

Lenovo ThinkSystem D4390 Direct Attached Storage Product Guide

The Lenovo ThinkSystem D4390 Direct Attached Storage offers 24 Gbps SAS direct-attached storage expansion capabilities that are designed to provide density, speed, scalability, security, and high availability for medium to large businesses. The D4390 delivers enterprise-class storage technology in a cost-effective dense solution with flexible drive configurations of up to 90 drives in 4U rack space and RAID or JBOD (non-RAID) host connectivity.

The Lenovo ThinkSystem D4390 is ideal for HPC simulations, object storage, Tier 3 cloud data providers, video streaming, global file sharing, big data and analytics, video surveillance, private and hybrid clouds, and backup and archiving.



Figure 1. D4390 High Density Expansion Enclosure

Did you know?

The Lenovo ThinkSystem D4390 supports 24 Gbps SAS connectivity, which doubles the data transfer rate compared to 12 Gbps SAS solutions to maximize performance of storage I/O-intensive applications.

With support for daisy chaining, the D4390 can be scaled up to 3.240 PB for capacity-optimized configurations.

The Lenovo ThinkSystem D4390 Direct Attached Storage is a single, flexible expansion platform that utilizes existing infrastructure, providing a lower TCO and immediate savings on traditional capital costs.

Key features

Key features and benefits provided by the D4390 Direct Attached Storage include:

- Versatile, scalable storage expansion with dual Electronic Service Module (ESM) configurations for high availability and performance
- Flexible host connectivity to match diverse client needs for direct attach storage with support for 12 Gb or 24 Gb SAS RAID adapters for advanced data protection or 12 Gb or 24 Gb SAS Host Bus Adapters (HBAs) for maximum JBOD performance
- Support 90x 3.5-inch large form factor (LFF) 12Gb Nearline SAS drives in a 4U rack space
- Scalability of up to 180 drives per HBA with the attachment of up to two D4390 daisy-chained high density expansion enclosures
- Flexibility in storing data on high performance SAS SSDs or capacity-optimized enterprise NL SAS HDDs; mixing and matching drive types on a single HBA to perfectly meet performance and capacity requirements for various workloads
- Support multiple host attachments

The D4390 Direct Attached Storage is designed to support a wide range of data storage requirements, from highly utilized applications to high-capacity, low usage applications.

The following SAS drives are supported by the D4390:

- High-capacity, archival-class nearline HDDs, up to 18 TB 7.2K rpm
- High performance SSDs (2.5" drive in 3.5" tray): 800 GB

Additional drives and expansion units are designed to be dynamically added with virtually no downtime (operating system dependent), helping to quickly and seamlessly respond to growing capacity demands.

The D4390 Direct Attached Storage is designed to offer high levels of system and data availability with the following technologies:

- Dual ESMs provide redundant paths from a supported HBA to the drives in the enclosures for I/O load balancing and failover
- Dual-port drives (both HDDs and SSDs)
- Redundant hardware, including host ports, ESMs, power supplies, 5V DC/DC regulators and cooling fans
- Hot-swappable and customer replaceable components; including ESMs, power supplies, cooling fans, 5V DC/DC modules, and drives

Components and connectors

The following figures show the front of the D4390 Direct Attached Storage.

