



IBM Storwize V3700 for Lenovo Product Guide

IBM Storwize V3700 Storage System for Lenovo (Machine Type 6099) is a member of the IBM Storwize family of disk systems. By using IBM Storwize V7000 Storage System and IBM SAN Volume Controller functions, interoperability, and management tools, Storwize V3700 delivers innovation and new levels of storage efficiency with ease of use in an entry-level disk system to enable organizations to overcome their storage challenges.

Storwize V3700 Storage System features two node canisters, with 4 GB cache per canister upgradeable to 8 GB, in a compact, 2U, 19-inch rack mount enclosure. A 6 Gb SAS and 1 Gb iSCSI connectivity is standard, with an option for 8 Gb Fibre Channel (FC) or 10 iSCSI or Fibre Channel over Ethernet (FCoE) connectivity.

Storwize V3700 supports up to 240 drives with up to nine external expansion units. It also offers flexible drive configurations with the choice of 2.5-inch and 3.5-inch drive form factors, 10 K or 15 K rpm SAS and 7.2 K rpm NL SAS hard disk drives (HDDs), and SAS solid-state drives (SSDs).

The Storwize V3700 SFF enclosure is shown in the following figure.



Figure 1. Storwize V3700 SFF enclosure

Did you know?

Storwize V3700 provides small and mid-sized organizations with the ability to consolidate and share data at an affordable price, while utilizing advanced software capabilities that often are found in more expensive systems.

Storwize V3700 can be scaled up to 960 TB of raw storage capacity.

Storwize V3700 offers hybrid block storage connectivity with support for 6 Gb SAS, 1 Gb iSCSI, and 10 Gb iSCSI or FCoE or 8 Gb FC at the same time.

Key features

Note: Storwize V3700 functional capabilities that are described in this product guide are based on the IBM Spectrum Virtualize Family Software for Storwize V3700 version 7.6. The Spectrum Virtualize Software for Storwize V3700 version 7.6 requires 8 GB cache memory per node canister.

The Storwize V3700 storage system provides the following key features and benefits:

- Scalable, modular storage with dual-active intelligent array node canisters with up to 8 GB cache per canister.
- Flexible host connectivity to match diverse client needs with support for 6 Gb SAS and 1 Gb iSCSI connectivity standard, with optional 10 Gb iSCSI or FCoE, 8 Gb FC, or extra 6 Gb SAS or 1 Gb iSCSI connectivity.
- 6 Gb SAS drive-side connectivity with support for 12x 3.5-inch large form factor (LFF) or 24x 2.5-inch small form factor (SFF) drives in the controller unit; scalable up to 120 LFF drives per system with the attachment of LFF expansion units (12x LFF drives each) or up to 240 SFF drives per system with the attachment of SFF expansion unit (24x SFF drives each) to satisfy growing needs for storage capacity and performance.
- Flexibility in storing data on high-performance SAS SSDs, performance-optimized enterprise SAS HDDs, or capacity-optimized enterprise NL SAS HDDs; mixing and matching drive types and form factors within a single system to perfectly meet performance and capacity requirements for various workloads.
- Rich set of standard functions are available at no extra cost, including virtualized internal storage, snapshots, thin provisioning, data migration, and data replication.
- Optional licensed functions, including higher number of snapshots for added scalability, Turbo performance, Easy Tier, and remote mirroring.
- VMware vSphere Virtual Volumes (VVol) integration brings advanced storage management functions to the virtual machine level for finer VM storage service level control and policy-driven automation.

Note: VVol integration feature requires IBM Spectrum Control Base Edition for Lenovo that can be downloaded from <http://www.ibm.com/support/fixcentral>.

- Intuitive, web-based GUI for easy system set up and management.
- Extensive interoperability with support for most major server platforms and operating systems.
- Conforms to applicable Network Equipment Building System (NEBS) level 3 documents and to applicable European Telecommunications Standards Institute (ETSI) documents

The Storwize V3700 LFF enclosure is shown in the following figure.



Figure 2. Storwize V3700 LFF enclosure

The Storwize V3700 supports the complete range of data storage requirements, from highly utilized applications to high-capacity, low usage applications, with the flexible choice of drives.

The following 2.5-inch drives are supported:

- High-performance SSDs: 200 GB, 400 GB, 800 GB, and 1.6 TB SAS
- Performance-optimized, enterprise class disk drives:
 - 300 GB and 600 GB 15K rpm SAS
 - 600 GB, 900 GB, 1.2 TB, and 1.8 TB 10K rpm SAS
- High-capacity, archival-class nearline disk drives: 1 TB and 2 TB 7.2K rpm NL SAS

The following 3.5-inch drives are supported:

- Performance-optimized, enterprise class disk drives:
 - 300 GB and 600 GB 15K rpm SAS
 - 900 GB, 1.2 TB, and 1.8 TB 10K rpm SAS
- High-capacity, archival-class nearline disk drives: 3 TB, 4 TB, 6 TB, and 8 TB 7.2K rpm NL SAS

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 nine Storwize V3700 expansion units are supported by a single Storwize V3700 controller unit. You can intermix 3.5-inch and 2.5-inch expansion units behind a 3.5-inch or 2.5-inch controller unit. This configuration delivers the added flexibility to mix 3.5-inch and 2.5-inch drives within a single system. More drives and expansion units are designed to be dynamically added with virtually no downtime, which helps to quickly and seamlessly respond to ever-growing capacity demands.

The Storwize V3700 storage system is designed to offer high levels of system and data availability with the following technologies:

- Dual-active, intelligent node canisters with mirrored cache
- Dual-port drives with automatic drive failure detection and RAID rebuild with global hot spares
- Redundant hardware, including power supplies and fans
- Hot-swappable and customer replaceable components
- Automated path failover support for the data path between the server and the drives

The following features are included with every Storwize V3700 storage system:

- RAID levels 0, 1, 5, 6, and 10
Provides the flexibility to choose the level of data protection that is required.
- Distributed RAID 5 and 6
Helps improve performance and availability with significantly faster rebuild time by allowing data to be distributed across more physical drives that are used simultaneously.
- Virtualization of internal storage
Enables rapid, flexible provisioning and simple configuration changes.
- Thin Provisioning
Optimizes efficiency by allocating disk storage space in a flexible manner among multiple users, based on the minimum space required by each user at any time. With thin provisioning, applications use only the space they are actually using, not the total space that is allocated to them.
- One-way Data Migration
Enables easy and nondisruptive moves of volumes from another storage system onto the Storwize V3700 Storage System by using FC or SAS connectivity.
- FlashCopy
Enables creation of copies of data for backup, parallel processing, testing, and development, and have the copies available almost immediately. Base software supports up to 64 FlashCopy targets per system.

The Storwize V3700 storage capabilities can be expanded with optional licensed functions. Each optional Storwize V3700 function is licensed on a per-system basis and covers controller unit and all attached expansion units.

To help evaluate the benefits of these new capabilities, licensed functions (with the exception of FlashCopy upgrade) can be enabled at no charge for a 90-day trial period. Trials are started from the Storwize management GUI and do not require any Lenovo intervention. Upon expiration of the trial, the function is automatically disabled unless a license key for that function was installed onto the machine.

The following optional licensed functions are available:

- **Turbo Performance**
Turbo performance increases the maximum IOPS and throughput of a Storwize V3700 Storage System. Configurations with greater than 80 disk drives or more than five SSDs are ideal candidates to benefit from the increased IOPS offered with Turbo performance. Configurations with greater than 30 disk drives are suited to benefit from the throughput increase offered with Turbo performance.
- **FlashCopy Upgrade**
FlashCopy allows the creation of copies of data for backup, parallel processing, testing, and development, and have the copies available almost immediately. All Storwize V3700 storage systems support up to 64 targets per system at no charge. The FlashCopy upgrade option increases this support to 2,040 FlashCopy targets per system.
- **Easy Tier**
Storage tiering helps optimize storage use with data location to improve system performance, reduce costs, and simplify management. Easy Tier automatically and dynamically moves frequently accessed data to flash (solid-state) drives in the system, which results in flash drive performance without manually creating and managing storage tier policies. Easy Tier makes it easy and economical to deploy flash drives in the environment.
- **Remote Mirroring**
The remote mirroring feature provides storage system-based data replication by using synchronous or asynchronous data transfers over IP, FC, or FCoE communication links:
 - Metro Mirror maintains a fully synchronized copy at metropolitan distances (up to 300 km).
 - Global Mirror operates asynchronously and helps maintain a copy at much greater distances (up to 8000 km)

Both functions support VMware Site Recovery Manager for disaster recovery.

