

Lenovo ThinkSystem SD550 V3 Server Product Guide

The Lenovo ThinkSystem SD550 V3 is a two-socket server in a 2U2N multi-node form factor. Combining the efficiency and density of blades with the value and simplicity of rack-based servers, the SD550 V3 delivers a cost-efficient scale-out platform that is thermally designed to deliver maximum performance in the smallest footprint. The solution consists of a 2U ThinkSystem D3 Chassis containing two front-access SD550 V3 servers (nodes). Each node incorporates two 5th Gen Intel Xeon Scalable processors.

The SD550 V3 is well suited for workloads including cloud computing, hyperconverged infrastructure, and energy-efficient transactional processing.

The following figure shows two ThinkSystem SD550 V3 servers installed in a D3 Chassis.



Figure 1. Two ThinkSystem SD550 V3 servers installed in a D3 Chassis

Did you know?

The SD550 V3 combines the efficiency and density of blades with the value and simplicity of rack-based servers. With high-performance features such as 5th Gen Intel Xeon Platinum processors, Intel and NVIDIA GPU support, and high-performance 200Gb Ethernet, to power through your most demanding HPC, technical computing and AI workloads.

Key features

The Lenovo ThinkSystem SD550 V3 server supports one or two 5th Gen Intel Xeon Scalable processors, plus support for the latest low-profile GPUs, and fast networking and storage. Two SD550 V3 servers can be installed in the D3 Chassis, and each server has its own fans to ensure proper cooling for installed components, and its own networking to ensure maximum performance.

The front-accessible design optimized for best-in-class thermal capabilities provides a dense, flexible solution with a low TCO. The half-wide, dual-socket server is designed for data centers that require high performance but are constrained by floor space.

The ThinkSystem D3 Chassis is an efficient, 2U rack mount enclosure with no built-in networking or switching capabilities; therefore, it requires no enclosure-level management. Sensibly designed to provide shared, high-efficiency power for housed servers, the D3 Chassis is designed to scale with your business needs.

Scalability and performance

The SD550 V3 server offers numerous features to boost performance, improve scalability, and reduce costs:

- Each SD550 V3 server supports up to two 5th Gen Intel Xeon Scalable processors, 16 TruDDR5 DIMMs, two PCIe x16 slots plus an OCP 3.0 slot for high-speed I/O, and up to six 2.5-inch drive bays, all in a half-wide 2U form factor.
- Up to two SD550 V3 servers are installed in the D3 Chassis, occupying only 2U of rack space. It is a highly dense, scalable, and price-optimized offering.
- Supports one or two 5th Gen Intel Xeon Processor Scalable processors
 - TDP ratings of up to 350W
 - Up to 64 cores
 - Core speeds of up to 3.9 GHz
- Support for DDR5 memory DIMMs to maximize the performance of the memory subsystem. Each node supports the following:
 - Up to 16 DDR5 memory DIMMs, 8 DIMMs per processor
 - 8 memory channels per processor (1 DIMM per channel)
 - Supports 1 DIMM per channel operating at 5600 MHz
 - Using 128GB 3DS RDIMMs, the server supports up to 2TB of system memory
- Each SD550 V3 server supports up to six 2.5-inch hot-swap drives supporting SATA or NVMe SSDs using onboard controllers. For configurations with two processors, the server also supports a RAID adapter with SAS or SATA drive support. NVMe drives can have a PCIe 5.0 x4 interface, to maximize I/O performance in terms of throughput, bandwidth, and latency.
- Supports two M.2 SATA or NVMe drives for convenient operating system boot functions. Optional RAID-1 redundancy using Intel VROC RAID.
- The server has a dedicated industry-standard OCP 3.0 small form factor (SFF) slot, with a PCIe 5.0 x16 interface, supporting a variety of Ethernet network adapters. A simple-swap mechanism with a thumbscrew and pull-tab enables tool-less installation and removal of the adapter. The adapter supports shared BMC network sideband connectivity (NC-SI) to enable out-of-band systems management.
- Up to two PCIe x16 full-height half-length (FHHL) slots (1x PCIe 5.0, 1x PCIe 4.0) with two processors installed. With one processor, the server supports up to one PCIe 5.0 x16 slot.
- The server offers PCI Express 5.0 I/O expansion capabilities that doubles the theoretical maximum bandwidth of PCIe 4.0 (32GT/s in each direction for PCIe Gen 5, compared to 16 GT/s with PCIe Gen 4 and 8 GT/s with PCIe Gen 3). A PCIe 5.0 x16 slot provides 128 GB/s bandwidth, enough to support a dual-port 200GbE network connection.

Availability and serviceability

The SD550 V3 server and the D3 Chassis provide many features to simplify serviceability and increase system uptime:

- Designed to run 24 hours a day, 7 days a week
- 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), and memory mirroring for redundancy in the event of a non-correctable memory failure.
- The server offers hot-swap drives, supporting RAID-1 redundancy (using Intel VROC) for data protection and greater system uptime.
- The server supports two M.2 drives with support for RAID-1 (using Intel VROC)
- The D3 Chassis supports three hot-swap power supplies which are N+1 redundant 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 (SSDs and M.2 storage), fans, power supplies, 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.
- 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)
- Offers a diagnostics port on the front of the server to allow you to attach an external diagnostics handset for enhanced systems management capabilities.
- Support for the XClarity Administrator Mobile app running on a supported smartphone or tablet and connected to the server through the service-enabled USB port, enables additional local systems management functions.
- Three-year or one-year customer-replaceable unit and onsite limited warranty (varies by geography), 9 x 5 next business day. Optional service upgrades are available.

Manageability and security

Powerful systems management features simplify local and remote management of the SD550 V3:

- The server includes XClarity Controller 2 (XCC2) to monitor server availability. Optional upgrade to XCC Platinum to provide remote control (keyboard video mouse) functions, support for the mounting of remote media files (ISO and IMG image files), boot capture, power capping and new XCC2 Platinum features. New XCC2 Platinum features include System Guard, new security modes including a CNSA-compliant mode, a FIPS 140-3-compliant mode and enhanced NIST 800-193 support, and a new Neighbor Group feature.
- Dedicated Ethernet port at the rear of the server for remote management (BMC management).
- Lenovo XClarity Administrator offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- 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.
- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Support for industry standard management protocols, IPMI 2.0, SNMP 3.0, Redfish REST API, serial console via IPMI
- An integrated hardware Trusted Platform Module (TPM) supporting TPM 2.0 enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Administrator and power-on passwords help protect from unauthorized access to the server.
- Supports Secure Boot to ensure only a digitally signed operating system can be used. Supported with the 2.5-inch and M.2 drives.
- 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.

Energy efficiency

The SD550 V3 and the D3 Chassis offer the following energy efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- ASHRAE A2 compliance for certain configurations to enable operation in 35°C data centers
- Energy-efficient planar components help lower operational costs.
- High-efficiency power supplies with 80 PLUS Titanium certifications.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed to reduce power draw.
- 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

Components and connectors

The following figure shows the front of the SD550 V3 server.

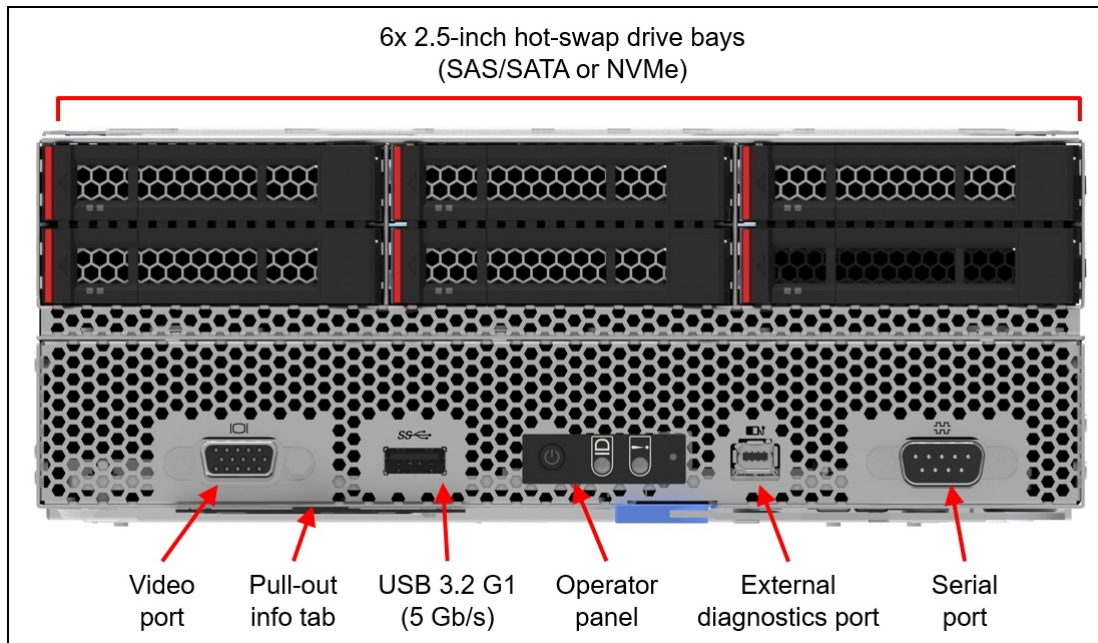


Figure 2. Front view of the SD550 V3 node

The following figure shows the rear of the SD550 V3 server.

