Lenovo ThinkSystem SD530 Server (Xeon SP Gen 2)
Product Guide

The Lenovo ThinkSystem SD530 is an ultradense and economical two-socket server in a 0.5U rack form factor. With four SD530 servers installed in either the ThinkSystem D2 Enclosure or ThinkSystem Modular Enclosure, you have an ideal high-density 2U four-node (2U4N) platform for enterprise and cloud workloads.

For the ultimate in performance, the SD530 now supports second-generation Intel Xeon Scalable processors, along with 2933 MHz TruDDR4 DIMMs and the new Intel Optane DC Persistent Memory.

2U4N systems have gained popularity in a variety of data centers, from large enterprises to service providers, because their small footprint and inherent density make them ideal for building solution-based appliances at a low cost. The combination of the Lenovo ThinkSystem SD530 and D2 Enclosure is engineered to deliver these types of solutions.

Suggested use: Cloud, MSP, CSP, HPC, hyperconverged solutions, branch office or remote office needs

The following figure shows four ThinkSystem SD530 servers installed in a D2 Enclosure.

Figure 1. Four ThinkSystem SD530 servers installed in a D2 Enclosure

Did you know?

The SD530 combines the efficiency and density of blades with the value and simplicity of rack-based servers. With high-performance features such as high-core-count Xeon Platinum processors and high-performance 100Gb Ethernet, EDR InfiniBand and OPA fabrices, to power through your most demanding HPC/technical computing/AI workloads.

The SD530 also supports two high-performance GPUs with the addition of the GPU Tray. The server supports a variety of NVIDIA and AMD GPUs.

Key features

The ThinkSystem SD530 dense offering fits four hot-pluggable SD530 servers into a ThinkSystem D2 Enclosure or ThinkSystem Modular Enclosure. The enclosures each take up only 2U (0.5U per server) and include room for plenty of internal storage. The overall design makes the solution extremely affordable, with a low total cost of ownership (TCO).

Scalability and performance

The SD530 server and the enclosures offer numerous features to boost performance, improve scalability, and reduce costs:

- Up to four nodes in a single 2U enclosure, each with two processors from the Intel Xeon processor Scalable family, up to 16 DIMMs, 6 drive bays, and two PCIe slots. It is a highly dense, scalable, and price-optimized offering.
- Supports second-generation Intel Xeon Processor Scalable processors - designed to operate with the cost-effective Bronze processors up to the highest-core-count Xeon Platinum processors.
- Supports processors with up to 28 cores, core speeds up to 3.8 GHz, and TDP ratings up to 205W.
- Two processors in each server, up to 52 cores total, and 104 threads maximize the concurrent execution of multithreaded applications. With four nodes in the enclosure, a total of 208 cores are available in only 2U of rack space.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
- Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.
- Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better use the hardware for virtualization workloads.
- Intel Speed Select Technology provides improvements in server utilization and guaranteed per-core performance service levels with more granular control over processor performance.
- Intel Deep Learning Boost (Vector Neural Network Instruction set or VNNI) is designed to deliver significant, more efficient Deep Learning (Inference) acceleration for high-performance Artificial Intelligence (AI) workloads.
- Intel Advanced Vector Extensions 512 (AVX-512) enable acceleration of enterprise-class workloads, including databases, and enterprise resource planning.
- Each processor has six memory channels with memory speeds of up to 2933 MHz to maximize system performance. The SD530 has 12 or 16 DIMM slots, supporting up to 1 TB using 16x 64 GB RDIMMs. Higher memory capacity by using Persistent Memory.
- Supports the new Intel Optane DC Persistent Memory; up to four Data Center Persistent Memory Modules (DCPMMs) can be installed in conjunction with regular memory DIMMs. DCPMMs are up to 512 GB each, for a total of up to 2 TB of Persistent Memory.
- Supports up to two GPUs with the addition of a 1U GPU Tray, providing increased processing power.
- The 12 Gbps SAS internal storage connectivity doubles the data transfer rate of 6 Gb SAS solutions, to maximize performance of storage-intensive applications.
- Each SD530 server supports up to six 2.5-inch hot-swap drives. Two drive bays can be configured to support NVMe drives to maximize I/O performance in terms of throughput, bandwidth, and latency.
- With 7.68 TB 2.5-inch SAS hot-swap SSDs, each SD530 supports up to 46 TB of internal storage.
- Supports a new Lenovo patented-design M.2 adapter for convenient operating system boot functions. Available M.2 adapters support either one M.2 drive or two M.2 drives in a RAID 1

configuration for boot drive performance and reliability.

- The use of solid-state drives (SSDs) instead of, or along with, traditional hard disk drives (HDDs) can improve I/O performance. An SSD can support up to 100 times more I/O read operations per second (IOPS) than a typical HDD.
- The server has two optional 10 Gb Ethernet ports, either 10GBASE-T or SFP+, routed from the embedded X722 controller to the optional 8-port EIOM module at the rear of the enclosure.
- One PCIe 3.0 x16 or two PCIe 3.0 x8 slots for added I/O flexibility.
- PCI Express 3.0 I/O expansion capabilities improve the theoretical maximum bandwidth by 60% compared with the previous generation of PCI Express 2.0.

Manageability and security

Powerful systems management features simplify local and remote management of the SD530:

- The server includes an XClarity Controller (XCC) to monitor server availability. Optional upgrade to XCC Advanced to provide remote control (keyboard video mouse) functions. Optional upgrade to XCC Enterprise enables the additional support for the mounting of remote media files (ISO and IMG image files), boot capture, and power capping.
- Lenovo XClarity Administrator offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- New UEFI-based Lenovo XClarity Provisioning Manager, accessible from F1 during boot, provides system inventory information, graphical UEFI Setup, platform update function, RAID Setup wizard, operating system installation function, and diagnostic functions.
- Support for Lenovo XClarity Energy Manager which captures real-time power and temperature data from the server and provides automated controls to lower energy costs.
- Integrated Trusted Platform Module (TPM) 2.0 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Supports Secure Boot to ensure only a digitally signed operating system can be used. Supported with HDDs and SSDs as well as M.2 drives in the M.2 Adapter.
- Industry-standard Advanced Encryption Standard (AES) NI support for faster, stronger encryption.
- Intel Execute Disable Bit functionality can prevent certain classes of malicious buffer overflow attacks when combined with a supported operating system.
- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space, protected from all other software running on a system.
- With the SMM management module installed in the enclosure, only one Ethernet connection is needed to provide remote systems management functions for all four SD530 servers and the enclosure.
- The enclosure also supports the Dual Ethernet Port SMM management module with allows a single Ethernet connection to be daisy chained across 7 enclosures and 28 servers, thereby significantly reducing the number of Ethernet switch ports needed to manage an entire rack of SD530 servers and enclosures.

Energy efficiency

The SD530 and the enclosures offer the following energy efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- ASHRAE A4 compliance for certain configurations to enable operation in 45°C datacenters
- Energy-efficient planar components help lower operational costs.

- High-efficiency power supplies with 80 PLUS Platinum certifications. Energy Star 2.1 certified.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- Low-voltage 1.2 V DDR4 memory DIMMs use up to 20% less energy than 1.35 V DDR3 DIMMs.
- SSDs use as much as 80% less power than 2.5-inch HDDs.
- Optional Lenovo XClarity Energy Manager provide advanced data center power notification, analysis, and policy-based management to help achieve lower heat output and reduced cooling needs.
- The server uses hexagonal ventilation holes, which can be grouped more densely than round holes, providing more efficient airflow through the system.

Availability and serviceability

The SD530 server and the enclosures provide many features to simplify serviceability and increase system uptime:

- The server offers Single Device Data Correction (SDDC, also known as Chipkill), Adaptive Double-Device Data Correction (ADDDC, also known as Redundant Bit Steering or RBS), memory mirroring, and memory rank sparing for redundancy in the event of a non-correctable memory failure.
- The server offers hot-swap drives, supporting RAID redundancy for data protection and greater system uptime.
- The Dual M.2 Boot Adapter supports RAID-1 which enables two installed M.2 drives to be configured as a redundant pair.
- The D2 Enclosure and Modular Enclosure both support two hot-swap power supplies, which form a redundant pair to provide availability for business-critical applications.
- Toolless access to upgrades and serviceable parts, such as fans, adapters, CPUs, and memory.
- Proactive Platform Alerts (including PFA and SMART alerts): Processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs), fans, power supplies, RAID controllers, and server ambient and sub-component temperatures. Alerts can be surfaced through the XClarity Controller (XCC) to managers such as Lenovo XClarity Administrator, VMware vCenter, and Microsoft System Center. These proactive alerts let you take appropriate actions in advance of possible failure, thereby increasing server uptime and application availability.
- SSDs offer significantly better reliability than traditional mechanical HDDs for greater uptime.
- The built-in XClarity Controller continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failures to minimize downtime.
- Built-in diagnostics in UEFI, using Lenovo XClarity Provisioning Manager, speed up troubleshooting tasks to reduce service time.
- Lenovo XClarity Provisioning Manager supports diagnostics and can save service data to a USB key drive or remote CIFS share folder for troubleshooting and reduce service time.
- Auto restart in the event of a momentary loss of AC power (based on power policy setting in the XClarity Controller service processor)
- Support for the XClarity Administrator Mobile app running on a supported smartphone and connected to the server through the service-enabled USB port, enables additional local systems management functions (requires the optional KVM Breakout Module).
- Three-year customer-replaceable unit and onsite limited warranty, 9 x 5 next business day. Optional service upgrades are available.

Components and connectors

The following figure shows the front of the D2 Enclosure. The front view shows the four SD530 nodes, each with 6 drive bays.

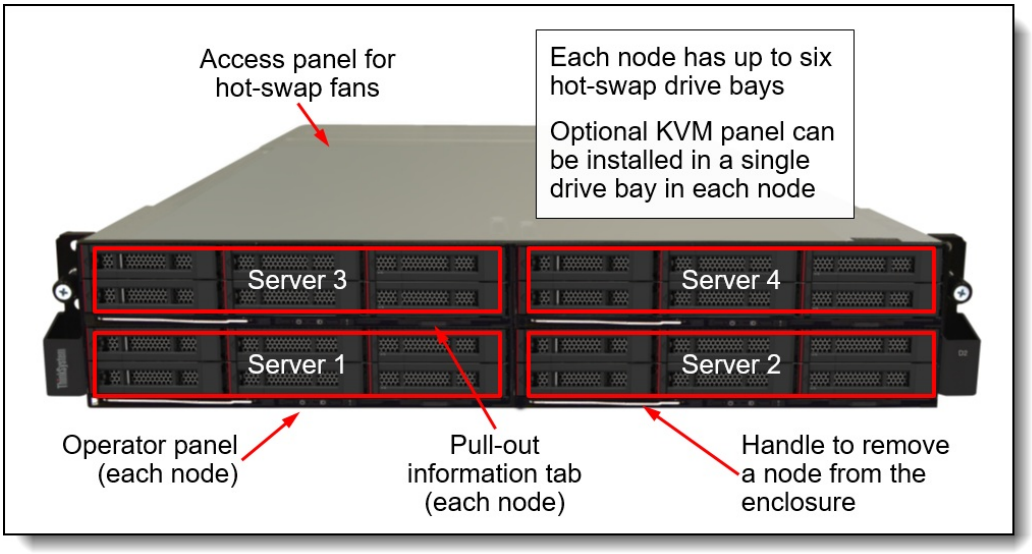

Figure 2. Front view of the ThinkSystem D2 Enclosure

The following figure shows the rear of the D2 Enclosure.

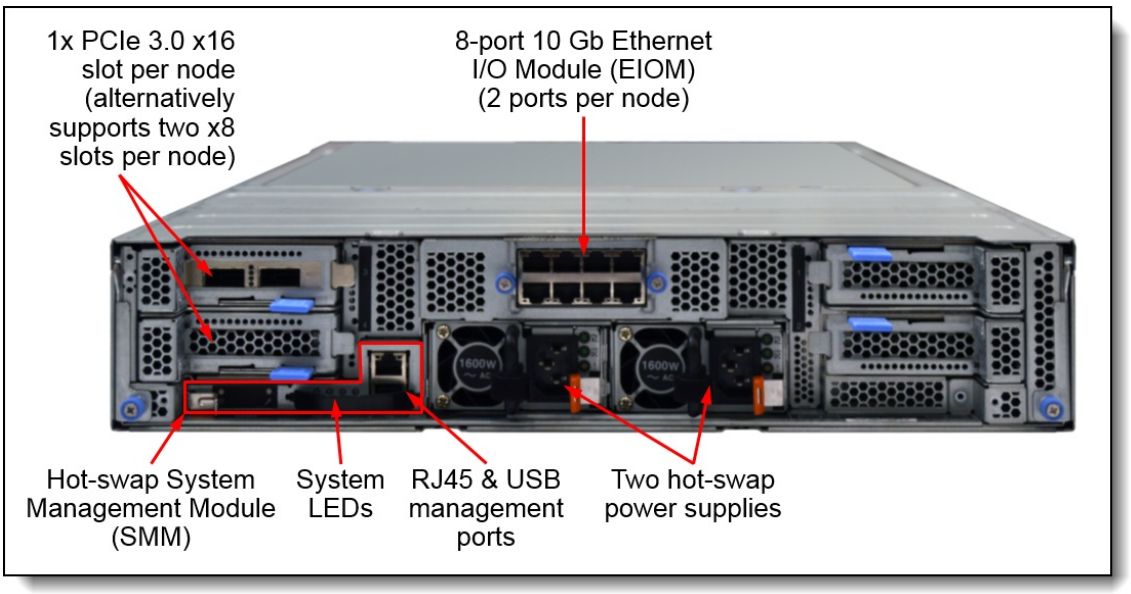

Figure 3. Rear view of the ThinkSystem D2 Enclosure

The following figure shows the I/O shuttle removed from the rear of the D2 Enclosure. The fans are hot-swap and are accessible from a removable cover on the top of the enclosure.

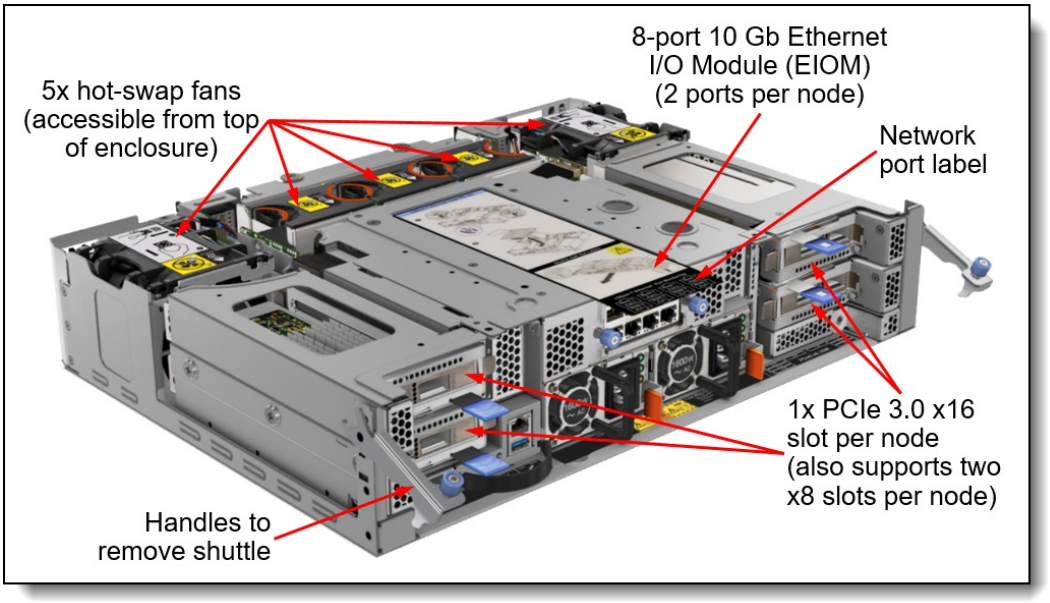

Figure 4. I/O Shuttle in the ThinkSystem D2 Enclosure

The following figure shows the front of the SD530 server.

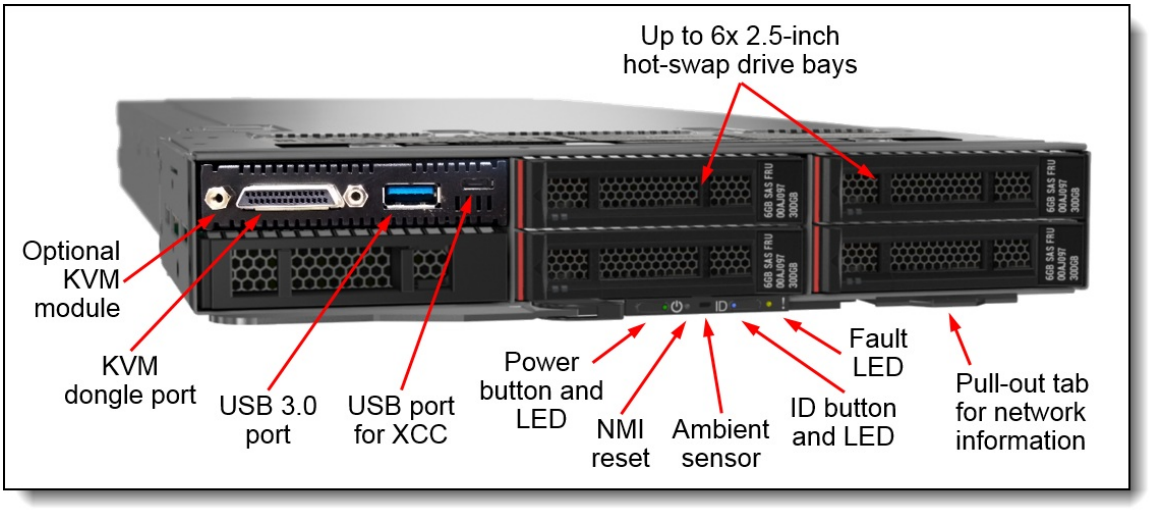

Figure 5. Front view of the SD530 compute node

The following figure shows the internals of the SD530 server identifying key components.

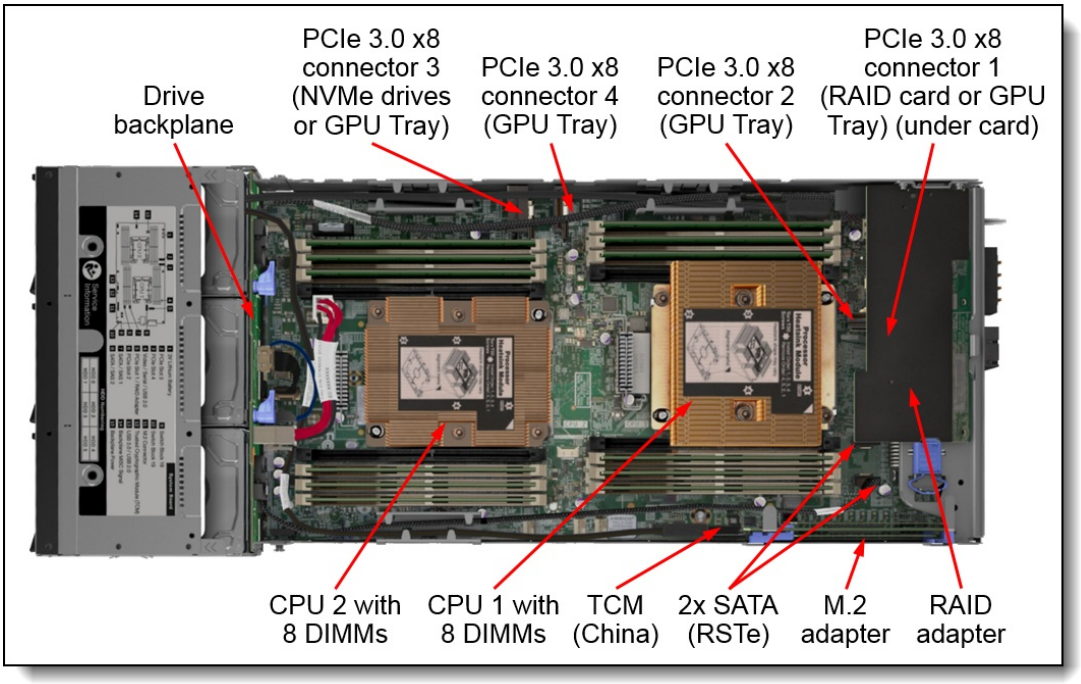

Figure 6. Internal view of the SD530 compute node

The SD530 also supports the addition of a GPU Tray which adds support for two double-wide GPUs, as shown in the following figure.

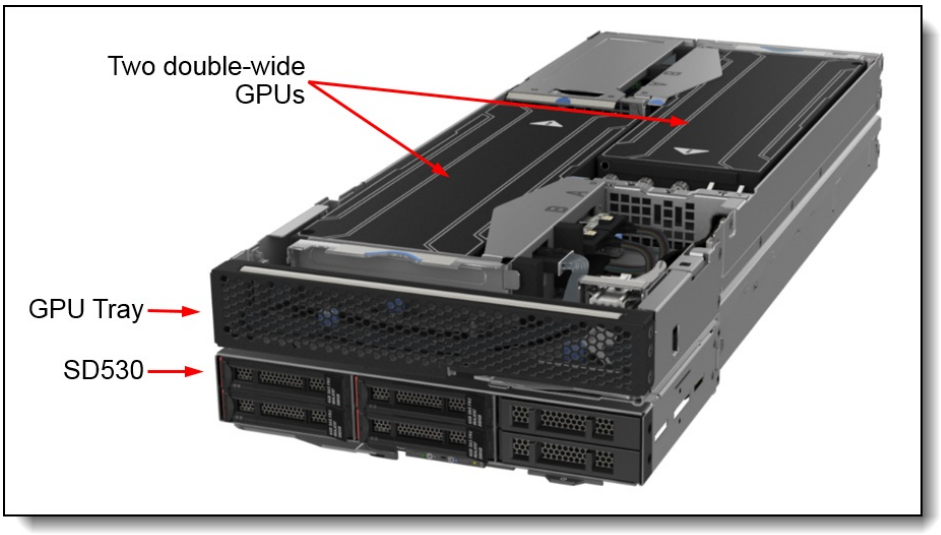

Figure 7. SD530 with attached GPU Tray

Standard specifications - SD530 server

The following table lists the standard specifications of the ThinkSystem SD530.

Table 1. Standard specifications - ThinkSystem SD530

Components	Specification
Machine type	7X21
Form factor	Half-wide, 1U compute node. Optional GPU Tray adds 1U.
Supported chassis	ThinkSystem D2 Enclosure, 2U high; up to 4 servers per chassis. ThinkSystem Modular Enclosure, 2U high; up to 4 servers per chassis.
Processor	One or two second-generation Intel Xeon Processor Scalable Family of processors (formerly codename "Cascade Lake"). Supports processors with up to 28 cores, core speeds up to 3.8 GHz, and TDP ratings up to 205W. Two Intel Ultra Path Interconnect (UPI) links at up to 10.4 GTps each.
Chipset	Intel C624 "Lewisburg" chipset
Memory	• Configurations with some processors and heatsinks: Up to 16 DIMM sockets (8 DIMMs per processor) • Other processors: Up to 12 DIMM sockets (6 DIMMs per processor) DIMM slots are shared between standard system memory and persistent memory. Supports Lenovo TruDDR4 DIMMs at 2933 MHz or 2666 MHz. RDIMMs, LRDIMMs and 3DS RDIMMs are supported (RDIMMs currently only available), but memory types cannot be intermixed.
Persistent memory	Supports up to four 2666 MHz Intel Optane DC Persistent Memory modules (DCPMMs) installed in the DIMM slots. Only supported with processors that have a heatsink that enables 16 DIMM slots. Persistent memory is installed in combination with system memory DIMMs.