For ultimate flexibility, Storwize V3700 remote mirroring interoperates with any other Storwize family system, including Storwize V7000, Storwize V5000, and SAN Volume Controller.

The remote mirroring option must be acquired (or licensed) for the primary (local) and secondary (remote) systems. If Storwize V3700 is mirrored to a system other than Storwize V3700, the other system must have the appropriate and applicable license for remote mirroring.

The Storwize V3700 supports the following management interfaces:

- Web-based graphical user interface (GUI) via HTTPS that 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
- Storage Management Initiative Specification (SMI-S)
- SNMP and email notifications

Components and connectors

The following figure shows the front of the Storwize V3700 SFF enclosure.

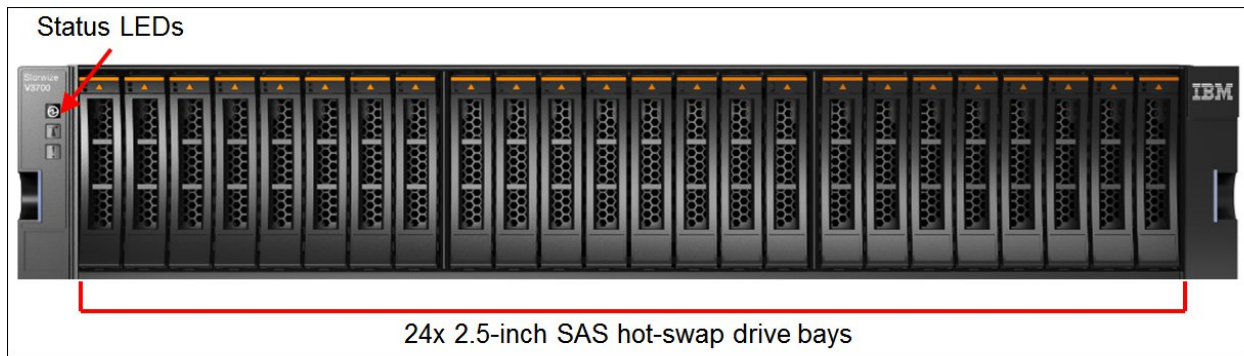


Figure 3. Front view of the Storwize V3700 SFF enclosure

The following figure shows the front of the Storwize V3700 LFF enclosure.

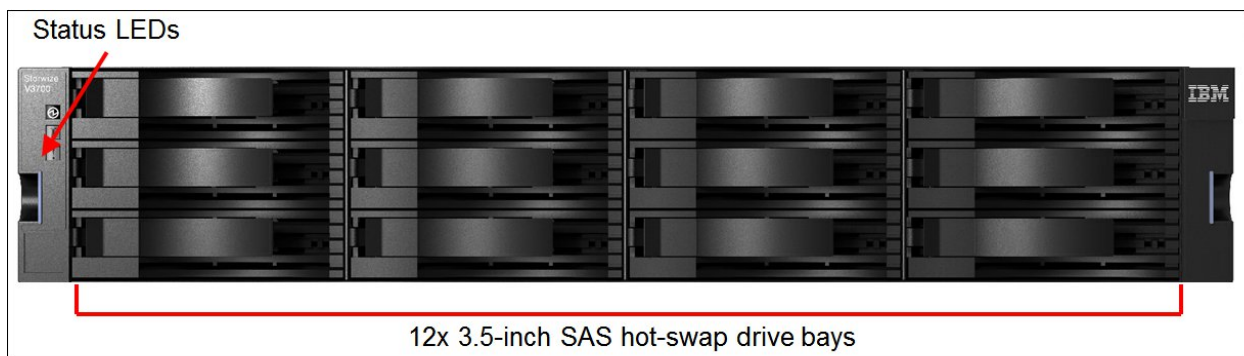


Figure 4. Front view of the Storwize V3700 LFF enclosure

The following figure shows the rear of the Storwize V3700 Controller Unit.

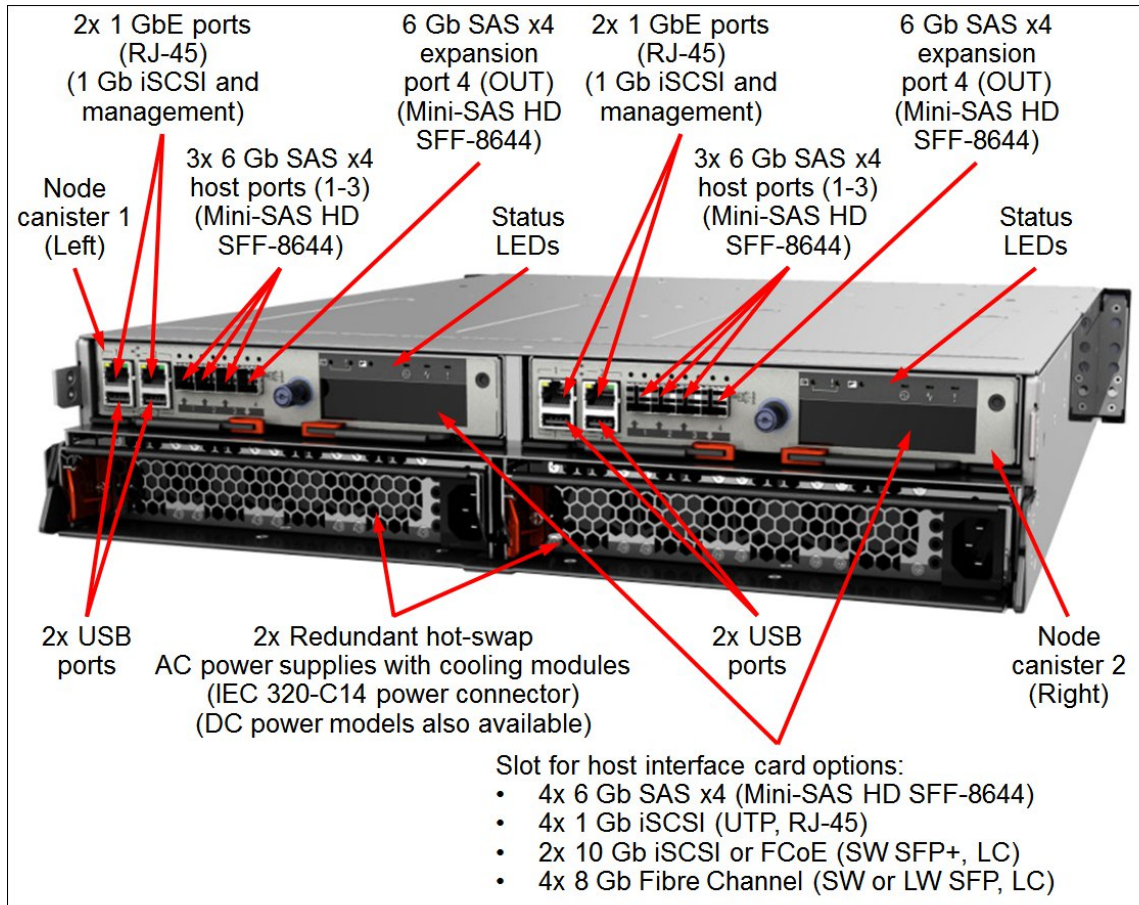


Figure 5. Rear view of the Storwize V3700 Controller Unit

The following figure shows the rear of the Storwize V3700 Expansion Unit.