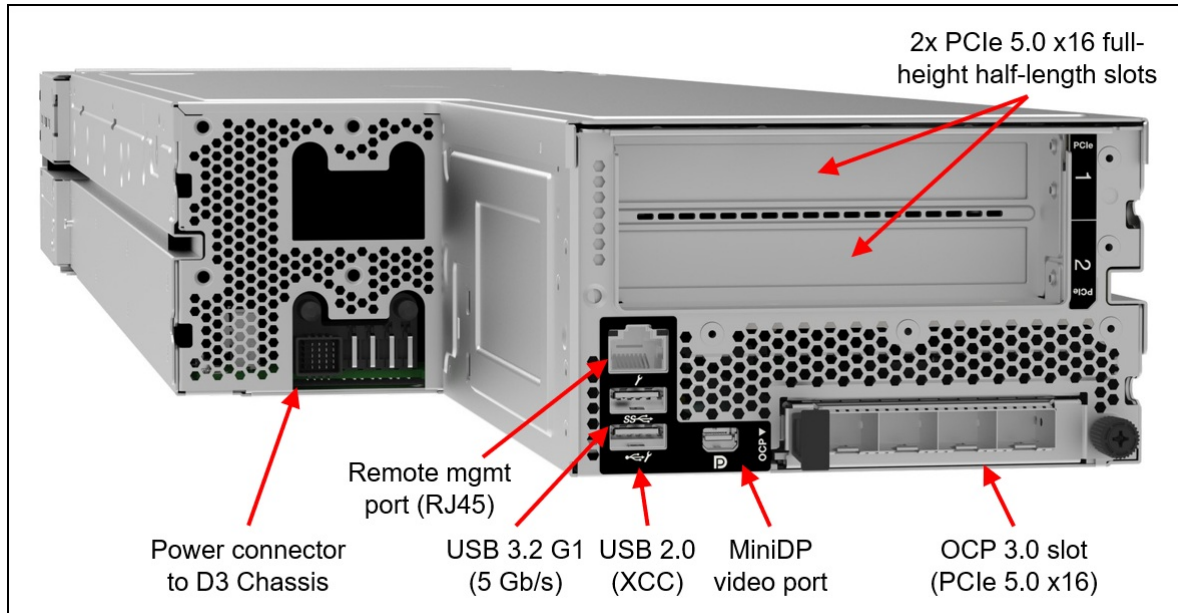


Figure 3. Rear view of the SD550 V3 node

The following figure shows the internals of the SD550 V3 server identifying key components.

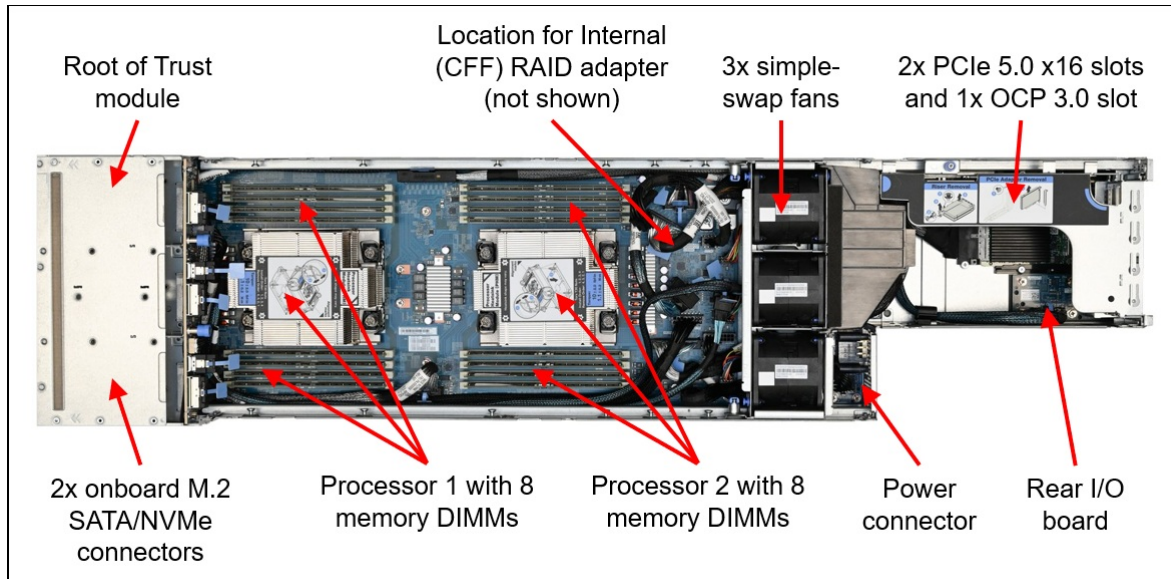


Figure 4. Internal view of the SD550 V3 compute node

The following figure shows the location of the Internal (CFF) RAID adapter and the RAID adapter supercap holder.

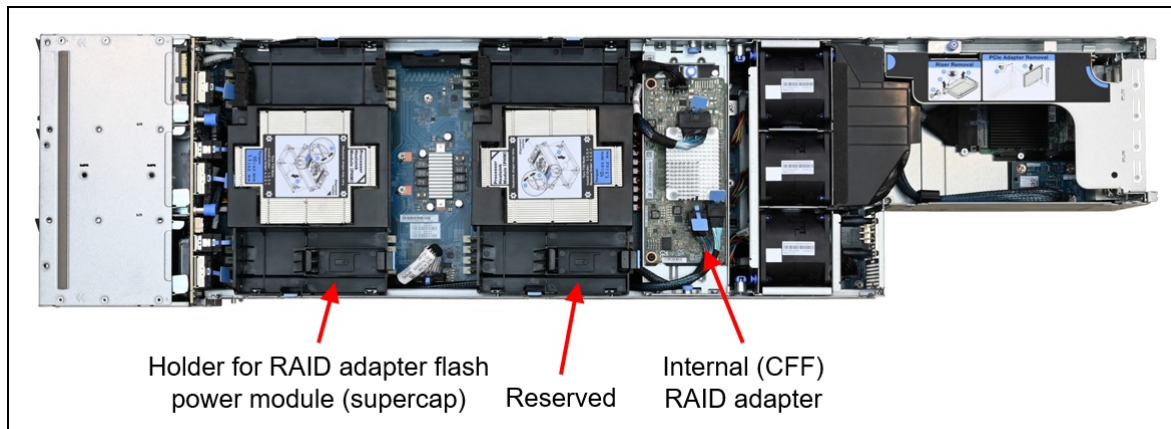


Figure 5. Location of the RAID adapter and supercap holder

The following figure shows the front of the D3 Chassis. The front view shows the two SD550 V3 nodes. The node on the right of the chassis is installed upside down.

Mixing servers: The D3 Chassis supports mixing the SD550 V3 and SD530 V3 in the same chassis.

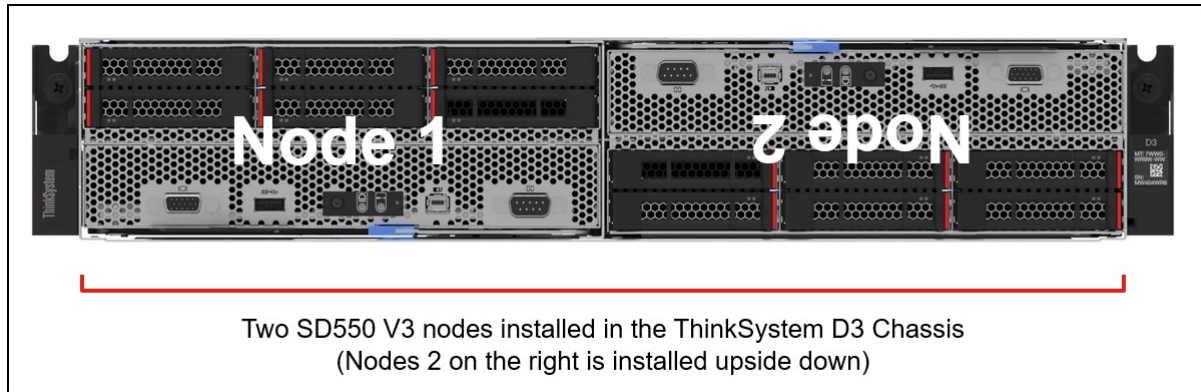


Figure 6. Front view of the ThinkSystem D3 Chassis

The following figure shows the rear of the D3 Chassis.