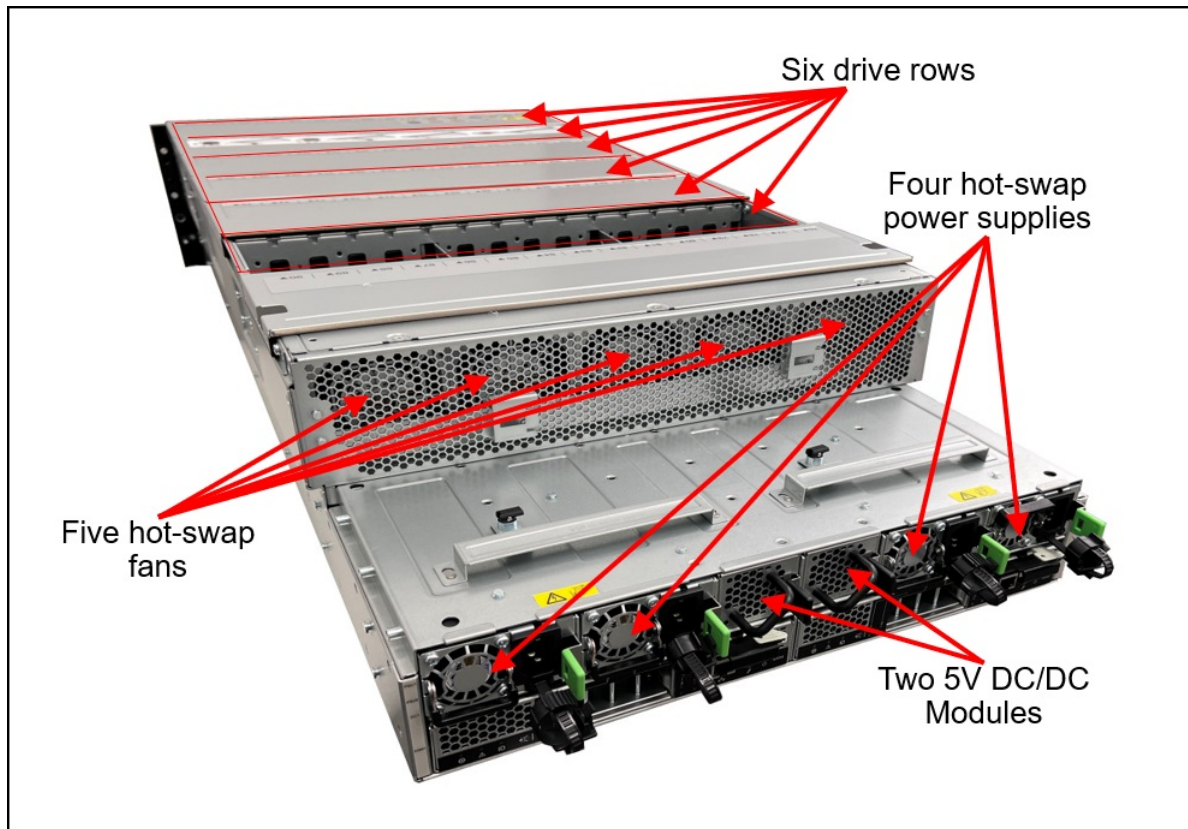


Figure 2. Rear view of the D4390 Direct Attached Storage

The following figures show the rear of the D4390 Direct Attached Storage.

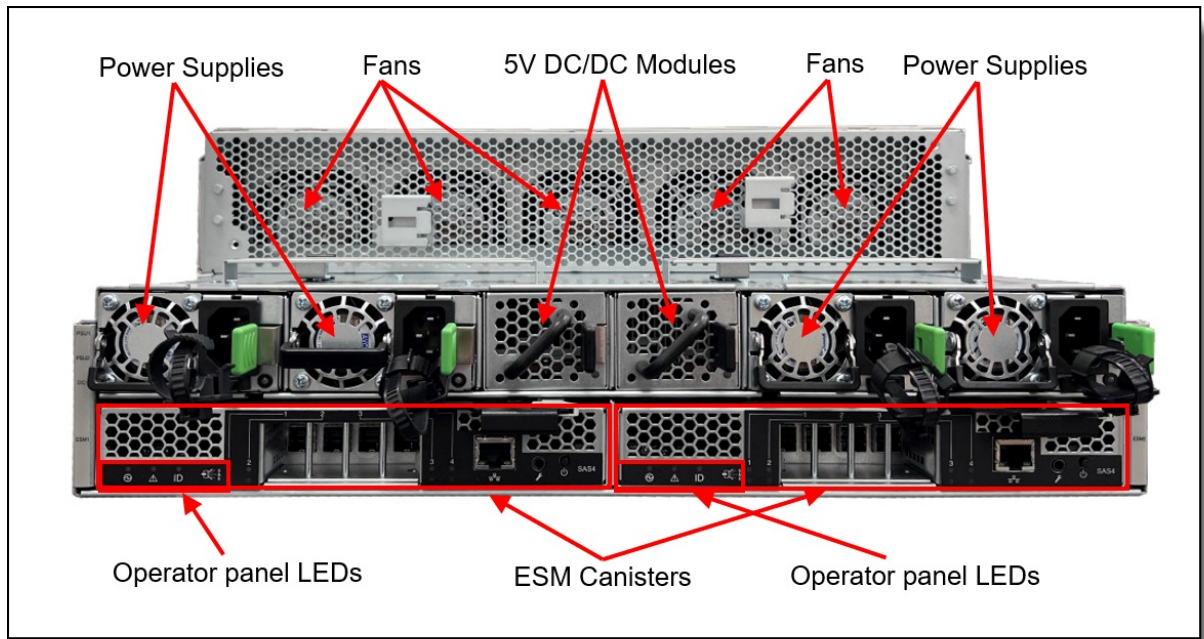


Figure 3. Rear view of the D4390 Direct Attached Storage

Notes:

- The ESMs (shown in the previous figure) have additional service ports, and these ports are reserved for use by a Lenovo service technician.
- The Ethernet management port on the ESMs are disabled.

System specifications

The following table lists the D4390 system specifications.