Memory maximums	• With system memory DIMMs only:
	  ◦ With 16 DIMM slots: Up to 1 TB with 16x 64 GB RDIMMs and two processors
	  ◦ With 12 DIMM slots: Up to 768 GB with 12x 64 GB RDIMMs and two processors
	• With Persistent Memory in memory mode (requires 16 DIMM slots): Up to 2 TB of Persistent Memory with 4x 512GB Intel Optane DC Persistent Memory modules and two processors (1TB per processor)
	• With Persistent Memory in AppDirect mode (requires 16 DIMM slots): Up to 2.75 TB total memory (2TB of Persistent Memory using 4x 512GB DCPMMs + 768 GB of system memory using 12x 64GB RDIMMs) with two processors (1.375 TB per processor)
	
	Note: Support for more than 1TB of memory per processor (more than 2TB per server) requires M-suffix processors. These calculations include any Persistent Memory installed. See the Processor options section for information.

Memory protection	ECC, SDDC (for x4-based memory DIMMs), ADDDC (for x4-based memory DIMMs, requires Intel Xeon Gold or Platinum processors), memory mirroring, and memory sparing.
Storage bays	Up to six 2.5-inch hot-swap drive bays. Depending on the drive backplane selected, the supported drives can be SAS, SATA or NVMe drives. Up to four NVMe drives can be installed with a suitable drive backplane. Also supports one or two M.2 drives installed internally to each node. Other configurations exist including the substitution of a KVM Module in one drive bay for keyboard, video and mouse support. See the Internal storage section for details.
Maximum internal storage	• 46 TB with 6x 7.68 TB 2.5-inch SAS hot-swap SSDs • 12 TB with 6x 2 TB 2.5-inch SATA hot-swap HDDs • Intermix of SAS and SATA is supported.

Components	Specification
Storage controller	Onboard 6 Gb SATA using embedded Intel RSTe software RAID, supporting RAID 0, 1, 10, 5, 50. Optional 12 Gb SAS/SATA RAID using SAS3408-based cacheless RAID controller, supporting RAID 0, 1, 10, 5. Optional 12 Gb SAS/SATA HBA.
Optical drive bays	No internal bays; use an external USB drive.
Tape drive bays	No internal bays. Use an external USB drive.
Network interfaces	Two 10 Gb interfaces, either 10GBASE-T ports (RJ-45) or SFP+ ports, routed through the Ethernet I/O Module at the rear of the enclosure. Networking ports are based on the Intel Ethernet Connection X722 in the chipset of the SD530 node.
PCI Expansion slots	One or two PCIe 3.0 slots: • One PCIe 3.0 x16 low-profile slot, or • Two PCIe 3.0 x8 low-profile slots Additional slots with the optional GPU Tray: • Two PCIe 3.0 x16 full-length double-width slots
Ports	Front: Optional KVM Breakout Module providing one USB 3.0 port, one micro USB port for XClarity Controller connectivity, and a KVM connector port for a breakout cable that provides one VGA port, two USB 2.0 ports and one DB9 serial port for local connectivity. Additional ports provided by the enclosure as described in theEnclosure specifications section.
Cooling	Supplied by the D2 Enclosure.
Power supply	Supplied by the D2 Enclosure.
Hot-swap parts	HDDs and SSDs
Systems management	Operator panel with system error LED and ID and power controls. XClarity Controller embedded management, XClarity Administrator centralized infrastructure delivery, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XClarity Controller Advanced to enable remote control functions. System Management Module (SMM) in the D2 Enclosure provides additional systems management functions.
Video	G200 graphics with 16 MB memory with 2D hardware accelerator, integrated into the XClarity Controller. Maximum resolution is 1920x1200 32bpp at 60Hz.
Security	Power-on password, administrator's password, Trusted Platform Module (TPM), supporting TPM 1.2 or TPM 2.0. In China only, optional Trusted Cryptographic Module (TCM).
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi. See the Operating system support section for specifics.
Limited warranty	Three-year customer-replaceable unit and onsite limited warranty with 9x5 next business day (NBD).
Service and support	Optional service upgrades are available through Lenovo Services: 4-hour or 2-hour response time, 6-hour fix time, 1-year or 2-year warranty extension, software support for Lenovo hardware and some third-party applications.
Temperature	Up to ASHRAE Class A4: 5°C to 45°C (41°F to 113°F)
Dimensions	Height: 41 mm (1.7 inches), depth: 562 mm (22.2 inches), width: 222 mm (8.8 inches)
Weight	Minimum weight: 3.5 kg (7.8 lb), maximum weight: 7.5 kg (16.6 lb)

Standard specifications - Enclosure

The SD530 servers are supported in both the ThinkSystem D2 Enclosure and ThinkSystem Modular Enclosure. The following table lists the standard specifications of the enclosures.

Tip: The only difference between the D2 Enclosure and the Modular Enclosure is that the D2 Enclosure has a single-port SMM management module and the Modular Enclosure has a dual-port SMM management module.

Table 2. Standard specifications: D2 Enclosure and Modular Enclosure

Components	Specification
Machine type	7X20: D2 Enclosure (ships with single port SMM) 7X22: Modular Enclosure (ships with dual port SMM)
Form factor	2U rack-mounted chassis.
Server support	Up to 4 servers per chassis.
Servers per 42U rack	Up to 84 servers in 21 enclosures
System Management Module	*D2 Enclosure*: Single port SMM is standard, supports Dual Port SMM as a field upgrade *Modular Enclosure*: Dual Port SMM is standard The hot-swappable System Management Module (SMM) is the management device for the enclosure. Provides integrated systems management functions and controls the power and cooling features of the enclosure. Provides remote browser and CLI-based user interfaces for remote access via the dedicated Gigabit Ethernet port. Remote access is to both the management functions of the enclosure as well as the XClarity Controller (XCC) in each server. Supports the SMM with one Ethernet port (D2 Enclosure) or the Dual Port SMM with two Ethernet ports (Modular Enclosure, or the D2 Enclosure with the Dual Port SMM installed). The Dual Port SMM allows a single incoming Ethernet connection to be daisy chained across 7 enclosures and 28 servers, thereby significantly reducing the number of Ethernet switch ports needed to manage an entire rack of SD530 servers and enclosures.
Ethernet I/O Module	8-port Ethernet I/O Module (EIOM) routes two 10 GbE connections to each of the four servers.
Controls and LEDs	SMM has four LEDs: system error, identification, status, and system power. Each power supply has AC, DC and error LEDs
Power supplies	Two hot-swap power supplies either 1100 W, 1600 W, or 2000 W functioning as a redundant pair. Power supplies must be identical. Power supplies require a 200-240 V ac, 50 or 60 Hz supply, although the 1100 W also supports 100-127V ac 50 or 60 Hz. Power supplies are installed at the rear of the chassis. 80 PLUS Platinum certified. Built-in overload and surge protection.
Cooling	Five hot-swap system fans, accessible via removable panel in the top cover of the enclosure.
Hot-swap parts	Power supplies, fans, System Management Module
Power consumption	Input kilovolt-amperes (kVA): minimum: 0.153 kVA, maximum: 2.61 kVA
Limited warranty	Three-year customer-replaceable unit and onsite limited warranty with 9x5/NBD coverage.
Dimensions	2U chassis. Height: 87 mm (3.5 inches), depth: 892 mm (35.1 inches), width: 488 mm (19.3 inches)
Weight	Minimum configuration (with one minimally configured node): 22.4 kg (49.4 lbs) Maximum configuration (with four fully configured nodes): 55.0 kg (121.2 lbs)

SD530 models

SD530 server models are country-specific; that is, each country may define their own server models, and not all server models are available in every country. This section lists the available models. Information on the models is also available on the PSREF website, http://psref.lenovo.com.

Configure-to-order (CTO) models can also be created for factory-integrated server customization. CTO orders are built using the Data Center Solution Configurator, available at https://dcsc.lenovo.com

The following table lists the base CTO models of the ThinkSystem SD530 server.

Table 3. Base CTO models

Machine Type/Model	Description
7X21CTO1WW	ThinkSystem SD530 (3-Year Warranty)

The following table lists the base chassis choices for CTO configurations of the SD530 with second-generation Intel Xeon Scalable processors.

Table 4. Base chassis for CTO models

Feature code	Description
B4LT	ThinkSystem SD530 CLX Computing Node
B4LU	ThinkSystem SD530 CLX Computing Node for GPU Tray

The following tables list the available models, grouped by region.

- Models for Japan

Refer to the Specifications section for information about standard features of the server.

Server models for Japan

Table 5. Server models for Japan

Model	Intel Xeon processors†	Memory	RAID	Drive bays (Avail/Max)	Drives	KVM Breakout	M.2 drives	XCC Level
Standard models								
7X21A03YJP	1x Bronze 3204 6C 85W 1.9GHz	1x 16GB 2Rx8 2666	RSTe RAID	4x SAS/SATA*	Open	Optional	Open	Standard
7X21A040JP	1x Silver 4210 10C 85W 2.2GHz	1x 16GB 2Rx8 2666	RAID 530-8i	4x SAS/SATA	Open	Optional	Open	Standard
7X21A03ZJP	2x Gold 6254 18C 200W 3.1GHz	2x 16GB 2Rx8 2933	RSTe RAID	4x SAS/SATA*	Open	Included No cable	Open	Advanced

† Processor detail: Quantity, model, core count, TDP, core frequency
* The backplane supports SAS drives, however since the included RAID controller is RSTe, SAS drives are not supported by this model

Enclosure models

Up to four SD530 servers are supported in a D2 Enclosure or a Modular Enclosure.

The following table lists the base CTO models of the enclosures.

Table 6. Base CTO models

Machine Type/Model	Description
7X20CTO1WW	ThinkSystem D2 Enclosure (3-Year Warranty)
7X22CTO1WW	ThinkSystem Modular Enclosure (3-Year Warranty)

The following table lists the base chassis choices for CTO configurations

Table 7. Base chassis for CTO models

Feature code	Description
AUXM	ThinkSystem D2 Enclosure (for both 7X20 and 7X22)

The preconfigured D2 Enclosure models and Modular Enclosure models are listed in the following table.

The following tables list the available models, grouped by region.

- Models for Australia and New Zealand
- Models for South East Asian countries (ASEAN)
- Models for Brazil
- Models for EMEA countries
- Models for Hong Kong, Taiwan, Korea (HTK)
- Models for India
- Models for Japan
- Models for Latin America (except Brazil)
- Models for USA and Canada

Refer to the Enclosure specifications section for information about standard features of the enclosure.

Enclosure models for Australia and New Zealand

Table 8. Enclosure models for Australia and New Zealand

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
D2 Enclosure models (Includes the single-port SMM)						
7X20A00VAU	4-slot x16 shuttle	Open	2x 1600W	2x 2.8m C13-C14	D2 Slide Rail	Included
7X20A011AU	4-slot x16 shuttle	Open	2x 1100W	2x 2.8m C13-C14	D2 Slide Rail	Included
7X20A013AU	4-slot x16 shuttle	Open	2x 2000W	2x 2.8m C13-C14	D2 Slide Rail	Included
7X20A00XAU	8-slot x8 shuttle	Open	2x 2000W	2x 2.8m C13-C14	D2 Slide Rail	Included
7X20A00WAU	8-slot x8 shuttle	Open	2x 1100W	2x 2.8m C13-C14	D2 Slide Rail	Included
7X20A00YAU	8-slot x8 shuttle	Open	2x 1600W	2x 2.8m C13-C14	D2 Slide Rail	Included
Modular Enclosure models (Includes the dual-port SMM)						
7X221000AU	4-slot x16 shuttle	10Gb RJ45 EIOM	2x 2000W	2x 1.5m C13-C14	D2 Slide Rail	Optional
7X221003AU	4-slot x16 shuttle	10Gb SFP+ EIOM	2x 2000W	2x 1.5m C13-C14	D2 Slide Rail	Optional
7X221001AU	8-slot x8 shuttle	10Gb RJ45 EIOM	2x 2000W	2x 1.5m C13-C14	D2 Slide Rail	Optional
7X221002AU	8-slot x8 shuttle	10Gb SFP+ EIOM	2x 2000W	2x 1.5m C13-C14	D2 Slide Rail	Optional

Enclosure models for South East Asian countries (ASEAN)

Table 9. Enclosure models for South East Asian countries (ASEAN)

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
D2 Enclosure models (Includes the single-port SMM)						
7X20A00GSG	4-slot x16 shuttle	Open	2x 2000W	2x 2.8m C13-C14	D2 Slide Rail	Optional
7X20A00FSG	8-slot x8 shuttle	Open	2x 2000W	2x 2.8m C13-C14	D2 Slide Rail	Optional

Enclosure models for Brazil

Table 10. Enclosure models for Brazil

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
Modular Enclosure models (Includes the dual-port SMM)						
7X22A00BBR	4-slot x16 shuttle	Open	2x 2000W	2x 2.8m C13-C14 10A	D2 Slide Rail	Optional
7X22A00CBR	8-slot x8 shuttle	Open	2x 2000W	2x 2.8m C13-C14 10A	D2 Slide Rail	Optional

Enclosure models for EMEA countries

Table 11. Enclosure models for EMEA countries

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
D2 Enclosure models (Includes the single-port SMM)						
7X20A00EEA	8-slot x8 shuttle	Open	2x 1600W	2x 2.0m C13-C14	D2 Slide Rail	Included
Modular Enclosure models (Includes the dual-port SMM)						
7X22A008EA	4-slot x16 shuttle	Open	2x 2000W	2x 2.8m C13-C14	D2 Slide Rail	Included
7X22A006EA	8-slot x8 shuttle	Open	2x 2000W	2x 2.8m C13-C14	D2 Slide Rail	Included

Enclosure models for Hong Kong, Taiwan, Korea (HTK)

Table 12. Enclosure models for Hong Kong, Taiwan, Korea (HTK)

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
D2 Enclosure models (Includes the single-port SMM)						
7X20A00BCN	8-slot x8 shuttle	10Gb SFP+ EIOM	2x 1600W	2x 2.8m C13-C14	D2 Slide Rail	Optional

Enclosure models for India

Table 13. Enclosure models for India

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
D2 Enclosure models (Includes the single-port SMM)						
7X20A00KSG	4-slot x16 shuttle	Open	2x 1100W	2x 2.8m C13-C14 2x 2.8m IS 6538	D2 Slide Rail	Included
7X20A00QSG	4-slot x16 shuttle	Open	2x 1600W	2x 2.8m C13-C14 2x 2.8m IS 6538	D2 Slide Rail	Included
7X20A00PSG	4-slot x16 shuttle	Open	2x 2000W	2x 2.8m C13-C14 2x 2.8m IS 6538	D2 Slide Rail	Included
7X20A00NSG	8-slot x8 shuttle	Open	2x 1100W	2x 2.8m C13-C14 2x 2.8m IS 6538	D2 Slide Rail	Included
7X20A00LSG	8-slot x8 shuttle	Open	2x 2000W	2x 2.8m C13-C14 2x 2.8m IS 6538	D2 Slide Rail	Included
7X20A00MSG	8-slot x8 shuttle	Open	2x 1600W	2x 2.8m C13-C14 2x 2.8m IS 6538	D2 Slide Rail	Included

Enclosure models for Japan

Table 14. Enclosure models for Japan

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
D2 Enclosure models (Includes the single-port SMM)						
7X20A00DJP	4-slot x16 shuttle	10Gb RJ45 EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Included
7X20A009JP	4-slot x16 shuttle	10Gb SFP+ EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Included
7X20A007JP	8-slot x8 shuttle	10Gb RJ45 EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Included
7X20A008JP	8-slot x8 shuttle	10Gb SFP+ EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Included
Modular Enclosure models (Includes the dual-port SMM)						
7X22A002JP	4-slot x16 shuttle	10Gb RJ45 EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Included
7X22A004JP	4-slot x16 shuttle	10Gb SFP+ EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Included
7X22A001JP	8-slot x8 shuttle	10Gb SFP+ EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Included
7X22A007JP	8-slot x8 shuttle	10Gb RJ45 EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Included

Enclosure models for Latin American (except Brazil)

Table 15. Enclosure models for Latin American (except Brazil)

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
D2 Enclosure models (Includes the single-port SMM)						
7X20A019LA	8-slot x8 shuttle	10Gb SFP+ EIOM	2x 1100W	2x 2.0m C13-C14 13A	D2 Slide Rail	Optional

Enclosure models for USA and Canada

Table 16. Enclosure models for USA and Canada

Model	I/O Shuttle	External IO Module	Power supplies	Power cords	Rail kit	CMA
D2 Enclosure models (Includes the single-port SMM)						
7X20A00JNA	4-slot x16 shuttle	10Gb RJ45 EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Optional
7X20A003NA	4-slot x16 shuttle	10Gb SFP+ EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Optional
7X20A00RNA	4-slot x16 shuttle	10Gb SFP+ EIOM	2x 2000W	2x 2.0m C13-C14	D2 Slide Rail	Optional
7X20A002NA	8-slot x8 shuttle	10Gb RJ45 EIOM	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Optional
Modular Enclosure models (Includes the dual-port SMM)						
7X22A003NA	4-slot x16 shuttle	Open	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Optional
7X22A005NA	8-slot x8 shuttle	Open	2x 2000W	2x 1.0m C13-C14	D2 Slide Rail	Optional

Enclosure support

The SD530 is supported in all models of the D2 Enclosure or Modular Enclosure. The number of servers that are supported in each chassis depends on the TDP value of the processors that are used in the servers, the number and capacity of power supplies installed (1100W, 1600W or 2000W), and the AC input voltage (100 - 127V or 200 - 240V).

All servers installed in an enclosure must have the same drive backplane (for example, all four servers use the 6-drive backplane)

The enclosure supports oversubscription and power supply redundancy options to ensure efficient use of the available system power. By using oversubscription, users can make the most of the extra power from the redundant power supplies when the power supplies are in healthy condition.

Use Lenovo Capacity Planner to determine the exact power needs of the configuration:
https://datacentersupport.lenovo.com/us/en/products/solutions-and-software/software/lenovo-capacity-planner/solutions/ht504651

System power consumption is highly dependent on configuration, workload, and ambient temperature. Lenovo recommends that customers use Lenovo Capacity Planner to select the power supplies best suited for their deployment requirements.

Processor options

The SD530 supports the second-gneration Intel Xeon Scalable processors that are listed in the following table. The server supports one or two processors.

First generation processors: The SD530 also supports first-generation Xeon Scalable processors. For details, see https://lenovopress.com/lp0635.

All supported processors have the following characteristics:

- Second-generation Intel Xeon Scalable processors (formerly codenamed "Cascade Lake")
- 14 nm process technology
- Six DDR4 memory channels
- 48 PCIe 3.0 I/O lanes
- 1 MB L2 cache
- 1.375 MB or more L3 cache per core
- Intel Hyper-Threading Technology
- Intel Turbo Boost Technology 2.0
- Intel Advanced Vector Extensions 512 (AVX-512)
- Intel Ultra Path Interconnect (UPI) links at up to 10.4 GT/s

Some processors include a suffix letter in the processor model number:

- L: Large memory tier (supports total memory up to 4.5TB per processor)
- M: Medium memory tier (supports total memory up to 2TB per processor)
- N: NFV optimized
- S: Search optimized
- T: High Tcase
- U: Single socket
- V: VM Density optimized
- Y: Speed Select

Processors with a suffix other than L or M, as well as those without a suffix, support up to 1TB per processor.

B suffix: B is not an official suffix, but instead used by Intel to distinguish between the Xeon Gold 5218 and the Xeon Gold 5218B processors. These two processor models have the same core counts, frequencies, and features, however they are based on different die configurations. You should not install 5218 and 5218B processors in the same server.

Table 17. Second-generation processor options for the SD530

Part number	Feature code	Description
4XG7A14328	B4HU	Intel Xeon Bronze 3204 6C 85W 1.9GHz Processor
4XG7A14327	B4HT	Intel Xeon Silver 4208 8C 85W 2.1GHz Processor
4XG7A14344	B4P4	Intel Xeon Silver 4209T 8C 70W 2.2GHz Processor
4XG7A14326	B4HS	Intel Xeon Silver 4210 10C 85W 2.2GHz Processor
4XG7A14325	B4HR	Intel Xeon Silver 4214 12C 85W 2.2GHz Processor
4XG7A14343	B4NW	Intel Xeon Silver 4214Y 12/10/8C 85W 2.2GHz Processor
4XG7A14324	B4HQ	Intel Xeon Silver 4215 8C 85W 2.5GHz Processor
4XG7A14323	B4HP	Intel Xeon Silver 4216 16C 100W 2.1GHz Processor
4XG7A14321	B4HN	Intel Xeon Gold 5215 10C 85W 2.5GHz Processor
4XG7A14342	B4P9	Intel Xeon Gold 5215L 10C 85W 2.5GHz Processor
4XG7A14340	B4P1	Intel Xeon Gold 5215M 10C 85W 2.5GHz Processor
4XG7A14322	B4HM	Intel Xeon Gold 5217 8C 115W 3.0GHz Processor
4XG7A14320	B4HL	Intel Xeon Gold 5218 16C 125W 2.3GHz Processor
4XG7A37104	B6BS	Intel Xeon Gold 5218B 16C 125W 2.3GHz Processor
4XG7A14338	B4P3	Intel Xeon Gold 5218T 16C 105W 2.1GHz Processor
4XG7A14319	B4HK	Intel Xeon Gold 5220 18C 125W 2.2GHz Processor
4XG7A37066	B6CW	Intel Xeon Gold 5220S 18C 125W 2.7GHz Processor
4XG7A37059	B6CQ	Intel Xeon Gold 5220T 18C 105W 1.9GHz Processor
4XG7A16657	B5S1	Intel Xeon Gold 5222 4C 105W 3.8GHz Processor
4XG7A37070	B6CV	Intel Xeon Gold 6222V 20C 115W 1.8GHz Processor
4XG7A37067	B6CL	Intel Xeon Gold 6226 12C 125W 2.8GHz Processor
4XG7A14318	B4HJ	Intel Xeon Gold 6230 20C 125W 2.1GHz Processor
4XG7A16658	B5RY	Intel Xeon Gold 6230N 20C 125W 2.3GHz Processor
4XG7A37058	B6CP	Intel Xeon Gold 6230T 20C 125W 2.1GHz Processor
4XG7A37065	B6CK	Intel Xeon Gold 6234 8C 130W 3.3GHz Processor
4XG7A37060	B6CJ	Intel Xeon Gold 6238 22C 140W 2.1GHz Processor

Part number	Feature code	Description
4XG7A37069	B6CR	Intel Xeon Gold 6238L 22C 140W 2.1GHz Processor
4XG7A37068	B6CM	Intel Xeon Gold 6238M 22C 140W 2.1GHz Processor
4XG7A14337	B4P2	Intel Xeon Gold 6238T 22C 125W 1.9GHz Processor
4XG7A14317	B4HH	Intel Xeon Gold 6240 18C 150W 2.6GHz Processor
4XG7A37064	B6CS	Intel Xeon Gold 6240L 18C 150W 2.6GHz Processor
4XG7A37061	B6CN	Intel Xeon Gold 6240M 18C 150W 2.6GHz Processor
4XG7A14336	B4NV	Intel Xeon Gold 6240Y 18/14/8C 150W 2.6GHz Processor
4XG7A14316	B4HG	Intel Xeon Gold 6242 16C 150W 2.8GHz Processor
4XG7A14313	B4HF	Intel Xeon Gold 6244 8C 150W 3.6GHz Processor
4XG7A38862	B6X6	Intel Xeon Gold 6246 12C 165W 3.3GHz Processor
4XG7A14315	B4HE	Intel Xeon Gold 6248 20C 150W 2.5GHz Processor
4XG7A14314	B4HC	Intel Xeon Gold 6252 24C 150W 2.1GHz Processor
4XG7A37062	B6CT	Intel Xeon Gold 6252N 24C 150W 2.3GHz Processor
4XG7A14312	B4HD	Intel Xeon Gold 6254 18C 200W 3.1GHz Processor
4XG7A37063	B6CU	Intel Xeon Gold 6262V 24C 135W 1.9GHz Processor
4XG7A16656	B5RZ	Intel Xeon Platinum 8253 16C 125W 2.2GHz Processor
4XG7A16655	B5S2	Intel Xeon Platinum 8256 4C 105W 3.8GHz Processor
4XG7A14311	B4HB	Intel Xeon Platinum 8260 24C 165W 2.4GHz Processor
4XG7A14330	B4P7	Intel Xeon Platinum 8260L 24C 165W 2.4GHz Processor
4XG7A14331	B4NZ	Intel Xeon Platinum 8260M 24C 165W 2.4GHz Processor
4XG7A14329	B4NU	Intel Xeon Platinum 8260Y 24/20/16C 165W 2.4GHz Processor
4XG7A14310	B4HA	Intel Xeon Platinum 8268 24C 205W 2.9GHz Processor
4XG7A14309	B4H9	Intel Xeon Platinum 8270 26C 205W 2.7GHz Processor
4XG7A14308	B4H8	Intel Xeon Platinum 8276 28C 165W 2.2GHz Processor
4XG7A14332	B4P6	Intel Xeon Platinum 8276L 28C 165W 2.2GHz Processor
4XG7A14333	B4NY	Intel Xeon Platinum 8276M 28C 165W 2.2GHz Processor
4XG7A14307	B4H7	Intel Xeon Platinum 8280 28C 205W 2.7GHz Processor
4XG7A14334	B4P5	Intel Xeon Platinum 8280L 28C 205W 2.7GHz Processor
4XG7A14335	B4NX	Intel Xeon Platinum 8280M 28C 205W 2.7GHz Processor

Memory capacity of processors

Second-generation Xeon Scalable processors are limited to the amount of memory they can address, as follows:

- Processors with an L suffix (eg 8280L): Up to 4.5 TB per processor
- Processors with an M suffix (eg 8280M): Up to 2 TB per processor
- All other processors: Up to 1 TB per processor

The calculation of the total memory per processor includes both the system memory DIMMs and the Persistent Memory DCPMMs installed in the server.