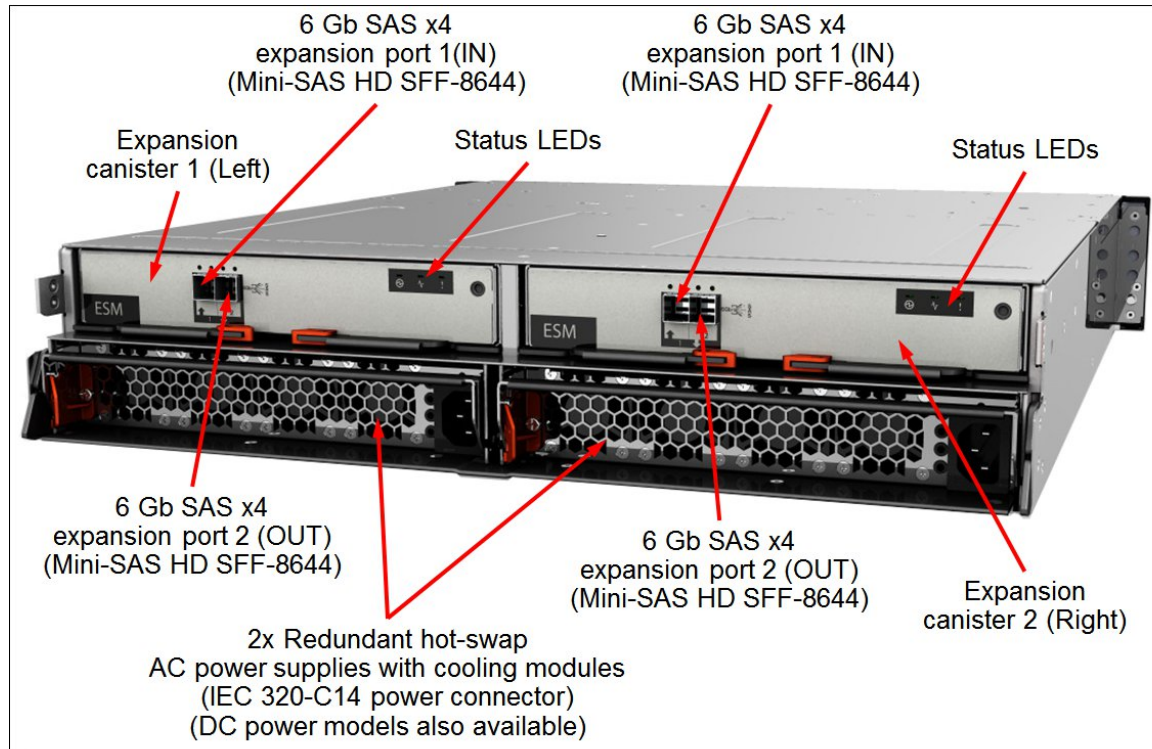


Figure 6. Rear view of the Storwize V3700 Expansion Unit

System specifications

The following table lists the Storwize V3700 storage system specifications.

Table 1. System specifications

Component	Specification
Form factor	Storwize V3700 Controller Unit: 2U rack mount Storwize V3700 Expansion Unit: 2U rack mount
Controller unit configuration	Dual controller (known as <i>node canister</i>) configuration.
RAID levels	RAID 0, 1, 5, 6, and 10; Distributed RAID 5 and 6 (Distributed RAID is supported with the Spectrum Virtualize Software for V3700 version 7.6 onwards, which requires 4 GB to 8 GB cache upgrades).
Controller cache	8 GB per system (4 GB per node canister) upgradeable to 16 GB (8 GB per node canister). Battery-backed cache protection.
Drive bays	Up to 240 SFF drive bays per storage system: <ul style="list-style-type: none"> • 24 SFF drive bays in the controller unit • 24 SFF drive bays in the expansion unit; up to 9x expansion units Up to 120 LFF drive bays per storage system: <ul style="list-style-type: none"> • 12 LFF drive bays in the controller unit • 12 LFF drive bays in the expansion unit; up to 9x expansion units Intermix of SFF and LFF units is supported.
Drive technology	SAS and NL SAS HDDs and SAS SSDs. Intermix of HDDs and SSDs is supported.

Component	Specification
Drive connectivity	<p>Dual-ported 6 Gb SAS drive attachment infrastructure.</p> <p>Controller unit with two node canisters (ports per one node canister):</p> <ul style="list-style-type: none"> • 24x 6 Gb SAS internal drive ports (SFF enclosure) • 12x 6 Gb SAS internal drive ports (LFF enclosure) • 1x 6 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion port for the attachment of the expansion units <p>Expansion unit with two expansion canisters (ports per one expansion canister):</p> <ul style="list-style-type: none"> • 24x 6 Gb SAS internal drive ports (SFF enclosure) • 12x 6 Gb SAS internal drive ports (LFF enclosure) • 2x 6 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports for the daisy chained attachment of the expansion units
Drives	<p>SFF drives:</p> <ul style="list-style-type: none"> • 200 GB, 400 GB, 800 GB, and 1.6 TB SAS SSDs • 300 GB and 600 GB 15K rpm SAS HDDs • 600 GB, 900 GB, 1.2 TB, and 1.8 TB 10K rpm SAS HDDs • 1 TB and 2 TB 7.2K rpm NL SAS HDDs <p>LFF drives:</p> <ul style="list-style-type: none"> • 300 GB and 600 GB 15K rpm SAS HDDs • 900 GB, 1.2 TB, and 1.8 TB 10K rpm SAS HDDs • 3 TB, 4 TB, 6 TB, and 8 TB 7.2K rpm NL SAS HDDs
Storage capacity	Up to 960 TB (120x 8 TB NL SAS HDDs)
Host connectivity	<p>Standard ports (per controller unit with two node canisters):</p> <ul style="list-style-type: none"> • 6x 6 Gb SAS host ports (Mini-SAS HD, SFF-8644) (3 ports per node canister) • 4x 1 Gb iSCSI host ports (UTP, RJ-45) (2 ports per node canister) <p>Optional additional ports on host interface cards (per controller unit with two node canisters):</p> <ul style="list-style-type: none"> • 8x 6 Gb SAS host ports (Mini-SAS HD, SFF-8644) (4 ports per node canister) • 8x 1 Gb iSCSI host ports (UTP, RJ-45) (4 ports per node canister) • 4x 10 Gb iSCSI or FCoE SFP+ host ports (SW fiber optics, LC) (2 ports per node canister) • 8x 8 Gb FC SFP host ports (SW or LW fiber optics, LC) (4 ports per node canister)
Host operating systems	Microsoft Windows Server 2008 R2, 2012 and 2012 R2; Red Hat Enterprise Linux (RHEL) 5, 6, and 7; SUSE Linux Enterprise Server (SLES) 10, 11, and 12; VMware vSphere 5.0, 5.1, 5.5, and 6.0.
Standard software features	Virtualization of internal storage, Thin Provisioning, One-way Data Migration, FlashCopy snapshots (up to 64 targets).
Optional features	Turbo Performance, Easy Tier, Remote Mirroring, FlashCopy snapshots (up to 2,040 targets).
Performance (non-Turbo / Turbo)*	<ul style="list-style-type: none"> • Up to 280,000 / 530,000 cache read IOPS • Up to 40,000 / 70,000 disk read IOPS • Up to 9,000 / 15,000 disk write IOPS • Up to 21,000 / 36,000 disk mixed (70% read/30% write) IOPS • Up to 3.3 / 5.5 GBps sequential cache read throughput • Up to 2.0 / 3.8 GBps sequential disk read throughput • Up to 0.75 / 1.5 GBps sequential disk write throughput

Component	Specification
Configuration maximums**	Per system: <ul style="list-style-type: none"> • Maximum number of storage pools: 1,024 • Maximum number of logical volumes: 2,048 • Maximum logical volume size: 256 TB • Maximum number of drives in a RAID array: 16 • Maximum number of drives in a distributed RAID array: 128 (including up to 4 spares) • Maximum number of RAID arrays: 128 • Maximum number of distributed RAID arrays: 10 • Maximum hot spare drives: No limit • Maximum number of host ports: 2,048 • Maximum number of hosts: 256 • Maximum number of host ports per one host: 32 • Maximum number of snapshots: 2,040 (requires an optional license) • Maximum number of remote mirroring relationships: 2,048 (requires an optional license)
Cooling	Redundant cooling with the fan modules that are built into power supplies.
Power supply	Two redundant hot-swap 735 W AC or 800 W DC power supplies.
Hot-swap parts	Node canisters, expansion canisters, SFP/SFP+ transceivers, drives, power supplies with fans.
Management interfaces	2x 1 GbE ports (UTP, RJ-45) in a primary/redundant configuration. Web-based GUI; SSH CLI; SMI-S; SNMP and email notifications.
Security features	Secure Socket Layer (SSL), Secure Shell (SSH), user level security, LDAP authentication
Warranty	Three-year customer-replaceable unit and onsite warranty with 9x5 next business day terms.
Service and support	Optional warranty service upgrades are available through Lenovo: 24x7 coverage, 2-hour or 4-hour response time, 1-year or 2-year warranty extensions, Hard Drive Retention.
Dimensions	Height: 87 mm (3.4 in.); width: 483 mm (19.0 in.); depth: 556 mm (21.9 in.)
Weight	<ul style="list-style-type: none"> • 3.5-inch controller unit: Empty: 18.0 kg (39.6 lb); Fully configured: 28.3 kg (62.2 lb) • 3.5-inch expansion unit: Empty: 16.4 kg (36.1 lb); Fully configured: 26.7 kg (58.8 lb) • 2.5-inch controller unit: Empty: 19.0 kg (41.8 lb); Fully configured: 27.3 kg (60.0 lb) • 2.5-inch expansion unit: Empty: 16.7 kg (36.7 lb); Fully configured: 25.0 kg (55.2 lb)

* Performance measurements in systems unconstrained by the number of drives.

