post-process data compression to reduce the amount of storage that customers need to purchase and manage.
- **Deduplication:** Performs general-purpose deduplication for removal of redundant data to reduce the amount of storage that customers need to purchase and manage.
- **Snapshots**: Enables creation of read-only copies of data for backup, parallel processing, testing, and development, and have the copies available almost immediately.
- **Encryption:** Provides software-based encryption for data at rest for enhanced data security with the traditional drives and embedded key management (requires the encryption-capable version of the ONTAP software).
- **Balanced placement:** Provides automated workload distribution across the cluster to help increase utilization and performance.
- **Dynamic capacity expansion:** Allows the capacity of a volume or aggregate to be expanded by adding new physical drives.
- **Adaptive Quality of Service:** Simplifies operations and maintains consistent workload performance by defining QoS policies and automatically adjusting storage resources to respond to workload changes.
- **SnapRestore:** Enables quick recovery of data by reverting a local volume or file to its previous state from a particular snapshot copy stored on the file system.
- **FlexClone:** References snapshot metadata to create writable point-in-time copies of a volume.
- **FlexVol:** Provides abstraction layer between the logical volume and its physical location in the storage array.
- **FlexCache:** Speeds up access to data and offloads traffic from heavily accessed volumes for read-intensive workloads by placing frequently used data in cache locally or remotely (closer to the point of client access) and serving the data to the clients directly from cache without accessing the data source.
- **SnapMirror asynchronous replication:** Provides storage system-based data replication between the storage systems containing source (local) and destination (remote) volumes by using asynchronous (at specified regular intervals) data transfers over IP communication links.
- **SyncMirror data protection:** Adds extra level of data protection and availability by mirroring a pair of RAID aggregates.
- **Trusted Platform Module (TPM)**: For encryption enabled systems. The encryption keys for the

onboard key manager (OKM) are no longer stored in the boot device, but instead are stored in the physical TPM for systems so equipped, offering greater security and protection. Moving to the TPM is a nondisruptive process.

- **MetroCluster IP:** Provides storage system-based clustering with online, real-time data mirroring between the local and remote sites by using synchronous data transfers over IP communication links to deliver continuous availability with zero RPO and near-zero RTO. All storage systems in a MetroCluster IP configuration must be of the same model. New to ONTAP 9.11: MetroCluster with Storage Virtual Machine Disaster Recovery (SVM-DR) can now use a third site for the SVM-DR
- **NVMe over TCP Protocol**: Enables NVMe over TCP
- **Data Protection Optimized (DPO)**: Increases the amount of concurrent SnapMirror sessions per node, as well as improving SnapMirror performance to the cluster.
- **SnapMirror synchronous replication:** Provides storage system-based data replication between the storage systems containing source (local) and destination (remote) volumes by using synchronous (as soon as the data is written to the source volume)
- **FlexGroup:** Enables a single volume to span across multiple clustered storage arrays to maximize storage capacity and automate load distribution. New to ONTAP 9.11: FlexGroups can now be created as SnapLock volumes.
- **SnapVault disk-based storage backup:** Enables data stored on multiple systems to be backed up to a central, secondary system quickly and efficiently as read-only snapshot copies.
- **SnapCenter:** Provides application- and virtual machine-aware backup and restoration of data by using the Snapshots technology and leverages the SnapMirror capabilities of storage systems to provide onsite or offsite backup set mirroring for disaster recovery.
- **ONTAP S3**: Expands the DG/DM Series unified story and allows customers to manage, block, file, and object data from one interface. Customers can now natively store data in S3 buckets onboard the DG/DM Series.
- **SnapMirror S3** : Enables you to protect buckets in ONTAP S3 object stores using familiar SnapMirror mirroring and backup functionality. Requires ONTAP 9.11 or later on both source and destination clusters. Requires the Unified Premium Bundle.
- **SnapMirror Cloud**: A backup and recovery technology designed for ONTAP users who want to transition their data protection workflows to the cloud. SnapMirror Cloud is an extension to the family of SnapMirror replication technologies. While SnapMirror is frequently used for ONTAP-to-ONTAP backups, SnapMirror Cloud uses the same replication engine to transfer Snapshot copies for ONTAP to S3-compliant object storage backups.
- **Multitenant Key Management (MTKM)**: Provides the ability for individual tenants or storage virtual machines (SVMs) to maintain their own keys through KMIP for NVE. With multitenant external key management, you can centralize your organization's key management functions by department or tenant while inherently confirming that keys are not stored near the assets. This approach decreases the possibility of compromise.
- **Anti-ransomware**: Uses workload analysis in NAS (NFS and SMB) environments to proactively detect and warn about abnormal activity that might indicate a ransomware attack. When an attack is suspected, anti-ransomware also creates new Snapshot backups, in addition to existing protection from scheduled Snapshot copies. New to ONTAP 9.11: Optional multi-admin verification to approve administration functions that could result in data loss.