For example:

- A configuration using 8x 64GB DIMMs per processor is 512 GB per processor, which means that neither an M nor an L processor is required

- A configuration using 6x 32GB DIMMs + 2x 256GB DCPMMs is a total of 1.1875 TB which means an M processor is required
- A configuration using 6x 64GB DIMMs + 2x 512GB DCPMMs is a total of 1.375 TB which means an M processor is required

Tip: There are no memory configurations of the SD530 that require an L-suffix processor.

The processors in the SD530 require specific heatsinks depending on their thermal profile of the processor:

- 85mm heatsinks are used on processors with low thermal requirements. This heatsink allows the use of 16 DIMMs and the use of a storage adapter in the PCIe slot at the rear of the server
- 108mm heatsinks are used on CPU 1 when the processors installed have medium thermal requirements. Due to its shape, this heatsink limits the number of DIMMs to 12. A storage adapter can be used with these processors. Only CPU 1 (rear) needs this larger heatsink; CPU 2 (front) uses an 85mm heatsink.
- Thermal Transfer Module heatsinks are used on CPU 1 when the processors installed have high thermal requirements. The Thermal Transfer Module is two heatsinks connected together via thermal pipes as shown in the following figure. Due to its shape, this heatsink prevents an adapter (RAID or HBA) from being installed in PCIe slot 1 at the rear of the server and limits the number of DIMMs to 12. CPU 2 will use a larger 102mm heatsink in such configurations.

The Thermal Transfer Module (TTM) heatsink is shown in the following figure. For additional information, see the Lenovo Press article, *The Benefits of Lenovo Thermal Transfer Module Technology in ThinkSystem SD530 Servers*, https://lenovopress.com/lp0922.

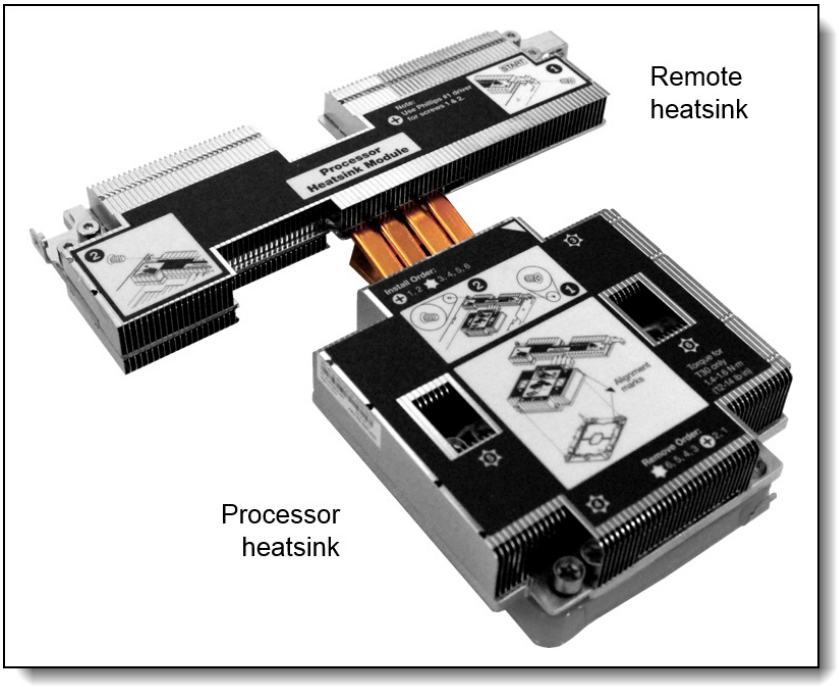

Figure 8. Thermal Transfer Module

The following table lists the heatsink used for each processor model, and the resulting support for 16 DIMMs and support for a RAID adapter or HBA. The table also lists which processors (those with an M suffix) that support more than 768 GB per processor (1.5TB for two processors).

16 DIMM support: The use of 16 DIMMs requires that smaller heatsinks be used. As a result, only a subset of processors support 16 DIMMs (8 DIMMs per processor), as noted in the table below. All others are limited to 12 DIMMs (6 DIMMs processors).

Drive bay support: Only a subset of processors support 6 drive bays. See the Drive bays and backplanes section for details.

Storage adapter support: Some procesors require the larger T-shaped Thermal Transfer Module heatsink which precludes the use of the RAID adapter or HBA installed in the dedicated slot at the rear of the server.

Table 18. Processor support for server features

Description	Heatsink for CPU1	Supports 16 DIMMs*	Supports DCPMMs†	Supports Storage Adapter‡
Intel Xeon Bronze 3204 6C 85W 1.9GHz	85mm	Yes	No	Yes
Intel Xeon Silver 4208 8C 85W 2.1GHz	85mm	Yes	No	Yes
Intel Xeon Silver 4209T 8C 70W 2.2GHz	85mm	Yes	No	Yes
Intel Xeon Silver 4210 10C 85W 2.2GHz	85mm	Yes	No	Yes
Intel Xeon Silver 4214 12C 85W 2.2GHz	85mm	Yes	No	Yes
Intel Xeon Silver 4214Y 12/10/8C 85W 2.2GHz	85mm	Yes	No	Yes
Intel Xeon Silver 4215 8C 85W 2.5GHz	85mm	Yes	Yes	Yes
Intel Xeon Silver 4216 16C 100W 2.1GHz	85mm	Yes	No	Yes
Intel Xeon Gold 5215 10C 85W 2.5GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 5215L 10C 85W 2.5GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 5215M 10C 85W 2.5GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 5217 8C 115W 3.0GHz	108mm	No	No	Yes
Intel Xeon Gold 5218 16C 125W 2.3GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 5218B 16C 125W 2.3GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 5218T 16C 105W 2.1GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 5220 18C 125W 2.2GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 5220S 18C 125W 2.7GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 5220T 18C 105W 1.9GHz	TTM	No	No	No
Intel Xeon Gold 5222 4C 105W 3.8GHz	108mm	No	No	Yes
Intel Xeon Gold 6222V 20C 115W 1.8GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 6226 12C 125W 2.8GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 6230 20C 125W 2.1GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 6230N 20C 125W 2.3GHz	108mm	No	No	Yes
Intel Xeon Gold 6230T 20C 125W 2.1GHz	108mm	No	No	Yes
Intel Xeon Gold 6234 8C 130W 3.3GHz	108mm	No	No	Yes
Intel Xeon Gold 6238 22C 140W 2.1GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 6238L 22C 140W 2.1GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 6238M 22C 140W 2.1GHz	85mm	Yes	Yes	Yes
Intel Xeon Gold 6238T 22C 125W 1.9GHz	108mm	No	No	Yes
Intel Xeon Gold 6240 18C 150W 2.6GHz	108mm	No	No	Yes
Intel Xeon Gold 6240L 18C 150W 2.6GHz	108mm	No	No	Yes
Intel Xeon Gold 6240M 18C 150W 2.6GHz	108mm	No	No	Yes
Intel Xeon Gold 6240Y 18/14/8C 150W 2.6GHz	TTM	No	No	No
Intel Xeon Gold 6242 16C 150W 2.8GHz	108mm	No	No	Yes

Description	Heatsink for CPU1	Supports 16 DIMMs*	Supports DCPMMs†	Supports Storage Adapter‡
Intel Xeon Gold 6244 8C 150W 3.6GHz	TTM	No	No	No
Intel Xeon Gold 6246 12C 165W 3.3GHz	TTM	No	No	No
Intel Xeon Gold 6248 20C 150W 2.5GHz	108mm	No	No	Yes
Intel Xeon Gold 6252 24C 150W 2.1GHz	108mm	No	No	Yes
Intel Xeon Gold 6252N 24C 150W 2.3GHz	108mm	No	No	Yes
Intel Xeon Gold 6254 18C 200W 3.1GHz	TTM	No	No	No
Intel Xeon Gold 6262V 24C 135W 1.9GHz	85mm	Yes	Yes	Yes
Intel Xeon Platinum 8253 16C 125W 2.2GHz	85mm	Yes	Yes	Yes
Intel Xeon Platinum 8256 4C 105W 3.8GHz	108mm	No	No	Yes
Intel Xeon Platinum 8260 24C 165W 2.4GHz	108mm	No	No	Yes
Intel Xeon Platinum 8260L 24C 165W 2.4GHz	108mm	No	No	Yes
Intel Xeon Platinum 8260M 24C 165W 2.4GHz	108mm	No	No	Yes
Intel Xeon Platinum 8260Y 24/20/16C 165W 2.4GHz	108mm	No	No	Yes
Intel Xeon Platinum 8268 24C 205W 2.9GHz	TTM	No	No	No
Intel Xeon Platinum 8270 26C 205W 2.7GHz	TTM	No	No	No
Intel Xeon Platinum 8276 28C 165W 2.2GHz	108mm	No	No	Yes
Intel Xeon Platinum 8276L 28C 165W 2.2GHz	108mm	No	No	Yes
Intel Xeon Platinum 8276M 28C 165W 2.2GHz	108mm	No	No	Yes
Intel Xeon Platinum 8280 28C 205W 2.7GHz	TTM	No	No	No
Intel Xeon Platinum 8280L 28C 205W 2.7GHz	TTM	No	No	No
Intel Xeon Platinum 8280M 28C 205W 2.7GHz	TTM	No	No	No

* With 16 DIMMs, drive bays are limited to 4x 2.5-inch SAS/SATA drives or 4x 2.5-inch NVMe drives (6 drive bays not supported). See the Drive bays and backplanes section for details.
† DCPMM support requires that the processor supports DCPMMs. In addition, DCPMM support requires a processor that uses the 85mm heatsink so that the slots that supprt DCPMMs are actually available for use.
‡ No in this column means no support for ThinkSystem SD530 HW RAID Kit or ThinkSystem 430-8i SAS/SATA 12Gb Dense HBA

Processor features

The following table compares the features of the supported second-generation Intel Xeon processors.

DCPMM support: For a listing of which processors support DCPMM in the SD530, see the Processor support for server features table.

Abbreviations used in the table:

- UPI: Ultra Path Interconnect
- TDP: Thermal Design Power
- FMA: Number of Intel AVX-512 Fused-Multiply Add (FMA) units
- HT: Hyper-Threading
- TB: Turbo Boost 2.0
- VT: Virtualization Technology (includes VT-x and VT-d)
- SST-PP: Speed Select Technology - Performance Profile
- DCPMM: DC Persistent Memory Module support
- RAS: Reliability, Availability, and Serviceability: Std = Standard, Adv = Advanced

The processors that support SST-PP offer three distinct operating points that are defined by a core count with a base speed associated with that core count. The operating point is selected during the boot process and cannot be changed at runtime.

Table 19. Processor specifications

CPU model	Cores / threads	Core speed (Base / TB max)	L3 cache*	Max memory speed	Max memory per CPU	UPI links & speed	FMA units	TDP	HT	TB	VT	SST-PP	RAS
Intel Xeon 3200 (Bronze) processors													
3204	6 / 6	1.9 / None	8.25 MB	2133 MHz	1 TB	2, 9.6 GT/s	1	85 W	N	N	Y	N	Std
Intel Xeon 4200 (Silver) processors													
4208	8 / 16	2.1 / 3.2 GHz	11 MB	2400 MHz	1 TB	2, 9.6 GT/s	1	85 W	Y	Y	Y	N	Std
4209T	8 / 16	2.2 / 3.2 GHz	11 MB	2400 MHz	1 TB	2, 9.6 GT/s	1	70 W	Y	Y	Y	N	Std
4210	10 / 20	2.2 / 3.2 GHz	13.75 MB	2400 MHz	1 TB	2, 9.6 GT/s	1	85 W	Y	Y	Y	N	Std
4214	12 / 24	2.2 / 3.2 GHz	16.5 MB	2400 MHz	1 TB	2, 9.6 GT/s	1	85 W	Y	Y	Y	N	Std
4214Y	12 / 24	2.2 / 3.2 GHz	16.5 MB	2400 MHz	1 TB	2, 9.6 GT/s	1	85 W	Y	Y	Y	Y	Std
	10 / 20	2.3 / 3.2 GHz											
	8 / 16	2.4 / 3.2 GHz											
4215	8 / 16	2.5 / 3.5 GHz	11 MB	2400 MHz	1 TB	2, 9.6 GT/s	1	85 W	Y	Y	Y	N	Std
4216	16 / 32	2.1 / 3.2 GHz	22 MB	2400 MHz	1 TB	2, 9.6 GT/s	1	100 W	Y	Y	Y	N	Std
Intel Xeon 5200 (Gold) processors													
5215	10 / 20	2.5 / 3.4 GHz	13.75 MB	2666 MHz	1 TB	2, 10.4 GT/s	1	85 W	Y	Y	Y	N	Adv
5215M	10 / 20	2.5 / 3.4 GHz	13.75 MB	2666 MHz	2 TB	2, 10.4 GT/s	1	85 W	Y	Y	Y	N	Adv
5215L	10 / 20	2.5 / 3.4 GHz	13.75 MB	2666 MHz	4.5 TB	2, 10.4 GT/s	1	85 W	Y	Y	Y	N	Adv
5217	8 / 16	3.0 / 3.7 GHz	11 MB	2666 MHz	1 TB	2, 10.4 GT/s	1	115 W	Y	Y	Y	N	Adv
5218**	16 / 32	2.3 / 3.9 GHz	22 MB	2666 MHz	1 TB	2, 10.4 GT/s	1	125 W	Y	Y	Y	N	Adv
5218B**	16 / 32	2.3 / 3.9 GHz	22 MB	2666 MHz	1 TB	2, 10.4 GT/s	1	125 W	Y	Y	Y	N	Adv
5218T	16 / 32	2.1 / 3.9 GHz	22 MB	2666 MHz	1 TB	2, 10.4 GT/s	1	105 W	Y	Y	Y	N	Adv
5220	18 / 36	2.2 / 3.9 GHz	24.75 MB	2666 MHz	1 TB	2, 10.4 GT/s	1	125 W	Y	Y	Y	N	Adv
5220S	18 / 36	2.7 / 3.9 GHz	24.75 MB	2666 MHz	1 TB	2, 10.4 GT/s	1	125 W	Y	Y	Y	N	Adv
5220T	18 / 36	1.9 / 3.9 GHz	24.75 MB	2666 MHz	1 TB	2, 10.4 GT/s	1	105 W	Y	Y	Y	N	Adv
5222	4 / 8	3.8 / 3.9 GHz	16.5 MB*	2933 MHz	1 TB	2, 10.4 GT/s	2	105 W	Y	Y	Y	N	Adv
Intel Xeon 6200 (Gold) processors													
6222V	20 / 40	1.8 / 3.6 GHz	27.5 MB	2400 MHz	1 TB	3, 10.4 GT/s	2	115 W	Y	Y	Y	N	Adv
6226	12 / 24	2.7 / 3.7 GHz	19.25 MB*	2933 MHz	1 TB	3, 10.4 GT/s	2	125 W	Y	Y	Y	N	Adv
6230	20 / 40	2.1 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	125 W	Y	Y	Y	N	Adv
6230N	20 / 40	2.3 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	125 W	Y	Y	Y	N	Adv
6230T	20 / 40	2.1 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	125 W	Y	Y	Y	N	Adv

CPU model	Cores / threads	Core speed (Base / TB max)	L3 cache*	Max memory speed	Max memory per CPU	UPI links & speed	FMA units	TDP	HT	TB	VT	SST-PP	RAS
6234	8 / 16	3.3 / 4.0 GHz	24.75 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	130 W	Y	Y	Y	N	Adv
6238	22 / 44	2.1 / 3.7 GHz	30.25 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	140 W	Y	Y	Y	N	Adv
6238M	22 / 44	2.1 / 3.7 GHz	30.25 MB	2933 MHz	2 TB	3, 10.4 GT/s	2	140 W	Y	Y	Y	N	Adv
6238L	22 / 44	2.1 / 3.7 GHz	30.25 MB	2933 MHz	4.5 TB	3, 10.4 GT/s	2	140 W	Y	Y	Y	N	Adv
6238T	22 / 44	1.9 / 3.7 GHz	30.25 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	125 W	Y	Y	Y	N	Adv
6240	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	N	Adv
6240M	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	2 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	N	Adv
6240L	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	4.5 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	N	Adv
6240Y	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	Y	Adv
	14 / 28	2.8 / 3.9 GHz											
	8 / 16	3.1 / 3.9 GHz											
6242	16 / 32	2.8 / 3.9 GHz	22 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	N	Adv
6244	8 / 16	3.6 / 4.4 GHz	24.75 MB*	2933 MHz	1 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	N	Adv
6246	12 / 24	3.3 / 3.9 GHz	24.75 MB*	2933 MHz	1 TB	3, 10.4 GT/s	2	165 W	Y	Y	Y	N	Adv
6248	20 / 40	2.5 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	N	Adv
6252	24 / 48	2.1 / 3.7 GHz	35.75 MB*	2933 MHz	1 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	N	Adv
6252N	24 / 48	2.3 / 3.6 GHz	33 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	150 W	Y	Y	Y	N	Adv
6254	18 / 36	3.1 / 4.0 GHz	24.75 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	200 W	Y	Y	Y	N	Adv
6262V	24 / 48	1.9 / 3.6 GHz	33 MB	2400 MHz	1 TB	3, 10.4 GT/s	2	135 W	Y	Y	Y	N	Adv
Intel Xeon 8200 (Platinum) processors													
8253	16 / 32	2.2 / 3.0 GHz	22 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	125 W	Y	Y	Y	N	Adv
8256	4 / 8	3.8 / 3.9 GHz	16.5 MB*	2933 MHz	1 TB	3, 10.4 GT/s	2	105 W	Y	Y	Y	N	Adv
8260	24 / 48	2.4 / 3.9 GHz	35.75 MB*	2933 MHz	1 TB	3, 10.4 GT/s	2	165 W	Y	Y	Y	N	Adv
8260M	24 / 48	2.4 / 3.9 GHz	35.75 MB*	2933 MHz	2 TB	3, 10.4 GT/s	2	165 W	Y	Y	Y	N	Adv
8260L	24 / 48	2.4 / 3.9 GHz	35.75 MB*	2933 MHz	4.5 TB	3, 10.4 GT/s	2	165 W	Y	Y	Y	N	Adv
8260Y	24 / 48	2.4 / 3.9 GHz	35.75 MB*	2933 MHz	1 TB	3, 10.4 GT/s	2	165 W	Y	Y	Y	Y	Adv
	20 / 40	2.5 / 3.9 GHz											
	16 / 32	2.7 / 3.9 GHz											
8268	24 / 48	2.9 / 3.9 GHz	35.75 MB*	2933 MHz	1 TB	3, 10.4 GT/s	2	205 W	Y	Y	Y	N	Adv
8270	26 / 52	2.7 / 4.0 GHz	35.75 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	205 W	Y	Y	Y	N	Adv
8276	28 / 56	2.2 / 4.0 GHz	38.5 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	165 W	Y	Y	Y	N	Adv
8276M	28 / 56	2.2 / 4.0 GHz	38.5 MB	2933 MHz	2 TB	3, 10.4 GT/s	2	165 W	Y	Y	Y	N	Adv
8276L	28 / 56	2.2 / 4.0 GHz	38.5 MB	2933 MHz	4.5 TB	3, 10.4 GT/s	2	165 W	Y	Y	Y	N	Adv
8280	28 / 56	2.7 / 4.0 GHz	38.5 MB	2933 MHz	1 TB	3, 10.4 GT/s	2	205 W	Y	Y	Y	N	Adv
8280M	28 / 56	2.7 / 4.0 GHz	38.5 MB	2933 MHz	2 TB	3, 10.4 GT/s	2	205 W	Y	Y	Y	N	Adv
8280L	28 / 56	2.7 / 4.0 GHz	38.5 MB	2933 MHz	4.5 TB	3, 10.4 GT/s	2	205 W	Y	Y	Y	N	Adv

* L3 cache is 1.375 MB per core or larger. Processors with a larger L3 cache per core are marked with an *
** The Intel Xeon Gold 5218 and 5218B processors have similar specifications; however, they use different silicon designs and cannot be mixed in the same system.

Memory options

The SD530 with second-generation Intel Xeon Scalable processors uses Lenovo TruDDR4 memory operating at up to 2933 MHz. The SD530 supports up to 6 or 8 DIMMs per processor, for a total of 12 or 16 DIMMs when two processors are installed. The total DIMMs supported depends on the processor selected,

as described in the Processor options section.

The SD530 with second-generation Intel Xeon Scalable processors also supports Intel Optane DC Persistent Memory, as described in the Persistent Memory section.

With second-generation processors, the server supports these memory DIMMs:

- 2666 MHz DIMMs, that operate at 2666 MHz both at 1 DIMM per channel and 2 DIMMs per channel
- 2933 MHz DIMMs, that operate at 2933 MHz at 1 DIMM per channel, and at 2666 MHz at 2 DIMMs per channel

Note that if the processor selected has a lower memory bus speed (eg 2133 MHz or 2400 MHz), then all DIMMs will operate at lower sppeed, even if the DIMMs are rated for 2666 MHz or 2933 MHz. See the Processor features section for details.

The following table lists the memory options that are available for the server.

Lenovo TruDDR4 memory uses the highest quality components that are sourced from Tier 1 DRAM suppliers and only memory that meets the strict requirements of Lenovo is selected. It is compatibility tested and tuned to maximize performance and reliability. From a service and support standpoint, Lenovo TruDDR4 memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

Table 20. Memory options

Part number	Feature code	Description	Maximum supported
2933 MHz DIMMs			
4ZC7A08706	B4H1	ThinkSystem 8GB TruDDR4 2933MHz (1Rx8 1.2V) RDIMM	16 (8 per processor)
4ZC7A08707	B4LY	ThinkSystem 16GB TruDDR4 2933 MHz (1Rx4 1.2V) RDIMM	16 (8 per processor)
4ZC7A08708	B4H2	ThinkSystem 16GB TruDDR4 2933MHz (2Rx8 1.2V) RDIMM	16 (8 per processor)
4ZC7A08709	B4H3	ThinkSystem 32GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	16 (8 per processor)
4ZC7A08710	B4H4	ThinkSystem 64GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	16 (8 per processor)
2666 MHz DIMMs			
7X77A01302	AUNB	ThinkSystem 16GB TruDDR4 2666 MHz (1Rx4 1.2V) RDIMM	16 (8 per processor)
7X77A01303	AUNC	ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	16 (8 per processor)
7X77A01304	AUND	ThinkSystem 32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	16 (8 per processor)

The following rules apply when selecting the memory configuration:

- The server architecturally supports RDIMMs, LRDIMMs and 3DS RDIMMs, however only RDIMMs are currently supported. UDIMMs are not supported.
- Mixing RDIMMs, LRDIMMs or 3DS RDIMMs is not supported.
- Mixing x4 and x8 DIMMs is supported.
- Mixing of 2666 MHz and 2933 MHz is supported, however, all installed memory will operate at the lowest speed.