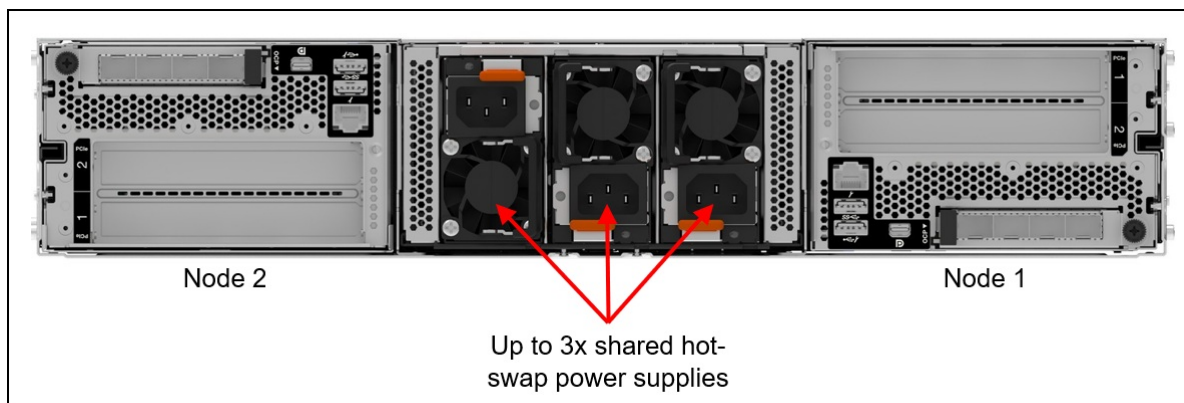


Figure 7. Rear view of the ThinkSystem D3 Chassis

The following figure shows how two servers are installed in the D3 Chassis. The servers have a cutout at the rear where the shared power supplies are connected.

Note: This figure is an artistic representation to show internal detail. The top of the D3 Chassis is fixed and cannot be removed.

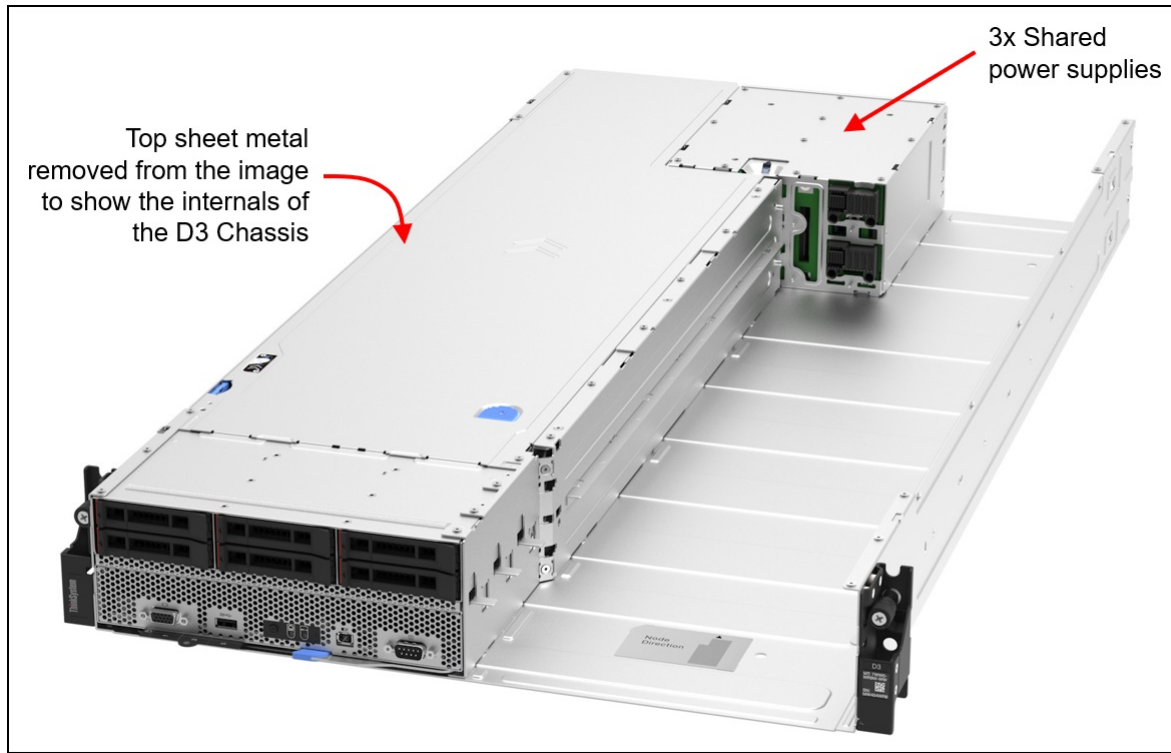


Figure 8. Front view of the D3 Chassis with the top removed (artistic representation)

The D3 Chassis supports mixing the SD530 V3 and SD550 V3 in the same chassis. The figure below shows the D3 Chassis with two SD530 V3 server and one SD550 V3 server.



Figure 9. Front view of the ThinkSystem D3 Chassis with 2x SD530 V3 (left) and 1x SD550 V3 (right)

System architecture

The following figures show the architectural block diagram of the SD550 V3, showing the major components and their connections.

The following figure shows the 2-processor configuration.

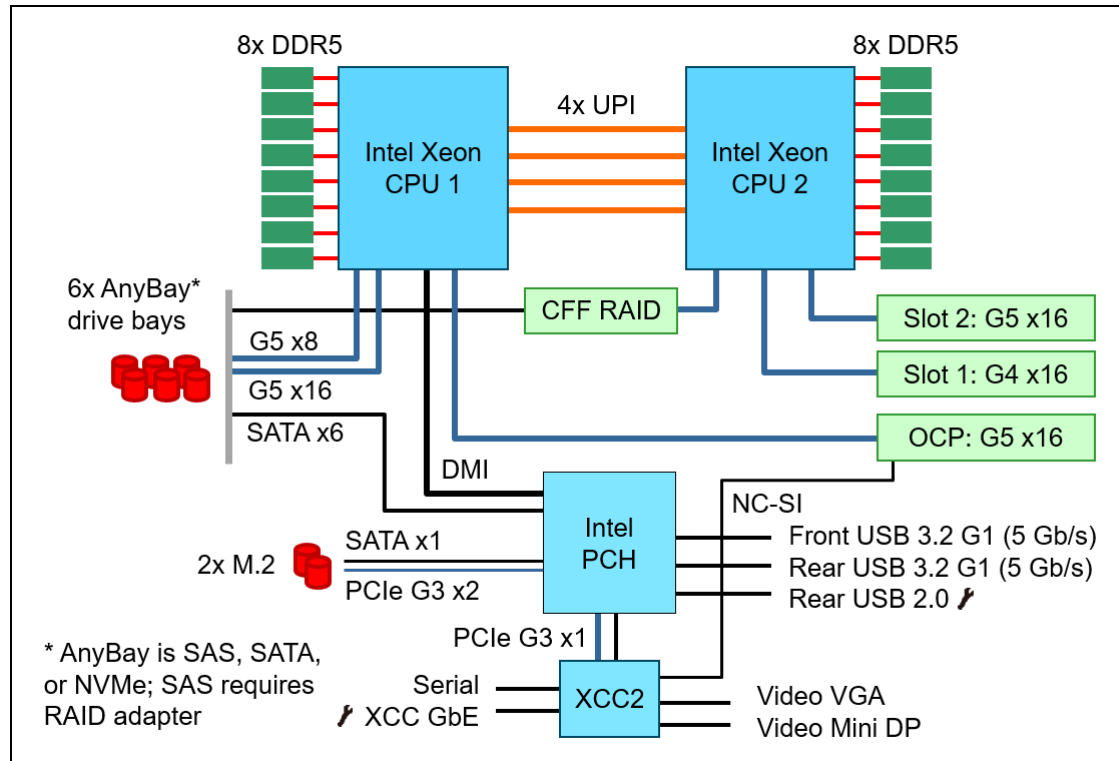


Figure 10. SD550 V3 system architectural block diagram - 2 processors

The following figure shows the 1-processor configuration. With one processor:

- The use of an Internal (CFF) RAID adapter is not supported
- Slot 2 is not available
- With Slot 1 selected, only 2x NVMe drives can be configured
- Without Slot 1, 6x NVMe drives can be configured

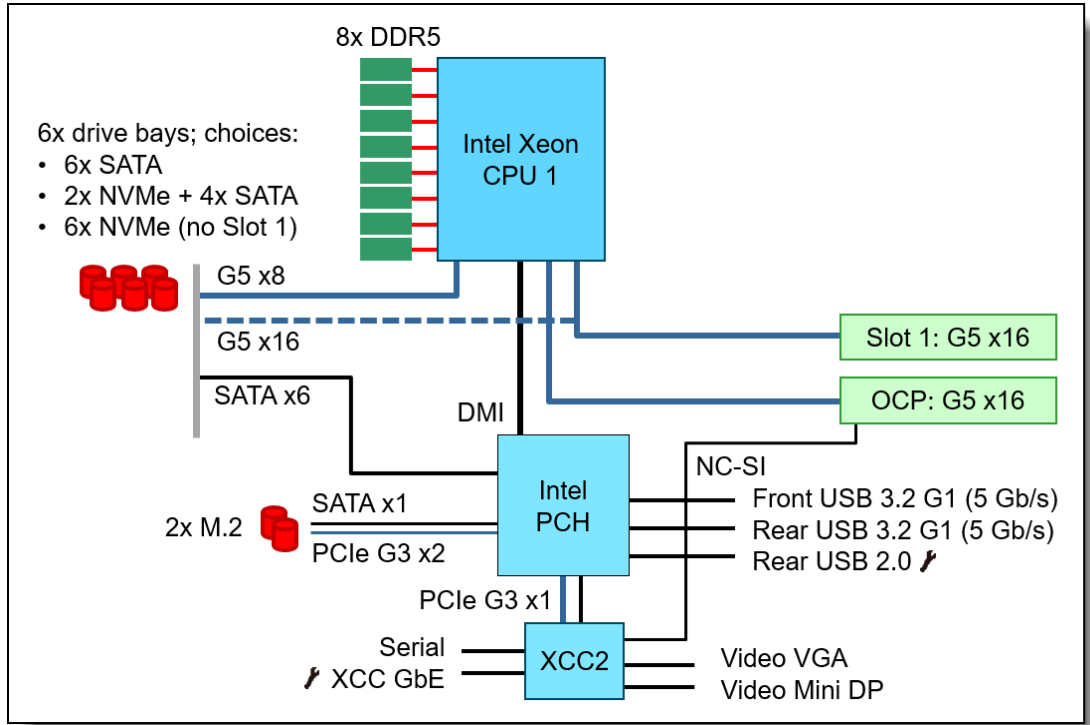


Figure 11. SD550 V3 system architectural block diagram - 2 processors

Standard specifications - SD550 V3 server

The following table lists the standard specifications of the SD550 V3.