Optional Extended features also available via Feature on Demand (FoD) (see the Extended ONTAP features section)

- **FabricPool**: FabricPool is a hybrid storage solution that uses an all flash (all SSD) aggregate as the performance tier and an object store as the external capacity tier. Data in a FabricPool is stored in a tier based on whether it is frequently accessed or not. Using a FabricPool helps you reduce storage cost without compromising performance, efficiency, or protection.
- No license is required when tiering to StorageGRID or ONTAP S3.

ONTAP software versions

The following table lists the software selection options for the DG7000. The table also indicates which markets each version is available in.

Table 8. Software selection

Feature code	Description	Availability
ONTAP 9.1x		
C4K5	Lenovo ThinkSystem Storage ONTAP 9.15 Software Encryption - IPAv2	All markets
C4K6	Lenovo ThinkSystem Storage ONTAP 9.15 Software NonEncryption - IPAv2	All markets
C4AG	Lenovo ThinkSystem Storage ONTAP 9.16 Software Encryption - IPAv2	All markets
C4AH	Lenovo ThinkSystem Storage ONTAP 9.16 Software NonEncryption - IPAv2	All markets

Software maintenance is included in the DG7000 warranty and support (see Warranty and support for details)

Extended ONTAP features

FabricPool is an optional extended feature. To obtain this feature license, order the part numbers as listed in the following table.

Note: Extended features are only available as field upgrades and are not orderable as part of a CTO configuration.

Table 9. Optional software features

Part number	Feature code	Description	Quantity
4P47A37057	None*	DM Series FabricPool – 1TB Increment – 3 years	1 per TB of storage capacity
4P47A37288	None*	DM Series FabricPool – 1TB Increment – 5 years	1 per TB of storage capacity

* Field upgrade only; no factory installation.

Configuration notes:

- The FabricPool feature is a cluster-wide, capacity-based license that is available for 3-year or 5-year subscription terms.
- No license is required when tiering to StorageGRID or ONTAP S3.

Ansible playbooks for DM/DG Series

Ansible Playbooks give customers the ability to quickly deploy and use DM/DG Series storage systems using a standard open source deployment tool. Each playbook executes a set of tasks to achieve a configuration/provisioning goal.

Lenovo has created playbooks that can be used with DM/DG Series storage systems to help with:

- Provisioning
- Configuring

To access the Ansible Playbooks for Lenovo ThinkSystem DM/DG Series storage systems, go to the following page:
https://github.com/lenovo/ansible-dm-series-ontap

Management

The Lenovo ThinkSystem DG7000 supports the following management interfaces:

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

Power supplies and cables

The ThinkSystem DG7000 4U controller enclosure ships with four redundant hot-swap 1600 W (100 - 240 V) Platinum AC power supplies, each with an IEC 320-C14 connector.

The ThinkSystem DG240N 2U24 SFF expansion enclosures ship with two redundant hot-swap 1600 W (100 - 240 V) Platinum AC power supplies, each with an IEC 320-C14 connector.

Each ThinkSystem DG Series enclosure requires the selection of two or four power cables, depending on the quantity of the power supplies in the enclosure.

The following table lists the rack power cable and line cord options that can be ordered for the DG7000 4U and DG240N 2U24 SFF enclosures (four or two power cords per enclosure).