For best performance, consider the following:

- Ensure the memory installed is at least the same speed as the memory bus of the selected processor.
- Populate memory DIMMs in quantities of 6 or 12 per processor, so that all memory channels are used.

- When mixing 16 GB and 32 GB DIMMs in the same configuration, use 16GB 2Rx8 DIMMs instead of 16 GB 1Rx4 DIMMs for better performance.
- Populate memory channels so they all have the same total memory capacity.
- Ensure all memory controllers on a processor socket have the same DIMM configuration.
- All processor sockets on the same physical server should have the same DIMM configuration.

The following memory protection technologies are supported:

- ECC
- SDDC (for x4-based memory DIMMs; look for "x4" in the DIMM description)
- ADDDC (for x4-based memory DIMMs)
- Memory mirroring
- Memory rank sparing

If memory channel mirroring is used, then DIMMs must be installed in pairs or sets of three (minimum of one pair or set of three per processor), and all DIMMs in the pair or set of three must be identical in type and size. 50% of the installed capacity is available to the operating system.

If memory rank sparing is used, then a minimum of two single-rank or dual-rank DIMMs must be installed per populated channel (the DIMMs do not need to be identical). In rank sparing mode, one rank of a DIMM in each populated channel is reserved as spare memory. The largest rank in the channel will be automatically selected as the spare rank. The amount of memory available to the operating system depends on the number, capacity and rank counts of the DIMMs installed.

Persistent Memory

The SD530 server supports Intel Optane DC Persistent Memory, a new class of memory and storage technology explicitly architected for data center usage. Persistent Memory offers significantly lower latency than fetching data from SSDs, even NVMe SSDs, and offers higher capacities than system memory.

Using Lenovo ThinkSystem servers running applications that are tuned for Intel Optane DC Persistent Memory will result in lower data latency compared to solid-state drive technology. When data is stored closer to the processor on nonvolatile media, applications can see significant overall improvement in performance.

The following table lists the ordering information for the DC Persistent Memory modules (DCPMMs).

Table 21. DCPMM part numbers

Part number	Feature code	Description	Maximum supported
4ZC7A15110	B4LV	ThinkSystem 128GB TruDDR4 2666MHz (1.2V) Intel Optane DC Persistent Memory	4 (2 per processor)
4ZC7A15111	B4LW	ThinkSystem 256GB TruDDR4 2666MHz (1.2V) Intel Optane DC Persistent Memory	4 (2 per processor)
4ZC7A15112	B4LX	ThinkSystem 512GB TruDDR4 2666MHz (1.2V) Intel Optane DC Persistent Memory	4 (2 per processor)

The following are the requirements when installing DCPMMs:

- Only second-generation Intel Xeon Scalable Family processors support DCPMMs. First generation Xeon Scalable processors are not supported.
- Only the Platinum level, Gold level, and the Silver 4215 processor models support DCPMMs. All other Silver and all Bronze level processors do not support DCPMMs. See the Processor features section for details.

- All installed DCPMMs must be the same size. Mixing DCPMMs of different capacities is not supported
- DCPMMs are installed in the black DIMM slots (see the Internal view of the server)
- Minimum 2 TruDDR4 DIMMs per processor (1 per memory controller)
- For Memory Mode, minimum 2 DCPMMs per processor (install 1 per memory controller)
- For App Direct Mode, mimimum 1 DCPMM installed in the server (any processor)
- When either Memory Mode or Mixed Mode is used, the ratio of memory to DCPMMs must be between 1:16 and 1:4, but the recommended ratio is 1:4 for the best performance. For example, 6x 16GB DIMMs + 2x 256GB DCPMMs is a ratio of 1:5.33. This ratio requirement does not apply to App Direct mode.
- In configurations with DCPMMs installed, memory mirroring is supported, with two restrictions:
  - Mirroring is only enabled on the DRAM DIMMs installed in the server; The DCPMMs themselves do not support mirroring.
  - Only App Direct mode is supported. Memory mirroring cannot be enabled when DCPMMs are in Memory Mode or Mixed Mode.
- Memory sparing is not supported with DCPMMs installed

DCPMMs offer the following memory protection technologies:

- ECC
- SDDC
- DDDC
- Patrol scrubbing
- Demand scrubbing

In the App Direct mode, the DCPMMs also support memory mirroring that is performed by the processor's integrated memory controllers. Memory mirroring is not supported in Memory Mode or Mixed Mode. Memory rank sparing is not supported by DCPMMs in any mode.

For more information, see the Intel Optane DC Persistent Memory (DCPMM) product guide, https://lenovopress.com/LP1066

Internal storage

The SD530 supports up to six 2.5-inch hot-swap drive bays, all of which are accessible from the front of the server.

In this section:

Drive bays and backplanes

The server supports three different drive bay configurations, all comprised of 2.5-inch hot-swap drive bays:

- Six drive bays, four bays supporting SAS or SATA drives and two Lenovo AnyBay bays, supporting NVMe, SAS or SATA drives
- Five drive bays, three of which are SAS/SATA and two are AnyBay bays. This configuration also includes a KVM breakout module to provide front-accessible VGA, Serial and USB ports.
- Four drive bays, all of which are SAS/SATA drive bays or all of which are NVMe. These configurations also support an optional KVM breakout module.

The three configurations are shown in the following figure. When the AnyBay backplane is selected the rightmost two drives are the AnyBay drive bays. AnyBay is the term for a bay with a U.2 connector that has both SAS/SATA and NVMe connections. It is designed to support either a SAS, SATA or NVMe drive.

Enclosure requirement: All servers installed in an enclosure must have the same drive backplane (for example, all four servers use the 6-drive backplane).

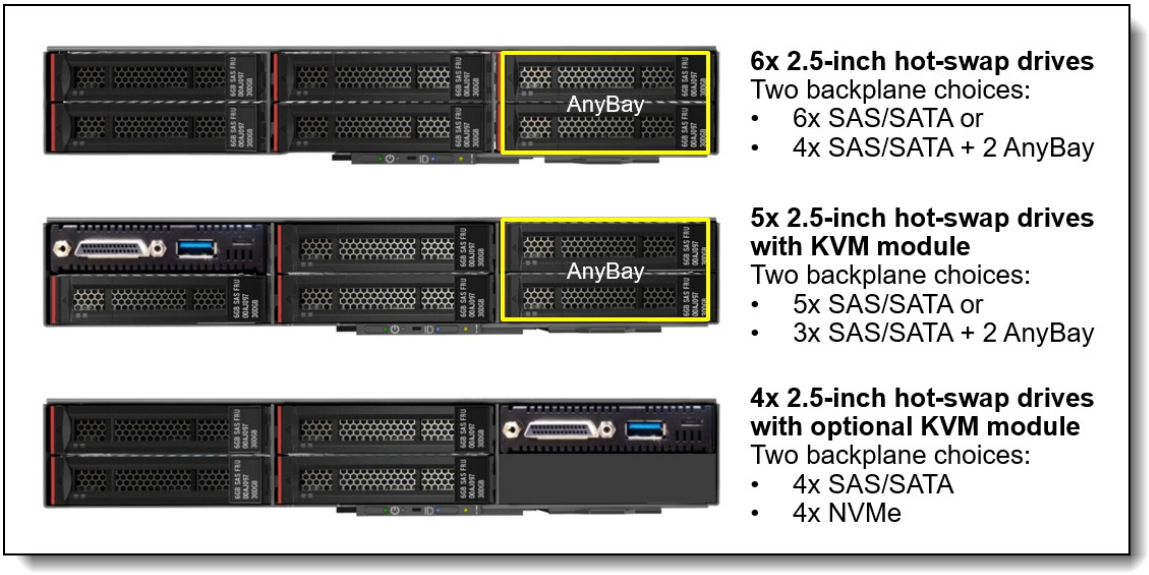

Figure 9. Drive bay configurations of the SD530

The drive bay configurations are made available through the use of either a 2x3 SAS/SATA backplane, 2x3 AnyBay backplane, a 2x2 SAS/SATA backplane or a 2x2 NVMe backplane. Ordering details are listed in the following table.

Processor 2 needed for AnyBay: The use of AnyBay or NVMe requires that processor 2 be installed. Processor 2 provides the necessary PCIe connectivity.

Table 22. Backplane ordering information

Part number	Feature code	Description	Drive bay configuration
None*	AUYG	ThinkSystem SD530 3x2 SAS/SATA BP	6x SAS/SATA 5x SAS/SATA
None*	AUYH	ThinkSystem SD530 3x2 SAS/SATA/NVMe BP	4x SAS/SATA + 2 AnyBay 3x SAS/SATA + 2 AnyBay
None*	AUYJ	ThinkSystem SD530 2x2 SAS/SATA BP	4x SAS/SATA
None*	B324	ThinkSystem SD530 2.5" NVMe 4-Bay Backplane Kit	4x NVMe

* Available in predefined models or configure-to-order only

Not all processor selections support the 3x2 backplanes, and some ony support 3x2 backplanes when 12 DIMMs are installed. The following table shows the supported combinations.

Tip: Support is based on the cooling needs of the processor, not the TDP or core frequency.

Table 23. Backplane support by processor

Intel Xeon processor	12 DIMMs		16 DIMMs	
	2x2 backplane	2x3 backplane	2x2 backplane	2x3 backplane
Intel Xeon Bronze 3204 6C 85W 1.9GHz	Yes	Yes	Yes	No
Intel Xeon Silver 4208 8C 85W 2.1GHz	Yes	Yes	Yes	No
Intel Xeon Silver 4209T 8C 70W 2.2GHz	Yes	Yes	Yes	No
Intel Xeon Silver 4210 10C 85W 2.2GHz	Yes	Yes	Yes	No
Intel Xeon Silver 4214 12C 85W 2.2GHz	Yes	Yes	Yes	No
Intel Xeon Silver 4214Y 12/10/8C 85W 2.2GHz	Yes	Yes	Yes	No
Intel Xeon Silver 4215 8C 85W 2.5GHz	Yes	Yes	Yes	No
Intel Xeon Silver 4216 16C 100W 2.1GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5215 10C 85W 2.5GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5215L 10C 85W 2.5GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5215M 10C 85W 2.5GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5217 8C 115W 3.0GHz	Yes	No	No	No
Intel Xeon Gold 5218 16C 125W 2.3GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5218B 16C 125W 2.3GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5218T 16C 105W 2.1GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5220 18C 125W 2.2GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5220S 18C 125W 2.7GHz	Yes	Yes	Yes	No
Intel Xeon Gold 5220T 18C 105W 1.9GHz	Yes	No	No	No
Intel Xeon Gold 5222 4C 105W 3.8GHz	Yes	No	No	No
Intel Xeon Gold 6222V 20C 115W 1.8GHz	Yes	Yes	Yes	No
Intel Xeon Gold 6226 12C 125W 2.8GHz	Yes	Yes	Yes	No
Intel Xeon Gold 6230 20C 125W 2.1GHz	Yes	Yes	Yes	No
Intel Xeon Gold 6230N 20C 125W 2.3GHz	Yes	No	No	No
Intel Xeon Gold 6230T 20C 125W 2.1GHz	Yes	No	No	No
Intel Xeon Gold 6234 8C 130W 3.3GHz	Yes	No	No	No
Intel Xeon Gold 6238 22C 140W 2.1GHz	Yes	Yes	Yes	No
Intel Xeon Gold 6238L 22C 140W 2.1GHz	Yes	Yes	Yes	No
Intel Xeon Gold 6238M 22C 140W 2.1GHz	Yes	Yes	Yes	No
Intel Xeon Gold 6238T 22C 125W 1.9GHz	Yes	No	No	No
Intel Xeon Gold 6240 18C 150W 2.6GHz	Yes	No	No	No
Intel Xeon Gold 6240L 18C 150W 2.6GHz	Yes	No	No	No
Intel Xeon Gold 6240M 18C 150W 2.6GHz	Yes	No	No	No
Intel Xeon Gold 6240Y 18/14/8C 150W 2.6GHz	Yes	No	No	No
Intel Xeon Gold 6242 16C 150W 2.8GHz	Yes	No	No	No
Intel Xeon Gold 6244 8C 150W 3.6GHz	Yes	No	No	No
Intel Xeon Gold 6246 12C 165W 3.3GHz	Yes	No	No	No
Intel Xeon Gold 6248 20C 150W 2.5GHz	Yes	No	No	No
Intel Xeon Gold 6252 24C 150W 2.1GHz	Yes	No	No	No

Intel Xeon processor	12 DIMMs		16 DIMMs	
	2x2 backplane	2x3 backplane	2x2 backplane	2x3 backplane
Intel Xeon Gold 6252N 24C 150W 2.3GHz	Yes	No	No	No
Intel Xeon Gold 6254 18C 200W 3.1GHz	Yes	No	No	No
Intel Xeon Gold 6262V 24C 135W 1.9GHz	Yes	Yes	Yes	No
Intel Xeon Platinum 8253 16C 125W 2.2GHz	Yes	Yes	Yes	No
Intel Xeon Platinum 8256 4C 105W 3.8GHz	Yes	No	No	No
Intel Xeon Platinum 8260 24C 165W 2.4GHz	Yes	No	No	No
Intel Xeon Platinum 8260L 24C 165W 2.4GHz	Yes	No	No	No
Intel Xeon Platinum 8260M 24C 165W 2.4GHz	Yes	No	No	No
Intel Xeon Platinum 8260Y 24/20/16C 165W 2.4GHz	Yes	No	No	No
Intel Xeon Platinum 8268 24C 205W 2.9GHz	Yes	No	No	No
Intel Xeon Platinum 8270 26C 205W 2.7GHz	Yes	No	No	No
Intel Xeon Platinum 8276 28C 165W 2.2GHz	Yes	No	No	No
Intel Xeon Platinum 8276L 28C 165W 2.2GHz	Yes	No	No	No
Intel Xeon Platinum 8276M 28C 165W 2.2GHz	Yes	No	No	No
Intel Xeon Platinum 8280 28C 205W 2.7GHz	Yes	No	No	No
Intel Xeon Platinum 8280L 28C 205W 2.7GHz	Yes	No	No	No
Intel Xeon Platinum 8280M 28C 205W 2.7GHz	Yes	No	No	No

Adapters and cabling

The SD530 supports the following backplane connectivity:

- Hardware RAID adapter installed in a dedicated slot at the back of the server - supporting SAS or SATA drives
- Software RAID from the embedded Intel RSTe controller - supporting only SATA drives
- PCIe NVMe connectivity for the AnyBay backplane from the PCIe connector #3 on the system board which is routed from Processor 2.
- PCIe NVMe connectivity for the 2x2 NVMe backplane from the PCIe connectors #3 and #4 on the system board which is routed from Processor 2.

These connectors are shown in the Internal view of the server in the Components and connectors section.

Tip: The controllers are described in detail in the Controllers for internal storage section.

M.2 drives

The server supports one or two M.2 form-factor SATA drives for use as an operating system boot solution. With two M.2 drives configured, the drives are configured by default as a RAID-1 mirrored pair for redundancy.

The M.2 drives install into an M.2 adapter which in turn is installed in a dedicated slot on the system board. See the internal view of the server in the Components and connectors section for the location of the M.2 slot.

There are two M.2 adapters supported, as listed in the following table.

Table 24. M.2 components

Part number	Feature code	Description	Maximum supported
7Y37A01092	AUMU	ThinkSystem M.2 Enablement Kit (contains the Single M.2 Boot Adapter; supports 1 drive)	1
7Y37A01093	AUMV	ThinkSystem M.2 with Mirroring Enablement Kit (contains the Dual M.2 Boot Adapter, supports 1 or 2 drives)	1

Supported drives are listed in the Internal drive options section.

For details about M.2 components, see the *ThinkSystem M.2 Drives and M.2 Adapters* product guide: https://lenovopress.com/lp0769-thinksystem-m2-drives-adapters

Controllers for internal storage

The SD530 supports the following RAID controllers for internal storage:

- 12 Gb SAS/SATA RAID adapter installed in a dedicated slot
- 12 Gb SAS/SATA HBA installed in a dedicated slot
- Intel RSTe 6 Gb SATA software RAID controller integrated in the the Intel chipset

Storage adapters with high-end processors: The use of processors with a high thermal profile such as the 205W processors preclude the use of the RAID adapter or the HBA. See Processor options for specifics. With such processors, only the onboard Intel RSTe 6 Gb SATA software RAID controller can be used.

Virtualization support: The onboard SATA ports can be used with virtualization hypervisors, including VMware ESXi, Linux KVM, Xen, and Microsoft Hyper-V, however support is limited to AHCI (non-RAID) mode. RSTe mode is not supported with virtualization hypervisors.

The following table lists the ordering information.

Table 25. RAID controllers

Part number	Feature code	Description
None	AUYL	ThinkSystem SD530 SW RAID Kit
4C57A16216	AUYK	ThinkSystem SD530 HW RAID Kit (RAID 530-8i equivalent)
4C57A16217	B0SS	ThinkSystem 430-8i SAS/SATA 12Gb Dense HBA

Table 26. Controller specifications

Feature	Intel RSTe	430-8i Dense	SD530 RAID
Adapter type	Software RAID	HBA	RAID controller
Part number	None	4C57A16217	4C57A16216
Form factor	Onboard	Custom	Custom
Controller chip	Intel PCH (RSTe)	LSI SAS3408	LSI SAS3408
Host interface	Not applicable	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	6 Gb SATA	12 Gb SAS	12 Gb SAS
Number of ports	6	6	6
Port connectors	2x onboard SATA	2x SlimSAS x4	2x SlimSAS x4
Drive interface	SATA	SAS, SATA	SAS, SATA
Drive type	HDD, SSD	HDD, SSD, SED**	HDD, SSD, SED
Hot-swap drives	No	Yes	Yes
Max devices	Varies	8	6
RAID levels	0, 1, 10, 5	No RAID	0, 1, 10, 5, 50
JBOD mode	Yes	Yes	Yes
Cache	None	No	None
CacheVault cache protection	No	No	No
Performance Accelerator (FastPath)	No	No	Yes
SSD Caching (CacheCade Pro 2.0)	No	No	No
SED support	No	Yes**	Yes (SafeStore)

** The SAS/SATA HBA supports SEDs (self-encrypting drives) by using software on the server and simply passing SED commands through the HBA to the drives.

Internal drive options

The following tables list the hard disk drive and solid-state drive options for the internal disk storage of the server.

- Table 27: 2.5-inch hot-swap 12 Gb SAS HDDs
- Table 28: 2.5-inch hot-swap 6 Gb SAS/SATA HDDs
- Table 29: 2.5-inch hot-swap 12 Gb SAS SSDs
- Table 30: 2.5-inch hot-swap 6 Gb SAS/SATA SSDs
- Table 31: 2.5-inch U.2 NVMe SSDs
- Table 32: M.2 drives

Tip: The use of M.2 drives requires an additional adapter as described in the M.2 drives subsection.

Table 27. 2.5-inch hot-swap 12 Gb SAS HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 12 Gb SAS 10K			
7XB7A00024	AULY	ThinkSystem 2.5" 300GB 10K SAS 12Gb Hot Swap 512n HDD	6
7XB7A00025	AULZ	ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD	6
7XB7A00026	AUM0	ThinkSystem 2.5" 900GB 10K SAS 12Gb Hot Swap 512n HDD	6
7XB7A00027	AUM1	ThinkSystem 2.5" 1.2TB 10K SAS 12Gb Hot Swap 512n HDD	6
7XB7A00028	AUM2	ThinkSystem 2.5" 1.8TB 10K SAS 12Gb Hot Swap 512e HDD	6
7XB7A00069	B0YS	ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD	6
2.5-inch hot-swap HDDs - 12 Gb SAS 15K			
7XB7A00021	AULV	ThinkSystem 2.5" 300GB 15K SAS 12Gb Hot Swap 512n HDD	6
7XB7A00022	AULW	ThinkSystem 2.5" 600GB 15K SAS 12Gb Hot Swap 512n HDD	6
7XB7A00023	AULX	ThinkSystem 2.5" 900GB 15K SAS 12Gb Hot Swap 512e HDD	6
2.5-inch hot-swap HDDs - 12 Gb NL SAS			
7XB7A00034	AUM6	ThinkSystem 2.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD	6
7XB7A00035	AUM7	ThinkSystem 2.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD	6
2.5-inch hot-swap SED HDDs - 12 Gb SAS 10K			
7XB7A00070	B0YV	ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD FIPS	6
2.5-inch hot-swap SED HDDs - 12 Gb NL SAS			
7XB7A00064	B0YM	ThinkSystem 2.5" 2TB 7.2K SAS 12Gb Hot Swap 512e HDD FIPS	6

Table 28. 2.5-inch hot-swap 6 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gb NL SATA			
7XB7A00036	AUUE	ThinkSystem 2.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	6
7XB7A00037	AUUJ	ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	6

Table 29. 2.5-inch hot-swap 12 Gb SAS SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 12 Gb SAS - Performance (10+ DWPD)			
4XB7A10219	B4Y4	ThinkSystem 2.5" SS530 400GB Performance SAS 12Gb Hot Swap SSD	6
4XB7A10230	B4Y5	ThinkSystem 2.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	6
4XB7A10231	B4Y6	ThinkSystem 2.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	6
4XB7A10232	B4Y7	ThinkSystem 2.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	6
2.5-inch hot-swap SSDs - 12 Gb SAS - Mainstream (3-5 DWPD)			
4XB7A17062	B8HU	ThinkSystem 2.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	6
4XB7A17063	B8J4	ThinkSystem 2.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	6
4XB7A17064	B8JD	ThinkSystem 2.5" PM1645a 3.2TB Mainstream SAS 12Gb Hot Swap SSD	6
4XB7A13653	B4A0	ThinkSystem 2.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	6
4XB7A13654	B4A1	ThinkSystem 2.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	6
4XB7A13655	B4A2	ThinkSystem 2.5" PM1645 3.2TB Mainstream SAS 12Gb Hot Swap SSD	6
2.5-inch hot-swap SSDs - 12 Gb SAS - Entry / Capacity (<3 DWPD)			
4XB7A38175	B91A	ThinkSystem 2.5" PM1643a 960GB Entry SAS 12Gb Hot Swap SSD	6
4XB7A38176	B91B	ThinkSystem 2.5" PM1643a 1.92TB Entry SAS 12Gb Hot Swap SSD	6
4XB7A17054	B91C	ThinkSystem 2.5" PM1643a 3.84TB Entry SAS 12Gb Hot Swap SSD	6
4XB7A17055	B91D	ThinkSystem 2.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	6
4XB7A17168	B6TL	ThinkSystem 2.5" PM1643 960GB Entry SAS 12Gb Hot Swap SSD	6
4XB7A13646	B4A6	ThinkSystem 2.5" PM1643 7.68TB Capacity SAS 12Gb Hot Swap SSD	6
4XB7A13645	B4A7	ThinkSystem 2.5" PM1643 3.84TB Capacity SAS 12Gb Hot Swap SSD	6

Table 30. 2.5-inch hot-swap 6 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 6 Gb SATA - Mainstream (3-5 DWPD)			
4XB7A17087	B8J1	ThinkSystem 2.5" 5300 240GB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A17088	B8HY	ThinkSystem 2.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A17089	B8J6	ThinkSystem 2.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A17090	B8JE	ThinkSystem 2.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A17091	B8J7	ThinkSystem 2.5" 5300 3.84TB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A13633	B49L	ThinkSystem 2.5" Intel S4610 240GB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A13634	B49M	ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A13635	B49N	ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A13636	B49P	ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A10237	B488	ThinkSystem 2.5" 5200 240GB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A10238	B489	ThinkSystem 2.5" 5200 480GB Mainstream SATA 6Gb Hot Swap SSD	6