Table 1. System specifications

Attribute	Specification
Form factor	4U rack mount.
Number of ESMs	2
Expansion ports	4x 24Gbps Mini-SAS HD (SFF-8644) ports per ESM.
Drive technologies	NL SAS HDDs and SAS SSDs. Intermix of HDDs and SSDs is supported within an enclosure.
Drive connectivity	Dual-ported 12 Gb SAS drive attachment infrastructure.
Drives	<ul style="list-style-type: none"> • Up to 12 hot-swap SAS SSDs per enclosure • Up to 90 hot-swap SAS HDD drives per enclosure • SSDs and HDDs can be mixed • Up to 18TB 7,200rpm NL-SAS HDDs • Up to 800GB SSDs (2.5" drive in 3.5" tray)

Attribute	Specification
Host adapters	RAID controllers: <ul style="list-style-type: none"> ThinkSystem RAID 940-8e PCIe 12Gb Adapter Host bus adapters (non-RAID): <ul style="list-style-type: none"> ThinkSystem 440-16e SAS/SATA PCIe Gen4 12Gb HBA ThinkSystem 440-8e PCIe 12Gb SAS/SATA HBA
Host operating systems	Red Hat Enterprise Linux (RHEL) 8.4, 8.5, 8.6, 9; SUSE Linux Enterprise Server (SLES) 15.3, 15.4.
Cooling	Five 80 mm hot-swap/redundant fan modules, hot-pluggable from the top.
Power supply	Four hot-swap 80PLUS Titanium 1300W AC power supplies (3+1 AC100~240V, 2+2 AC200~240V)
Hot-swap parts	HDDs, SSDs, ESMs, 5V DC-DC modules, fans, power supplies.
Management interfaces	In-band SAS commands.
Warranty	Three-year limited warranty, 9x5 Next Business Day Onsite (upgradeable).
Service and support	Optional warranty service upgrades are available through Lenovo: Technician installed parts, 24x7 coverage, 2-hour or 4-hour response time, 6-hour or 24-hour committed repair, 1-year or 2-year warranty extensions, YourDrive YourData, hardware installation.
Dimensions	Height: 175.3mm (6.9 in); Width: 446mm (17.56"); Depth: 1080mm (42.52") w/ CMA.
Weight	min. 45kg (95lbs); max. 118kg (260lbs) with full drive configuration.

Models

The following table lists the relationship models of the D4390 drive enclosures.

Table 2. D4390 CTO model

Description	Machine Type/Model
Lenovo ThinkSystem D4390 Direct Attached Storage	7DAHCTO1WW

The Lenovo ThinkSystem D4390 includes the following items:

- One chassis with the following components:
 - Dual 4-port electronic service modules (ESMs)
 - Six rows for drives
 - Four power supplies
 - Two 5V DC/DC modules
 - Five cooling fan modules
 - Drives (select models; see Table 6 for details)
- Four 2 m, 10A/100-250V, C13 to IEC 320-C14 rack power cables
- Four lift handles
- Pair - Lenovo Storage 12Gb High Density Rack Mount Kit - Rails 25"-33"
- Documentation package
- CMA (Cable Management Assembly) kit

For details about CMA and rack install, see the relevant D4390 user guide:

- <https://datacentersupport.lenovo.com>

Host connectivity

The D4390 high density expansion enclosure supports dual electronic service module (ESM) configurations. Each ESM has four universal 12/24 Gb SAS x4 ports (Mini-SAS HD SFF-8644 connectors). These ports are used for connections to a supported SAS RAID controller or SAS HBA installed in a server and for daisy chaining the D4390 enclosures between each other.

Cabling is as follows:

- A, B, C ports are for upstream
- D ports is for downstream

Up to two Lenovo ThinkSystem D4390 can be daisy-chained with support for up to 1 host server attached to the chain.

Without daisy-chaining, a standalone Lenovo ThinkSystem D4390 can support up to 1 directly attached host server.

- There is no support for intermixing chaining with D1212/1224/3284.

The following figures illustrate different host connectivity topologies.