Table 10. Power cables for DG7000 4U and DG240N 2U24 SFF enclosures

Description	Part number	Feature code
Rack power cables		
1.0m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08367	B0N5
1.2m, 16A/100-250V, 2 Short C13s to Short C20 Rack Power Cable	47C2491	A3SW
1.5m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08368	B0N6
2.0m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08369	6570
2.5m, 16A/100-250V, 2 Long C13s to Short C20 Rack Power Cable	47C2492	A3SX
2.8m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08370	6400
2.8m, 16A/100-250V, 2 Short C13s to Long C20 Rack Power Cable	47C2493	A3SY
4.1m, 16A/100-250V, 2 Long C13s to Long C20 Rack Power Cable	47C2494	A3SZ
4.3m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08371	6583
Line cords		
2.8m, 10A/250V, C13 to AS/NZS 3112 Line Cord	39Y7924	6211
2.8m, 10A/250V, C13 to BS 1363/A Line Cord	39Y7923	6215
2.8m, 10A/250V, C13 to CEE7-VII Line Cord	39Y7917	6212
2.8m, 10A/250V, C13 to CEI 23-16 Line Cord	39Y7921	6217
2.8m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2375	6317
2.8m, 10A/250V, C13 to DK2-5a Line Cord	39Y7918	6213
2.8m, 10A/250V, C13 to GB 2099.1 Line Cord	39Y7928	6210
2.8m, 10A/250V, C13 to IRAM 2073 Line Cord	39Y7930	6222
2.8m, 10A/250V, C13 to IS 6538 Line Cord	39Y7927	6269
2.8m, 10A/250V, C13 to NBR 14136 Line Cord	69Y1988	6532
2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord	46M2592	A1RF

Description	Part number	Feature code
2.8m, 10A/250V, C13 to SABS 164 Line Cord	39Y7922	6214
2.8m, 10A/250V, C13 to SEV 1011-S24507 Line Cord	39Y7919	6216
2.8m, 10A/250V, C13 to SI 32 Line Cord	39Y7920	6218
2.8m, 12A/125V, C13 to JIS C-8303 Line cord	46M2593	A1RE
2.8m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08357	6533
2.8m, 12A/250V, C13 to KS C8305 Line Cord	39Y7925	6219
2.8m, 13A/125V, C13 to NEMA 5-15P Line Cord	00WH545	6401
2.8m, 15A/125V, C13 to CNS 10917-3 Line Cord	81Y2374	6402
4.3m, 10A/250V, C13 to AS/NZS 3112 Line Cord	81Y2383	6574
4.3m, 10A/250V, C13 to BS 1363/A Line Cord	81Y2377	6577
4.3m, 10A/250V, C13 to CEE7-VII Line Cord	81Y2376	6572
4.3m, 10A/250V, C13 to CEI 23-16 Line Cord	81Y2380	6493
4.3m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2389	6531
4.3m, 10A/250V, C13 to DK2-5a Line Cord	81Y2382	6575
4.3m, 10A/250V, C13 to GB 2099.1 Line Cord	81Y2378	6580
4.3m, 10A/250V, C13 to IRAM 2073 Line Cord	81Y2384	6492
4.3m, 10A/250V, C13 to IS 6538 Line Cord	81Y2386	6567
4.3m, 10A/250V, C13 to NBR 14136 Line Cord	81Y2387	6404
4.3m, 10A/250V, C13 to NEMA 6-15P Line Cord	4L67A08361	6373
4.3m, 10A/250V, C13 to SABS 164 Line Cord	81Y2379	6576
4.3m, 10A/250V, C13 to SEV 1011-S24507 Line Cord	81Y2390	6578
4.3m, 10A/250V, C13 to SI 32 Line Cord	81Y2381	6579
4.3m, 12A/125V, C13 to JIS C-8303 Line Cord	39Y7926	6335
4.3m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08362	6495
4.3m, 12A/250V, C13 to KS C8305 Line Cord	81Y2385	6494
4.3m, 13A/125V, C13 to NEMA 5-15P Line Cord	4L67A08360	AX8A
4.3m, 15A/125V, C13 to CNS 10917-3 Line Cord	81Y2388	6530

Rack installation

The individually shipped ThinkSystem DG Series enclosures come with the following rail kits:

- DG7000: ThinkSystem Storage Rail Kit 4U60
- DG240N 2U24 SFF: ThinkSystem NVMe Rail Kit 4 post

The rack mount kits are listed in the following table.