** For a detailed list of configuration limits and restrictions for a specific version of the Storwize V3700 software, see the following online document: <http://www.ibm.com/support/docview.wss?uid=ssg1S1004388>

Controller units

The following table lists the models of the Storwize V3700 controller units.

Table 2. Part numbers and feature codes for ordering Storwize V3700 controller units

Description	Part number	Feature code (MTM* 6099-12C)	Feature code (MTM 6099-24C)	Feature code (MTM 6099-2DC)
IBM Storwize V3700 3.5-inch Storage Controller Unit	6099L2C	ACAN	None	None
IBM Storwize V3700 2.5-inch Storage Controller Unit	6099S2C	None	ACBN	None
IBM Storwize V3700 2.5-inch DC Storage Controller Unit	6099T2C	None	None	ACDJ

* MTM = Machine Type (first four digits) - Model (last three digits and letters)

The part number for the Storwize V3700 controller unit includes the following items:

- One Storwize V3700 LFF or SFF controller unit with two power supplies with cooling modules and with two node canisters
- Two 2.8 m, 10 A/100 - 250 V, C13 to IEC 320-C14 Rack Power Cables (AC-powered models only)
- Two DC power cables (DC-powered models only)
- Rack mount hardware kit
- Publications package

The Storwize V3700 controller units ship with two node canisters. A *node canister* provides interfaces for host connectivity, management, and internal drives, and it runs storage management and virtualization software.

Each Storwize V3700 controller unit ships with 8 GB of battery-backed cache (4 GB per node canister) that can be upgraded to 16 GB (8 GB per node canister). The following table lists cache upgrade option.

Table 3. Cache upgrade option

Description	Part number	Feature code (Models 12C, 24C, 2DC)	Maximum qty per one controller unit
4GB to 8GB Cache Upgrade	00MJ101	ACHB	2*

* One per node canister; both node canisters must have the same cache size.

The Storwize V3700 controller units ship with the following host connectivity interfaces:

- 4x Gigabit Ethernet (RJ-45) ports (2 ports per node canister) for 1 Gb iSCSI host connectivity and management
- 6x 6 Gb SAS x4 (Mini-SAS HD SFF-8644) ports (3 ports per node canister) for 6 Gb SAS direct host attachments

Each node canister has one expansion slot for an optional host interface card (HIC). The following host interfaces can be added to the Storwize V3700 controller unit with optional HICs (if HICs are used, two HICs of the same type are required per one controller unit):

- 8x 6 Gb SAS x4 (Mini-SAS HD SFF-8644) ports (4 ports per HIC) for extra SAS connectivity (for a total of 14x 6 Gb SAS ports per controller unit)
- 8x GbE (RJ-45) ports (4 ports per HIC) for extra iSCSI connectivity (for a total of 12x GbE ports per controller unit)
- 4x 10 GbE SFP+ ports (2 ports per HIC) with four SW SFP+ optical transceivers (LC connectors) installed for 10 Gb iSCSI or FCoE connectivity
- 8x 8 Gb FC SFP ports (4 ports per HIC) with four SW SFP optical transceivers (LC connectors) installed (2 transceivers per HIC) for FC connectivity (a pair of extra 8 Gb FC SW or LW SFP transceivers is available for ordering as an option)

Note: Both node canisters must have the same type of the host interface card installed, and both cards must have SFP/SFP+ modules of the same type, if any.

The following table lists the available host port configurations for the Storwize V3700 controller units.

Table 4. Storwize V3700 controller unit host port configurations

Port type	6 Gb SAS	1 Gb iSCSI	10 Gb iSCSI or FCoE	8 Gb FC
Number of ports	Standard configuration			
	6 (3 per node canister)	4 (2 per node canister)	-	-
	Optional configurations			
	14 (7 per node canister)	4 (2 per node canister)	-	-
	6 (3 per node canister)	12 (2 per node canister)	-	-
	6 (3 per node canister)	4 (2 per node canister)	4 (2 per node canister)	-
	6 (3 per node canister)	4 (2 per node canister)	-	8 (4 per node canister)

The following table lists ordering information for the host connectivity options for the Storwize V3700 controller units.

Table 5. Host connectivity options

Description	Part number	Feature code (Models 12C, 24C, 2DC)	Maximum qty per one controller unit
Host connectivity card options			
6Gb SAS 4 Port Host Interface Card	00MJ093	ACHJ	2*
8Gb FC 4 Port Host Interface Card	00MJ095	ACHK	2*
1Gb iSCSI 4 Port Host Interface Card	00MJ097	ACHL	2*
10Gb iSCSI - FCoE 2 Port Host Interface Card	00MJ099	ACHM	2*
SFP options for 8 Gb FC host interface card (ships with a pair of 8 Gb FC SW SFP transceivers)			
8Gb FC SW SFP Transceivers (Pair)	00MJ103	ACHS	2**
8Gb FC LW SFP Transceivers (Pair)	00MJ105	ACHT	4***
Cable options for FC, FCoE, and 10 Gb iSCSI host connectivity (AC-powered models only)			
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5	8
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6	8
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7	8
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8	8
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9	8
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA	8
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB	8
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC	8
Cable options for FC, FCoE, and 10 Gb iSCSI host connectivity (AC- and DC-powered models)			
1m Fiber Cable (LC) (FC only)	00MJ168	ACSJ	8
5m Fiber Cable (LC) (FC only)	00MJ170	ACSK	8
10m OM3 Fiber Cable (LC)	00MJ174	ACSS	8
25m Fiber Cable (LC) (FC only)	00MJ172	ACSL	8
SAS host connectivity cables - Mini-SAS HD (controller) to Mini-SAS (host)			
0.6m SAS Cable (mSAS HD to mSAS)	00MJ162	ACSA	14

Description	Part number	Feature code (Models 12C, 24C, 2DC)	Maximum qty per one controller unit
1.5m SAS Cable (mSAS HD to mSAS)	00MJ163	ACSB	14
3m SAS Cable (mSAS HD to mSAS)	00MJ166	ACSC	14
SAS host connectivity cables - Mini-SAS HD (controller) to Mini-SAS HD (host)			
0.6m SAS Cable (mSAS HD to mSAS HD)	00MJ176	ACTA	14
1.5m SAS Cable (mSAS HD to mSAS HD)	00MJ178	ACTB	14
3m SAS Cable (mSAS HD to mSAS HD)	00MJ180	ACTC	14

* Up to one per node canister; both node canisters must have the same connectivity type.

** Up to one extra SW SFP module pair per 8 Gb FC host interface card in the node canister; both node canisters must have the same connectivity type.

*** Up to two LW SFP module pairs per 8 Gb FC host interface card in the node canister; both node canisters must have the same connectivity type. The second pair of LW SFP modules replaces the SW SFP modules that ship standard with the 8 Gb FC HIC.

The Storwize V3700 controller units provide 6 Gb SAS internal dual-port drive connectivity, and each controller unit also has two 6 Gb SAS x4 (Mini-SAS HD SFF-8644) ports (1 port per node canister) for 6 Gb SAS expansion unit connectivity.

Expansion units

The Storwize V3700 controller unit supports attachment of up to nine Storwize V3700 expansion units. Intermix of LFF and SFF units is supported. The enclosures can be added to the system non-disruptively.

The following table lists the models of the Storwize V3700 expansion units.

Table 6. Part numbers and feature codes for ordering Storwize V3700 expansion units

Description	Part number	Feature code (MTM 6099-12E)	Feature code (MTM 6099-24E)	Feature code (MTM 6099-2DE)
IBM Storwize V3700 3.5-inch Storage Expansion Unit	6099LEU	ACAS	None	None
IBM Storwize V3700 2.5-inch Storage Expansion Unit	6099SEU	None	ACBS	None
IBM Storwize V3700 2.5-inch DC Storage Expansion Unit	6099TEU	None	None	ACDS

The part number for the expansion unit includes the following items:

- One Storwize V3700 LFF or SFF expansion unit with two power supplies with cooling modules and with two expansion canisters
- Two 2.8 m, 10 A/100 - 250 V, C13 to IEC 320-C14 Rack Power Cables (AC-powered models only)
- Two DC power cables (DC-powered models only)
- Rack mount hardware kit
- Publications package

Each Storwize V3700 expansion unit ships with two expansion canisters. Each *expansion canister* provides 6 Gb SAS connectivity to the internal drives and two external 6 Gb SAS x4 ports (Mini-SAS HD SFF-8644 connectors labelled Port 1 and Port 2) that are used for connections to the Storwize V3700 node canisters and for daisy chaining the expansion units between each other. The expansion port (Port 4) on the Storwize V3700 node canister is connected to the Port 1 on the expansion canister. The Port 2 on the expansion canister is connected to the Port 1 on the expansion canister in the adjacent enclosure, and so on.