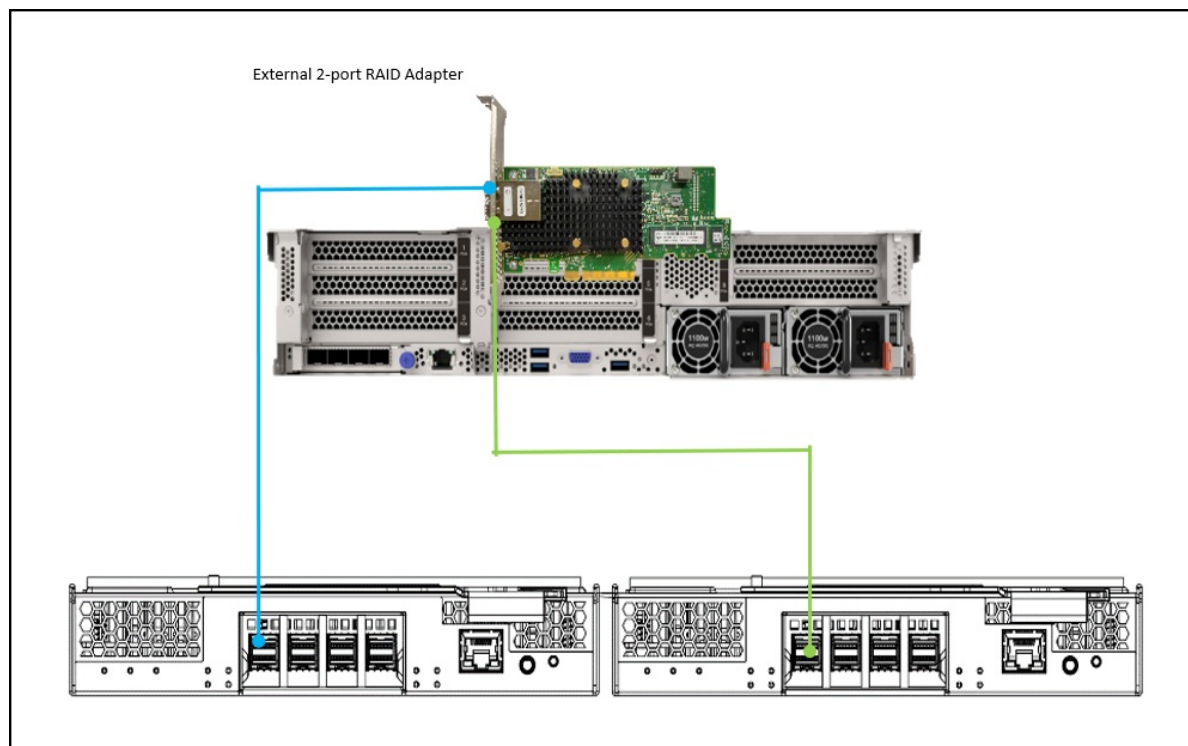


Figure 4. Connectivity topology one host with one RAID adapter and 1xD4390

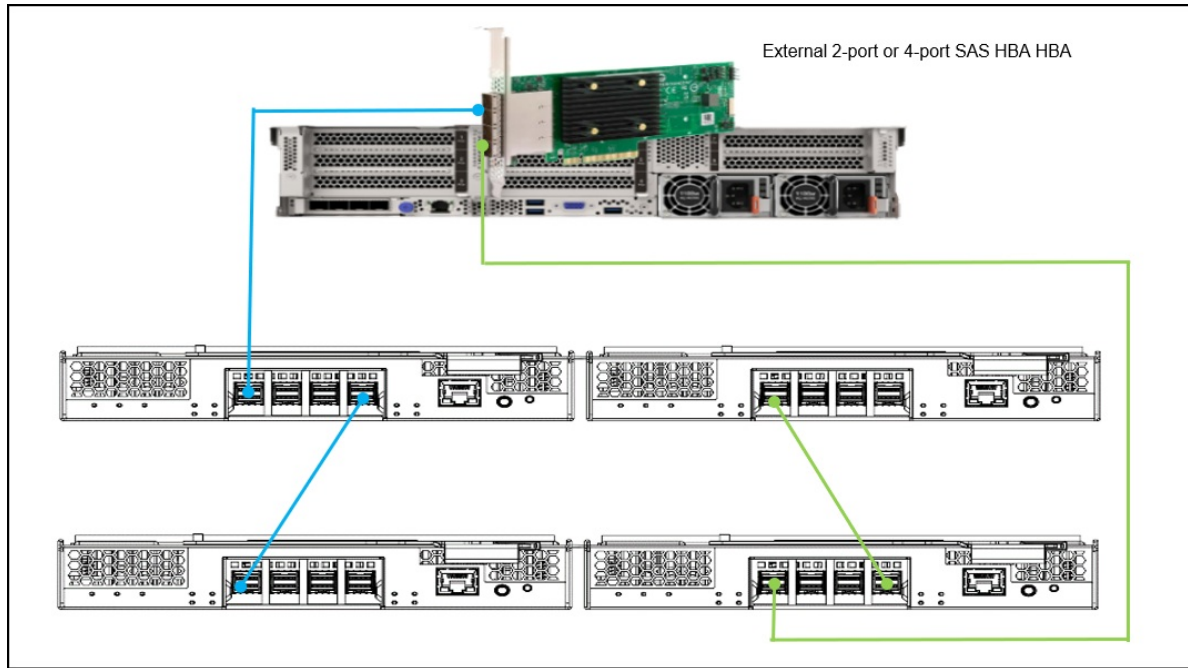


Figure 5. Connectivity topology one host with one HBA adapter and 2xD4390

The following table lists ordering information for the SAS cables that are supported with the D4390.