Table 1. Standard specifications - ThinkSystem SD550 V3

Components	Specification
Machine type	7DD2 - 3 year warranty 7DD9 - 1 year warranty
Form factor	Half-wide, 1U compute node.
Supported enclosure	ThinkSystem D3 Chassis, 2U high; up to 2x SD550 V3 servers per chassis.
Processor	One or two 5th Gen Intel Xeon Scalable processor (formerly codenamed "Emerald Rapids"). Supports processors up to 64 cores, core speeds of up to 3.9 GHz, and TDP ratings of up to 350W.
Chipset	Intel C741 "Emmitsburg" chipset, part of the platform codenamed "Eagle Stream"
Memory	16 DIMM slots with two processors (8 DIMM slots per processor) per node. Each processor has 8 memory channels, with 1 DIMM per channel (DPC). Lenovo TruDDR5 RDIMMs and 3DS RDIMMs are supported, up to 5600 MHz
Persistent memory	Not supported
Memory maximums	Up to 2TB by using 16x 128GB 3DS RDIMMs
Memory protection	ECC, SDDC, Patrol/Demand Scrubbing, Bounded Fault, DRAM Address Command Parity with Replay, DRAM Uncorrected ECC Error Retry, On-die ECC, ECC Error Check and Scrub (ECS), Post Package Repair

Components	Specification
Drive bays	<ul style="list-style-type: none"> 6x 2.5-inch hot-swap AnyBay drive bays supporting SAS, SATA, or PCIe 5.0 x4 NVMe drives 2x onboard M.2 slots supporting NVMe drives (x1 host interface) or SATA drives (6Gbps host interface)
Maximum internal storage	92.16TB using 6x 15.36TB 2.5-inch SAS/SATA SSDs 92.16TB using 6x 15.36TB 2.5-inch NVMe SSDs
Storage controller	Onboard NVMe ports (Optional Intel VROC NVMe for RAID) Onboard SATA ports Support for Internal (CFF) RAID adapter for SAS/SATA drive support
Optical drive bays	No internal bays; use an external USB drive.
Tape drive bays	No internal bays. Use an external USB drive.
Network interfaces	Dedicated OCP 3.0 SFF slot with PCIe 5.0 x16 host interface. Supports a variety of 2-port and 4-port adapters with 1, 10, 25 or 100 GbE network connectivity. One port can optionally be shared with the XClarity Controller 2 (XCC2) management processor for Wake-on-LAN and NC-SI support.
PCIe slots	One or two PCIe x16 full-height half-length (FHHL) slots, based on the number of processors installed: 1-processor configurations: <ul style="list-style-type: none"> Slot 1: PCIe 5.0 x16, connects to CPU 1 Slot 2: Not connected 2-processor configurations: <ul style="list-style-type: none"> Slot 1: PCIe 4.0 x16, connects to CPU 2 Slot 2: PCIe 5.0 x16, connects to CPU 2
GPU support	Supports 2x single-wide GPUs
Ports	Front: One VGA port for video, one USB 3.2 G1 (5 Gb/s) port, external diagnostics port, and one DB9 serial port for local connectivity Rear: One MiniDP port for video, one USB 3.2 G1 (5 Gb/s) port, 1x USB 2.0 port (also for XCC local management), 1x RJ-45 1GbE systems management port for XCC remote management
Cooling	3x 60mm simple-swap dual-rotor fans with N+1 rotor-redundancy
Power supply	Supplied by the D3 Chassis.
Hot-swap parts	Drives
Systems management	Operator panel with status LEDs. Optional External Diagnostics Handset with LCD display. XClarity Controller 2 (XCC2) embedded management based on the ASPEED AST2600 baseboard management controller (BMC), XClarity Administrator centralized infrastructure delivery, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XCC Platinum to enable remote control functions and other features.
Video	Embedded graphics with 16 MB memory with 2D hardware accelerator, integrated into the XClarity Controller 2 management controller. Two video ports (front VGA and rear Mini DisplayPort); both can be used simultaneously if desired. Maximum resolution of both ports is 1920x1200 at 60Hz.
Security	Power-on password, administrator's password, Trusted Platform Module (TPM), supporting TPM 2.0.
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi, Ubuntu Server. See the Operating system support section for specifics, including other operating systems that are Vendor Certified or Tested.

Components	Specification
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.
Ambient temperature	Up to ASHRAE Class A2: 10°C - 35°C (50°F - 95°F)
Dimensions	Width: 222 mm (8.7 inches), height: 82 mm (3.2 inches), depth 898 mm (35.4 inches)
Weight	Maximum: 11.76 kg (25.93 lb)

Standard specifications - D3 Chassis

The SD550 V3 servers are supported in the ThinkSystem D3 Chassis. The following table lists the standard specifications of the enclosure.

Table 2. Standard specifications: ThinkSystem D3 Chassis

Components	Specification
Machine type	7DD0 - 3 year warranty 7DD7 - 1 year warranty
Form factor	2U rack-mounted chassis
Server support	Up to two SD550 V3 servers per chassis Up to four SD530 V3 servers per chassis Servers can be mixed in the same chassis
Servers per rack	Up to 42x SD550 V3 servers in 21 chassis per 42U rack Up to 48x SD550 V3 servers in 24 chassis per 48U rack
Systems management	None. Management is provided by each node. An incoming remote management connection can be shared using a daisy chain connection (planned for 2Q/2024).
Ports	None.
I/O architecture	None integrated. Use top-of-rack networking and storage switches.
Power supplies	Three hot-swap power supplies, supplying power to all nodes installed in the chassis. Power supplies are either 1300W, 1600W (some markets), or 2700W, with N+1 redundancy. Power supplies are the CRPS form factor and are either 80 PLUS Platinum or 80 PLUS Titanium certified. All power supplies installed must be identical part numbers. Power supplies require a 200-240 V ac, 50 or 60 Hz supply. Power supplies are installed at the rear of the enclosure.
Power cords	One AC power cord for each power supply, C13 or C19 depending on the power supplies selected
Cooling	None. Fans are located in each server.
Enclosure LEDs	Each power supply has AC, DC and error LEDs.
Hot-swap parts	Power supplies
Limited warranty	Three-year customer-replaceable unit and onsite limited warranty with 9x5/NBD coverage.
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.
Dimensions	Height: 87 mm (3.43 inches), depth: 898 mm (35.36 inches), width: 448 mm (17.64 inches). See Physical and electrical specifications for details.
Weight	Empty (without servers and power supplies): 11.8 kg (26.1 lb) Maximum (4x 1U servers and 3x power supplies): 47.8 kg (105.4 lb)

SD550 V3 models

ThinkSystem SD550 V3 models can be configured by using the [Lenovo Data Center Solution Configurator \(DCSC\)](#).

Configure-to-order (CTO) models are used to create models with factory-integrated server customizations. For CTO models, two types of base CTO models are available for the SD550 V3 as listed in the columns in the following table:

- General purpose base CTO models are for general business (non-HPC) and is selectable by choosing **General Purpose** mode in DCSC.
- HPC and AI base models are intended for High Performance Computing (HPC) and Artificial Intelligence (AI) configurations and solutions, including configurations for Lenovo Scalable Infrastructure (LeSI), and is enabled using either the **HPC & AI LeSI Solutions** mode or **HPC & AI Hardware** mode in DCSC. These configurations can also be built using [System x and Cluster Solutions Configurator \(x-config\)](#). **Tip:** Some HPC and AI models are not be listed in DCSC and can only be configured in x-config.

Controlled GPU models: The "Controlled GPU" base CTO models listed in the table are the only models that support high-performance GPUs and accelerators. These models are classified under US Government ECCN regulations and have limited market and customer availability. All other base models do not support high-performance GPUs.

Preconfigured server models may also be available for the SD550 V3, however these are region-specific; that is, each region may define their own server models, and not all server models are available in every region.

The following table lists the base CTO models of the ThinkSystem SD550 V3 server.

Table 3. Base CTO models

Machine Type/Model General purpose	Machine Type/Model for HPC and AI	Description
7DD2CTO1WW	7DD2CTOLWW	ThinkSystem SD550 V3 - 3yr Warranty
7DD2CTOAWW	7DD2CTOHWW	ThinkSystem SD550 V3 - 3yr Warranty with Controlled GPU
7DD9CTO1WW	7DD9CTOLWW	ThinkSystem SD550 V3 - 1yr Warranty

The following table lists the base choices for CTO configurations of the SD550 V3.