The expansion unit connectivity topology is shown in the following figure.

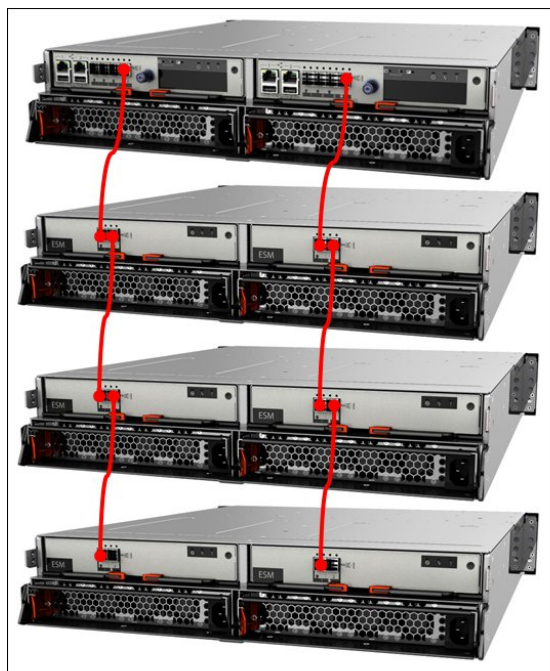


Figure 7. Expansion unit connectivity topology

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

Table 7. Expansion unit connectivity options

Description	Part number	Feature code (Models 12E, 24E, 2DE)	Maximum qty per one expansion unit
0.6m SAS Cable (mSAS HD to mSAS HD)	00MJ176	ACTA	2*
1.5m SAS Cable (mSAS HD to mSAS HD)	00MJ178	ACTB	2*
3m SAS Cable (mSAS HD to mSAS HD)	00MJ180	ACTC	2*

* One cable per expansion canister; two cables are required per each expansion unit.

Drive options

The Storwize V3700 LFF controller and expansion units support up to 12 LFF hot-swap drives, and the Storwize V3700 SFF units support up to 24 SFF hot-swap drives.

The following table lists drive options for the Storwize V3700 LFF units.

Table 8. LFF drive options

Description	Part number	Feature code (Models 12C, 12E)	Maximum qty per one LFF unit
3.5-inch SAS hot-swap HDDs			
300 GB 15,000 rpm 6 Gb SAS 3.5 Inch HDD	00MJ135	ACKS	12
600 GB 15,000 rpm 12 Gb SAS 3.5 Inch HDD	00MJ137	ACKT	12
900 GB 10,000 rpm 6 Gb SAS 3.5 Inch HDD	00MJ131	ACKJ	12
1.2 TB 10,000 rpm 6 Gb SAS 3.5 Inch HDD	00MJ133	ACKK	12
1.8 TB 10,000 rpm 12 Gb SAS 3.5 Inch HDD	00MN524	ASTK	12
3.5-inch NL SAS hot-swap HDDs			
3 TB 7,200 rpm 6 Gb NL SAS 3.5 Inch HDD	00MJ127	ACKB	12
4 TB 7,200 rpm 6 Gb NL SAS 3.5 Inch HDD	00MJ129	ACKC	12
6 TB 7,200 rpm 12 Gb NL SAS 3.5 Inch HDD	00MN522	ASTJ	12
8 TB 7,200 rpm 12 Gb NL SAS 3.5 Inch HDD	00WC008	AT0T	12

The following table lists drive options for the Storwize V3700 SFF units.

Table 9. SFF drive options

Description	Part number	Feature code (Models 24C, 24E, 2DC)	Maximum qty per one SFF unit
2.5-inch SAS hot-swap HDDs			
300 GB 15,000 rpm 6 Gb SAS 2.5 Inch HDD	00MJ141	ACLB	24
600 GB 10,000 rpm 6 Gb SAS 2.5 Inch HDD	00MJ145	ACLK	24
600 GB 15,000 rpm 12 Gb SAS 2.5 Inch HDD	00MJ143	ACLC	24
900 GB 10,000 rpm 6 Gb SAS 2.5 Inch HDD	00MJ147	ACLL	24
1.2 TB 10,000 rpm 6 Gb SAS 2.5 Inch HDD	00MJ149	ACLM	24
1.8 TB 10,000 rpm 12 Gb SAS 2.5 Inch HDD	00MN526	ASTL	24
2.5-inch NL SAS hot-swap HDDs			
1 TB 7,200 rpm 6 Gb NL SAS 2.5 Inch HDD	00MJ151	ACLT	24
2 TB 7,200 rpm 12 Gb NL SAS 2.5 Inch HDD	00WC011	AT0W	24
2.5-inch SAS hot-swap SSDs			
200 GB 12 Gb SAS 2.5 Inch Flash Drive	00MJ154	ACMD	24
400 GB 12 Gb SAS 2.5 Inch Flash Drive	00MJ156	ACME	24
800 GB 12 Gb SAS 2.5 Inch Flash Drive	00MJ158	ACMF	24
1.6 TB 12 Gb SAS 2.5 Inch Flash Drive	00WC014	AT0Z	24

Software options

The Storwize V3700 comes standard with the following software features:

- Virtualization of internal storage
- Thin Provisioning
- Data Migration
- FlashCopy: Up to 64 targets

The functionality of the Storwize V3700 can be expanded with the following optional software features:

- Turbo Performance
- FlashCopy Upgrade: Up to 2,040 targets
- Remote Mirroring
- Easy Tier

For more information about the standard and optional software features, see the Key features section.

The following table lists ordering information for optional software features.

Table 10. Optional software features

Description	Part number	Feature code (Models 12C, 24C, 2DC)	Maximum qty per one controller unit
Turbo Performance	00MJ117	ACFA	1
FlashCopy Upgrade	00MJ119	ACFE	1
Remote Mirroring	00MJ121	ACFJ	1
Easy Tier	00MJ123	ACFN	1

Power cables

The Storwize V3700 AC-powered units ship standard with two 2.8 m, 10 A/100 - 250 V, C13 to IEC 320-C14 rack power cables. Optionally, country-specific line cords also can be ordered (see the following table; each part number or feature code contains two line cords that are needed per one unit).

Table 11. Part numbers and feature codes for ordering country-specific line cords

Description	Part number	Feature code (Models 12C, 24C, 12E, 24E)
2.8m, 10A/230V, C13 to BS 1363/A (UK) Line Cord	00MJ232	ARZT
2.8m, 10A/230V, C13 to AS/NZS 3112 (Aus/NZ) Line Cord	00MJ233	ARZU
2.8m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord	00MJ234	ARZV
2.8m, 10A/230V, C13 to DK2-5a (Denmark) Line Cord	00MJ235	ARZW
2.8m, 10A/230V, C13 to SABS 164 (South Africa) Line Cord	00MJ236	ARZX
2.8m, 10A/230V, C13 to SEV 1011-S24507 (Sws) Line Cord	00MJ237	ARZY
2.8m, 10A/230V, C13 to CEI 23-16 (Italy) Line Cord	00MJ238	ARZZ
2.8m, 10A/230V, C13 to SI 32 (Israel) Line Cord	00MJ239	AS00
2.8m, 10A/220V, C13 to IRAM 2073 (Argentina) Line Cord	00MJ240	AS01
2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord	00MJ241	AS02
2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord	00MJ242	AS03
2.8m, 10A/120V, C13 to NEMA 5-15P (US) Line Cord	00MJ242	AS03

Description	Part number	Feature code (Models 12C, 24C, 12E, 24E)
2.8m, 10A/110V, C13 to CNS 10917-3 (Taiwan) Line Cord	00MJ243	AS04
2.8m, 10A/220V, C13 to NBR 6147 (Brazil) Line Cord	00MJ244	AS05
2.8m, 10A/240V, C13 to IS 6538 (India) Line Cord	00MJ245	AS06
2.8m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord	00MJ246	AS07
2.8m, 12A/220V, C13 to KSC 8305 (S. Korea) Line Cord	00MJ247	AS08
1.8m, 10A/120V, C13 to NEMA 5-15P (US/Chicago) Line Cord	00MJ248	AS25

For DC-powered units, two DC power cables are included with the unit.