Table 3. SAS cable options

Part number	Feature code	Description	Maximum quantity per one D4390
Connectivity cables - Mini-SAS HD Host Adapter to Expansion			
00KH452	AUJY	External MiniSAS HD 8644/MiniSAS HD 8644 6M Cable	8
00YL849	AU18	2m External MiniSAS HD 8644/MiniSAS HD 8644 Cable	8
00YL850	AU19	External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable	8
4X97A84506	BT4K	External 24Gb miniSAS HD Cable 2 meter	8
4X97A84507	BT4L	External 24Gb miniSAS HD Cable 3 meter	8
4X97A84508	BT4M	External 24Gb miniSAS HD Cable 3.5 meter	8
Connectivity cables - Expansion to Expansion			
00YL849	AU18	External MiniSAS HD 8644/MiniSAS HD 8644 2M Cable	2
00YL850	AU19	External MiniSAS HD 8644/MiniSAS HD 8644 3M Cable	2
00KH452	AUJY	External MiniSAS HD 8644/MiniSAS HD 8644 6M Cable	2
4X97A84506	BT4K	External 24Gb miniSAS HD Cable 2 meter	2
4X97A84507	BT4L	External 24Gb miniSAS HD Cable 3 meter	2
4X97A84508	BT4M	External 24Gb miniSAS HD Cable 3.5 meter	2

Configuration notes:

- Y-cable is not supported.

Drives

The D4390 Direct Attached Storage supports up to 90x 3.5-inch hot-swap drives. The supported drive types are NL SAS HDDs and SAS SSDs.

The following rules apply when adding drives to a system that start with less than 90 drives, add them in the following manner :

- For HDDs, add only complete rows of 15 drives at a time starting from the back of the system (the row next to the fan modules, row 6) and moving towards the front (row1).
- A partial filled row (except the back row, row 6) of drives (less than 15) is allowed, but if additional drives are added later, the row must be filled completely before adding more drives to the next empty row.
- For SSDs, drive slot 1 ~ slot 12 on row 1 is recommended for SSD usage for low latency. SSDs are allowed on drive slot 1~90 just like HDDs.
- HDDs and SSDs can be mixed and coexist on any row in the enclosure.
- Intermixing HDDs of various sizes within a row is supported.

The following tables list drive options for the D4390 Direct Attached Storage.

Table 4. Drive options

Part number	Feature code	Description	Maximum quantity per D4390
12 Gbps NL SAS hot-swap HDDs (15-pack)			
4XB7A84547	BT4V	Lenovo Storage (15x HDD) 3.5" 14TB 7.2K NL-SAS	6
4XB7A84545	BT4T	Lenovo Storage (15x HDD) 3.5" 18TB 7.2K NL-SAS	6
4XB7A84546	BT4U	Lenovo Storage (15x HDD) 3.5" 16TB 7.2K NL-SAS	6
4XB7A84548	BT4W	Lenovo Storage (15x HDD) 3.5" 12TB 7.2K NL-SAS	6
12 Gbps NL SAS hot-swap HDDs (1-pack)			
4XB7A84195	BT4R	Lenovo Storage 3.5" 12TB 7.2K NL-SAS	90
4XB7A84144	BT4N	Lenovo Storage 3.5" 18TB 7.2K NL-SAS	90
4XB7A84193	BT4P	Lenovo Storage 3.5" 16TB 7.2K NL-SAS	90
4XB7A84194	BT4Q	Lenovo Storage 3.5" 14TB 7.2K NL-SAS	90
12 Gbps SAS hot-swap SSDs (3 Drive Writes per Day) (1-pack)			
4XB7A84196	BT4S	Lenovo Storage 2.5 800GB 3DWD SAS SSD	12

Power supplies and cables

The Lenovo ThinkSystem D4390 Direct Attached Storage has four redundant 80PLUS Titanium 1300W AC hot-swap power supplies. Each power supply has c14 connector/plug.

The CTO models require the selection of four power cables.

Table 5. Power supply options

Part number	Feature code	Description
Power supply unit*		
4P57A84536	BTLH	D4390 Titanium 1300W AC-DC CSRPSU

* The power supply unit is not a configurable item in the [DCSC configurator](#), and does not include power cord

Power cable and line cord options are available, and the part numbers and feature codes to order the power cables are listed in the following table (four power cables are required per each D4390).