Table 4. Base for CTO models

Feature code	Description
BWHX	ThinkSystem SD550 V3 Node

Enclosure models

Up to four SD550 V3 servers are supported in a D3 Chassis.

The following table lists the base CTO models of the D3 Chassis.

Table 5. Base CTO models for the D3 Chassis

Machine Type/Model General purpose	Machine Type/Model for HPC and AI	Description
7DD0CTO1WW	7DD0CTOLWW	ThinkSystem D3 Chassis - 3 year Warranty
7DD7CTO1WW	7DD7CTOLWW	ThinkSystem D3 Chassis - 1 year Warranty

The following table lists the base choices for CTO configurations of the D3 Chassis.

Table 4. Base for CTO models

Feature code	Description
BWJW	ThinkSystem D3 2U Enclosure Base

Processors

The SD550 V3 supports processors in the 5th Gen Intel Xeon Scalable Processor family. The server supports one or two processors.

Support for 4th Gen processors: 4th Gen Intel Xeon Scalable processors may be supported via Special Bid. Please contact your Lenovo sales representative.

Topics in this section:

- [Processor options](#)
- [Processor features](#)
- [Intel On Demand feature licensing](#)
- [One-processor configurations](#)
- [UEFI operating modes](#)

Processor options

All supported processors have the following characteristics:

- 8 DDR5 memory channels at 2 DIMMs per channel
- Up to 4 UPI links between processors at up to 20 GT/s
- 80 PCIe 5.0 I/O lanes

The following table lists the 5th Gen processors that are currently supported by the SD550 V3.

Table 6. 5th Gen Intel Xeon Processor support

Part number	Feature code	SKU	Description	Quantity supported
4XG7A91860	BYVP	4514Y	ThinkSystem SD550 V3 Intel Xeon Silver 4514Y 16C 150W 2.0GHz Processor Option Kit	2
4XG7A91859	BYW6	4516Y+	ThinkSystem SD550 V3 Intel Xeon Silver 4516Y+ 24C 185W 2.2GHz Processor Option Kit	2
CTO only	BYVU	5512U	Intel Xeon Gold 5512U 28C 185W 2.1GHz Processor	1*

Part number	Feature code	SKU	Description	Quantity supported
4XG7A91869	BYVW	5515+	ThinkSystem SD550 V3 Intel Xeon Gold 5515+ 8C 165W 3.2GHz Processor Option Kit	2
4XG7A91858	BYW7	5520+	ThinkSystem SD550 V3 Intel Xeon Gold 5520+ 28C 205W 2.2GHz Processor Option Kit	2
4XG7A91868	BYVX	6526Y	ThinkSystem SD550 V3 Intel Xeon Gold 6526Y 16C 195W 2.8GHz Processor Option Kit	2
4XG7A91842	BYWK	6530	ThinkSystem SD550 V3 Intel Xeon Gold 6530 32C 270W 2.1GHz Processor Option Kit	2
4XG7A91865	BYW0	6534	ThinkSystem SD550 V3 Intel Xeon Gold 6534 8C 195W 3.9GHz Processor Option Kit	2
4XG7A91871	BYVQ	6538N	ThinkSystem SD550 V3 Intel Xeon Gold 6538N 32C 205W 2.1GHz Processor Option Kit	2
4XG7A91857	BYW8	6538Y+	ThinkSystem SD550 V3 Intel Xeon Gold 6538Y+ 32C 225W 2.2GHz Processor Option Kit	2
4XG7A91867	BYVY	6542Y	ThinkSystem SD550 V3 Intel Xeon Gold 6542Y 24C 250W 2.9GHz Processor Option Kit	2
4XG7A91864	BYW1	6544Y	ThinkSystem SD550 V3 Intel Xeon Gold 6544Y 16C 270W 3.6GHz Processor Option Kit	2
4XG7A91870	BYVR	6548N	ThinkSystem SD550 V3 Intel Xeon Gold 6548N 32C 250W 2.8GHz Processor Option Kit	2
4XG7A91866	BYVZ	6548Y+	ThinkSystem SD550 V3 Intel Xeon Gold 6548Y+ 32C 250W 2.5GHz Processor Option Kit	2
4XG7A91856	BYW9	6554S	ThinkSystem SD550 V3 Intel Xeon Gold 6554S 36C 270W 2.2GHz Processor Option Kit	2
4XG7A91840	BYW5	8558	ThinkSystem SD550 V3 Intel Xeon Platinum 8558 48C 330W 2.1GHz Processor Option Kit	2
4XG7A91854	BYWA	8558P	ThinkSystem SD550 V3 Intel Xeon Platinum 8558P 48C 350W 2.7GHz Processor Option Kit	2
CTO only	BYWE	8558U	Intel Xeon Platinum 8558U 48C 300W 2.0GHz Processor	1*
4XG7A91862	BYW2	8562Y+	ThinkSystem SD550 V3 Intel Xeon Platinum 8562Y+ 32C 300W 2.8GHz Processor Option Kit	2
4XG7A91850	BYWF	8568Y+	ThinkSystem SD550 V3 Intel Xeon Platinum 8568Y+ 48C 350W 2.3GHz Processor Option Kit	2
4XG7A91848	BYWG	8570	ThinkSystem SD550 V3 Intel Xeon Platinum 8570 56C 350W 2.1GHz Processor Option Kit	2
CTO only	BYWD	8571N	Intel Xeon Platinum 8571N 52C 300W 2.4GHz Processor	1*
4XG7A91846	BYWH	8580	ThinkSystem SD550 V3 Intel Xeon Platinum 8580 60C 350W 2.0GHz Processor Option Kit	2
CTO only	BYWC	8581V	Intel Xeon Platinum 8581V 60C 270W 2.0GHz Processor	1*
4XG7A91844	BYWJ	8592+	ThinkSystem SD550 V3 Intel Xeon Platinum 8592+ 64C 350W 1.9GHz Processor Option Kit	2
4XG7A91852	BYWB	8592V	ThinkSystem SD550 V3 Intel Xeon Platinum 8592V 64C 330W 2.0GHz Processor Option Kit	2

* These processors are single-socket capable processors and are only available in configure-to-order builds or in preconfigured models. Not available as option part numbers.

Configuration notes:

- Processor options include a heatsink but do not include a system fan

Processor features

Processors supported by the SD550 V3 introduce new embedded accelerators to add even more processing capability:

- QuickAssist Technology (Intel QAT)
Help reduce system resource consumption by providing accelerated cryptography, key protection, and data compression with Intel QuickAssist Technology (Intel QAT). By offloading encryption and decryption, this built-in accelerator helps free up processor cores and helps systems serve a larger number of clients.
- Intel Dynamic Load Balancer (Intel DLB)
Improve the system performance related to handling network data on multi-core Intel Xeon Scalable processors. Intel Dynamic Load Balancer (Intel DLB) enables the efficient distribution of network processing across multiple CPU cores/threads and dynamically distributes network data across multiple CPU cores for processing as the system load varies. Intel DLB also restores the order of networking data packets processed simultaneously on CPU cores.
- Intel Data Streaming Accelerator (Intel DSA)
Drive high performance for storage, networking, and data-intensive workloads by improving streaming data movement and transformation operations. Intel Data Streaming Accelerator (Intel DSA) is designed to offload the most common data movement tasks that cause overhead in data center-scale deployments. Intel DSA helps speed up data movement across the CPU, memory, and caches, as well as all attached memory, storage, and network devices.
- Intel In-Memory Analytics Accelerator (Intel IAA)
Run database and analytics workloads faster, with potentially greater power efficiency. Intel In-Memory Analytics Accelerator (Intel IAA) increases query throughput and decreases the memory footprint for in-memory database and big data analytics workloads. Intel IAA is ideal for in-memory databases, open source databases and data stores like RocksDB, Redis, Cassandra, and MySQL.
- Intel Advanced Matrix Extensions (Intel AMX)
Intel Advanced Matrix Extensions (Intel AMX) is a built-in accelerator in all Silver, Gold, and Platinum processors that significantly improves deep learning training and inference. With Intel AMX, you can fine-tune deep learning models or train small to medium models in just minutes. Intel AMX offers discrete accelerator performance without added hardware and complexity.

The processors also support a separate and encrypted memory space, known as the SGX Enclave, for use by Intel Software Guard Extensions (SGX). The size of the SGX Enclave supported varies by processor model. Intel SGX offers hardware-based memory encryption that isolates specific application code and data in memory. It allows user-level code to allocate private regions of memory (enclaves) which are designed to be protected from processes running at higher privilege levels.

The following table summarizes the key features of all supported 5th Gen processors in the SD550 V3.