Part number	Feature	Description	Maximum supported
4XB7A10239	B48A	ThinkSystem 2.5" 5200 960GB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A10240	B48B	ThinkSystem 2.5" 5200 1.92TB Mainstream SATA 6Gb Hot Swap SSD	6
4XB7A10241	B48C	ThinkSystem 2.5" 5200 3.84TB Mainstream SATA 6Gb Hot Swap SSD	6
7SD7A05761	B110	ThinkSystem 2.5" 5100 3.84TB Mainstream SATA 6Gb Hot Swap SSD	6
2.5-inch hot-swap SSDs - 6 Gb SATA - Entry (<3 DWPD)			
4XB7A17075	B8HV	ThinkSystem 2.5" 5300 240GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A17076	B8JM	ThinkSystem 2.5" 5300 480GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A17077	B8HP	ThinkSystem 2.5" 5300 960GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A17078	B8J5	ThinkSystem 2.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A17079	B8JP	ThinkSystem 2.5" 5300 3.84TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A17080	B8J2	ThinkSystem 2.5" 5300 7.68TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A38144	B7EW	ThinkSystem 2.5" 5210 1.92TB Entry SATA 6Gb Hot Swap QLC SSD	6
4XB7A38145	B7EX	ThinkSystem 2.5" 5210 3.84TB Entry SATA 6Gb Hot Swap QLC SSD	6
4XB7A38146	B7EY	ThinkSystem 2.5" 5210 7.68TB Entry SATA 6Gb Hot Swap QLC SSD	6
4XB7A10247	B498	ThinkSystem 2.5" Intel S4510 240GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10248	B499	ThinkSystem 2.5" Intel S4510 480GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10249	B49A	ThinkSystem 2.5" Intel S4510 960GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A13622	B49B	ThinkSystem 2.5" Intel S4510 1.92TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A13623	B49C	ThinkSystem 2.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10195	B34H	ThinkSystem 2.5" PM883 240GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10196	B34J	ThinkSystem 2.5" PM883 480GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10197	B34K	ThinkSystem 2.5" PM883 960GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10198	B34L	ThinkSystem 2.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10199	B34M	ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10200	B4D2	ThinkSystem 2.5" PM883 7.68TB Entry SATA 6Gb Hot Swap SSD	6
7SD7A05742	B0YY	ThinkSystem 2.5" Intel S4500 240GB Entry SATA 6Gb Hot Swap SSD	6
7SD7A05740	B0Z0	ThinkSystem 2.5" Intel S4500 960GB Entry SATA 6Gb Hot Swap SSD	6
7N47A00111	AUUQ	ThinkSystem 2.5" PM863a 240GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10153	B2X2	ThinkSystem 2.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10154	B2X3	ThinkSystem 2.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10155	B2X4	ThinkSystem 2.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10156	B2X5	ThinkSystem 2.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A10157	B2X6	ThinkSystem 2.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	6
4XB7A08505	B10R	ThinkSystem 2.5" 5100 3.84TB Entry SATA 6Gb Hot Swap SSD	6
2.5-inch hot-swap SED SSDs - 6 Gb SATA - Mainstream (3-5 DWPD)			
4XB7A38193	B93K	ThinkSystem 2.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD SED	6
4XB7A13981	B93J	ThinkSystem 2.5" 5200 (Max) 1.92TB Mainstream SATA 6Gb Hot Swap SSD SED	6
2.5-inch hot-swap SED SSDs - 6 Gb SATA - Entry (<3 DWPD)			
4XB7A38191	B93L	ThinkSystem 2.5" 5300 3.84TB Entry SATA 6Gb Hot Swap SSD SED	6
4XB7A38192	B93M	ThinkSystem 2.5" 5300 7.68TB Entry SATA 6Gb Hot Swap SSD SED	6

Table 31. 2.5-inch U.2 NVMe SSDs

Part number	Feature	Description	Maximum supported
2.5-inch SSDs - NVMe - Performance (10+ DWPD)			
7N47A00081	AUMJ	ThinkSystem U.2 Intel Optane P4800X 375GB Performance NVMe PCIe 3.0 x4 Hot Swap SSD	4
7N47A00083	B2ZJ	ThinkSystem U.2 Intel Optane P4800X 750GB Performance NVMe PCIe 3.0 x4 Hot Swap SSD	4
2.5-inch SSDs - NVMe - Mainstream (3-5 DWPD)			
4XB7A13936	B589	ThinkSystem U.2 Intel P4610 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A13937	B58A	ThinkSystem U.2 Intel P4610 3.2TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A13938	B58B	ThinkSystem U.2 Intel P4610 6.4TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A08516	B21W	ThinkSystem U.2 Toshiba CM5-V 800GB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A08517	B21X	ThinkSystem U.2 Toshiba CM5-V 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A08518	B21Y	ThinkSystem U.2 Toshiba CM5-V 3.2TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A08519	B2XJ	ThinkSystem U.2 Toshiba CM5-V 6.4TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
7SD7A05772	B11J	ThinkSystem U.2 Intel P4600 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
2.5-inch SSDs - NVMe - Entry (<3 DWPD)			
4XB7A10202	B58F	ThinkSystem U.2 Intel P4510 1.0TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A10204	B58G	ThinkSystem U.2 Intel P4510 2.0TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A10205	B58H	ThinkSystem U.2 Intel P4510 4.0TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A10175	B34N	ThinkSystem U.2 PM983 1.92TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A10176	B34P	ThinkSystem U.2 PM983 3.84TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A10177	B4D3	ThinkSystem U.2 PM983 7.68TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
7SD7A05777	B11E	ThinkSystem U.2 Intel P4500 4.0TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
2.5-inch SED SSDs - NVMe - Entry (<3 DWPD)			
4XB7A14058	B6K2	ThinkSystem U.2 CM5-R 960GB Entry NVMe PCIe 3.0 x4 Hot Swap SSD SED	4
4XB7A14059	B6K3	ThinkSystem U.2 CM5-R 1.92TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD SED	4
4XB7A14060	B6K4	ThinkSystem U.2 CM5-R 3.84TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD SED	4

Note: NVMe PCIe SSDs support informed hot removal and hot insertion, provided the operating system supports PCIe SSD hot-swap.

Table 32. M.2 drives

Part number	Feature	Description	Maximum supported
M.2 SSDs - 6 Gb SATA - Entry (<3 DWPD)			
7N47A00129	AUUL	ThinkSystem M.2 32GB SATA 6Gbps Non-Hot Swap SSD	2
7N47A00130	AUUV	ThinkSystem M.2 128GB SATA 6Gbps Non-Hot Swap SSD	2
4XB7A14049	B5S4	ThinkSystem M.2 5100 240GB SATA 6Gbps Non-Hot Swap SSD	2
7SD7A05703	B11V	ThinkSystem M.2 5100 480GB SATA 6Gbps Non-Hot Swap SSD	2
4XB7A17071	B8HS	ThinkSystem M.2 5300 240GB SATA 6Gbps Non-Hot Swap SSD	2

Internal tape drive

The server does not support internal tape drive options.

Optical drive

The server does not supports an internal optical drive.

An external USB optical drive is available, listed in the following table.

Table 33. External optical drive

Part number	Feature code	Description
7XA7A05926	AVV8	ThinkSystem External USB DVD RW Optical Disk Drive

I/O expansion options

The I/O slots for the SD530 nodes are housed in the I/O shuttle in the rear of the enclosure. See the Components and connectors section for the location.

Each SD530 supports internally either:

- One PCIe 3.0 x16 low-profile adapter slot, or
- Two PCIe 3.0 x8 low-profile adapter slot

Ordering information is as follows:

Table 34. I/O shuttle ordering information

Part number	Feature code	Description
CTO only	AUY7	ThinkSystem D2 8-slot x8 Shuttle ASM
CTO only	AUY8	ThinkSystem D2 4-slot x16 Shuttle

The following figure shows the locations of the slots.

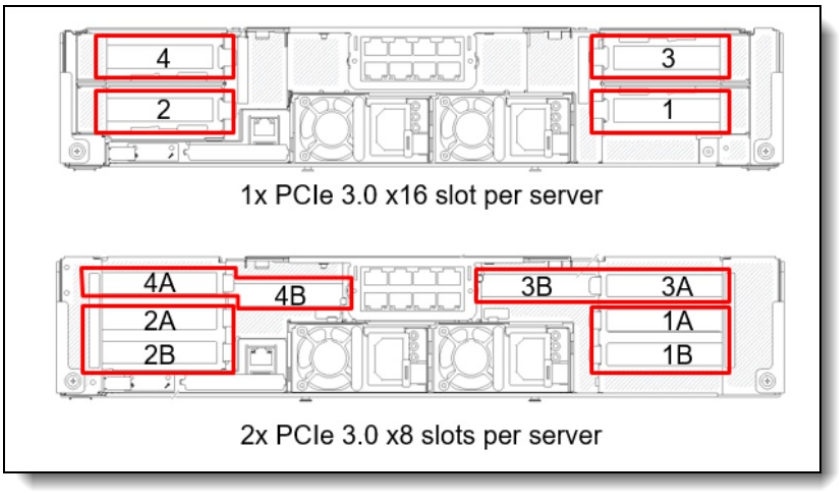

Figure 10. Location of the PCIe slots at the rear of the Enclosure

A key difference between the two choices, other than the difference in PCIe lane width is which servers must be powered off to perform service on the I/O adapter slots:

- Adding or replacing an adapter in the x16 slot only requires the one SD530 node to be powered off. The other three servers can remain fully operational.
- Adding or replacing an adapter in any x8 slot requires that *all four* SD530 nodes be powered off.

The SD530 also supports the addition of a GPU Tray with two full-length full-height slots. Details about the GPU Tray are in the GPU Tray and GPU adapters section.

SharedIO

SharedIO is a new feature of the SD530 which implements Mellanox Multi-Host technology. With SharedIO, a Mellanox VPI adapter is installed in a slot in one SD530 server and an auxiliary adapter is installed in a slot in second server in the same enclosure. The result is that the two servers share the network connection of the VPI adapter with significant savings both in the cost of the adapters but also the cost of switch ports.

The Mellanox SharedIO Adapter and Auxiliary Card are shown in the following figure.

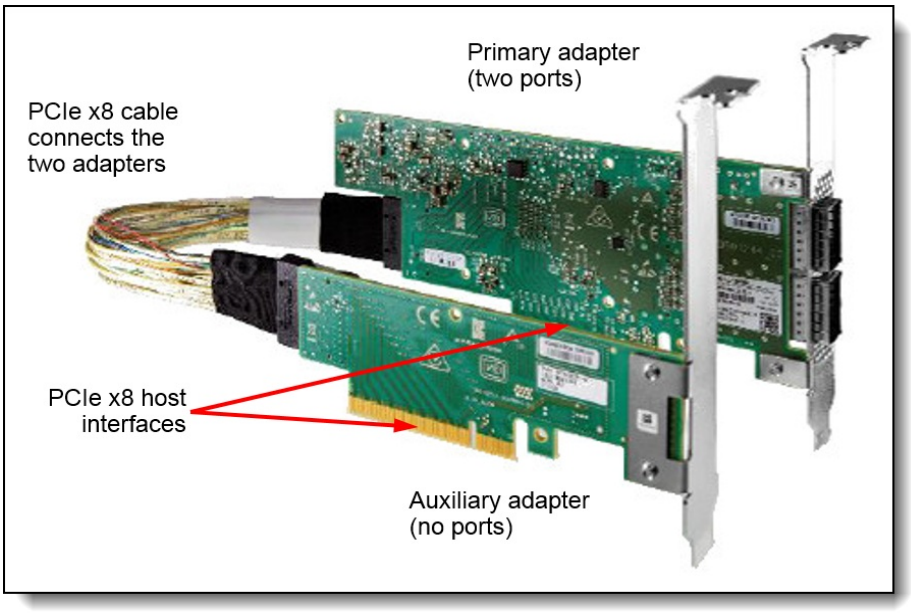

Figure 11. Lenovo ThinkSystem SharedIO ConnectX-5 Adapter

The feature takes advantage of the design of the D2 Enclosure's x8 shuttle where the slots of two of the SD530 servers are adjacent. The primary and auxiliary adapters are installed in the slots as shown in the following figure.

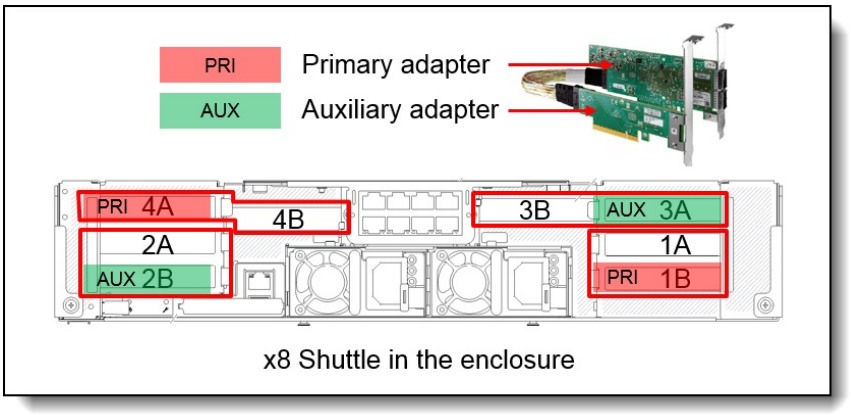

Figure 12. SharedIO adapters installed in the x8 shuttle

Configuration notes:

- When the SharedIO adapters are installed, the other slots (1A, 2A, 3B, 4B) are reserved and are not available for use with any other adapters.
- The SharedIO adapters are not supported with the x16 shuttle.

Ordering information for the adapters is in the Network adapters section.

Network adapters

Each SD530 has two dedicated 10Gb ports routed to the 8-port Ethernet I/O Module (EIOM) at the rear of the enclosure as shown in below. The ports are connected to the integrated Intel Ethernet Connection X722 controller.

Note: The EIOM is optional and can be deselected in the configurator. If the EIOM is not used, then the two 10 GbE ports are not accessible. The EIOM can be added later as a field upgrade.

The ports are assigned as shown in the following figure.

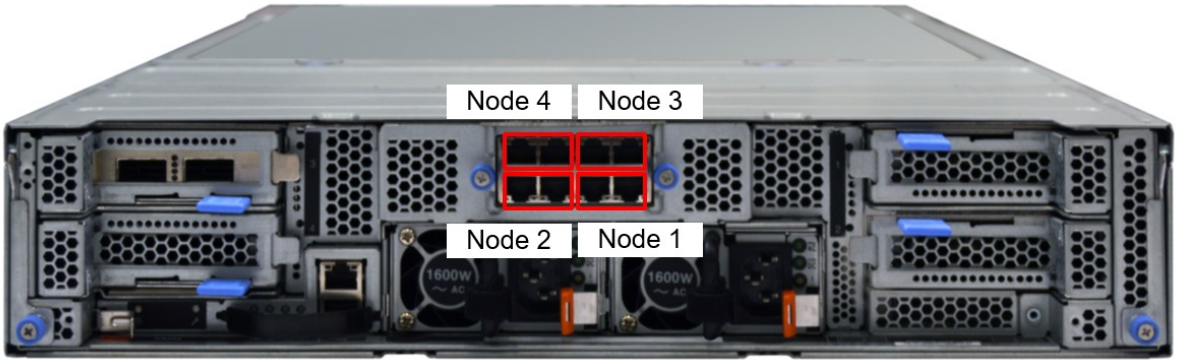

Figure 13. Network port numbering

The X722 has the following features:

- Integrated into the Intel PCH chipset
- Offers VXLAN/NVGRE Hardware Offloads
- Supports VMDq and SR-IOV for advanced virtualization
- Supports iWarp RDMA

Note: No support for 10 Mbps or 100 MBps Ethernet connections.

For more information about the X722 controller, see the Lenovo Press product guide: http://lenovopress.com/lp0654-intel-x722-integrated-controller

Tip: This port numbering is also located on a label affixed to the enclosure. See Figure 4 for the location.

The 10Gb ports have either RJ45 connections or SFP+ cages depending on the EIOM selected. Ordering information is in the following table.

Table 35. EIOM ordering information

Part number	Feature code	Description
7M17A04001	AUYA	ThinkSystem D2 10Gb 8 port EIOM Base T RJ45
7M17A04000	AUY9	ThinkSystem D2 10Gb 8 port EIOM SFP+

The following table lists the supported SharedIO adapters. For details about these adapters see the SharedIO section.

Note: SharedIO adapters are only supported in the x8 shuttle. They are not supported with the x16 shuttle.

Table 36. SharedIO network adapters

Part number	Feature code	Description	Slots supported	Maximum supported
CTO only	B3RZ*	Lenovo ThinkSystem SharedIO ConnectX-5 Adapter	Shuttle x8: 1-B, 4-A	1
CTO only	B3S0*	Lenovo ThinkSystem SharedIO ConnectX-5 Auxiliary Card	Shuttle x8: 2-B, 3-A	1

* Only available through Lenovo Scalable Infrastructure (LeSI). See the LeSI product guide for details, https://lenovopress.com/lp0900.

The following table lists other supported network adapters. PCIe x16 adapters require the x16 slot so only 1 adapter is supported per node.

Table 37. PCIe network adapters

Part number	Feature code	Description	Slots supported	Maximum supported
Gigabit Ethernet				
7ZT7A00535	AUZW	ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	Both slots	2
10 Gb Ethernet RJ45				
00MM860	ATPX	Intel X550-T2 Dual Port 10GBase-T Adapter	Both slots	2
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	Both slots	2
4XC7A08225	B31G	ThinkSystem QLogic QL41134 PCIe 10Gb 4-Port Base-T Ethernet Adapter	Both slots	2
10 Gb Ethernet SFP+				
00AG580	AT7T	Emulex VFA5.2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	Both slots	2
00AG570	AT7S	Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter	Both slots	2
7ZT7A00537	AUKX	ThinkSystem X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	Both slots	2
25 Gb Ethernet				
4XC7A08228	B21R	ThinkSystem QLogic QL41262 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	Both slots	2
7XC7A05523	B0WY	ThinkSystem Intel XXV710-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	Both slots	2
01GR250	AUAJ	Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-port PCIe Ethernet Adapter	Both slots	2
7ZT7A00505	AUKS	ThinkSystem Broadcom 57412 25GbE SFP28 1-Port PCIe Ethernet Adapter	Both slots	2
4XC7A08229	B31C	ThinkSystem Mellanox ConnectX-5 Ex 25/40GbE 2-port Low-Latency Adapter	PCIe x16 slot	1
4XC7A16683	B5XZ	ThinkSystem Mellanox Innova-2 ConnectX-5 FPGA 25GbE 2-port Adapter	Both slots	2
40 Gb Ethernet				
00MM950	ATRN	Mellanox ConnectX-4 Lx 1x40GbE QSFP+ Adapter	Both slots	2
4XC7A08229	B31C	ThinkSystem Mellanox ConnectX-5 Ex 25/40GbE 2-port Low-Latency Adapter	PCIe x16 slot	1
100 Gb Ethernet				
00MM960	ATRP	Mellanox ConnectX-4 2x100GbE/EDR IB QSFP28 VPI Adapter	PCIe x16 slot	1
InfiniBand				
7XC7A05524	B0WX	ThinkSystem Mellanox ConnectX-4 PCIe FDR 1-Port QSFP VPI Adapter	Both slots	2
7ZT7A00500	AUVG	ThinkSystem Mellanox ConnectX-4 PCIe FDR 2-Port QSFP VPI Adapter	Both slots	2
00KH924	ASWQ	Mellanox ConnectX-4 1x100GbE/EDR IB QSFP28 VPI Adapter	PCIe x16 slot	1

Part number	Feature code	Description	Slots supported	Maximum supported
4C57A14177	B4R9	ThinkSystem Mellanox ConnectX-6 HDR100 QSFP56 1-port PCIe InfiniBand Adapter	PCIe x16 slot	1
4C57A14178	B4RA	ThinkSystem Mellanox ConnectX-6 HDR100 QSFP56 2-port PCIe InfiniBand Adapter	PCIe x16 slot	1
Omni-Path Architecture (OPA)				
00WE027	AU0B	Intel OPA 100 Series Single-port PCIe 3.0 x16 HFA	PCIe x16 slot	1
00WE023	AU0A	Intel OPA 100 Series Single-port PCIe 3.0 x8 HFA	Both slots	2

For more information, including the transceivers and cables that each adapter supports, see the list of Lenovo Press Product Guides in the Networking adapters category:
https://lenovopress.com/servers/options/ethernet

SAS adapters for external storage

The following table lists the SAS HBAs suitable for connectivity to external storage.

Table 38. External SAS HBAs

Part number	Feature code	Description	Slots supported	Maximum supported
7Y37A01090	AUNR	ThinkSystem 430-8e SAS/SATA 12Gb HBA	Both slots	2
7Y37A01091	AUNN	ThinkSystem 430-16e SAS/SATA 12Gb HBA	Both slots	2

The following table summarizes features of supported adapters.

Table 39. SAS HBA specifications

Feature	430-8e	430-16e
Adapter type	HBA	HBA
Part number	7Y37A01090	7Y37A01091
Controller chip	LSI SAS3408	LSI SAS3416
Host interface	PCIe 3.0x8	PCIe 3.0x8
Port interface	12 Gb SAS	12 Gb SAS
Number of ports	8	16
Port connectors	2x Mini-SAS HD SFF8644	4x Mini-SAS HD SFF8644
Drive interface	SAS/SATA	SAS/SATA
Drive type	HDD/SSD/SED*	HDD/SSD/SED*
Hot-swap drives	Yes	Yes
Maximum devices	512 (planned: 1024)	512 (planned: 1024)
RAID levels	None	None
JBOD mode	Yes	Yes
Cache	None	None
CacheVault cache protection	None	None
Performance Accelerator (FastPath)	No	No
SSD Caching (CacheCade Pro 2.0)	No	No
SED support	Yes*	Yes*

* SED support of the SAS HBAs is by using software on the server (SED commands are passed through the HBA to the drives).

Fibre Channel host bus adapters

The following table lists Fibre Channel HBAs that are supported by the server.

Table 40. Fibre Channel HBAs

Part number	Feature code	Description	Slots supported	Maximum supported
32 Gb Fibre Channel				
7ZT7A00517	AUNT	ThinkSystem Emulex LPe32000-M2-L PCIe 32Gb 1-Port SFP+ Fibre Channel Adapter	Both slots	2
7ZT7A00519	AUNV	ThinkSystem Emulex LPe32002-M2-L PCIe 32Gb 2-Port SFP+ Fibre Channel Adapter	Both slots	2
7ZT7A00516	AUNS	ThinkSystem QLogic QLE2740 PCIe 32Gb 1-Port SFP+ Fibre Channel Adapter	Both slots	2
7ZT7A00518	AUNU	ThinkSystem QLogic QLE2742 PCIe 32Gb 2-Port SFP+ Fibre Channel Adapter	Both slots	2
16 Gb Fibre Channel				
01CV750	ATZB	QLogic 16Gb Enhanced Gen5 FC Single-port HBA	Both slots	2
01CV830	ATZU	Emulex 16Gb Gen6 FC Single-port HBA	Both slots	2
01CV760	ATZC	QLogic 16Gb Enhanced Gen5 FC Dual-port HBA	Both slots	2
01CV840	ATZV	Emulex 16Gb Gen6 FC Dual-port HBA	Both slots	2
8 Gb Fibre Channel				
4XC7A08220*	B0WZ	ThinkSystem Emulex LPe12000-M8-L PCIe 8Gb 1-Port SFP+ Fibre Channel Adapter	Both slots	2
4XC7A08221*	B0X0	ThinkSystem Emulex LPe12002-M8-L PCIe 8Gb 2-Port SFP+ Fibre Channel Adapter	Both slots	2

* Available in China, Japan, and AP countries only

Flash storage adapters

The following table lists the Flash Storage Adapters supported by the server.

Table 41. Flash Storage Adapters

Part number	Feature code	Description	Slots supported	Maximum supported
Mainstream NVMe PCIe Adapters - Optimized for mixed-intensive application workloads with an endurance of 3-5 DWPD.				
7SD7A05769	B11X	ThinkSystem HHHL Intel P4600 2.0TB Mainstream NVMe PCIe3.0 x4 Flash Adapter	Both slots	2

GPU Tray and GPU adapters

The SD530 supports GPU adapters with the addition of SD530 GPU tray. The GPU tray supports one or two double-wide GPUs. The SD530 server and attached GPU tray are show in the following figure. Two of these combined systems can be installed in the enclosure for a total of 4 processors and 4 GPUs in 2U of rack space.