Table 6. Power cable options

Part number	Feature code	Description
Rack power cables*		
4L67A08365	B0N4	2.0m,10A/100-250V,C13 to IEC 320-C14
4L67A08366	6311	2.8m,10A/100-250V,C13 to IEC 320-C14
39Y7938	6204	2.8m, 250V, C13 to IEC-C20
39Y7932	6263	4.3m,10A/100-250V,C13 to IEC 320-C14
Line cords*		
81Y2375	6317	2.8m,10A/240V,C13 to CNS 10917-3 (TW)
90Y3016	6313	2.8m,10A/120V,C13 to NEMA 5-15P (US)
46M2592	A1RF	2.8m, 10A/250V, C13 to NEMA 6-15P LC
39Y7927	6269	2.8m,10A/250V,C13(2P+Gnd) (IN)
69Y1988	6532	2.8m,10A/250V,C13 to NBR 14136(BR)
4L67A08357	6533	2.8m,200V,C13toJIS C8303 Japan
81Y2389	6531	4.3m,10A/250V,C13 to 76 CNS 10917-3Z(TW)
39Y7919	6216	2.8m,10A/250V,C13 to SEV1011-S24507(SW)
39Y7922	6214	2.8m,10A/250V,C13 to SABS 164 (ZA)
39Y7917	6212	2.8m,10A/230V,C13 to CEE7-VII (EU)
39Y7928	6210	2.8m,220-240V,C13 to GB 2099.1 (CN)
81Y2384	6492	4.3m,10A/220V,C13-IRAM 2073(AR)
81Y2385	6494	4.3m,12A/220V,C13 to KSC 8305(KR)
4L67A08361	6373	4.3m,10A/250V,C13 to NEMA 6-15P (US)
39Y7920	6218	2.8m,10A/250V,C13 to SI 32(IL)
81Y2378	6580	4.3m,10A/220V,C13 to GB 2099.1 (CN)
81Y2376	6572	4.3m,10A/230V,C13 to CEE7-VII (EU)
81Y2382	6575	4.3m,10A/230V,C13 to DK2-5a(DK)
81Y2383	6574	4.3m,10A/230V,C13 to AS/NZS 3112(AU/NZ)
39Y7930	6222	2.8m,10A/250V,C13 to IRAM 2073 (AR)

Part number	Feature code	Description
81Y2381	6579	4.3m,10A/230V,C13 to SI 32 (IL)
81Y2379	6576	4.3m,10A/230V,C13 to SABS 164(ZA)
81Y2377	6577	4.3m,10A/230V,C13 to BS 1363/A(UK)
81Y2390	6578	4.3m,10A/230V,C13 to SEV1011-S24507(SW)
39Y7923	6215	2.8m,10A/250V,C13 to BS 1363/A (UK)
39Y7921	6217	2.8m,220-240V,C13 to CEI 23-16 (IT/CL)
4L67A08359	6370	4.3m,10A/125V,C13 to NEMA 5-15P (US)
39Y7918	6213	2.8m,10A/250V,C13 to DK2-5a(DK)
81Y2387	6404	4.3m,10A/250V,C13 - 2P+Gnd(BR)
39Y7924	6211	2.8m,10A/250V,C13 to AS/NZ 3112(AU/NZ)
81Y2380	6493	4.3m,10A/230V,C13 to CEI 23-16 (IT/CL)
4L67A08362	6495	4.3m,12A/200V,C13 to JIS C-8303 (JP)
39Y7925	6219	2.8m,220-240V,C13 to KETI(KR)
81Y2386	6567	4.3m,10A/240V,C13 to IS 6538 (IN)

* Four cables are needed with the D4390 models listed in the Models section.

Physical specifications

The Lenovo ThinkSystem D4390 has the following dimensions and weight (approximate):

- Height: 175.3mm (6.9 in)
- Width: 446mm (17.56 in)
- Depth: 1080mm (42.52 in) w/ CMA
- Weight (Minimum): min. 45kg (95lbs), (Maximum): 118kg (260lbs) with full configuration

Operating environment

The D4390 expansion enclosures are supported in the following environment:

- Air temperature:
 - Operating: 5 °C to 35 °C (41 °F to 95 °F); De-rate max operating temperature 1°C/300m above 950m altitude
 - Non-operating: -40 °C to 60 °C (-104 °F to 140 °F)
- Humidity:
 - Operating: 8% to 85% (non-condensing)
 - Non-operating: 8% to 95% (no precipitation)
- Maximum altitude:
 - Operating: 3050 m (10,007 ft)
 - Non-operating: 12,000 m (39,370 ft)
- Electrical: 100 to 240 V AC (nominal); 50 Hz to 60 Hz; 7.76 A
- Maximum power load: 1708 W
- Heat output: 5827.94 BTU/hour
- Noise level: 7.6 bels

Warranty and support

The Lenovo ThinkSystem D4390 has a three-year customer-replaceable unit (CRU) warranty with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered.