Table 11. 4-post rack mount kit

Description	Feature code	Quantity
Lenovo ThinkSystem Storage Rail Kit 4U60	BE28	1
Lenovo ThinkSystem NVMe Rail Kit 4 post	B6Y6	1
Lenovo ThinkSystem Storage Rack Mount Kit 2U24/4U60	B38Y	1

When the ThinkSystem DG 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 12. 4-post SIR rack mount kits

Description	Feature code	Quantity
Lenovo ThinkSystem Storage Rail Kit 4U60	BE28	1
Lenovo ThinkSystem NVMe Adjustable Rail Kit (SIR)	B6Y7	1

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

Table 13. Rack mount kit features and specifications summary

	Screw-in fixed rail with adjustable depth			
Attribute	**2U24 NVMe**	**2U24 NVMe SIR**	**2U24 SAS SIR**	**4U60**
Feature code	B6Y6	B6Y7	B6TH	BE28
Enclosure support	DG240N	DG240N	DG240N	DM7100F
Rail type	Fixed (static) with adjustable depth	Fixed (static) with adjustable depth	Fixed (static) with adjustable depth	Fixed (static) with adjustable depth
Tool-less installation	No	No	No	No
In-rack maintenance	Yes*	Yes*	Yes*	Yes*
Ship-in-rack (SIR)	No	Yes	Yes	Yes
1U PDU support	Yes	Yes	Yes	Yes
0U PDU support	Limited**	Limited**	Limited**	Limited**
Rack type	IBM or Lenovo 4-post, IEC standard-compliant			
Mounting holes	Square or round	Square or round	Square or round	Square or round
Mounting flange thickness	2 mm (0.08 in.) – 3.3 mm (0.13 in.)	2 mm (0.08 in.) – 3.3 mm (0.13 in.)	2 mm (0.08 in.) – 3.3 mm (0.13 in.)	2 mm (0.08 in.) – 3.3 mm (0.13 in.)
Distance between front and rear mounting flanges^	605 mm (23.8 in.) – 812.8 mm (32 in.)	605 mm (23.8 in.) – 812.8 mm (32 in.)	605 mm (23.8 in.) – 812.8 mm (32 in.)	605 mm (23.8 in.) – 812.8 mm (32 in.)

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

Physical specifications

The ThinkSystem DG7000 controller enclosure has the following dimensions and weight (approximate):

- Height: 175 mm (6.9 in.)
- Width: 447 mm (17.6 in.)
- Depth: 828 mm (32.6 in.)
- Weight (fully configured): 49.2 kg (108.5 lb)

The ThinkSystem DG240N 2U24 SFF enclosures have the following dimensions and weight (approximate):

- Height: 87 mm (3.4 in.)
- Width: 447 mm (17.6 in.)
- Depth: 543 mm (21.4 in.)
- Weight (fully configured): 30.2 kg (66.7 lb)

Operating environment

The ThinkSystem DG7000 and DG240N 2U24 SFF enclosures are supported in the following environment:

- Air temperature:
  - Operating:
    - DG7000: 10 °C - 35 °C (50 °F - 95 °F)
    - DG240N 2U24 SFF: 5 °C - 45 °C (41 °F - 113 °F)
  - Non-operating: -40 °C - +70 °C (-40 °F - 158 °F)
  - Maximum altitude: 3050 m (10,000 ft)
- Relative humidity (non-condensing):
  - Operating:
    - DG7000: 8% - 80%
    - DG240N 2U24 SFF: 8% - 90%
  - Non-operating: 10% - 95%
- Electrical power:
  - DG7000
    - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 16.12 A
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 8.06 A
    - Maximum system power load: 1579 W
  - DG240N 2U24 SFF
    - 100 to 127 (nominal) V AC; 50 Hz or 60 Hz; 8.66 A
    - 200 to 240 (nominal) V AC; 50 Hz or 60 Hz; 4.33 A
    - Maximum system power load: 848 W
  - Heat dissipation:
    - DG7000: 5388 BTU/hour
    - DG240N 2U24 SFF: 2894 BTU/hour
- Acoustical noise emission:
  - DG7000: 8.5 bels
  - DG240N 2U24 SFF: 6.4 bels

Warranty upgrades and post-warranty support

The DG7000 and DG240N expansion have a 3-year warranty based on the machine type of the system:

- DG7000 controller enclosure: 7DE5 (3-year warranty)
- DG240N expansion enclosure: 7Y62 (3-year warranty)

Our global network of regional support centers offers consistent, local-language support enabling you to vary response times and level of service to match the criticality of your support needs:

- **Standard Next Business Day** – Best choice for non-essential systems requiring simple maintenance.
- **Premier Next Business Day** – Best choice for essential systems requiring technical expertise from senior-level Lenovo engineers.
- **Premier 24x7 4-Hour Response** – Best choice for systems where maximum uptime is critical.
- **Premier Enhanced Storage Support 24x7 4-Hour Response** – Best choice for storage systems where maximum uptime is critical.