Table 7. 5th Gen Intel Xeon Processor features

CPU model	Cores/ threads	Core speed (Base / TB max†)	L3 cache*	Max memory speed	UPI 2.0 links & speed	TDP	Accelerators				SGX Enclave Size
							QAT	DLB	DSA	IAA	
4514Y	16 / 32	2.0 / 3.4 GHz	30 MB	4400 MHz	2 / 16 GT/s	150W	0	0	1	0	64GB
4516Y+	24 / 48	2.2 / 3.7 GHz	45 MB	4400 MHz	2 / 16 GT/s	185W	1	1	1	1	64GB
5512U	28 / 56	2.1 / 3.7 GHz	52.5 MB	4800 MHz	None‡	185W	0	0	1	0	128GB
5515+	8 / 16	3.2 / 4.1 GHz	22.5 MB*	4800 MHz	3 / 20 GT/s	165W	1	1	1	1	128GB
5520+	28 / 56	2.2 / 4.0 GHz	52.5 MB	4800 MHz	3 / 20 GT/s	205W	1	1	1	1	128GB
6526Y	16 / 32	2.8 / 3.9 GHz	37.5 MB*	5200 MHz	3 / 20 GT/s	195W	0	0	1	0	128GB
6530	32 / 64	2.1 / 4.0 GHz	160 MB*	4800 MHz	3 / 20 GT/s	270W	0	0	1	0	128GB
6534	8 / 16	3.9 / 4.2 GHz	22.5 MB*	4800 MHz	3 / 20 GT/s	195W	0	0	1	0	128GB
6538N	32 / 64	2.1 / 4.1 GHz	60 MB	5200 MHz	3 / 20 GT/s	205W	2	2	1	0	128GB
6538Y+	32 / 64	2.2 / 4.0 GHz	60 MB	5200 MHz	3 / 20 GT/s	225W	1	1	1	1	128GB
6542Y	24 / 48	2.9 / 4.1 GHz	60 MB*	5200 MHz	3 / 20 GT/s	250W	0	0	1	0	128GB
6544Y	16 / 32	3.6 / 4.1 GHz	45 MB*	5200 MHz	3 / 20 GT/s	270W	0	0	1	0	128GB
6548N	32 / 64	2.8 / 4.1 GHz	60 MB	5200 MHz	3 / 20 GT/s	250W	2	2	1	0	128GB
6548Y+	32 / 64	2.5 / 4.1 GHz	60 MB	5200 MHz	3 / 20 GT/s	250W	1	1	1	1	128GB
6554S	36 / 72	2.2 / 4.0 GHz	180 MB*	5200 MHz	4 / 20 GT/s	270W	4	4	4	0	128GB
8558	48 / 96	2.1 / 4.0 GHz	260 MB*	5200 MHz	4 / 20 GT/s	330W	0	0	1	0	512GB
8558P	48 / 96	2.7 / 4.0 GHz	260 MB*	5600 MHz	3 / 20 GT/s	350W	1	1	1	1	512GB
8558U	48 / 96	2.0 / 4.0 GHz	260 MB*	4800 MHz	None‡	300W	0	0	1	0	512GB
8562Y+	32 / 64	2.8 / 4.1 GHz	60 MB	5600 MHz	3 / 20 GT/s	300W	1	1	1	1	512GB
8568Y+	48 / 96	2.3 / 4.0 GHz	300 MB*	5600 MHz	4 / 20 GT/s	350W	1	1	1	1	512GB
8570	56 / 112	2.1 / 4.0 GHz	300 MB*	5600 MHz	4 / 20 GT/s	350W	0	0	1	0	512GB
8571N	52 / 104	2.4 / 4.0 GHz	300 MB*	4800 MHz	None‡	300W	4	4	4	4	512GB
8580	60 / 120	2.0 / 4.0 GHz	300 MB*	5600 MHz	4 / 20 GT/s	350W	0	0	1	0	512GB
8581V	60 / 120	2.0 / 3.9 GHz	300 MB*	4800 MHz	None‡	270W	1	1	1	1	512GB
8592+	64 / 128	1.9 / 3.9 GHz	320 MB*	5600 MHz	4 / 20 GT/s	350W	1	1	1	1	512GB
8592V	64 / 128	2.0 / 3.9 GHz	320 MB*	4800 MHz	3 / 20 GT/s	330W	1	1	1	1	512GB

† The maximum single-core frequency at with the processor is capable of operating

* L3 cache is 1.875 MB per core or larger. Processors with a larger L3 cache per core are marked with an *

Intel On Demand feature licensing

Intel On Demand is a licensing offering from Lenovo for certain 4th Gen and 5th Gen Intel Xeon Scalable processors that implements software-defined silicon (SDSi) features. The licenses allow customers to activate the embedded accelerators and to increase the SGX Enclave size in specific processor models as their workload and business needs change.

The available upgrades are the following:

- Up to 4x QuickAssist Technology (Intel QAT) accelerators
- Up to 4x Intel Dynamic Load Balancer (Intel DLB) accelerators
- Up to 4x Intel Data Streaming Accelerator (Intel DSA) accelerators
- Up to 4x Intel In-Memory Analytics Accelerator (Intel IAA) accelerators
- 512GB SGX Enclave, an encrypted memory space for use by Intel Software Guard Extensions (SGX)

See the [Processor features](#) section for a brief description of each accelerator and the SGX Enclave.

The following table lists the ordering information for the licenses. Accelerator licenses are bundled together based on the suitable workloads each would benefit with the additional accelerators.

Licenses can be activated in the factory (CTO orders) using feature codes, or as field upgrades using the option part numbers. With the field upgrades, they allow customers to only activate the accelerators or to increase the SGX Enclave size when their applications can best take advantage of them.

Intel On Demand is licensed on individual processors. For servers with two processors, customers will need a license for each processor and the licenses of the two processors must match. If customers add a second processor as a field upgrade, then you must ensure that the Intel On Demand licenses match the first processor.

Each license enables a certain quantity of embedded accelerators - the total number of accelerators available after activation is listed in the table. For example, Intel On Demand Communications & Storage Suite 4 (4L47A89451), once applied to the server, will result in a total of 4x QAT, 4x DLB and 4x DSA accelerators to be enabled the processor. The number of IAA accelerators is unchanged in this example.

Table 8. Ordering information for Intel on Demand

Part number	Feature code	License bundle	Accelerators and SGX Enclave enabled after the upgrade is applied (NC = No change)				
			QAT	DLB	DSA	IAA	SGX Enclave
4L47A89451	BX9C	Intel On Demand Communications & Storage Suite 4 (CSS4)	4	4	4	NC	No change
4L47A89452	BX9D	Intel On Demand Analytics Suite 4 (AS4)	NC	NC	4	4	No change
4L47A89453	BX9A	Intel On Demand Communications & Storage Suite 2 (CSS2)	2	2	NC	NC	No change
4L47A89454	BX9B	Intel On Demand Analytics Suite 1 (AS1)	NC	NC	NC	1	No change
4L47A89455	BX9E	Intel On Demand SGX 512GB Enclave	NC	NC	NC	NC	512 GB

The following table lists the 5th Gen processors that support Intel on Demand. The table shows the default accelerators and default SGX Enclave size, and it shows (with green highlight) what the total new accelerators and SGX Enclave would be once the Intel On Demand features have been activated.

Table 9. Intel On Demand support by processor - 5th Gen processors

CPU model	Default accelerators and SGX Enclave					Intel On Demand upgrades					New accelerator quantities and SGX Enclave after applying Intel On Demand				
	QAT	DLB	DSA	IAA	SGX Enclv	BX9C	BX9D	BX9A	BX9B	BX9E	Green = additional accelerators/enclave added				
						CSS4 (4xQAT, 4xDLB, 4xDSA)	AS4 (4xDSA, 4xIAA)	CSS2 (2xQAT, 2xDLB)	AS1 (1xIAA)	SGX512	QAT	DLB	DSA	IAA	SGX Enclv
4514Y	0	0	1	0	64GB	No	No	No	Support	Support	0	0	1	1	512GB
4516Y+	1	1	1	1	64GB	No	No	Support	No	Support	2	2	1	1	512GB
5512U	0	0	1	0	128GB	No	No	No	Support	Support	0	0	1	1	512GB
5515+	1	1	1	1	128GB	No	No	Support	No	Support	2	2	1	1	512GB
5520+	1	1	1	1	128GB	No	No	Support	No	Support	2	2	1	1	512GB
6526Y	0	0	1	0	128GB	No	No	No	Support	Support	0	0	1	1	512GB
6530	0	0	1	0	128GB	No	Support	No	No	Support	0	0	4	4	512GB
6534	0	0	1	0	128GB	No	No	No	Support	Support	0	0	1	1	512GB
6538N	2	2	1	0	128GB	No	No	No	Support	Support	2	2	1	1	512GB
6538Y+	1	1	1	1	128GB	No	No	Support	No	Support	2	2	1	1	512GB
6542Y	0	0	1	0	128GB	No	No	No	Support	Support	0	0	1	1	512GB
6544Y	0	0	1	0	128GB	No	No	No	Support	Support	0	0	1	1	512GB
6548N	2	2	1	0	128GB	No	No	No	Support	Support	2	2	1	1	512GB
6548Y+	1	1	1	1	128GB	No	No	Support	No	Support	2	2	1	1	512GB
6554S	4	4	4	0	128GB	No	Support	No	No	Support	4	4	4	4	512GB
8558	0	0	1	0	512GB	No	Support	No	No	No	0	0	4	4	512GB
8558P	1	1	1	1	512GB	No	Support	No	No	No	1	1	4	4	512GB
8558U	0	0	1	0	512GB	No	Support	No	No	No	0	0	4	4	512GB
8562Y+	1	1	1	1	512GB	No	No	Support	No	No	2	2	1	1	512GB
8568Y+	1	1	1	1	512GB	Support	Support	No	No	No	4	4	4	4	512GB
8570	0	0	1	0	512GB	No	Support	No	No	No	0	0	4	4	512GB
8571N	4	4	4	4	512GB	No	No	No	No	No	4	4	4	0	512GB
8580	0	0	1	0	512GB	No	Support	No	No	No	0	0	4	4	512GB
8581V	1	1	1	1	512GB	No	Support	No	No	No	1	1	4	4	512GB
8592+	1	1	1	1	512GB	Support	Support	No	No	No	4	4	4	4	512GB
8592V	1	1	1	1	512GB	No	Support	No	No	No	1	1	4	4	512GB