Lenovo's additional support services provide a sophisticated, unified support structure for a customer's data center, with an experience consistently ranked number one in customer satisfaction worldwide.

The following Lenovo support services are available:

- **Premier Support** provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following capabilities:
 - Direct technician-to-technician access through a dedicated phone line.
 - 24x7x365 remote support.
 - Single point of contact service.
 - End to end case management.
 - 3rd Party collaborative software support.
 - Online case tools and live chat support.
 - On-demand remote system analysis.
- **Warranty Upgrades (Preconfigured Support)** are available to meet the on-site response time targets that match the criticality of your systems:
 - 3, 4, or 5 years of service coverage.
 - 1-year or 2-year post-warranty extensions.
 - **Foundation Service:** 9x5 service coverage with next business day onsite response, with optional YourDrive YourData.
 - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select regions), with optional YourDrive YourData.
 - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select regions), with optional YourDrive YourData.
- **Managed Services**

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

Quarterly reviews check error logs, verify firmware and operating system device driver levels, and software as needed. Lenovo will also maintain records of latest patches, critical updates, and firmware levels, to ensure customer's systems are providing business value through optimized performance.
- **Technical Account Management (TAM)**

A Lenovo Technical Account Manager helps customers optimize operations of their data centers based on a deep understanding of customer's business. Customers gain direct access to a Lenovo TAM, who serves as their single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. Also, a TAM helps proactively make service recommendations and manage service relationship with Lenovo to make certain that customer's needs are met.
- **YourDrive YourData**

Lenovo's YourDrive YourData service is a multi-drive retention offering that ensures that customer's data is always under their control, regardless of the number of drives that are installed in their Lenovo server. In the unlikely event of a drive failure, customers retain possession of their drive while Lenovo replaces the failed drive part. Customer's data stays safely on customer premises, in their hands. The YourDrive YourData service can be purchased in convenient bundles with Foundation, Essential, or Advanced Service upgrades and extensions.

- **Health Check**

Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that customer systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

Some regions might have different warranty terms and conditions than the standard warranty. This is due to local business practices or laws in the specific region. Local service teams can assist in explaining region-specific terms when needed. Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

If warranty terms and conditions include onsite labor for repair or replacement of parts, Lenovo will dispatch a service technician to the customer site to perform the replacement. Onsite labor under base warranty is limited to labor for replacement of parts that have been determined to be field-replaceable units (FRUs). Parts that are determined to be customer-replaceable units (CRUs) do not include onsite labor under base warranty.

If warranty terms include parts-only base warranty, Lenovo is responsible for delivering only replacement parts that are under base warranty (including FRUs) that will be sent to a requested location for self-service. Parts-only service does not include a service technician being dispatched onsite. Parts must be changed at customer's own cost and labor and defective parts must be returned following the instructions supplied with the spare parts.

Lenovo support services are region-specific. Not all support services are available in every region. For information about Lenovo support services that are available in a specific region, refer to the following resources:

- Service part numbers in Data Center Solution Configurator (DCSC):
<http://dcsc.lenovo.com/#/services>
- Lenovo Services Availability Locator
<https://lenovocator.com/>

For service definitions, region-specific details, and service limitations, refer to the following documents:

- Lenovo Statement of Limited Warranty for Infrastructure Solutions Group (ISG) Servers and System Storage
<http://pcsupport.lenovo.com/us/en/solutions/ht503310>
- Lenovo Data Center Services Agreement
<http://support.lenovo.com/us/en/solutions/ht116628>

Services

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

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

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

- **Asset Recovery Services**

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

- **Assessment Services**

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

- **Design Services**

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

- **Basic Hardware Installation**

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

- **Deployment Services**

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

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

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

Regulatory compliance

The Lenovo ThinkSystem D4390 conforms to the following regulations:

- BSMI CNS 13438, Class A; CNS 14336 (Taiwan)
- CE UKCA Mark (European Union)
- CISPR 32 and 35, Class A
- EAC (Russia)
- EN55032, Class A
- EN55035
- FCC Part 15, Class A (United States)
- ICES-003/NMB-03, Class A (Canada)
- IEC/EN60950-1
- MSIP (Korea)
- NOM-019 (Mexico)
- RCM (Australia)
- Reduction of Hazardous Substances (ROHS)
- UL/CSA IEC 62368-1
- VCCI, Class A (Japan)

Interoperability

Lenovo provides end-to-end storage compatibility testing to deliver interoperability throughout the network. The Lenovo ThinkSystem D4390 supports attachment to hosts that support the RAID controllers and HBAs listed in the [SAS RAID controllers and HBAs](#) section.