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

Services

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

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

In this section:

Lenovo Advisory Services

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

- **Assessment Services**

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

- **Design Services**

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

Lenovo Plan & Design Services

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

Lenovo Deployment, Migration, and Configuration Services

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

- **Deployment Services for Storage and ThinkAgile**

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

- **Hardware Installation Services**

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

- **DM/DG File Migration Services**

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

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

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

- **Factory Integrated Services**

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

Lenovo Support Services

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

- **Premier Support for Data Centers**

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

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

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

- **Committed Service Repair (CSR)**

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

- **Multivendor Support Services (MVS)**

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

- **Keep Your Drive (KYD)**

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

- **Technical Account Manager (TAM)**

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

- **Enterprise Software Support (ESS)**

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

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

Lenovo Managed Services

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

Lenovo Managed Services provides continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of your data center using state-of-the-art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

Quarterly reviews check error logs, verify firmware & OS device driver levels, and software as needed. We'll also maintain records of latest patches, critical updates, and firmware levels, to ensure you systems are providing business value through optimized performance.

Lenovo Sustainability Services

- **Asset Recovery Services**

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

- **CO2 Offset Services**

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

- **Lenovo Certified Refurbished**

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

Lenovo TruScale

Lenovo TruScale XaaS is your set of flexible IT services that makes everything easier. Streamline IT procurement, simplify infrastructure and device management, and pay only for what you use – so your business is free to grow and go anywhere.

Lenovo TruScale is the unified solution that gives you simplified access to:

- The industry's broadest portfolio – from pocket to cloud – all delivered as a service
- A single-contract framework for full visibility and accountability
- The global scale to rapidly and securely build teams from anywhere
- Flexible fixed and metered pay-as-you-go models with minimal upfront cost
- The growth-driving combination of hardware, software, infrastructure, and solutions – all from one single provider with one point of accountability.

For information about Lenovo TruScale offerings that are available in your region, contact your local Lenovo sales representative or business partner.

Regulatory compliance

The ThinkSystem DG Series enclosures conform to the following regulations:

- FCC Part 15, Class A; UL 60950-1
- ICES-003, Class A; CAN/CSA-C22.2 60950-1
- NOM
- CE Mark (EN55032 Class A, EN55024, IEC/EN60950-1, IEC/EN62368-1); ROHS Directive 2011/65/EU
- EAC
- CCC GB 4943.1, GB 17625.1, GB 9254 Class A; CELP; CECP
- VCCI, Class A
- CNS 13438, Class A; CNS 14336-1
- KN32/35, Class A
- AS/NZS CISPR 22 Class A

Interoperability

Lenovo provides end-to-end storage compatibility testing to deliver interoperability throughout the network. The Lenovo ThinkSystem DG7000 supports attachment to Lenovo servers by using NVMe over Fibre Channel (NVMe/FC), NAS (NFS and CIFS/SMB), iSCSI, and Fibre Channel storage connectivity protocols.

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

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

Cluster interconnect

The following table lists the Ethernet storage switch that can be used with the Lenovo ThinkSystem DG7000 for cluster interconnect and MetroCluster IP configurations.

Table 14. Ethernet storage switch

Description	Part number
Mellanox SN2100 16 Port, QSFP28, 100GbE Switch, Rear to Front (PSE) Exhaust	7DBUCTO1WW
Mellanox SN2100 16 port, QSFP28, 100GbE Switch, Front to Rear (oPSE) Exhaust	7DBUCTO2WW

For more information, see the NVIDIA SN2100 16-port 100Gb Ethernet Storage Switch Article: https://lenovopress.lenovo.com/lp1756-nvidia-sn2100-100gb-ethernet-storage-switch

Fibre Channel SAN switches

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

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

Rack cabinets

The following table lists the supported rack cabinets.