Configuration rules:

- Not all processors support Intel On Demand upgrades - see the table for those that do not support Intel On Demand
- Upgrades can be performed in the factory (feature codes) or in the field (part numbers) but not both, and only one time
- Upgrades cannot be removed once activated
- SGX Enclave upgrades are independent of the accelerator upgrades; install either or both as desired
- For processors that support more than one upgrade, all upgrades must be performed at the same time
- Only one of each type of upgrade can be applied to a processor (eg 2x BX9A is not supported; 4x BX9B is not supported)
- The following processors support two accelerator upgrades, Intel On Demand Analytics Suite 4

(4L47A89452) and Intel On Demand Communications & Storage Suite 4 (4L47A89451); the table(s) above shows the accelerators based on both upgrades being applied.

- Intel Xeon Platinum 8568Y+
- Intel Xeon Platinum 8592+
- The number of accelerators listed for each upgrade is the number of accelerators that will be active one the upgrade is complete (ie the total number, not the number to be added)
- If a server has two processors, then two feature codes must be selected, one for each processor. The upgrades on the two processors must be identical.
- If a one-processor server with Intel On Demand features activated on it has a 2nd processor added as a field upgrade, the 2nd processor must also have the same features activated by purchasing the appropriate part numbers.

One-processor configurations

The SD550 V3 can be used with only one processor installed. Most core functions of the server (including the XClarity Controller) are connected to processor 1 as shown in the [System architecture](#) section.

With only one processor, the server has the following capabilities:

- 8 memory DIMMs for a 1TB maximum
- PCIe slot 1 is available with configurations of 2x NVMe drives
- PCIe slot 2 is not available
- Internal (CFF) RAID is not supported

UEFI operating modes

The SD550 V3 offers preset operating modes that affect energy consumption and performance. These modes are a collection of predefined low-level UEFI settings that simplify the task of tuning the server to suit your business and workload requirements.

The following table lists the feature codes that allow you to specify the mode you wish to preset in the factory for CTO orders.

Table 10. UEFI operating mode presets in DCSC

Feature code	Description
BFYB	Operating mode selection for: "Maximum Performance Mode"
BFYC	Operating mode selection for: "Minimal Power Mode"
BFYD	Operating mode selection for: "Efficiency Favoring Power Savings Mode"
BFYE	Operating mode selection for: "Efficiency - Favoring Performance Mode"

The preset modes for the SD550 V3 are as follows:

- **Maximum Performance Mode** (feature BFYB): Achieves maximum performance but with higher power consumption and lower energy efficiency.
- **Minimal Power Mode** (feature BFYC): Minimize the absolute power consumption of the system.
- **Efficiency Favoring Power Savings Mode** (feature BFYD): Maximize the performance/watt efficiency with a bias towards power savings. This is the favored mode for SPECpower benchmark testing, for example.
- **Efficiency Favoring Performance Mode** (feature BFYE): Maximize the performance/watt efficiency with a bias towards performance. This is the favored mode for Energy Star certification, for example.

For details about these preset modes, and all other performance and power efficiency UEFI settings offered in the SD550 V3, see the paper "Tuning UEFI Settings for Performance and Energy Efficiency on Intel Xeon Scalable Processor-Based ThinkSystem Servers", available from <https://lenovopress.lenovo.com/lp1477>.

Memory options

The SD550 V3 uses Lenovo TruDDR5 memory operating at up to 5600 MHz. The server supports up to 16 DIMMs with 2 processors. The processors have 8 memory channels and support 1 DIMMs per channel (DPC). The server supports up to 2TB of memory using 16x 128GB 3DS RDIMMs and two processors.

Lenovo TruDDR5 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 TruDDR5 memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

The following table lists the 5600 MHz memory options that are currently supported by the SD550 V3.

Table 11. 5600 MHz memory options

Part number	Feature code	Description	DRAM technology
10x4 RDIMMs - 5600 MHz			
4X77A88049	BWHW	ThinkSystem 32GB TruDDR5 5600MHz (1Rx4) 10x4 RDIMM	16Gb
4X77A88052	BWHS	ThinkSystem 64GB TruDDR5 5600MHz (2Rx4) 10x4 RDIMM	16Gb
4X77A88058	BWHV	ThinkSystem 96GB TruDDR5 5600MHz (2Rx4) RDIMM	24Gb
x8 RDIMMs - 5600 MHz			
4X77A88051	BWJC	ThinkSystem 32GB TruDDR5 5600MHz (2Rx8) RDIMM	16Gb
4X77A88056	BWSL	ThinkSystem 24GB TruDDR5 5600MHz (1Rx8) RDIMM	24Gb
4X77A88057	BWJD	ThinkSystem 48GB TruDDR5 5600MHz (2Rx8) RDIMM	24Gb
3DS RDIMMs - 5600 MHz			
4X77A88054	BWHU	ThinkSystem 128GB TruDDR5 5600MHz (4Rx4) 3DS RDIMM	16Gb

For more information on DDR5 memory, see the Lenovo Press paper, *Introduction to DDR5 Memory*, available from <https://lenovopress.com/lp1618>.

The following rules apply when selecting the memory configuration:

- All memory DIMMs must be identical part numbers; mixing is not supported
- The SD550 V3 supports the following memory quantities:
 - 16Gb DRAM DIMMs: 1, 2, 4, 6, or 8 per processor
 - 24Gb DRAM DIMMs: 1, 6, 8 per processor
- The memory channels will operate at 5600 MHz or the speed of the processor's memory bus, whichever is lower

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 all 8 memory channels.

The following memory protection technologies are supported:

- ECC detection/correction
- Bounded Fault detection/correction
- SDDC (for x4-based memory DIMMs; look for "x4" in the DIMM description)
- ADDDC (for 10x4-based memory DIMMs, not supported with 9x4 DIMMs)
- Memory mirroring

See the Lenovo Press article "RAS Features of the Lenovo ThinkSystem Intel Servers" for more information about memory RAS features: <https://lenovopress.lenovo.com/lp1711-ras-features-of-the-lenovo-thinksystem-intel-servers>

If memory channel mirroring is used, then DIMMs must be installed in pairs (minimum of one pair per processor), and both DIMMs in the pair must be identical in type and size. 50% of the installed capacity is available to the operating system. Memory rank sparing is not supported.

Internal storage

The SD550 V3 offers six 2.5-inch hot-swap drive bays supporting SATA, SAS or NVMe drives, depending on the controllers selected.

With 2 processors, the server supports either:

- 6x NVMe drives using onboard NVMe connections
- 6x SATA drives using onboard SATA connections
- 6x SAS or SATA drives using an internal (CFF) RAID adapter
- Mix of SAS, SATA and NVMe drives, with onboard NVMe connections and a CFF RAID adapter

With 1 processor, the server supports either:

- 2x NVMe drives + 4x SATA drives using onboard NVMe and SATA connections (supports the use of PCIe slot 1)
- 6x NVMe drives using onboard NVMe connections, provided no slots are selected
- 6x SATA drives using onboard SATA connections

Note: The use of an internal (CFF) RAID adapter is not supported with a 1-processor configuration

Topics in this section:

- [Ordering information](#)
- [Field upgrades for storage](#)
- [M.2 drives](#)
- [SED encryption key management with SKLM](#)

Ordering information

The drive backplane is optional in CTO orders and is available as a field upgrade. Ordering information is listed in the table below.

Table 12. Drive backplane

Part number	Feature code	Description
4TA7A91722	BWJG	6 Tray Any-Bay Backplane

Field upgrades for storage

The front drive bay backplane is optional and can be ordered as a field upgrade as listed in the following table.

Tip: The drive cage and drive bay fillers are included in all configurations; only the backplane and cables optional and are included in the part number listed below.

Table 13. Drive backplane

Part number	Description
4TA7A91722	ThinkSystem SD555 V3 Anybay 6 Drive Backplane Kit with Cables <ul style="list-style-type: none">• 1x Backplane (SBB7A75445)• 1x Power cable (SBB7A77078)• 1x SATA cable (SBB7A77077)• 1x NVMe cable for 2x NVMe drives (1-CPU configuration with PCIe slot 1) (SBB7A77076)• 1x NVMe cable for 6x NVMe drives (2-CPU configurations or 1-CPU configuration without PCIe slot 1) (SBB7A77075)

It is also supported to add an Internal (CFF) RAID adapter as a field upgrade for 2-processor configurations. You will need to order the RAID adapter separately.