Important: Information that is provided in these sections is for order reference purposes only.

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

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

SAS RAID controllers and HBAs

The Lenovo ThinkSystem D4390 support the RAID adapters and HBAs that are listed in the following table.

- For SAS RAID controllers, the controller's firmware manages multiple I/O paths to SAS drives.
- For SAS HBAs, the host operating system runs multi-pathing software to manage multiple I/O paths.

Table 7. RAID controllers and HBAs

Part number	Description	Maximum quantity of D4390 per adapter				
		Dual I/O path	Single I/O path	Max SAS devices (single path)	Max SAS devices (dual path)	Max expanders supported per IOC/ROC
ThinkSystem RAID controllers						
4Y37A78836	ThinkSystem RAID 940-8e 4GB Flash PCIe Gen4 12Gb	1	1	240	120	16
ThinkSystem HBAs						
4Y37A78837	ThinkSystem 440-8e SAS/SATA PCIe Gen4 12Gb HBA*	2	2	1024	512	20
4Y37A09724	ThinkSystem 440-16e SAS/SATA PCIe Gen4 12Gb HBA*	2	2	1024	512	20

* The maximum enclosure quantity is based on the dual HBA environment.

Rack cabinets

The following table lists the supported rack cabinets.

Table 8. Rack cabinets

Part number	Description
93072RX	25U Standard Rack (1000mm)
93072PX	25U Static S2 Standard Rack (1000mm)
7D6DA007WW	ThinkSystem 42U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6DA008WW	ThinkSystem 42U 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)
7D6EA009WW	ThinkSystem 48U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA00AWW	ThinkSystem 48U Pearl Primary Heavy Duty Rack Cabinet (1200mm)

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 9. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
00YJ776	ATZY	0U 36 C13/6 C19 24A 1 Phase PDU	N	Y	Y	N	N	N	N	N	N	Y	Y	Y	N
00YJ777	ATZZ	0U 36 C13/6 C19 32A 1 Phase PDU	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y
00YJ778	AU00	0U 21 C13/12 C19 32A 3 Phase PDU	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y
0U Switched and Monitored PDUs															
00YJ783	AU04	0U 12 C13/12 C19 Switched and Monitored 48A 3 Phase PDU	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
00YJ781	AU03	0U 20 C13/4 C19 Switched and Monitored 24A 1 Phase PDU	N	N	Y	N	Y	N	Y	N	N	Y	Y	Y	N
00YJ782	AU02	0U 18 C13/6 C19 Switched and Monitored 32A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
00YJ780	AU01	0U 20 C13/4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
1U Switched and Monitored PDUs															
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
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
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
4PU7A77468	BLC5	1U 12 C19/C13 switched and monitored 32A 3P WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A81118	BNDW	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
1U Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)															
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
1U C13 Enterprise PDUs (12x IEC 320 C13 outlets)															
39M2816	6030	DPI C13 Enterprise PDU Plus Module (WW)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8941	6010	DPI C13 Enterprise PDU Module (WW)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U C19 Enterprise PDUs (6x IEC 320 C19 outlets)															
39Y8948	6060	DPI C19 Enterprise PDU Module (WW)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U Front-end PDUs (3x IEC 320 C19 outlets)															
39Y8938	6002	DPI Single-phase 30A/120V Front-end PDU (US)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8939	6003	DPI Single-phase 30A/208V Front-end PDU (US)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
39Y8934	6005	DPI Single-phase 32A/230V Front-end PDU (International)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8940	6004	DPI Single-phase 60A/208V Front-end PDU (US)	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N
39Y8935	6006	DPI Single-phase 63A/230V Front-end PDU (International)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U NEMA PDUs (6x NEMA 5-15R outlets)															
39Y8905	5900	DPI 100-127V NEMA PDU	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	4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
40K9617	6505	4.3m, 32A/230V, Souriau UTG Female to AS/NZ 3112 (Aus/NZ) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9618	6506	4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

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 10. Uninterruptible power supply units

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

† Only available in China and the Asia Pacific market.

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

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

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Related publications and links

For more information, see the following documents:

- Lenovo Storage product page
<https://www.lenovo.com/us/en/data-center/storage/>
- Lenovo Data Center Solution Configurator
<http://dcsc.lenovo.com>
- Lenovo Storage D4390 Support
<https://datacentersupport.lenovo.com/us/en/products/storage/lenovo-storage/>

Related product families

Product families related to this document are the following:

- [Direct-Attached Storage](#)
- [External Storage](#)

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