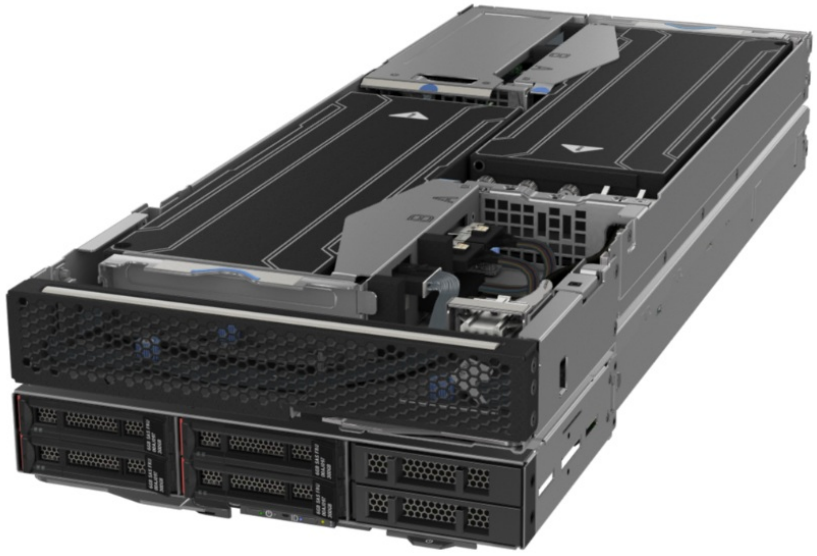

Figure 14. SD530 with GPU Tray attached

Ordering information for the GPU tray is as follows.

Table 42. GPU tray

Part number	Feature code	Description
4M17A09509	B0MU	ThinkSystem SD530 GPU Tray

The GPU Tray option includes the necessary PCIe cables to connect the two installed GPUs to the system. The GPU options, listed in the table below, include the necessary auxiliary power cables.

The GPU Tray supports 2 GPUs, once connected to each processor in the SD530. Each GPU is connected via a PCIe 3.0 x16 connect routed from two PCIe 3.0 x8 connectors on the SD530 system board. See Figure 6 for locations of the PCIe connectors.

Table 43. GPU options

Part number	Feature code	Description	Maximum supported
7C57A02888	B0LZ	ThinkSystem SD530 NVIDIA Tesla P40	2
4C57A09498	B1JY	ThinkSystem NVIDIA Tesla V100 16GB PCIe Passive GPU	2
4X67A12088	B34S	ThinkSystem NVIDIA Tesla V100 32GB PCIe Passive GPU	2
7C57A02891	B0RK	ThinkSystem SD530 NVIDIA Tesla M10	2
00KG655	B0M0	ThinkSystem SD530 NVIDIA Tesla M60	2
7C57A02897	B228	ThinkSystem AMD Radeon Instinct MI25 16GB PCIe Passive GPU	2
4C57A09497	B32P	ThinkSystem AMD Radeon Pro V340 32GB PCIe Passive GPU	2

For information about these adapters, see the ThinkSystem GPU Summary:
https://lenovopress.com/lp0768-thinksystem-gpu-summary

If the GPU tray is selected then the following configuration rules apply:

- Two processors are required
- At most 12 DIMMs can be installed
- DCPMMs are not supported
- When the Tesla M10 or M60 GPUs are installed, the server system memory must be less than 1 TB
- Only SATA HDDs and SSDs are supported
- Only software RAID is supported; the RAID adapter (Feature AUYK) is not supported
- Only the 4-drive SAS/SATA drive backplane is supported. The 6-drive backplanes (including AnyBay) are not supported.
- The optional KVM module is supported.
- OS preload cannot be selected
- The GPUs installed in the GPU Tray must be identical
- The enclosure must have 2000W power supplies installed
- The following enclosure configurations are supported:
  - 2 servers and 2 GPU Trays
  - 1 server and 1 GPU Tray (the other two bays must have 2 fillers installed)
- The following enclosure configurations are **not** supported:
  - 2 servers and 1 GPU Tray is not supported
  - 3 servers and 1 GPU Tray is not supported

Power supplies

The D2 Enclosure and Modular Enclosure come standard with two hot-plug power supplies and the power supplies act as a redundant pair ensuring that the enclosure remains powered even if one power supply fails or is disconnected. These AC power supplies are 80 PLUS Platinum certified for energy efficiency.

The following table lists the supported power supply options.

Table 44. Power supply options for the D2 and Modular Enclosures

Part number	Feature code	Description	110V AC	220V AC	240V DC China only
None*	AUZ0	ThinkSystem D2 1100W Platinum PSU	Yes	Yes	Yes
None*	AUZ1	ThinkSystem D2 1600W Platinum PSU	No	Yes	Yes
None*	AUZ2	ThinkSystem D2 2000W Platinum PSU	No	Yes	Yes

* CTO only

Two power supplies are standard and maximum. You cannot mix power supplies.

The 1100W power supply is auto-sensing and supports both 110V AC (100-127V 50/60 Hz) and 220V AC (200-240V 50/60 Hz) power. The 1600 W and 2000 W power supplies only supports 220V AC power. In China only, all power supplies also support 240V DC.

Power supply options do not include a power cord. For models of the D2 Enclosure and Modular Enclosure, the inclusion of a power cords is model dependent. Configure-to-order models can be configured without a power cord if desired.

Use the Lenovo Capacity Planner to determine exactly what power your server needs:
https://datacentersupport.lenovo.com/us/en/products/solutions-and-software/software/lenovo-capacity-planner/solutions/ht504651

Power cords

Line cords and rack power cables can be ordered as listed in the following table.

110V customers: If you plan to use the ThinkSystem 1100W power supply with a 110V power source, select a power cable that is rated above 10A. Power cables that are rated at 10A or below are not supported with 110V power.

Table 45. Power cords

Part number	Feature code	Description
Rack cables		
00Y3043	A4VP	1.0m, 10A/100-250V, C13 to C14 Jumper Cord
39Y7937	6201	1.5m, 10A/100-250V, C13 to C14 Jumper Cord
4L67A08369	6570	2.0m, 13A/100-250V, C13 to C14 Jumper Cord
4L67A08366	6311	2.8m, 10A/100-250V, C13 to C14 Jumper Cord
4L67A08370	6400	2.8m, 13A/100-250V, C13 to C14 Jumper Cord
39Y7932	6263	4.3m, 10A/100-250V, C13 to C14 Jumper Cord
4L67A08371	6583	4.3m, 13A/100-250V, C13 to C14 Jumper Cord
Line cords		
39Y7930	6222	2.8m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord
81Y2384	6492	4.3m, 10A/250V, C13 to IRAM 2073 (Argentina) Line Cord
39Y7924	6211	2.8m, 10A/250V, C13 to AS/NZS 3112 (Australia/NZ) Line Cord
81Y2383	6574	4.3m, 10A/250V, C13 to AS/NZS 3112 (Australia/NZ) Line Cord
69Y1988	6532	2.8m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord
81Y2387	6404	4.3m, 10A/250V, C13 to NBR 14136 (Brazil) Line Cord
39Y7928	6210	2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord
81Y2378	6580	4.3m, 10A/250V, C13 to GB 2099.1 (China) Line Cord
39Y7918	6213	2.8m, 10A/250V, C13 to DK2-5a (Denmark) Line Cord
81Y2382	6575	4.3m, 10A/250V, C13 to DK2-5a (Denmark) Line Cord
39Y7917	6212	2.8m, 10A/250V, C13 to CEE 7/7 (Europe) Line Cord
81Y2376	6572	4.3m, 10A/250V, C13 to CEE 7/7 (Europe) Line Cord
39Y7927	6269	2.8m, 10A/250V, C13 to IS 6538 (India) Line Cord
81Y2386	6567	4.3m, 10A/250V, C13 to IS 6538 (India) Line Cord
39Y7920	6218	2.8m, 10A/250V, C13 to SI 32 (Israel) Line Cord
81Y2381	6579	4.3m, 10A/250V, C13 to SI 32 (Israel) Line Cord
39Y7921	6217	2.8m, 10A/250V, C13 to CEI 23-16 (Italy) Line Cord
81Y2380	6493	4.3m, 10A/250V, C13 to CEI 23-16 (Italy) Line Cord
4L67A08362	6495	4.3m, 12A/200V, C13 to JIS C-8303 (Japan) Line Cord
39Y7922	6214	2.8m, 10A/250V, C13 to SABS 164-1 (South Africa) Line Cord
81Y2379	6576	4.3m, 10A/250V, C13 to SANS 164-1 (South Africa) Line Cord
39Y7926	6335	4.3m, 12A/100V, C13 to JIS C-8303 (Japan) Line Cord

Part number	Feature code	Description
39Y7925	6219	2.8m, 12A/220V, C13 to KSC 8305 (S. Korea) Line Cord
81Y2385	6494	4.3m, 12A/250V, C13 to KSC 8305 (S. Korea) Line Cord
39Y7919	6216	2.8m, 10A/250V, C13 to SEV 1011-S24507 (Swiss) Line Cord
81Y2390	6578	4.3m, 10A/250V, C13 to SEV 1011-S24507 (Swiss) Line Cord
23R7158	6386	2.8m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord
81Y2375	6317	2.8m, 10A/250V, C13 to CNS 10917 (Taiwan) Line Cord
81Y2374	6402	2.8m, 13A/125V, C13 to CNS 10917 (Taiwan) Line Cord
4L67A08363	AX8B	4.3m, 10A/125V, C13 to CNS 10917 (Taiwan) Line Cord
81Y2389	6531	4.3m, 10A/250V, C13 to CNS 10917 (Taiwan) Line Cord
81Y2388	6530	4.3m, 13A/125V, C13 to CNS 10917 (Taiwan) Line Cord
39Y7923	6215	2.8m, 10A/250V, C13 to BS 1363/A (UK) Line Cord
81Y2377	6577	4.3m, 10A/250V, C13 to BS 1363/A (UK) Line Cord
90Y3016	6313	2.8M, 10A/125V, C13 to NEMA 5-15P (US) Line Cord
46M2592	A1RF	2.8m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord
00WH545	6401	2.8M, 13A/125V, C13 to NEMA 5-15P (US) Line Cord
4L67A08359	6370	4.3m, 10A/125V, C13 to NEMA 5-15P (US) Line Cord
4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord
4L67A08360	AX8A	4.3m, 13A/125V, C13 to NEMA 5-15P (US) Line Cord

Cooling

The enclosures have 5 hot-swap fans which are used to cool all components. In addition, each power supply has its own integrated fan.

The five system fans have the following specifications:

- Three 60mm hot-swap fans
- Two 80mm hot-swap fans

The fans are accessible by simply removing the panel on the top of the enclosure.

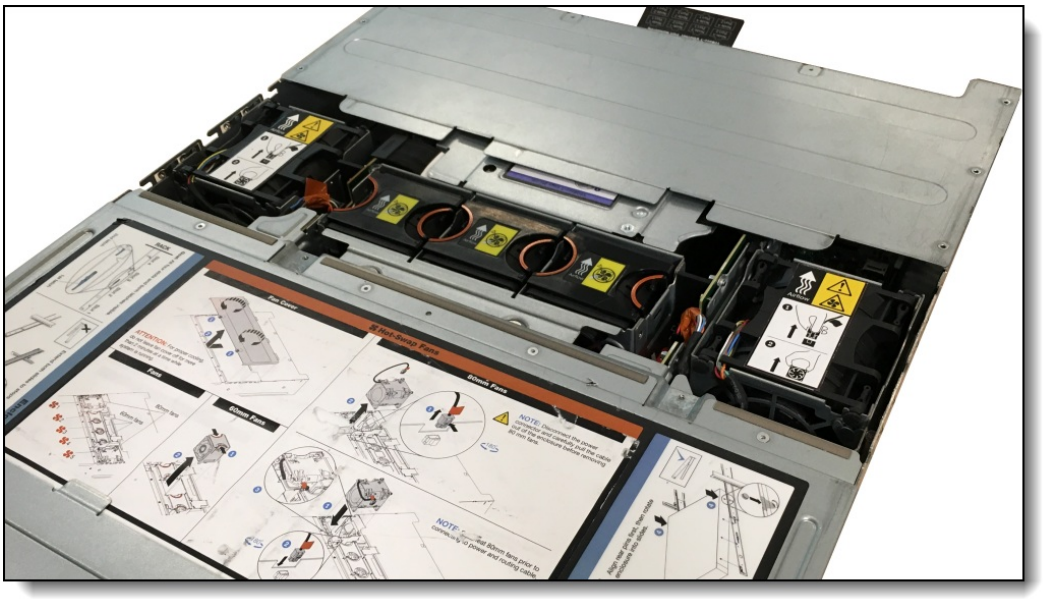

Figure 15. Location of hot-swap fans

Tip: The 80mm fans are hot-swap but you must first disconnect the cable before removing the fan.

Integrated virtualization

The server supports booting from an operating system or hypervisor installed on an M.2 solid-state drive. See the M.2 drives section for details and the list of available options.

You can download supported VMware vSphere hypervisor images from the following web page and load it on the M.2 drive using the instructions provided:
https://vmware.lenovo.com/content/custom_iso/

Systems management

The server contains an integrated service processor, XClarity Controller (XCC), which provides advanced service-processor control, monitoring, and alerting functions. The XCC is based on the Pilot4 XE401 baseboard management controller (BMC) using a dual-core ARM Cortex A9 service processor.

Local management

The SD530 server optionally supports local console support with the addition of the KVM breakout module. The KVM module is installed in one of the drive bays at the front of the server.

The KVM module is shown in the following figure.

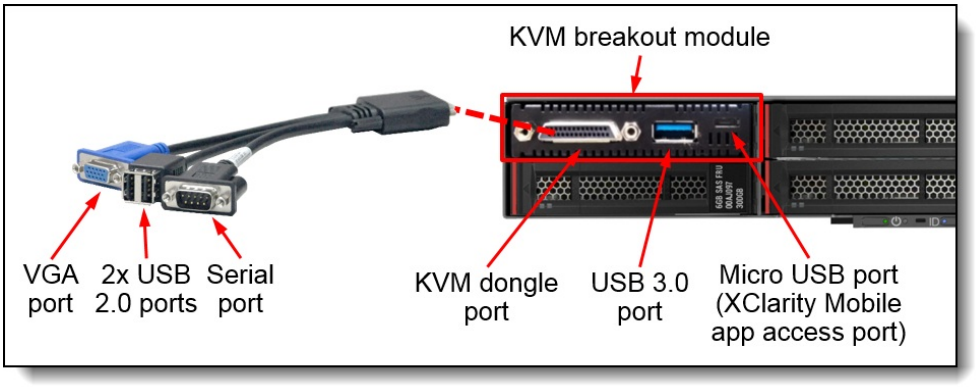

Figure 16. KVM breakout module and console breakout cable

The KVM module provides the following:

- KVM dongle port for optional console breakout cable, which provides VGA port, DB9 serial port, and two USB 2.0 ports
- USB 3.0 port
- Micro USB port for connectivity to the XClarity Controller

The Micro USB port is for local tethered connectivity to a mobile device running the XClarity Mobile app. This connection allows the app to connect to the XClarity Controller and provides additional status information about the server. See the XClarity Mobile section below for information.

Ordering information for module and cable are as follows.

Table 46. KVM breakout module and cable ordering information

Part number	Feature code	Description
7M17A04002	AUYM	ThinkSystem SD530 Front VGA/USB KVM Breakout Module
81Y5286	A1NF	Console Breakout Cable

The KVM module can be installed in the field:

- For servers with the 2x2 SAS/SATA backplane, the KVM module is installed in the upper-right drive bay
- For servers with either 2x3 backplane, the KVM module is installed in the upper-left drive bay

System status with XClarity Mobile

The XClarity Mobile app includes a tethering function where you can connect your Android or iOS device to the server via USB to see the status of the server.

The steps to connect the mobile device are as follows:

1. Enable USB Management on the server, by holding down the ID button for 3 seconds (or pressing the dedicated USB management button if one is present)
2. Connect the mobile device via a USB cable to the server's USB port with the management symbol 
3. In iOS or Android settings, enable Personal Hotspot or USB Tethering
4. Launch the Lenovo XClarity Mobile app

Once connected you can see the following information:

- Server status including error logs (read only, no login required)
- Server management functions (XClarity login credentials required)

Remote management

The D2 Enclosure (machine type 7X20) includes a System Management Module (SMM), installed in the rear of the enclosure. See Figure 3 for the location of the SMM. The SMM provides remote management via a Gigabit Ethernet port of both the enclosure and the individual servers.

The following figure shows the LEDs and connectors of the SMM.

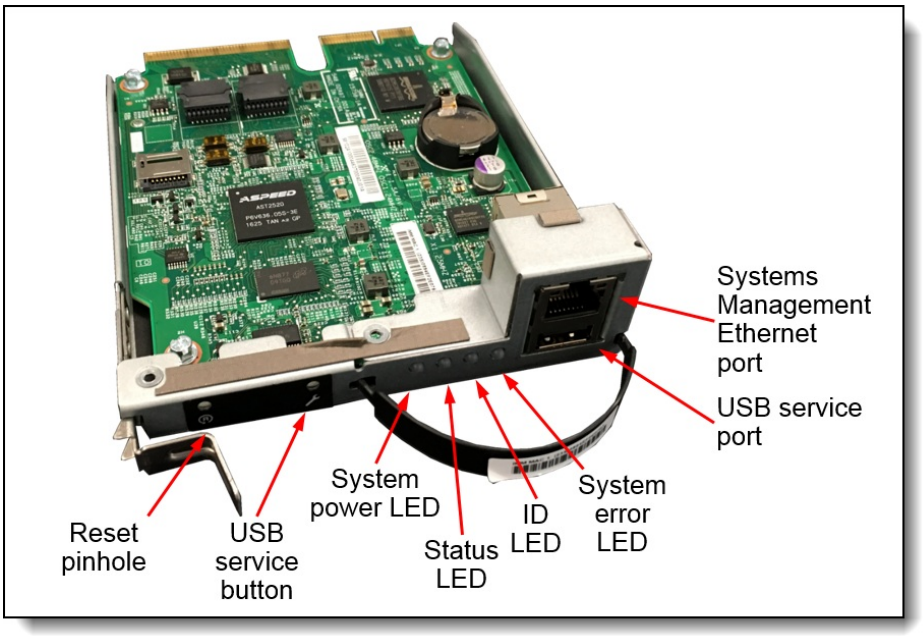

Figure 17. System management module

The SMM has the following ports and LEDs:

- RJ45 for remote management access
- USB port for service
- System error LED (yellow)
- Identification LED (blue)
- Status LED (green)
- System power LED (green)

The Modular Enclosure (machine type 7X22) has a dual-port SMM standard instead of the single-port SMM. The dual-port SMM is identical to the single-port SMM except that the dual-port SMM contains two RJ45 Ethernet ports instead of one port and supports daisy-chaining. The D2 Enclosure can be upgraded to the dual-port SMM in the field using the option part number listed in the following table.

Table 47. Part number information for the dual-port SMM (for D2 Enclosure only)

Part number	Feature code	Description
4M17A09510	AXKS	ThinkSystem Dual Ethernet Port SMM

The following figure shows the dual-port SMM on the left and the standard (single-port) SMM on the right.

Figure 18. Dual-port SMM and standard (single-port) SMM

The dual-port SMM provides the ability to daisy-chain the Ethernet management connections thereby reducing the number of ports you need in your management switches and reducing the overall cable density needed for systems management. With this feature you can connect the first SMM to your management network and the SMM in a second enclosure connects to the first SMM. The SMM in the third enclosure can then connect to the SMM in the second enclosure.

Up to 7 enclosures can be connected in a daisy-chain configuration, which means that with 4 servers in each node, a total of 28 servers can be managed remotely via one single Ethernet connection.

Notes:

- If you are using IEEE 802.1D spanning tree protocol (STP) then at most 6 enclosures can be connected together
- Do not form a loop with the network cabling. The dual-port SMM at the end of the chain should not be connected back to the switch that is connected to the top of the SMM chain.

For more information, see the Internal cable routing section of the SD530 Setup Guide at:
http://thinksystem.lenovofiles.com/help/topic/7X21/cable_routing_6U_enclosure.html?cp=2_0_5_6_5

SMM functions

The SMM provides the following functions:

- IPMI and Web interface for remote management of the enclosure
- Remote connectivity to XCC controllers in each node in the enclosure
- Node-level reporting and control (for example, node virtual reseat/reset)
- Enclosure power management
- Enclosure thermal management
- Enclosure inventory

The USB service button and USB service port are used to gather service data in the event of an error. Pressing the service button copies First Failure Data Collection (FFDC) data to a USB key installed in the USB service port.

The reset button is used to perform an SMM reset (short press) or to restore the SMM back to factory defaults (press for 4+ seconds).

Supported interfaces

The SMM (both single-port and dual-port versions) can be accessed though a web browser interface and via Intelligent Platform Management Interface (IPMI) 2.0 commands.

The XClarity Controller (XCC) in each node also supports remote management, provided though the following interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0

- Simple Network Management Protocol (SNMP) Version 3 (no SET commands; no SMNP v1)
- Common Information Model (CIM-XML)
- Representational State Transfer (REST) support
- Redfish support (DMTF compliant)
- Web browser - HTML 5-based browser interface (Java and ActiveX not required) using a responsive design (content optimized for device being used - laptop, tablet, phone) with NLS support

IPMI via the Ethernet port (IPMI over LAN) is supported, however it is disabled by default. For CTO orders you can specify whether you want to the feature enabled or disabled in the factory, using the feature codes listed in the following table.

Table 48. IPMI-over-LAN settings

Part number	Feature code	Description
CTO only	B7XZ	Disable IPMI-over-LAN (default)
CTO only	B7Y0	Enable IPMI-over-LAN

XClarity Controller upgrades

In addition, a virtual presence (remote control & remote media) capability is also optionally available by upgrading each node's XClarity Controller. The available upgrades are XClarity Controller Advanced Upgrade and XClarity Controller Enterprise Upgrade.

Lenovo XClarity Controller Advanced Upgrade adds the following remote control functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel, regardless of the system state
- Remotely accessing the server using the keyboard and mouse from a remote client
- Capturing blue-screen errors
- International keyboard mapping support
- LDAP-based authentication
- Optionally, with the XCC Enterprise license upgrade, mapping ISO and diskette IMG image files as virtual drives that are available for use by the server

Lenovo XClarity Controller Enterprise Upgrade enables the following additional features:

- Boot Capture
- Remote mounting of ISO and IMG files
- Virtual console collaboration - Ability for up to 6 remote users to be log into the remote session simultaneously
- Power capping
- License for XClarity Energy Manager

Preconfigured models come with either XClarity Controller Standard, Advanced or Enterprise, depending on the model. See the SD530 models section for details. The following table shows the field upgrades available for preconfigured models.

Table 49. XClarity Controller field upgrades

Part number	Feature code	Description
4L47A09132	AVUT	ThinkSystem XClarity Controller Standard to Advanced Upgrade (for servers that have XCC Standard)
4L47A09133	AVUU	ThinkSystem XClarity Controller Advanced to Enterprise Upgrade (for servers that have XCC Advanced)

For configure-to-order (CTO) models, you can elect to have one of the following XCC functionality by selecting the appropriate XCC feature codes as listed in the following table:

- XCC Standard - select neither feature listed in the table
- XCC Advanced - select feature AVUT
- XCC Enterprise - select feature AUPW

Table 50. XClarity Controller Upgrades for configure-to-order

Feature code	Description
AVUT	ThinkSystem XClarity Controller Standard to Advanced Upgrade
AUPW	ThinkSystem XClarity Controller Standard to Enterprise Upgrade

Lenovo XClarity Provisioning Manager

Lenovo XClarity Provisioning Manager (LXPM) is a UEFI-based application embedded in ThinkSystem servers and accessible via the F1 key during system boot.

LXPM provides the following functions:

- Graphical UEFI Setup
- System inventory information and VPD update
- System firmware updates (UEFI and XCC)
- RAID setup wizard
- OS installation wizard (including unattended OS installation)
- Diagnostics functions

Lenovo XClarity Essentials

Lenovo offers the following XClarity Essentials software tools that can help you set up, use, and maintain the server at no additional cost:

- Lenovo Essentials OneCLI

  OneCLI is a collection of server management tools that uses a command line interface program to manage firmware, hardware, and operating systems. It provides functions to collect full system health information (including health status), configure system settings, and update system firmware and drivers.