Table 15. Rack cabinets (D)

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

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 16. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
4PU7A93176	C0QH	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93169	C0DA	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93177	C0QJ	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93170	C0D9	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
0U Switched and Monitored PDUs															
4PU7A93181	C0QN	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 48A 3 Phase Delta PDU v2 (60A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
4PU7A93174	C0D5	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 48A 3 Phase Delta PDU (60A derated)	N	Y	N	N	N	N	N	Y	N	N	N	Y	N
4PU7A93178	C0QK	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93171	C0D8	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
4PU7A93182	C0QP	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93175	C0CS	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93180	C0QM	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93173	C0D6	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93179	C0QL	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 24A 1 Phase PDU v2 (30A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
4PU7A93172	C0D7	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 24A 1 Phase PDU(30A derated)	N	Y	N	N	N	N	N	Y	N	N	N	Y	N
1U Switched and Monitored PDUs															
4PU7A90808	C0D4	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 ETL	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A81117	BNDV	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - ETL	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7A90809	C0DE	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A81118	BNDW	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU – CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A90810	C0DD	1U 18 C19/C13 Switched and monitored 80A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A77467	BLC4	1U 18 C19/C13 Switched and Monitored 80A 3P Delta PDU	N	N	N	N	N	N	N	N	N	Y	N	Y	N
4PU7A90811	C0DC	1U 12 C19/C13 Switched and monitored 32A 3P WYE PDU V2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A90812	C0DB	1U 12 C19/C13 Switched and monitored 60A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A77469	BLC6	1U 12 C19/C13 switched and monitored 60A 3P Delta PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
71763NU	6051	Ultra Density Enterprise C19/C13 PDU 60A/208V/3PH	N	N	Y	N	N	N	N	N	N	Y	Y	Y	N
71762NX	6091	Ultra Density Enterprise C19/C13 PDU Module	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Line cords for 1U PDUs that ship without a line cord															
40K9611	6504	DPI 32a Cord (IEC 309 3P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	DPI 32a Cord (IEC 309 P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	DPI 63a Cord (IEC 309 P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	DPI 30a Cord (NEMA L6-30P)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	DPI 60a Cord (IEC 309 2P+G)	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N

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

Uninterruptible power supply units

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

Table 17. Uninterruptible power supply units

Part number	Description
Rack-mounted or tower UPS units - 100-125VAC	
7DD5A001WW	RT1.5kVA 2U Rack or Tower UPS-G2 (100-125VAC)
7DD5A003WW	RT3kVA 2U Rack or Tower UPS-G2 (100-125VAC)
Rack-mounted or tower UPS units - 200-240VAC	
7DD5A002WW	RT1.5kVA 2U Rack or Tower UPS-G2 (200-240VAC)
7DD5A005WW	RT3kVA 2U Rack or Tower UPS-G2 (200-240VAC)
7DD5A007WW	RT5kVA 3U Rack or Tower UPS-G2 (200-240VAC)
7DD5A008WW	RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC)
7DD5A00AWW	RT11kVA 6U Rack or Tower UPS-G2 (200-240VAC)

† Only available in China and the Asia Pacific market.

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

Lenovo Financial Services

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

- **Flexible**

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

- **100% Solution Financing**

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

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

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

- **24/7 Asset management**

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

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

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

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

Seller training courses

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

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

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

   Tags: Data Management

   Published: 2025-01-14
   Length: 60 minutes

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

   Course code: 011025
2. **Lenovo ThinSystem DG/DM Storage Series Portfolio Overview**
   2024-09-10 | 60 minutes | Employees and Partners

   This course builds on what you've learned in the Data Management Overview course. The course will help position the Lenovo ThinSystem DG and DM series storage products. Completing this course will help you:
   - understand the advantages of each product line and
   - understand the key features and relate them to a range of customer business needs, whether small-scale or enterprise-level storage needs

   Tags: Data Management, Storage, ThinkSystem

   Published: 2024-09-10
   Length: 60 minutes

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

   Course code: DDMO103
3. **Partner Technical Webinar - Commvault Data Protection and Resiliency**
   2024-06-25 | 60 minutes | Employees and Partners

   In this 60-minute replay, Nate Saunders, Commvault Solution Director for Global Partners, reviewed the Commvault solutions for Data Protection and Resiliency and the Lenovo ThinkSystem offerings that support those solutions.