Physical specifications

The Storwize V3700 units have the following dimensions and weight (approximate):

- Height: 87 mm (3.4 in.)
- Width: 483 mm (19.0 in.)
- Depth: 556 mm (21.9 in.)
- Approximate weight::
 - 3.5-inch storage controller unit:
 - Empty: 18.0 kg (39.6 lb)
 - Fully configured: 28.3 kg (62.2 lb)
 - 3.5-inch storage expansion unit:
 - Empty: 16.4 kg (36.1 lb)
 - Fully configured: 26.7 kg (58.8 lb)
 - 2.5-inch storage controller unit:
 - Empty: 19.0 kg (41.8 lb)
 - Fully configured: 27.3 kg (60.0 lb)
 - 2.5-inch storage expansion unit:
 - Empty: 16.7 kg (36.7 lb)
 - Fully configured: 25.0 kg (55.2 lb)

Operating environment

The Storwize V3700 units are supported in the following environment:

- Air temperature:
 - Operating: 10 °C - 35 °C (50 °F - 95 °F) at 30.5 m (100 ft) below to 3,000 m (9,840 ft) above sea level
 - Storage: -10 °C - +50 °C (14 °F - 125 °F)
 - Maximum altitude: 3,000 m (9,840 ft)
- Humidity:
 - Operating: 20% - 80%
 - Storage: 10% - 90%
- Electrical power (AC-powered models):
 - Voltage range: 100 V AC - 240 V AC
 - Frequency: 50 Hz - 60 Hz
 - Power:
 - 3.5-inch storage controller unit: 358 watts
 - 3.5-inch storage expansion unit: 300 watts
 - 2.5-inch storage controller unit: 405 watts
 - 2.5-inch storage expansion unit: 338 watts

- Electrical power (DC-powered models):
 - Voltage range: -42 V DC to -60 V DC
 - Voltage nominal:-48 V DC
 - Current: 12.0 A
 - Power:
 - SFF control enclosure: 356 watts
 - SFF expansion enclosure: 278 watts
- Heat dissipation (BTU per hour):
 - AC-powered models:
 - 3.5-inch storage controller unit: 1,222
 - 3.5-inch storage expansion unit: 1,024
 - 2.5-inch storage controller unit: 1,383
 - 2.5-inch storage expansion unit: 1,154
 - DC-powered models:
 - 2.5-inch storage controller unit: 1,215
 - 2.5-inch storage expansion unit: 949
- Acoustical noise emission:
 - 3.5-inch controller unit:
 - 6.0 bels (idling)
 - 6.0 bels (operating)
 - 2.5-inch controller unit:
 - 6.1 bels (idling)
 - 6.1 bels (operating)

Warranty options

The Storwize V3700 has a three-year Customer Replaceable Unit (CRU) and onsite warranty with 9x5/next business day (NBD) terms. Lenovo offers the service upgrades through warranty maintenance upgrades and post-warranty maintenance agreements with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

Lenovo warranty service upgrade offerings are country-specific; that is, each country might have its own service types, service levels, response times, and terms and conditions. Not all covered types of warranty service upgrades might be available in a particular country or area. For more information about Lenovo warranty service upgrade offerings that are available in your country, see the Lenovo Services Product Selector that is available at this website:

<https://www-304.ibm.com/sales/gss/download/spst/servicepac>

The warranty service definitions for the Storwize V3700 system are listed in the following table.

Table 12. Warranty service definitions

Term	Description
On-site service	A service technician arrives at the client's location for equipment service.
24x7x2 hour	A service technician is scheduled to arrive at the client's location within two hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
24x7x4 hour	A service technician is scheduled to arrive at the client's location within four hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.

Term	Description
9x5x4 hour	A service technician is scheduled to arrive at the client's location within four business hours after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday - Friday, excluding Lenovo holidays. For example, if a customer reports an incident at 3:00 pm on Friday, the technician will arrive by 10:00 am the following Monday.
9x5 next business day	A service technician is scheduled to arrive at the client's location on the business day after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday - Friday, excluding Lenovo holidays. Calls received after 4:00 pm local time require an extra business day for service dispatch. Next business day service is not guaranteed.

In general, the following types of Lenovo warranty service upgrades for the Storwize V3700 are available:

- Warranty and maintenance service upgrades:
 - Three or five years of 9x5 or 24x7 service coverage
 - Onsite response from next business day to two or four hours
 - Up to five years of warranty extension for all service levels in one or two year increments
- Hard Drive Retention

Lenovo's Hard Drive Retention service is a multi-drive hard drive retention offering that ensures your data is always under your control, regardless of the number of hard drives that are installed in your Lenovo system. In the unlikely event of a hard drive failure, you retain possession of your hard drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The Hard Drive Retention service can be purchased in convenient bundles with our warranty upgrades and extensions.
- Remote Technical Support Services (RTS) - 1 or 3 years

RTS provides comprehensive technical call center support. RTS can reduce problem resolution time, which decreases the cost to address technical problems and increases uptime.

Regulatory compliance

The Storwize V3700 conforms to the following regulations:

- FCC: Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, Class A
- Australia and New Zealand Class A statement
- European Union Council Directive 2004/108/EC
- EN 55022, Class A
- Japan VCCI Class A statement
- People's Republic of China Class A statement
- Taiwan Class A compliance statement
- Korea KCC Class A statement
- Russia EMI Class A statement

Interoperability

Lenovo provides end-to-end storage compatibility testing to deliver interoperability throughout the network. The Storwize V3700 supports attachment to Lenovo System x®, ThinkServer®, BladeCenter®, and Flex System™ hosts by using SAS, iSCSI, FC, or FC over Ethernet (FCoE) storage connectivity protocols. Hybrid storage connectivity also is supported.

Note: Tables that are provided in this section are for ordering reference purposes only. End-to-end storage configuration support *must* be verified through the System Storage Interoperation Center (SSIC):

<http://ibm.com/systems/support/storage/ssic>

SAS connectivity

The following table lists currently available SAS adapters for Lenovo servers that are compatible with the Storwize V3700 SAS storage (direct attach).

Table 13. SAS adapters

Description	Part number
System x SAS HBAs	
6Gb SAS HBA	46M0907
N2125 SAS/SATA HBA (6Gb)	46C9010
N2225 SAS/SATA HBA (12Gb)	00AE912
N2226 SAS/SATA HBA (12Gb)	00AE916
ThinkServer SAS HBAs	
Lenovo ThinkServer 9300-8e PCIe 12Gb 8 Port External SAS Adapter by LSI	4XB0F28703

FCoE or iSCSI connectivity

The Storwize V3700 supports end-to-end 10 Gb FCoE connectivity with native FCoE ports or FCoE connectivity via FCoE/FC gateways with native FC ports. Lenovo RackSwitch™, Brocade, and Cisco converged switches can be used to provide FCoE connectivity with the Storwize V3700 FC storage.

The Storwize V3700 also supports iSCSI attachments via standard 1 Gb or 10 Gb Ethernet network. Any compatible Ethernet switch, including Lenovo RackSwitch top of rack (TOR) switches and integrated BladeCenter or Flex System Ethernet I/O modules, can be used to provide iSCSI connectivity with the Storwize V3700 iSCSI storage.

With software iSCSI initiators, any supported 1 Gb Ethernet or 10 Gb Ethernet adapter for Lenovo servers is compatible with the Storwize V3700 iSCSI storage.

Currently available converged FCoE/iSCSI adapters for Lenovo servers that are compatible with Storwize V3700 are listed in the following table. Other HBAs also might be supported (see the SSIC for details).

Table 14. Converged FCoE/iSCSI adapters

Description	Part number
System x converged adapters	
Emulex VFA5 ML2 Dual Port 10GbE SFP+ Adapter (Requires 00D8544)	00D1996
Emulex Dual Port 10GbE SFP+ Embedded VFA IIIr (Requires 90Y5178)	00Y7730
Emulex Dual Port 10GbE SFP+ VFA IIIr (Requires 95Y3760)	00D8540
Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	00JY830
Emulex VFA5 2x10 GbE SFP+ PCIe Adapter (Requires 00JY824)	00JY820
Qlogic Dual Port 10GbE SFP+ Embedded VFA (Requires 90Y5179)	90Y6454
Qlogic 8200 Dual Port 10GbE SFP+ VFA (Requires 00Y5624)	90Y4600
System x FoD upgrades required for FCoE/iSCSI support	
Emulex VFA5 ML2 FCoE/iSCSI License (FoD) (Required for 00D1996)	00D8544
Emulex Mezz VFA III/IIIr FCoE/iSCSI License (FoD) (Required for 00Y7730)	90Y5178
Emulex VFA III/IIIr FCoE/iSCSI License (FoD) (Required for 00D8540)	95Y3760
Emulex VFA5 FCoE/iSCSI SW for PCIe Adapter (FoD) (Required for 00JY820)	00JY824
Qlogic Embedded VFA FCoE/iSCSI License (FoD) (Required for 90Y6454)	90Y5179
Qlogic 8200 VFA FCoE/iSCSI License (FoD) (Required for 90Y4600)	00Y5624