- Lenovo Essentials UpdateXpress

  The UpdateXpress tool is a standalone GUI application for firmware and device driver updates that enables you to maintain your server firmware and device drivers up-to-date and help you avoid unnecessary server outages. The tool acquires and deploys individual updates and UpdateXpress System Packs (UXSPs) which are integration-tested bundles.

- Lenovo Essentials Bootable Media Creator

  The Bootable Media Creator (BOMC) tool is used to create bootable media for offline firmware update.

For more information and downloads, visit the Lenovo XClarity Essentials web page:
http://support.lenovo.com/us/en/documents/LNVO-center

Lenovo XClarity Administrator

Lenovo XClarity Administrator is a centralized resource management solution designed to reduce complexity, speed response, and enhance the availability of Lenovo systems and solutions.

Lenovo XClarity Administrator provides agent-free hardware management for ThinkSystem servers, in addition to ThinkServer, System x, and Flex System servers. The administration dashboard is based on HTML 5 and allows fast location of resources so tasks can be run quickly.

Because Lenovo XClarity Administrator does not require any agent software to be installed on the managed endpoints, there are no CPU cycles spent on agent execution, and no memory is used, which means that up to 1GB of RAM and 1 - 2% CPU usage is saved, compared to a typical managed system where an agent is required.

Lenovo XClarity Administrator provides full management function to ThinkSystem servers, including the following:

- Discovery
- Inventory
- Monitoring and alerting
- Call home
- Centralized user management
- Cryptography modes, server certificates, and encapsulation
- Configuration patterns
- Operating system deployment
- Firmware updates

For more information about Lenovo XClarity Administrator, including ordering part numbers, see the Lenovo XClarity Administrator Product Guide: https://lenovopress.com/tips1200-lenovo-xclarity-administrator

Lenovo XClarity Integrators

Lenovo also offers software plug-in modules, Lenovo XClarity Integrators, to manage physical infrastructure from leading external virtualization management software tools including those from Microsoft and VMware.

These integrators are offered at no charge, however if software support is required, a Lenovo XClarity Pro software subscription license should be ordered.

Lenovo XClarity Integrators offer the following additional features:

- Ability to discover, manage, and monitor Lenovo server hardware from VMware vCenter or Microsoft System Center
- Deployment of firmware updates and configuration patterns to Lenovo x86 rack servers and Flex System from the virtualization management tool
- Non-disruptive server maintenance in clustered environments that reduces workload downtime by dynamically migrating workloads from affected hosts during rolling server updates or reboots
- Greater service level uptime and assurance in clustered environments during unplanned hardware events by dynamically triggering workload migration from impacted hosts when impending hardware failures are predicted

For more information about all the available Lenovo XClarity Integrators, see the Lenovo XClarity Administrator Product Guide: https://lenovopress.com/tips1200-lenovo-xclarity-administrator

Lenovo XClarity Energy Manager

Lenovo XClarity Energy Manager is an agent-free, web-based console that provides power management for ThinkSystem servers as well as System x and ThinkServer systems. It enables server density and data center capacity to be increased through the use of power capping.

Lenovo XClarity Energy Manager is a licensed product. A single-node XClarity Energy Manager license is included with the XClarity Controller Enterprise (XCC Enterprise) upgrade as described in the Remote Management section. If your server does not have the XCC Enterprise upgrade, Energy Manager licenses can be ordered as shown in the following table.

Table 51. Lenovo XClarity Energy Manager

Description	Part number
4L40E51621	Lenovo XClarity Energy Manager Node License (1 license needed per server)

Security

The server offers the following security features:

- Administrator and power-on password
- Trusted Platform Module (TPM) supporting both TPM 1.2 and TPM 2.0
- Optional plugin Trusted Cryptographic Module (TCM) or Nationz TPM, available only in China

The plugin modules, available only for China customers, are installed in a dedicated socket on the system board, as shown in Figure 6. Ordering information is shown in the following table.

Table 52. Security features

Part number	Feature code	Description
None*	AVKE	ThinkSystem Trusted Cryptographic Module (China customers only)
None*	B22N	ThinkSystem Nationz Trusted Platform Module v2.0 (China customers only)

* Available configure-to-order or pre-configured models only; Not available as a field upgrade.

Operating system support

The server supports the following operating systems:

- Microsoft Windows Server 2016
- Microsoft Windows Server 2019
- Red Hat Enterprise Linux 7.6
- Red Hat Enterprise Linux 7.7
- Red Hat Enterprise Linux 8.0
- Red Hat Enterprise Linux 8.1
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 12 SP5
- SUSE Linux Enterprise Server 12 Xen SP4
- SUSE Linux Enterprise Server 12 Xen SP5
- SUSE Linux Enterprise Server 15
- SUSE Linux Enterprise Server 15 SP1
- SUSE Linux Enterprise Server 15 Xen
- SUSE Linux Enterprise Server 15 Xen SP1
- VMware ESXi 6.5 U2
- VMware ESXi 6.5 U3
- VMware ESXi 6.7 U1
- VMware ESXi 6.7 U2
- VMware ESXi 6.7 U3

For a complete list of supported, certified and tested operating systems, plus additional details and links to relevant web sites, see the Operating System Interoperability Guide:
https://lenovopress.com/osig#servers=sd530-7x21-sp-gen-2

Virtualization support: The onboard SATA ports in the server can be used with virtualization hypervisors, including VMware ESXi, Linux KVM, Xen, and Microsoft Hyper-V, however support is limited to AHCI (non-RAID) mode. RSTe mode is not supported with virtualization hypervisors.

For configure-to-order configurations, the server can be preloaded with VMware ESXi installed on M.2 cards. Ordering information is listed in the following table.

Table 53. VMware ESXi preload

Part number	Feature code	Description
CTO only	B3VW	VMware ESXi 6.5 U2 (Factory Installed)
CTO only	B6U0	VMware ESXi 6.5 U3 (factory installed)
CTO only	B4XA	VMware ESXi 6.7 U1 (Factory Installed)
CTO only	B6U1	VMware ESXi 6.7 U2 (factory installed)
CTO only	B88T	VMware ESXi 6.7 U3 (factory installed)

Rack installation

The D2 Enclosure and Modular Enclosure can be installed in a 19-inch rack cabinet. A rail kit is included in all models and can be included in configure-to-order models. Also available to order as an option is a cable management arm. Ordering information is in the following table.

Table 54. Rail installation components

Part number	Feature code	Description
CTO only	AUYC	ThinkSystem D2 Slide Rail
7XF7A03997	AUYD	ThinkSystem D2 CMA (Cable Management Arm)

Supported Lenovo racks are listed in the Rack cabinets section.

Physical and electrical specifications

The SD530 server and the enclosures have the following physical specifications.

D2 Enclosure and Modular Enclosure dimensions and weight:

- Height: 2U enclosure - 87 mm (3.5 inches)
- Depth: 892 mm (35.1 inches)
- Width: 488 mm (19.3 inches)
- Weight:
  - Minimum configuration (with one minimally configured node): 22.4 kg (49.4 lbs)
  - Maximum configuration (with four fully configured nodes): 55.0 kg (121.2 lbs)

SD530 dimensions and weight:

- Height: 41 mm (1.7 inches)
- Depth: 562 mm (22.2 inches)
- Width: 222 mm (8.8 inches)
- Weight:
  - Minimum weight: 3.5 kg (7.8 lb)
  - Maximum weight: 7.5 kg (16.6 lb)

Electrical input for the D2 Enclosure and Modular Enclosure:

- Models with 2000 W AC power supplies:
  - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 9.9 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.17 kVA
    - Maximum configuration: 2.1 kVA
- Models with 1600 W AC power supplies:
  - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 7.8 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.16 kVA
    - Maximum configuration: 1.7 kVA
- Models with 1100 W AC power supplies:
  - 100 - 127 (nominal) V AC; 50 Hz or 60 Hz; 11.9 A
  - 200 - 240 (nominal) V AC; 50 Hz or 60 Hz; 5.4 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.12 kVA
    - Maximum configuration: 1.2 kVA

240V DC support for China customers only:

- Models with 2000 W 240V DC power supplies:
  - 200 - 240 (nominal) V dc; 9.1 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.16 kVA
    - Maximum configuration: 2.2 kVA
- Models with 1600 W 240V DC power supplies:
  - 200 - 240 (nominal) V dc; 8.6 A
  - Input kilovolt-amperes (kVA) (approximately):
    - Minimum configuration: 0.15 kVA
    - Maximum configuration: 1.7 kVA

- Models with 1100 W 240V DC power supplies:
    - 200 - 240 (nominal) V dc; 4.9 A
    - Input kilovolt-amperes (kVA) (approximately):
        - Minimum configuration: 0.15 kVA
        - Maximum configuration: 1.1 kVA

Operating environment

The SD530 complies with ASHRAE class A2 specifications, and depending on the hardware configuration, the SD530 also supports ASHRAE Class A3 or Class A4 specifications.

To comply with ASHRAE Class A3 and Class A4 specifications, the SD530 needs to meet the following hardware configuration requirements:

- Processor: See the table below for ASHRAE support by processor
- PCIe adapters: The following PCIe adapters are not supported with ASHRAE A3 and A4 specifications:
    - Mellanox Ethernet adapters with active optical cables
    - Flash Storage Adapters
    - GPU adapters
- Power supplies: Two power supplies, either 1600W or 2000W. 1100W power supplies are not supported with ASHRAE A3 and A4

Environmental information:

The ThinkSystem SD530 and the enclosures are supported in the following environment:

- Air temperature:
    - Power on:
        - ASHRAE Class A2: 10°C to 35°C (50°F to 95°F);
          Above 900 m (2,953 ft), de-rated maximum air temperature 1°C / 300m (984 ft)
        - ASHRAE Class A3: 5°C to 40°C (41°F to 104°F)
          Above 900 m (2,953 ft), de-rated maximum air temperature 1°C / 175m (574 ft)
        - ASHRAE Class A4: 5°C to 45°C (41°F to 113°F)
          Above 900 m (2,953 ft), de-rated maximum air temperature 1°C / 125m (410 ft)
    - Power off (removed from shipping container): 5°C to 45°C (41°F to 113°F)
- Maximum altitude: 3,050 m (10,000 ft)
- Relative Humidity (non-condensing):
    - Power on:
        - ASHRAE Class A2: 8% to 80%, maximum dew point 21°C (70°F)
        - ASHRAE Class A3: 8% to 85%, maximum dew point 24°C (75°F)
        - ASHRAE Class A4: 8% to 90%, maximum dew point 24°C (75°F)
    - Shipment/storage: 8% to 90%

Table 55. Processor support of ASHRAE standards

Description	Supports ASHRAE A2	Supports ASHRAE A3 and A4
Intel Xeon Bronze 3204 6C 85W 1.9GHz Processor	Yes	Yes
Intel Xeon Silver 4208 8C 85W 2.1GHz Processor	Yes	Yes
Intel Xeon Silver 4209T 8C 70W 2.2GHz Processor	Yes	Yes
Intel Xeon Silver 4210 10C 85W 2.2GHz Processor	Yes	Yes
Intel Xeon Silver 4214 12C 85W 2.2GHz Processor	Yes	Yes
Intel Xeon Silver 4214Y 12/10/8C 85W 2.2GHz Processor	Yes	Yes

Description	Supports ASHRAE A2	Supports ASHRAE A3 and A4
Intel Xeon Silver 4215 8C 85W 2.5GHz Processor	Yes	Yes
Intel Xeon Silver 4216 16C 100W 2.1GHz Processor	Yes	Yes
Intel Xeon Gold 5215 10C 85W 2.5GHz Processor	Yes	Yes
Intel Xeon Gold 5215L 10C 85W 2.5GHz Processor	Yes	Yes
Intel Xeon Gold 5215M 10C 85W 2.5GHz Processor	Yes	Yes
Intel Xeon Gold 5217 8C 115W 3.0GHz Processor	Yes	No
Intel Xeon Gold 5218 16C 125W 2.3GHz Processor	Yes	Yes
Intel Xeon Gold 5218B 16C 125W 2.3GHz Processor	Yes	Yes
Intel Xeon Gold 5218T 16C 105W 2.1GHz Processor	Yes	Yes
Intel Xeon Gold 5220 18C 125W 2.2GHz Processor	Yes	Yes
Intel Xeon Gold 5220S 18C 125W 2.7GHz Processor	Yes	Yes
Intel Xeon Gold 5220T 18C 105W 1.9GHz Processor	Yes	No
Intel Xeon Gold 5222 4C 105W 3.8GHz Processor	Yes	No
Intel Xeon Gold 6222V 20C 115W 1.8GHz Processor	Yes	Yes
Intel Xeon Gold 6226 12C 125W 2.8GHz Processor	Yes	Yes
Intel Xeon Gold 6230 20C 125W 2.1GHz Processor	Yes	Yes
Intel Xeon Gold 6230N 20C 125W 2.3GHz Processor	Yes	No
Intel Xeon Gold 6230T 20C 125W 2.1GHz Processor	Yes	No
Intel Xeon Gold 6234 8C 130W 3.3GHz Processor	Yes	No
Intel Xeon Gold 6238 22C 140W 2.1GHz Processor	Yes	Yes
Intel Xeon Gold 6238L 22C 140W 2.1GHz Processor	Yes	Yes
Intel Xeon Gold 6238M 22C 140W 2.1GHz Processor	Yes	Yes
Intel Xeon Gold 6238T 22C 125W 1.9GHz Processor	Yes	No
Intel Xeon Gold 6240 18C 150W 2.6GHz Processor	Yes	No
Intel Xeon Gold 6240L 18C 150W 2.6GHz Processor	Yes	No
Intel Xeon Gold 6240M 18C 150W 2.6GHz Processor	Yes	No
Intel Xeon Gold 6240Y 18/14/8C 150W 2.6GHz Processor	Yes	No
Intel Xeon Gold 6242 16C 150W 2.8GHz Processor	Yes	No
Intel Xeon Gold 6244 8C 150W 3.6GHz Processor	Yes	No
Intel Xeon Gold 6246 12C 165W 3.3GHz Processor	Yes	No
Intel Xeon Gold 6248 20C 150W 2.5GHz Processor	Yes	No
Intel Xeon Gold 6252 24C 150W 2.1GHz Processor	Yes	No
Intel Xeon Gold 6252N 24C 150W 2.3GHz Processor	Yes	No
Intel Xeon Gold 6254 18C 200W 3.1GHz Processor	Yes	No
Intel Xeon Gold 6262V 24C 135W 1.9GHz Processor	Yes	Yes
Intel Xeon Platinum 8253 16C 125W 2.2GHz Processor	Yes	Yes
Intel Xeon Platinum 8256 4C 105W 3.8GHz Processor	Yes	No
Intel Xeon Platinum 8260 24C 165W 2.4GHz Processor	Yes	No
Intel Xeon Platinum 8260L 24C 165W 2.4GHz Processor	Yes	No
Intel Xeon Platinum 8260M 24C 165W 2.4GHz Processor	Yes	No
Intel Xeon Platinum 8260Y 24/20/16C 165W 2.4GHz Processor	Yes	No

Description	Supports ASHRAE A2	Supports ASHRAE A3 and A4
Intel Xeon Platinum 8268 24C 205W 2.9GHz Processor	Yes	No
Intel Xeon Platinum 8270 26C 205W 2.7GHz Processor	Yes	No
Intel Xeon Platinum 8276 28C 165W 2.2GHz Processor	Yes	No
Intel Xeon Platinum 8276L 28C 165W 2.2GHz Processor	Yes	No
Intel Xeon Platinum 8276M 28C 165W 2.2GHz Processor	Yes	No
Intel Xeon Platinum 8280 28C 205W 2.7GHz Processor	Yes	No
Intel Xeon Platinum 8280L 28C 205W 2.7GHz Processor	Yes	No
Intel Xeon Platinum 8280M 28C 205W 2.7GHz Processor	Yes	No

Acoustical noise emissions:

With the maximum configuration of four nodes with two processors installed, full memory installed, full hard disk drives installed, and two 2000W power supplies installed:

- Operation: 6.8 bels
- Idle: 6.2 bels

Heat output:

Approximate, based on two 2000W power supplies:

- Minimum configuration (with one minimally configured node): 604.1 BTU per hour (177 watts)
- Maximum configuration (with four fully configured nodes): 7564.4 BTU per hour (2610 watts)

Shock and vibration:

The server has the following vibration and shock limits:

- Vibration:
  - Operating: 0.21 G rms at 5 Hz to 500 Hz for 15 minutes across 3 axes
  - Non-operating: 1.04 G rms at 2 Hz to 200 Hz for 15 minutes across 6 surfaces
- Shock:
  - Operating: 15 G for 3 milliseconds in each direction (positive and negative X, Y, and Z axes)
  - Non-operating:
    - 12 kg - 22 kg: 50 G for 152 in./sec velocity change across 6 surfaces
    - 23 kg - 31 kg: 35 G for 152 in./sec velocity change across 6 surfaces

Warranty and Support

The SD530, D2 Enclosure and Modular Enclosure all have a 3 year warranty.

The standard warranty terms are customer-replaceable unit (CRU) and onsite (for field-replaceable units FRUs only) 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 your data center, with an experience consistently ranked number one in customer satisfaction worldwide. Available offerings include:

- **Premier Support**

  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:

  - Direct technician-to-technician access through a dedicated phone line
  - 24x7x365 remote support
  - Single point of contact service
  - End to end case management
  - Third-party collaborative software support
  - Online case tools and live chat support
  - On-demand remote system analysis

- **Warranty Upgrade (Preconfigured Support)**

  Services 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. YourDrive YourData is an optional extra (see below).
  - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select countries). Bundled with YourDrive YourData.
  - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select countries). Bundled with YourDrive YourData.

- **Managed Services**

  Lenovo Managed Services provides continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of a 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.

- **Technical Account Management (TAM)**

  A Lenovo Technical Account Manager helps you optimize the operation of your data center based on a deep understanding of your business. You gain direct access to your Lenovo TAM, who serves as your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. In addition, your TAM will help proactively make service recommendations and manage your service relationship with Lenovo to make certain your needs are met.

- **Enterprise Server Software Support**

  Enterprise Software Support is an additional support service providing customers with software support on Microsoft, Red Hat, SUSE, and VMware applications and systems. Around the clock availability for critical problems plus unlimited calls and incidents helps customers address challenges fast, without incremental costs. Support staff can answer troubleshooting and diagnostic questions, address product comparability and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

- **YourDrive YourData**

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

- **Health Check**

  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that your 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.

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 spares parts.

Lenovo Service offerings are region-specific. Not all preconfigured support and upgrade options are available in every region. For information about Lenovo service upgrade offerings that are available in your region, refer to the following resources:

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

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

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

Services

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

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.

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

Regulatory compliance

The ThinkSystem SD530 server conforms or there are plans for the server to conform to the following international standards:

- UL/IEC 60950-1
- IEC 60950-1 (CB Certificate and CB Test Report)
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 6, Class A
- CSA C22.2 No. 60950-1
- CISPR 22, Class A
- Japan VCCI, Class A
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- CE Mark (EN55022 Class A, EN60950-1, EN55024, and EN61000-3-2, EN61000-3-3)
- Korea KN32, Class A, KN35
- Australia/New Zealand AS/NZS CISPR 32, Class A; AS/NZS 60950.1
- China CELP certificate, HJ 2507-2011
- UL Green Guard, UL2819
- Energy Star 2.1

The D2 Enclosure and Modular Enclosure conform or there are plans for the enclosures to conform to the following international standards:

- UL/IEC 60950-1
- Canada ICES-003, issue 6, Class A
- CSA C22.2 No. 60950-1
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Argentina IEC60950-1
- Japan VCCI, Class A
- IEC 60950-1 (CB Certificate and CB Test Report)
- China CCC GB4943.1, GB9254, Class A, and GB17625.1
- Australia/New Zealand AS/NZS CISPR 32, Class A; AS/NZS 60950.1
- Korea KN32, Class A, KN35
- Russia, Belorussia and Kazakhstan, EAC: TP TC 004/2011(for Safety); TP TC 020/2011(for EMC).
- Mexico NOM-019
- CE Mark (EN55022 Class A, EN60950-1, EN55024, and EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- TUV-GS (EN60950-1/IEC 60950-1, and EK1-ITB2000)
- UL Green Guard, UL2819
- China CELP certificate, HJ 2507-2011

External drive enclosures

The server supports attachment to external drive enclosures using a RAID controller with external ports or a SAS host bus adapter. Adapters supported by the server are listed in the SAS adapters for external storage section.

Note: Information provided in this section is for ordering reference purposes only. For the operating system and adapter support details, refer to the interoperability matrix for a particular storage enclosure that can be found on the Lenovo Data Center Support web site:
http://datacentersupport.lenovo.com

Table 56. External drive enclosures

Description	Part number		
	Worldwide	Japan	PRC
Lenovo Storage D1212 LFF Disk Expansion with Dual SAS IO Modules	4587A11	4587A1J	4587A1C
Lenovo Storage D1224 SFF Disk Expansion with Dual SAS IO Modules	4587A31	4587A3J	4587A3C
Lenovo Storage D3284 4TB x 84 HD Expansion Enclosure	641311F		
Lenovo Storage D3284 6TB x 84 HD Expansion Enclosure	641312F		
Lenovo Storage D3284 8TB x 84 HD Expansion Enclosure	641313F		
Lenovo Storage D3284 10TB x 84 HD Expansion Enclosure	641314F		

For details about supported drives, adapters, and cables, see the following Lenovo Press Product Guides:

- Lenovo Storage D1212 and D1224
  http://lenovopress.com/lp0512
- Lenovo Storage D3284
  http://lenovopress.com/lp0513

External storage systems

The following table lists the external storage systems that are currently offered by Lenovo.

Note: Information provided in this section is for ordering reference purposes only. End-to-end storage configuration support *must* be verified through the interoperability matrix for a particular storage system that can be found on the Lenovo Data Center Support web site, http://datacentersupport.lenovo.com.