   Tags: Data Management

   Published: 2024-06-25
   Length: 60 minutes

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

   Course code: 062124

4. **Lenovo Data Center Product Portfolio**
   2024-05-29 | 20 minutes | Employees and Partners

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

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

   Published: 2024-05-29
   Length: 20 minutes

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

   Course code: SXXW1110r7

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

   In this course, you will know:

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

   Tags: Data Management, Storage

   Published: 2024-04-10
   Length: 60 minutes

   Start the training:
   Employee link: Grow@Lenovo

   Course code: DVDAT209

6. **ONTAP Technical Positioning**
   2024-03-14 | 45 minutes | Employees and Partners

   This course focuses on enabling you to interpret the technical market trends and challenges that ONTAP customers face. You also learn to ask qualifying questions that identify which industries, companies, and customer contacts are appropriate targets for ONTAP software. Module two covers explaining ONTAP features and functionality and enabling you to strengthen ONTAP marketing claims with technical details.
   Learning Objectives:
   •Interpret the technical market trends and challenges that ONTAP customers face
   •Ask qualifying questions that identify which industries, companies, and customer contacts are appropriate targets for ONTAP software
   •Explain ONTAP features and functionality
   •Strengthen ONTAP marketing claims with technical details

   Tags: Data Management, Sales, Storage, Technical Sales, ThinkSystem

   Published: 2024-03-14
   Length: 45 minutes

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

   Course code: DDMT200r2

7. **Data management Overview**
   2024-03-14 | 25 minutes | Employees and Partners

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

   Tags: Data Management, Storage, ThinkSystem

   Published: 2024-03-14
   Length: 25 minutes

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

   Course code: DSTOO201

8. **VTT ONTAP 9.14.1 and Bundle Change Update - February 2024**
   2024-03-07 | 25 minutes | Employees and Partners

   In this course, you will know more about:
   - The new Features of ONTAP 9.14.1 update
   - ONTAP Bundle Update

   Tags: Data Management, Storage

   Published: 2024-03-07
   Length: 25 minutes

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

   Course code: DVDAT207

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

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

   Tags: DataCenter Products, Storage, ThinkSystem

   Published: 2024-02-02
   Length: 15 minutes

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

   Course code: SXSW1201r16

10. **VTT ONTAP 9.13.1 and Bundle Change Update - November 2023**
    2023-11-14 | 60 minutes | Employees Only

    In this course, you will know more about:
    - The new Features of ONTAP 9.13.1 update
    - ONTAP Bundle Update

    Tags: Data Management, Storage

    Published: 2023-11-14
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo

    Course code: DVDAT205

11. **VTT The Benefits of Scale Out Clustering with DM/DG - September 2023**
    2023-09-12 | 60 minutes | Employees Only

    In this course, you will know more about:
    - What is scale out?
    - Hardware benefits
    - Administrative benefits
    - Scale out Features

    Tags: Data Management, ThinkSystem

    Published: 2023-09-12
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo

    Course code: DVDAT204

12. **VTT The new ThinkSystem DG storage product - August 2023**
    2023-08-16 | 60 minutes | Employees Only

    Introduce and explore the new ThinkSystem DG storage product based on the NetApp DM. This product features QLC SSDs focused on improved sustainability standards and workload consolidation.

    Tags: Data Management, Storage, ThinkSystem

    Published: 2023-08-16
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo

    Course code: DVDAT203

Related publications and links

For more information, see the following resources:

- Lenovo ThinkSystem DG and DM Series product page
  https://www.lenovo.com/us/en/c/data-center/storage/unified-storage
- Lenovo Data Center Solution Configurator
  http://dcsc.lenovo.com
- ThinkSystem DG and DM Series documentation
  http://thinksystem.lenovofiles.com/help/topic/ontap_software/overview.html
- ThinkSystem DG Series datasheet
  https://lenovopress.lenovo.com/datasheet/ds0170-thinksystem-dg-series
- ONTAP Ransomware Protection
  https://thinksystem.lenovofiles.com/storage/help/topic/ontap_anti-ransomware/anti-ransomware.pdf
- ThinkSystem DM Series Installation Videos and Video Tutorials
  https://www.youtube.com/playlist?list=PLLQclfVNrqzcBW55-7IAe7_Our6nMQxak
- Lenovo Data Center Support
  http://datacentersupport.lenovo.com

Related product families

Product families related to this document are the following:

- DG Series Storage
- External Storage
- Lenovo SAN Storage

Notices

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