Description	Part number
BladeCenter converged adapters	
10Gb Interposer Card for BladeCenter HS23 (LOM) (Requires 90Y9310)	94Y8550
Emulex 10GbE VFA II for BladeCenter HS23 (Requires 90Y9350)	81Y3120
Emulex 10GbE VFA Advanced II for BladeCenter HS23	90Y9332
BladeCenter FoD upgrades required for FCoE/iSCSI support	
Virtual Fabric Advanced Software Upgrade (LOM) (Required for 94Y8550)	90Y9310
Virtual Fabric Advanced FOD Upgrade for BladeCenter HS23 (Required for 81Y3120)	90Y9350
Flex System converged adapters	
Flex System CN4022 2-port 10Gb Converged Adapter	88Y5920
Flex System CN4052 2-port 10Gb Virtual Fabric Adapter (Requires 00JY804)	00JY800
Flex System CN4054 10Gb Virtual Fabric Adapter (Requires 90Y3558)	90Y3554
Flex System CN4054R 10Gb Virtual Fabric Adapter (Requires 90Y3558)	00Y3306
Flex System CN4058S 8-port 10Gb Virtual Fabric Adapter (Requires 94Y5164)	94Y5160
Flex System FoD upgrades required for FCoE/iSCSI support	
Flex System CN4052 Virtual Fabric Adapter SW Upgrade (FoD) (Required for 00JY800)	00JY804
Flex System CN4054 Virtual Fabric Adapter Upgrade (FoD) (Required for 90Y3554, 00Y3306)	90Y3558
Flex System CN4058S Virtual Fabric Adapter SW Upgrade (FoD) (Required for 94Y5160)	94Y5164

Fibre Channel connectivity

The Storwize V3700 supports direct FC attachments and FC switch-based attachments. Brocade and Cisco SAN switches can be used to provide FC connectivity with the Storwize V3700 FC storage.

Currently available FC adapters for Lenovo servers that are compatible with the Storwize V3700 FC storage are listed in the following table. Other HBAs also might be supported (see the SSIC for details).

Table 15. Fibre Channel adapters

Description	Part number
System x HBAs: 16 Gb FC	
Emulex 16Gb FC Dual-port HBA	81Y1662
Emulex 16Gb FC Single-port HBA	81Y1655
QLogic 16Gb FC Single-port HBA	00Y3337
QLogic 16Gb FC Dual-port HBA	00Y3341
System x HBAs: 8 Gb FC	
Emulex 8Gb FC Dual-port HBA	42D0494
Emulex 8Gb FC Single-port HBA	42D0485
QLogic 8Gb FC Dual-port HBA	42D0510
QLogic 8Gb FC Single-port HBA	42D0501
ThinkServer HBAs: 16 Gb FC	
ThinkServer QLE2672 PCIe 16Gb 2 Port FC Adapter by Qlogic	4XC0F28745
ThinkServer LPe16000B Single Port 16Gb FC HBA by Emulex	4XB0F28653
ThinkServer LPe16002B Dual Port 16Gb Fiber Channel HBA by Emulex	4XB0F28650
ThinkServer LPe16002B-M6-L PCIe 16Gb 2 Port FC HBA by Emulex	4XB0F28705
ThinkServer LPe16004B-M6-L PCIe 16Gb 4 Port FC HBA by Emulex	4XB0F28681

Description	Part number
ThinkServer LPm16002-M6-L AnyFabric 16Gb 2 Port FC HBA by Emulex	4XB0F28706
ThinkServer HBAs: 8 Gb FC	
ThinkServer QLE2562 Dual Port 8Gb Fibre Channel HBA by Qlogic	0C19482
ThinkServer LPe16002B-M8-L PCIe 8Gb 2 Port FC HBA by Emulex	4XB0F28704
Flex System HBAs: 16 Gb FC	
Flex System FC5052 2-port 16Gb FC Adapter	95Y2386
Flex System FC5054 4-port 16Gb FC Adapter	95Y2391
Flex System FC5172 2-port 16Gb FC Adapter	69Y1942
Flex System HBAs: 8 Gb FC	
Flex System FC3052 2-port 8Gb FC Adapter	95Y2375
Flex System FC3172 2-port 8Gb FC Adapter	69Y1938
BladeCenter HBAs: 8 Gb FC	
Qlogic 8Gb Fibre Channel Expansion Card (CIOv) for BladeCenter	44X1945
Emulex 8Gb Fibre Channel Expansion Card (CIOv) for BladeCenter	46M6140
QLogic Ethernet and 8Gb FC Expansion Card (CFFh) for BladeCenter	00Y3270

Networking switches

The following table lists currently available Ethernet and FC rack-mount switches that are offered by Lenovo that can be used in Storwize V3700 storage solutions.

Table 16. Ethernet and FC rack-mount switches

Description	Part number
1 Gb Ethernet (iSCSI connectivity)	
Lenovo RackSwitch G7028 (Rear to Front)	7159BAX
Lenovo RackSwitch G7052 (Rear to Front)	7159CAX
Lenovo RackSwitch G8052 (Rear to Front)	7159G52
10 Gb Ethernet (iSCSI connectivity, FCoE transit switch)	
Lenovo RackSwitch G8124E (Rear to Front)	7159BR6
Lenovo RackSwitch G8264 (Rear to Front)	7159G64
Lenovo RackSwitch G8272 (Rear to Front)	7159CRW
Lenovo RackSwitch G8296 (Rear to Front)	7159GR6
Converged 10 GbE and 8 Gb FC (iSCSI connectivity, FCoE/FC gateway, end-to-end FCoE)	
Lenovo RackSwitch G8264CS (Rear to Front)	7159DRX
8 Gb FC	
Brocade 300 FC SAN Switch	3873AR1
Lenovo B300, 8 ports activated w/ 8Gb SWL SFPs, 1 PS, Rail Kit	3873AR3
Lenovo B6505, 12 ports activated w/ 8Gb SWL SFPs, 1 PS, Rail Kit	3873AR4
Lenovo B6510, 24 ports activated w/ 8Gb SWL SFPs, 2 PS, Rail Kit	3873BR2
16 Gb FC	
Brocade 6505 FC SAN Switch	3873AR2
Brocade 6510 FC SAN Switch	3873BR1

Description	Part number
Lenovo B6505, 12 ports activated w/ 16Gb SWL SFPs, 1 PS, Rail Kit	3873AR5
Lenovo B6510, 24 ports activated w/ 16Gb SWL SFPs, 2 PS, Rail Kit	3873BR3

For more information, see the list of Product Guides in the following categories:

- Top-of-rack Switches: <http://lenovopress.com/servers/options/switches?rt=product-guide>
- Rack SAN Switches: <http://lenovopress.com/storage/switches/rack?rt=product-guide>

The following table lists currently available Ethernet and FC embedded switches and pass-thru modules for Flex System that can be used in Storwize V3700 storage solutions.

Table 17. Ethernet and FC embedded 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, FCoE transit switch)	
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
Cisco Nexus B22 Fabric Extender for Flex System*	94Y5350
Cisco Nexus B22 Fabric Extender with FET bundle for Flex System*	94Y5355
Converged 10 GbE and 8 Gb FC (iSCSI connectivity, FCoE/FC gateway, end-to-end FCoE)	
Lenovo Flex System Fabric CN4093 10Gb Converged Scalable Switch	00FM510
Converged 10 GbE and 16 Gb FC (iSCSI connectivity, FCoE/FC gateway)	
Lenovo Flex System EN4023 10Gb Scalable Switch	94Y5212
8 Gb FC	
Lenovo Flex System FC3171 8Gb SAN Switch	69Y1930
16 Gb FC	
Lenovo Flex System FC5022 16Gb SAN Scalable Switch	88Y6374
Lenovo Flex System FC5022 24-port 16Gb SAN Scalable Switch (includes two 16 Gb SFPs)	00Y3324
Lenovo Flex System FC5022 24-port 16Gb ESB SAN Scalable Switch	90Y9356
Pass-thru modules (require a compatible external switch)	
Lenovo Flex System EN4091 10Gb Ethernet Pass-thru	88Y6043
Lenovo Flex System FC3171 8Gb SAN Pass-thru	69Y1934

* Requires a supported Cisco Nexus top of rack switch.

The following table lists currently available Ethernet and FC embedded switches and pass-thru modules for BladeCenter that can be used in Storwize V3700 storage solutions.