Table 57. External storage systems: DE Series

Description	Part number	
	Worldwide	Japan
Lenovo ThinkSystem DE Series Storage (SAS connectivity)		
Lenovo ThinkSystem DE2000H SAS Hybrid Flash Array LFF	7Y70A000WW	7Y701003JP
Lenovo ThinkSystem DE2000H SAS Hybrid Flash Array SFF	7Y71A000WW	7Y711003JP
Lenovo ThinkSystem DE4000H SAS Hybrid Flash Array 4U60	7Y77A002WW	7Y771000JP
Lenovo ThinkSystem DE4000H SAS Hybrid Flash Array LFF	7Y74A000WW	7Y74A000JP
Lenovo ThinkSystem DE4000H SAS Hybrid Flash Array SFF	7Y75A000WW	7Y75A000JP
Lenovo ThinkSystem DE4000F SAS All Flash Array SFF	7Y76A000WW	7Y76A000JP
Lenovo ThinkSystem DE6000H SAS Hybrid Flash Array 4U60	7Y80A000WW	7Y801002JP
Lenovo ThinkSystem DE6000H SAS Hybrid Flash Array SFF	7Y78A000WW	7Y781002JP
Lenovo ThinkSystem DE6000F SAS All Flash Array SFF	7Y79A000WW	7Y79A000JP

Description	Part number	
	Worldwide	Japan
Lenovo ThinkSystem DE Series Storage (iSCSI connectivity)		
Lenovo ThinkSystem DE2000H 10GBASE-T Hybrid Flash Array LFF	7Y70A003WW	7Y701001JP
Lenovo ThinkSystem DE2000H 10GBASE-T Hybrid Flash Array SFF	7Y71A002WW	7Y711005JP
Lenovo ThinkSystem DE2000H iSCSI Hybrid Flash Array LFF	7Y70A004WW	7Y701000JP
Lenovo ThinkSystem DE2000H iSCSI Hybrid Flash Array SFF	7Y71A003WW	7Y711006JP
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array 4U60	7Y77A000WW	7Y771002JP
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array LFF	7Y74A002WW	7Y74A002JP
Lenovo ThinkSystem DE4000H iSCSI Hybrid Flash Array SFF	7Y75A001WW	7Y75A001JP
Lenovo ThinkSystem DE4000F iSCSI All Flash Array SFF	7Y76A002WW	7Y76A002JP
Lenovo ThinkSystem DE6000H iSCSI Hybrid Flash Array 4U60	7Y80A002WW	7Y801000JP
Lenovo ThinkSystem DE6000H iSCSI Hybrid Flash Array SFF	7Y78A002WW	7Y781000JP
Lenovo ThinkSystem DE6000F iSCSI All Flash Array SFF	7Y79A002WW	7Y79A002JP
Lenovo ThinkSystem DE Series Storage (FC connectivity)		
Lenovo ThinkSystem DE2000H FC Hybrid Flash Array LFF	7Y70A002WW	7Y701002JP
Lenovo ThinkSystem DE2000H FC Hybrid Flash Array SFF	7Y71A001WW	7Y711004JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array 4U60	7Y77A001WW	7Y771001JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array LFF	7Y74A001WW	7Y74A001JP
Lenovo ThinkSystem DE4000H FC Hybrid Flash Array SFF	7Y75A002WW	7Y75A002JP
Lenovo ThinkSystem DE4000F FC All Flash Array SFF	7Y76A001WW	7Y76A001JP
Lenovo ThinkSystem DE6000H FC Hybrid Flash Array 4U60	7Y80A001WW	7Y801001JP
Lenovo ThinkSystem DE6000H FC Hybrid Flash Array SFF	7Y78A001WW	7Y781001JP
Lenovo ThinkSystem DE6000F FC All Flash Array SFF	7Y79A001WW	7Y79A001JP

Table 58. External storage systems: DM Series

Description	Part number
Lenovo ThinkSystem DM Series Storage (NAS or iSCSI connectivity)	
ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y421003EA*
ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 10GBASE-T, ONTAP 9.5	7Y421007EA*
ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y421005EA*
ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 10GBASE-T, ONTAP 9.5	7Y421001EA*
ThinkSystem DM5000H, 11.5TB (12x 960GB SSDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y571004EA*
ThinkSystem DM5000H, 11.5TB (12x 960GB SSDs), 10GBASE-T, ONTAP 9.5	7Y57100LEA*
ThinkSystem DM5000H, 14.4TB (12x 1.2TB HDDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y57100CEA*
ThinkSystem DM5000H, 21.6TB (12x 1.8TB HDDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y57100GEA*
ThinkSystem DM5000H, 23TB (24x 960GB SSDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y571006EA*
ThinkSystem DM5000H, 23TB (24x 960GB SSDs), 10GBASE-T, ONTAP 9.5	7Y57100NEA*
ThinkSystem DM5000H, 28.8TB (24x 1.2TB HDDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y57100EEA*
ThinkSystem DM5000H, 28.8TB (24x 1.2TB HDDs), 10GBASE-T, ONTAP 9.5	7Y57100VEA*
ThinkSystem DM5000H, 43.2TB (24x 1.8TB HDDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y57100JEA*
ThinkSystem DM5000H, 43.2TB (24x 1.8TB HDDs), 10GBASE-T, ONTAP 9.5	7Y571002EA*

Description	Part number
ThinkSystem DM5000H, 46TB (12x 3.84TB SSDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y571008EA*
ThinkSystem DM5000H, 46TB (12x 3.84TB SSDs), 10GBASE-T, ONTAP 9.5	7Y57100QEA*
ThinkSystem DM5000H, 92TB (24x 3.84TB SSDs), 10GBASE-T, ONTAP 9.5 Fundamentals	7Y57100AEA*
ThinkSystem DM5000H, 92TB (24x 3.84TB SSDs), 10GBASE-T, ONTAP 9.5	7Y57100REA*
ThinkSystem DM5000F, 11.5TB (12x 960GB SSDs), 10GBASE-T, ONTAP 9.5	7Y411002EA*
ThinkSystem DM5000F, 23TB (24x 960GB SSDs), 10GBASE-T, ONTAP 9.5	7Y411004EA*
ThinkSystem DM5000F, 46TB (12x 3.84TB SSDs), 10GBASE-T, ONTAP 9.5	7Y411006EA*
ThinkSystem DM5000F, 92TB (24x 3.84TB SSDs), 10GBASE-T, ONTAP 9.5	7Y411007EA*
Lenovo ThinkSystem DM Series Storage (NAS, iSCSI, or FC connectivity)	
ThinkSystem DM3000H Hybrid Storage Array (2U12 LFF, CTO only)	7Y42CTO1WW
ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y421009NA*
ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y421002EA*
ThinkSystem DM3000H, 48TB (12x 4TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y421006EA*
ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y421004EA*
ThinkSystem DM3000H, 96TB (12x 8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y421008EA*
ThinkSystem DM5000H Hybrid Storage Array (2U24 SFF, CTO only)	7Y57CTO1WW
ThinkSystem DM5000H, 11.5TB (12x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571011NA*
ThinkSystem DM5000H, 11.5TB (12x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571003EA*
ThinkSystem DM5000H, 11.5TB (12x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100KEA*
ThinkSystem DM5000H, 14.4TB (12x 1.2TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y57100BEA*
ThinkSystem DM5000H, 21.6TB (12x 1.8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y57100FEA*
ThinkSystem DM5000H, 23TB (24x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571005EA*
ThinkSystem DM5000H, 23TB (24x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100MEA*
ThinkSystem DM5000H, 28.8TB (24x 1.2TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y57100DEA*
ThinkSystem DM5000H, 43.2TB (24x 1.8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571010NA*
ThinkSystem DM5000H, 43.2TB (24x 1.8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y57100HEA*
ThinkSystem DM5000H, 43.2TB (24x 1.8TB HDDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100ZEA*
ThinkSystem DM5000H, 46TB (12x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571007EA*
ThinkSystem DM5000H, 46TB (12x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100PEA*
ThinkSystem DM5000H, 92TB (24x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5 Fundamentals	7Y571009EA*
ThinkSystem DM5000H, 92TB (24x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y57100SEA*
ThinkSystem DM5000F Flash Storage Array (2U24 SFF, CTO only)	7Y41CTO1WW

Description	Part number
ThinkSystem DM5000F, 11.5TB (12x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y411001EA*
ThinkSystem DM5000F, 23TB (24x 960GB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y411003EA*
ThinkSystem DM5000F, 46TB (12x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y411005EA*
ThinkSystem DM5000F, 92TB (24x 3.84TB SSDs), 16Gb FC / 10GbE SFP+, ONTAP 9.5	7Y411000EA*
ThinkSystem DM7000H Hybrid Storage Array (3U, CTO only)	7Y56CTO1WW
ThinkSystem DM7000F Flash Storage Array (3U, CTO only)	7Y40CTO1WW

* Preconfigured models that are available only in North America (part numbers that have NA at the end) or EMEA (part numbers that have EA at the end) and require Preconfigured support to be purchased with the storage system (See the respective product guide for details).

For more information, see the list of Product Guides in the Lenovo Storage category:
https://lenovopress.com/storage/san/lenovo#rt=product-guide

External backup units

The following table lists the available external SAS tape backup options.

Tip: Verify the end-to-end support of an IBM tape backup solution through the IBM System Storage Interoperation Center (SSIC): http://www.ibm.com/systems/support/storage/ssic

Table 59. External SAS backup options

Part number	Description
External SAS tape backup drives	
6160S6E	IBM TS2260 Tape Drive Model H6S
6160S7E	IBM TS2270 Tape Drive Model H7S
6160S8E	IBM TS2280 Tape Drive Model H8S
External SAS tape backup autoloaders	
6171S6R	IBM TS2900 Tape Autoloader w/LTO6 HH SAS
6171S7R	IBM TS2900 Tape Autoloader w/LTO7 HH SAS
6171S8R	IBM TS2900 Tape Autoloader w/LTO8 HH SAS
External tape backup libraries	
6741A1F	IBM TS4300 3U Tape Library-Base Unit
SAS backup drives for TS4300 Tape Library	
01KP934	LTO 6 HH SAS Drive
01KP937	LTO 7 HH SAS Drive
01KP953	LTO 8 HH SAS Drive

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

Top-of-rack Ethernet switches

The following table lists the Ethernet LAN switches that are offered by Lenovo.

Table 60. Ethernet LAN switches

Part number	Description
1 Gb Ethernet Rack switches	
7Y810011WW	Lenovo ThinkSystem NE0152T RackSwitch (Rear to Front)
7Z320O11WW	Lenovo ThinkSystem NE0152TO RackSwitch (Rear to Front, ONIE)
7159BAX	Lenovo RackSwitch G7028 (Rear to Front)
7159CAX	Lenovo RackSwitch G7052 (Rear to Front)
7159G52	Lenovo RackSwitch G8052 (Rear to Front)
7165H1X	Juniper EX2300-C PoE Switch
7165H2X	Juniper EX2300-24p PoE Switch
1 Gb Ethernet Campus switches	
7Z340011WW	Lenovo CE0128TB Switch (3-Year Warranty)
7Z360011WW	Lenovo CE0128TB Switch (Limited Lifetime Warranty)
7Z340012WW	Lenovo CE0128PB Switch (3-Year Warranty)
7Z360012WW	Lenovo CE0128PB Switch (Limited Lifetime Warranty)
7Z350021WW	Lenovo CE0152TB Switch (3-Year Warranty)
7Z370021WW	Lenovo CE0152TB Switch (Limited Lifetime Warranty)
7Z350022WW	Lenovo CE0152PB Switch (3-Year Warranty)
7Z370022WW	Lenovo CE0152PB Switch (Limited Lifetime Warranty)
10 Gb Ethernet switches	
7159A1X	Lenovo ThinkSystem NE1032 RackSwitch (Rear to Front)
7159B1X	Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front)
7159C1X	Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front)
7159CRW	Lenovo RackSwitch G8272 (Rear to Front)
7159GR6	Lenovo RackSwitch G8296 (Rear to Front)
25 Gb Ethernet switches	
7159E1X	Lenovo ThinkSystem NE2572 RackSwitch (Rear to Front)
7Z210O21WW	Lenovo ThinkSystem NE2572O RackSwitch (Rear to Front, ONIE)
100 Gb Ethernet switches	
7159D1X	Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front)
7Z210O11WW	Lenovo ThinkSystem NE10032O RackSwitch (Rear to Front, ONIE)

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

- 1 Gb Ethernet switches: http://lenovopress.com/networking/tor/1gb?rt=product-guide
- 10 Gb Ethernet switches: http://lenovopress.com/networking/tor/10gb?rt=product-guide
- 25 Gb Ethernet switches: http://lenovopress.com/networking/tor/25gb?rt=product-guide
- 40 Gb Ethernet switches: http://lenovopress.com/networking/tor/40gb?rt=product-guide
- 100 Gb Ethernet switches: https://lenovopress.com/networking/tor/100Gb?rt=product-guide

Fibre Channel SAN switches

The following table lists the Fibre Channel SAN switches that are offered by Lenovo and can be used with this system.

Table 61. Fibre Channel SAN switches

Part number	Description
8 Gb FC	
3873AR6	Lenovo B300, E_Port License, 8 ports licensed, 8x 8Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
16 Gb FC	
6559F2A	Lenovo ThinkSystem DB610S, 8 ports licensed, 8x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
6559F1A	Lenovo ThinkSystem DB610S, ENT Bundle, 24 ports licensed, 24x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
6559D1Y	Lenovo ThinkSystem DB610S, ENT Bundle, 24 ports licensed, 24x 16Gb SWL SFPs, 1 PS, Rail Kit, 3Yr FW
3873ER1	Lenovo B6505, 12 ports licensed, 12x 16Gb SWL SFPs, 1 PS, Rail Kit, 1Yr FW
3873AR5	Lenovo B6505, 12 ports licensed, 12x 16Gb SWL SFPs, 1 PS, Rail Kit, 3Yr FW
3873IR1	Lenovo B6510, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
3873BR3	Lenovo B6510, 24 ports licensed, 24x 16Gb SWL SFPs, 2 PS, Rail Kit, 3Yr FW
32 Gb FC	
6559F3A	Lenovo ThinkSystem DB610S, 8 ports licensed, No SFPs, 1 PS, Rail Kit, 1Yr FW
6559D3Y	Lenovo ThinkSystem DB610S, 8 ports licensed, No SFPs, 1 PS, Rail Kit, 3Yr FW
6415G3A	Lenovo ThinkSystem DB620S, 24 ports licensed, No SFPs, 2 PS, Rail Kit, 1Yr FW
6415H11	Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
6415G11	Lenovo ThinkSystem DB620S, 24 ports licensed, 24x 32Gb SWL SFPs, 2 PS, Rail Kit, 3Yr FW
6415H2A	Lenovo ThinkSystem DB620S, ENT Bundle, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
7D1SA001WW	Lenovo ThinkSystem DB630S, 48 ports licensed, No SFPs, 2 PS, Rail Kit, 1Yr FW
7D1SA002WW	Lenovo ThinkSystem DB630S, 48 ports licensed, 48x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
7D1SA003WW	Lenovo ThinkSystem DB630S, ENT, 96 ports licensed, 96x 32Gb SWL SFPs, 2 PS, Rail Kit, 1Yr FW
6684D2A	Lenovo ThinkSystem DB400D 32Gb FC Director, ENT. Feature set, 4 Blade slots, 8U, 1Yr FW
6684B2A	Lenovo ThinkSystem DB400D 32Gb FC Director, ENT. Feature set, 4 Blade slots, 8U, 3Yr FW
6682D1A	Lenovo ThinkSystem DB800D 32Gb FC Director, ENT. Feature set, 8 Blade slots, 14U, 1Yr FW

For more information, see the list of Product Guides in the Rack SAN Switches category:
http://lenovopress.com/storage/switches/rack#rt=product-guide

Uninterruptible power supply units

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

Table 62. Uninterruptible power supply units

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

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

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

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo.

Table 63. Power distribution units

Part number	Description
0U Basic PDUs	
00YJ776	0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord
00YJ777	0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord
00YJ778	0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord
00YJ779	0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord
Switched and Monitored PDUs	
00YJ780	0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord
00YJ781	0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord
00YJ782	0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord

Part number	Description
00YJ783	0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord
46M4002*	1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)
46M4003*	1U 9 C19/3 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord
46M4004*	1U 12 C13 Switched and Monitored DPI PDU (without line cord)
46M4005*	1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
71762NX	Ultra Density Enterprise C19/C13 PDU Module (without line cord)
71763NU	Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
39M2816	DPI C13 Enterprise PDU+ (without line cord)
39Y8941	DPI Single Phase C13 Enterprise PDU (without line cord)
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
39Y8948	DPI Single Phase C19 Enterprise PDU (without line cord)
39Y8923	DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord
Front-end PDUs (3x IEC 320 C19 outlets)	
39Y8938	DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord
39Y8939	DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord
39Y8934	DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
39Y8940	DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
39Y8935	DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord
NEMA PDUs (6x NEMA 5-15R outlets)	
39Y8905	DPI 100-127V PDU with Fixed NEMA L5-15P line cord
Line cords for PDUs that ship without a line cord	
40K9611	DPI 32a Line Cord (IEC 309 3P+N+G)
40K9612	DPI 32a Line Cord (IEC 309 P+N+G)
40K9613	DPI 63a Cord (IEC 309 P+N+G)
40K9614	DPI 30a Line Cord (NEMA L6-30P)
40K9615	DPI 60a Cord (IEC 309 2P+G)
40K9617	DPI Australian/NZ 3112 Line Cord
40K9618	DPI Korean 8305 Line Cord

* Not available in USA and Canada

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

Rack cabinets

The following table lists the supported rack cabinets.

Table 64. Supported rack cabinets

Part number	Description	Supports enclosure	Maximum supported	Supports D2 CMA	Supports 0U PDUs
93072PX	25U Static S2 Standard Rack	Yes	11	No	No
93072RX	25U Standard Rack	Yes	11	No	No
93074RX	42U Standard Rack	Yes	20	No	No
93084EX	42U Enterprise Expansion Rack	Yes	17	No	Yes
93084PX	42U Enterprise Rack	Yes	17	No	Yes
93604PX	42U 1200mm Deep Dynamic Rack	Yes	17	Yes	No
93614PX	42U 1200mm Deep Static Rack	Yes	17	Yes	No
93634EX	42U 1100mm Dynamic Expansion Rack	Yes	18	Yes	Yes
93634PX	42U 1100mm Dynamic Rack	Yes	18	Yes	Yes
Withdrawn rack cabinets					
201886X*	11U Office Enablement Kit	No	-	-	-
93074XX*	42U Standard Rack Extension	Yes	20	No	No
93604EX*	42U 1200mm Deep Dynamic Expansion Rack	Yes	17	Yes	No
93614EX*	42U 1200mm Deep Static Expansion Rack	Yes	17	Yes	No
93624EX*	47U 1200mm Deep Static Expansion Rack	No	-	-	-
93624PX*	47U 1200mm Deep Static Rack	No	-	-	-
93634AX*	PureFlex System 42U Rack	No	-	-	-
93634BX*	PureFlex System 42U Expansion Rack	No	-	-	-
93634CX*	PureFlex System 42U Rack	No	-	-	-

* Withdrawn from marketing

For specifications about these racks, see the Lenovo Rack Cabinet Reference, available from: https://lenovopress.com/lp0658-lenovo-rack-cabinet-reference

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

KVM switches and consoles

The following table lists the supported KVM consoles, keyboards, and KVM switches.

Table 65. Console keyboards

Part number	Description
Consoles	
17238BX	1U 18.5" Standard Console (without keyboard)
Console keyboards	
7ZB7A05469	ThinkSystem Keyboard w/ Int. Pointing Device USB - Arabic 253 RoHS v2
7ZB7A05468	ThinkSystem Keyboard w/ Int. Pointing Device USB - Belg/UK 120 RoHS v2
7ZB7A05206	ThinkSystem Keyboard w/ Int. Pointing Device USB - Czech 489 RoHS v2

Part number	Description
7ZB7A05207	ThinkSystem Keyboard w/ Int. Pointing Device USB - Danish 159 RoHS v2
7ZB7A05208	ThinkSystem Keyboard w/ Int. Pointing Device USB - Dutch 143 RoHS v2
7ZB7A05210	ThinkSystem Keyboard w/ Int. Pointing Device USB - Fr/Canada 445 RoHS v2
7ZB7A05209	ThinkSystem Keyboard w/ Int. Pointing Device USB - French 189 RoHS v2
7ZB7A05211	ThinkSystem Keyboard w/ Int. Pointing Device USB - German 129 RoHS v2
7ZB7A05212	ThinkSystem Keyboard w/ Int. Pointing Device USB - Greek 219 RoHS v2
7ZB7A05213	ThinkSystem Keyboard w/ Int. Pointing Device USB - Hebrew 212 RoHS v2
7ZB7A05214	ThinkSystem Keyboard w/ Int. Pointing Device USB - Hungarian 208 RoHS v2
7ZB7A05215	ThinkSystem Keyboard w/ Int. Pointing Device USB - Italian 141 RoHS v2
7ZB7A05216	ThinkSystem Keyboard w/ Int. Pointing Device USB - Japanese 194 RoHS v2
7ZB7A05217	ThinkSystem Keyboard w/ Int. Pointing Device USB - Korean 413 RoHS v2
7ZB7A05218	ThinkSystem Keyboard w/ Int. Pointing Device USB - LA Span 171 RoHS v2
7ZB7A05219	ThinkSystem Keyboard w/ Int. Pointing Device USB - Norwegian 155 RoHS v2
7ZB7A05220	ThinkSystem Keyboard w/ Int. Pointing Device USB - Polish 214 RoHS v2
7ZB7A05221	ThinkSystem Keyboard w/ Int. Pointing Device USB - Portuguese 163 RoHS v2
7ZB7A05222	ThinkSystem Keyboard w/ Int. Pointing Device USB - Russian 441 RoHS v2
7ZB7A05223	ThinkSystem Keyboard w/ Int. Pointing Device USB - Slovak 245 RoHS v2
7ZB7A05231	ThinkSystem Keyboard w/ Int. Pointing Device USB - Slovenian 234 RoHS v2
7ZB7A05224	ThinkSystem Keyboard w/ Int. Pointing Device USB - Spanish 172 RoHS v2
7ZB7A05225	ThinkSystem Keyboard w/ Int. Pointing Device USB - Swed/Finn 153 RoHS v2
7ZB7A05226	ThinkSystem Keyboard w/ Int. Pointing Device USB - Swiss F/G 150 RoHS v2
7ZB7A05227	ThinkSystem Keyboard w/ Int. Pointing Device USB - Thai 191 RoHS v2
7ZB7A05467	ThinkSystem Keyboard w/ Int. Pointing Device USB - Trad Chinese/US 467 RoHS v2
7ZB7A05228	ThinkSystem Keyboard w/ Int. Pointing Device USB - Turkish 179 RoHS v2
7ZB7A05229	ThinkSystem Keyboard w/ Int. Pointing Device USB - UK Eng 166 RoHS v2
7ZB7A05470	ThinkSystem Keyboard w/ Int. Pointing Device USB - US Eng 103P RoHS v2
7ZB7A05230	ThinkSystem Keyboard w/ Int. Pointing Device USB - US Euro 103P RoHS v2
ThinkSystem Digital and Analog KVM Console switches and cables	
1754D1T	ThinkSystem Digital 2x1x16 KVM Switch (DVI video output port)
1754A1T	ThinkSystem Analog 1x8 KVM Switch (DVI video output port)
4X97A11108	ThinkSystem VGA to DVI Conversion Cable
4X97A11109	ThinkSystem Single-USB Conversion Cable for Digital KVM
4X97A11107	ThinkSystem Dual-USB Conversion Cable for Digital KVM
4X97A11106	ThinkSystem USB Conversion Cable for Analog KVM
GCM and LCM Console switches and cables	
1754D2X	Global 4x2x32 Console Manager (GCM32)
1754D1X	Global 2x2x16 Console Manager (GCM16)
1754A2X	Local 2x16 Console Manager (LCM16)
1754A1X	Local 1x8 Console Manager (LCM8)
43V6147	Single Cable USB Conversion Option (UCO)
39M2895	USB Conversion Option (4 Pack UCO)

Part number	Description
46M5383	Virtual Media Conversion Option Gen2 (VCO2)
46M5382	Serial Conversion Option (SCO)

For more information, see the list of Product Guides in the KVM Switches and Consoles category: http://lenovopress.com/servers/options/kvm

Lenovo Financial Services

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

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

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

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

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

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

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

Related publications and links

For more information, see these resources:

- ThinkSystem SD530 product page
  https://www.lenovo.com/us/en/data-center/servers/high-density/ThinkSystem-SD530/p/77XX7DSSD53
- Interactive 3D Tour of the ThinkSystem SD530:
  https://lenovopress.com/LP0667
- Lenovo Press walk-through video of the ThinkSystem SD530:
  https://lenovopress.com/LP0704
- ThinkSystem SD530 drivers and support
  http://datacentersupport.lenovo.com/products/servers/thinksystem/sd530/7x21/downloads
- Lenovo ThinkSystem SD530 product publications:
  http://thinksystem.lenovofiles.com/help/index.jsp
  - Quick Start
  - Rack Installation Guide
  - Setup Guide
  - Hardware Maintenance Manual
  - Messages and Codes Reference
  - Memory Population Reference
- ServerProven hardware compatibility:
  http://www.lenovo.com/us/en/serverproven
- Lenovo Press paper, *Lenovo ThinkSystem SD530 Performance Considerations with 12 DIMMs and 16 DIMMs*
  http://lenovopress.com/LP0659

Related product families

Product families related to this document are the following:

- High Density Servers
- ThinkSystem SD530 Server

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
1009 Think Place - Building One
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION ”AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document, LP1041, was created or updated on December 13, 2019.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  http://lenovopress.com/LP1041
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at http://lenovopress.com/LP1041.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at https://www.lenovo.com/us/en/legal/copytrade/.

The following terms are trademarks of Lenovo in the United States, other countries, or both:
AnyBay®
Bootable Media Creator
Flex System
Lenovo Services
Lenovo®
RackSwitch
ServerProven®
System x®
ThinkServer®
ThinkSystem
TruDDR4
UpdateXpress System Packs
XClarity®

The following terms are trademarks of other companies:

Intel®, Optane™, and Xeon® are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Linux® is a trademark of Linus Torvalds in the United States, other countries, or both.

ActiveX®, Hyper-V®, Microsoft®, Windows Server®, and Windows® are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.