Table 18. Ethernet and FC switches and pass-thru modules for BladeCenter

Description	Part number
1 Gb Ethernet (iSCSI connectivity)	
BladeCenter 1/10Gb Uplink Ethernet Switch Module for BladeCenter	44W4404
BladeCenter Layer 2/3 Fiber Gb Ethernet Switch Module	32R1861

Description	Part number
BladeCenter Layer 2/3 Copper Gb Ethernet Switch Module	32R1860
BladeCenter Server Connectivity Module	39Y9324
10 Gb Ethernet (iSCSI connectivity, FCoE transit switch)	
BladeCenter Virtual Fabric 10Gb Switch Module	46C7191
8 Gb FC	
Brocade 10-port 8Gb SAN Switch Module for BladeCenter	44X1921
Brocade 20-port 8Gb SAN Switch Module for BladeCenter	44X1920
Brocade Enterprise 20-port 8Gb SAN Switch Module for BladeCenter	42C1828
QLogic 20-port 8Gb SAN Switch Module for BladeCenter	44X1905
Pass-thru modules (require a compatible external switch)	
10Gb Ethernet Pass-Thru Module for BladeCenter	46M6181
QLogic 8Gb Intelligent Pass-thru Module for BladeCenter	44X1907

For more information, see the list of Product Guides in the following categories:

- Blade Network Modules: <http://lenovopress.com/servers/blades/networkmodule?rt=product-guide>
- Blade Storage Modules: <http://lenovopress.com/servers/blades/storagemodule?rt=product-guide>

Operating systems

The Storwize V3700 supports host attachments to the System x, ThinkServer, and BladeCenter servers, and Flex System compute nodes with the following operating systems:

- Microsoft:
 - Microsoft Windows Server 2012 R2
 - Microsoft Windows Server 2012 R2 (Hyper-V)
 - Microsoft Windows Server 2012
 - Microsoft Windows Server 2012 (Hyper-V)
 - Microsoft Windows Server 2008 R2
 - Microsoft Windows Server 2008 R2 (Hyper-V)
 - Microsoft Windows Server 2008
- Red Hat:
 - Red Hat Enterprise Linux 7
 - Red Hat Enterprise Linux 6
 - Red Hat Enterprise Linux 5
- SUSE:
 - SUSE Linux Enterprise Server 12
 - SUSE Linux Enterprise Server 11
 - SUSE Linux Enterprise Server 10
- VMware:
 - VMware vSphere 6.0
 - VMware vSphere 5.5
 - VMware vSphere 5.1
 - VMware vSphere 5.0

Rack cabinets

The following table lists the rack cabinets that are offered by Lenovo that can be used in Storwize V3700 storage solutions.

Table 19. Rack cabinets

Description	Part number
11U Rack Office Enablement Kit	201886X
25U S2 Standard Rack	93072RX
25U Static S2 Standard Rack	93072PX
42U S2 Standard Rack	93074RX
42U 1100mm Enterprise V2 Dynamic Rack	93634PX
42U 1100mm Enterprise V2 Dynamic Expansion Rack	93634EX
42U 1200mm Deep Dynamic Rack	93604PX
42U 1200mm Deep Static Rack	93614PX
42U Enterprise Rack	93084PX
42U Enterprise Expansion Rack	93084EX

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

Power distribution units

The following table lists the the power distribution units (PDUs) that are offered by Lenovo that can be used in Storwize V3700 storage solutions.

Table 20. Power distribution units

Description	Part number
0U Basic PDUs	
0U 24 C13 16A 3 Phase PDU with IEC 309 P+N+Gnd line cord	46M4122
0U 24 C13 30A 3 Phase PDU with NEMA L21-30P line cord	46M4125
0U 24 C13 30A PDU with NEMA L6-30P line cord	46M4128
0U 24 C13 32A PDU with IEC 309 P+N+Gnd line cord	46M4131
0U 12 C19/12 C13 32A 3 Phase PDU with IEC 309 3P+N+Gnd line cord	46M4143
0U 12 C19/12 C13 60A 3 Phase PDU with CS8365L 3P+Gnd line cord	46M4140
Switched and Monitored PDUs	
1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)	46M4002
1U 9 C19/3 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord	46M4003
1U 12 C13 Switched and Monitored DPI PDU (without line cord)	46M4004
1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord	46M4005
0U 24 C13 Switched and Monitored 30A PDU with NEMA L6-30P line cord	46M4116
0U 24 C13 Switched and Monitored 32A PDU with IEC 309 P+N+Gnd line cord	46M4119
0U 12 C19/12 C13 Switched and Monitored 32A 3 Phase PDU with IEC 309 3P+N+Gnd cord	46M4137
0U 12 C19/12 C13 Switched and Monitored 50A 3 Phase PDU with CS8365L 3P+Gnd cord	46M4134

Description	Part number
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
Ultra Density Enterprise C19/C13 PDU Module (without line cord)	71762NX
Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord	71763NU
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
DPI C13 Enterprise PDU+ (without line cord)	39M2816
DPI Single Phase C13 Enterprise PDU (without line cord)	39Y8941
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
DPI Single Phase C19 Enterprise PDU (without line cord)	39Y8948
DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord	39Y8923
Front-end PDUs (3x IEC 320 C19 outlets)	
DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord	39Y8938
DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord	39Y8939
DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8934
DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8940
DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8935
Universal PDUs (7x IEC 320 C13 outlets)	
DPI Universal Rack PDU with US LV and HV line cords	39Y8951
DPI Universal Rack PDU with CEE7-VII Europe line cord	39Y8952
DPI Universal Rack PDU with Denmark line cord	39Y8953
DPI Universal Rack PDU with Israel line cord	39Y8954
DPI Universal Rack PDU with Italy line cord	39Y8955
DPI Universal Rack PDU with South Africa line cord	39Y8956
DPI Universal Rack PDU with UK line cord	39Y8957
DPI Universal Rack PDU with AS/NZ line cord	39Y8958
DPI Universal Rack PDU with China line cord	39Y8959
DPI Universal Rack PDU (Argentina)	39Y8962
DPI Universal Rack PDU (Brazil)	39Y8960
DPI Universal Rack PDU (India)	39Y8961
NEMA PDUs (6x NEMA 5-15R outlets)	
DPI 100-127V PDU with Fixed NEMA L5-15P line cord	39Y8905
Line cords for PDUs that ship without a line cord	
DPI 32a Line Cord (IEC 309 3P+N+G)	40K9611
DPI 32a Line Cord (IEC 309 P+N+G)	40K9612
DPI 63a Cord (IEC 309 P+N+G)	40K9613
DPI 30a Line Cord (NEMA L6-30P)	40K9614
DPI 60a Cord (IEC 309 2P+G)	40K9615
DPI Australian/NZ 3112 Line Cord	40K9617

For more information, see the list of Product Guides in the Power Distribution Units category:
<http://lenovopress.com/servers/options/pdu>

Uninterruptible power supply units

The following table list the uninterruptible power supply (UPS) units that are offered by Lenovo that can be used in Storwize V3700 storage solutions.

Table 21. Uninterruptible power supply units

Description	Part number
RT1.5kVA 2U Rack or Tower UPS (100-125VAC)	55941AX
RT1.5kVA 2U Rack or Tower UPS (200-240VAC)	55941KX
RT2.2kVA 2U Rack or Tower UPS (100-125VAC)	55942AX
RT2.2kVA 2U Rack or Tower UPS (200-240VAC)	55942KX
RT3kVA 2U Rack or Tower UPS (100-125VAC)	55943AX
RT3kVA 2U Rack or Tower UPS (200-240VAC)	55943KX
RT5kVA 3U Rack or Tower UPS (200-240VAC)	55945KX
RT6kVA 3U Rack or Tower UPS (200-240VAC)	55946KX
RT8kVA 6U Rack or Tower UPS (200-240VAC)	55948KX
RT11kVA 6U Rack or Tower UPS (200-240VAC)	55949KX
RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)	55948PX
RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)	55949PX

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category: <http://lenovopress.com/servers/options/ups>

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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: <http://www.lenovofs.com>

Related publications and links

For more information, see the following resources:

- Lenovo Storage product page:
<http://www.lenovo.com/systems/storage>
- US Announcement Letter - IBM Storwize V3700 for Lenovo:
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS114-123>
- IBM Spectrum Virtualize Software for Storwize V3700 for Lenovo (Machine Type 6099):
<http://www.ibm.com/support/fixcentral>
- Standalone Solutions Configuration Tool:
<http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-62168>
- System Storage Interoperation Center (SSIC):
<http://ibm.com/systems/support/storage/ssic>

Related product families

Product families related to this document are the following:

- [IBM Alliance](#)
- [IBM Storage](#)
- [External Storage](#)

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