Table 14. Internal (CFF) RAID adapter field upgrade

Part number	Description
4X97A91725	ThinkSystem RAID SD550 V3 Kit for 2 CPU configurations(w/o RAID Card) <ul style="list-style-type: none">• RAID adapter mounting tray (SBB7A75451)• PCIe cable (BB7A77066) and power cable (SBB7A77067) for the adapter• SAS cable to backplane (SBB7A77068)

M.2 drives

The SD550 V3 supports one or two M.2 form-factor SATA or NVMe drives for use as an operating system boot solution. The M.2 drives install two dedicated M.2 slots on the system board. See the internal view of the server in the [Components and connectors](#) section for the location of the M.2 slots.

SED encryption key management with SKLM

The server supports self-encrypting drives (SEDs) as listed in the [Internal drive options](#) section. To effectively manage a large deployment of these drives in Lenovo servers, IBM Security Key Lifecycle Manager (SKLM) offers a centralized key management solution. A Lenovo Feature on Demand (FoD) upgrade is used to enable this SKLM support in the management processor of the server.

The following table lists the part numbers and feature codes for the upgrades.

Table 15. FoD upgrades for SKLM support

Part number	Feature code	Description
Security Key Lifecycle Manager - FoD (United States, Canada, Asia Pacific, and Japan)		
00D9998	A5U1	SKLM for System x/ThinkSystem w/SEDs - FoD per Install with 1 year S&S
00D9999	AS6C	SKLM for System x/ThinkSystem w/SEDs - FoD per Install with 3 year S&S
Security Key Lifecycle Manager - FoD (Latin America, Europe, Middle East, and Africa)		
00FP648	A5U1	SKLM for System x/ThinkSystem w/SEDs - FoD per Install with 1 year S&S
00FP649	AS6C	SKLM for System x/ThinkSystem w/SEDs - FoD per Install with 3 year S&S

The IBM Security Key Lifecycle Manager software is available from Lenovo using the ordering information listed in the following table.

Table 16. IBM Security Key Lifecycle Manager licenses

Part number	Description
7S0A007FWW	IBM Security Key Lifecycle Manager Basic Edition Install License + SW Subscription & Support 12 Months
7S0A007HWW	IBM Security Key Lifecycle Manager For Raw Decimal Terabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months
7S0A007KWW	IBM Security Key Lifecycle Manager For Raw Decimal Petabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months
7S0A007MWW	IBM Security Key Lifecycle Manager For Usable Decimal Terabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months
7S0A007PWW	IBM Security Key Lifecycle Manager For Usable Decimal Petabyte Storage Resource Value Unit License + SW Subscription & Support 12 Months

Controllers for internal storage

The drives of the SD550 V3 are connected using these controllers:

- Onboard PCIe 5.0 x4 NVMe ports (RAID functionality is provided by [Intel VROC](#))
- Onboard SATA ports (RAID functionality is provided by [Intel VROC](#))
- Internal (CFF) SAS/SATA RAID adapter

The following table lists the ordering information for the controllers.

Table 17. Internal Storage adapter support

Part number	Feature code	Description
Onboard SATA or NVMe		
None	AVV0	On Board SATA Software RAID Mode
None	BC4V	Non RAID NVMe
RAID adapters		
4Y37A84028	BRQV	ThinkSystem RAID 5350-8i PCIe 12Gb Internal Adapter
4Y37A72484	BJHM	ThinkSystem RAID 9350-8i 2GB Flash PCIe 12Gb Internal Adapter

Configuration notes:

- The use of a RAID adapter requires 2 processors. For field upgrades to add the RAID controller, see the [Field upgrades for storage](#) section.
- The RAID 9350-8i adapter includes a RAID flash power module (supercap) which is mounted on the air baffle of CPU 1 as shown in the [Components and connectors](#) section. The cable used to connect the adapter to the supercap is either automatically derived (for CTO orders) or is included with the adapter (for field upgrades).

Intel VROC onboard RAID

Intel VROC (Virtual RAID on CPU) is a feature of the Intel processor that enables RAID support.

There are two separate functions of VROC in the SD550 V3:

- Intel VROC SATA RAID, formerly known as Intel RSTe
- Intel VROC NVMe RAID

VROC SATA RAID (RSTe) is available and supported with all SATA drives, both SATA SSDs and SATA HDDs. It offers a 6 Gb/s connection to each drive and on the SD550 V3 implements RAID levels 0, 1, 5, and 10. RAID 1 is limited to 2 drives per array, and RAID 10 is limited to 4 drives per array. Hot-spare functionality is also supported.

VROC NVMe RAID offers RAID support for any NVMe drives directly connected to the ports on the server's system board or via adapters such as NVMe retimers or NVMe switch adapters. On the SD550 V3, RAID levels implemented are based on the VROC feature selected as indicated in the following table. RAID 1 is limited to 2 drives per array, and RAID 10 is limited to 4 drives per array. Hot-spare functionality is also supported.

Performance tip: For best performance with VROC NVMe RAID, the drives in an array should all be connected to the same processor. Spanning processors is possible however performance will be unpredictable and should be evaluated based on your workload.

The SD550 V3 supports the VROC NVMe RAID offerings listed in the following table.

Tip: These feature codes and part numbers are only for VROC RAID using NVMe drives, not SATA drives

Table 18. Intel VROC NVMe RAID ordering information and feature support

Part number	Feature code	Description	Intel NVMe SSDs	Non-Intel NVMe SSDs	RAID 0	RAID 1	RAID 10	RAID 5
4L47A92670	BZ4W	Intel VROC RAID1 Only	Yes	Yes	No	Yes	No	No
4L47A83669	BR9B	Intel VROC (VMD NVMe RAID) Standard	Yes	Yes	Yes	Yes	Yes	No
4L47A39164	B96G	Intel VROC (VMD NVMe RAID) Premium	Yes	Yes	Yes	Yes	Yes	Yes

Configuration notes:

- If a feature code is ordered in a CTO build, the VROC functionality is enabled in the factory. For field upgrades, order a part number and it will be fulfilled as a Feature on Demand (FoD) license which can then be activated via the XCC management processor user interface.

Virtualization support: Virtualization support for Intel VROC is as follows:

- **VROC SATA RAID (RSTe)**: VROC SATA RAID is not supported by virtualization hypervisors such as ESXi, KVM, Xen, and Hyper-V. Virtualization is only supported on the onboard SATA ports in AHCI (non-RAID) mode.
- **VROC (VMD) NVMe RAID**: VROC (VMD) NVMe RAID is supported by ESXi, KVM, Xen, and Hyper-V. ESXi support is limited to RAID 1 only; other RAID levels are not supported. Windows and Linux OSes support VROC RAID NVMe, both for host boot functions and for guest OS function, and RAID-0, 1, 5, and 10 are supported. On ESXi, VROC is supported with both boot and data drives.

Internal drive options

The following tables list the drive options for internal storage of the server.

2.5-inch hot-swap drives:

- [2.5-inch hot-swap 24 Gb SAS SSDs](#)
- [2.5-inch hot-swap 6 Gb SATA SSDs](#)
- [2.5-inch hot-swap PCIe 5.0 NVMe SSDs](#)
- [2.5-inch hot-swap PCIe 4.0 NVMe SSDs](#)

M.2 drives:

- [M.2 SATA drives](#)
- [M.2 PCIe 4.0 NVMe drives](#)

SED support: The tables include a column to indicate which drives support SED encryption. The encryption functionality can be disabled if needed. Note: Not all SED-enabled drives have "SED" in the description.

Table 19. 2.5-inch hot-swap 24 Gb SAS SSDs

Part number	Feature code	Description	SED support	Max Qty
2.5-inch hot-swap SSDs - 24 Gb SAS - Mixed Use/Mainstream (3-5 DWPD)				
4XB7A80340	BNW8	ThinkSystem 2.5" PM1655 800GB Mixed Use SAS 24Gb HS SSD	Support	6
4XB7A80341	BNW9	ThinkSystem 2.5" PM1655 1.6TB Mixed Use SAS 24Gb HS SSD	Support	6
4XB7A80342	BNW6	ThinkSystem 2.5" PM1655 3.2TB Mixed Use SAS 24Gb HS SSD	Support	6
4XB7A80343	BP3K	ThinkSystem 2.5" PM1655 6.4TB Mixed Use SAS 24Gb HS SSD	Support	6
2.5-inch hot-swap SSDs - 24 Gb SAS - Read Intensive/Entry/Capacity (<3 DWPD)				
4XB7A80318	BNWC	ThinkSystem 2.5" PM1653 960GB Read Intensive SAS 24Gb HS SSD	Support	6
4XB7A80319	BNWE	ThinkSystem 2.5" PM1653 1.92TB Read Intensive SAS 24Gb HS SSD	Support	6
4XB7A80320	BNWF	ThinkSystem 2.5" PM1653 3.84TB Read Intensive SAS 24Gb HS SSD	Support	6
4XB7A80321	BP3E	ThinkSystem 2.5" PM1653 7.68TB Read Intensive SAS 24Gb HS SSD	Support	6
4XB7A80322	BP3J	ThinkSystem 2.5" PM1653 15.36TB Read Intensive SAS 24Gb HS SSD	Support	6

Table 20. 2.5-inch hot-swap 6 Gb SATA SSDs

Part number	Feature code	Description	SED support	Max Qty
2.5-inch hot-swap SSDs - 6 Gb SATA - Mixed Use/Mainstream (3-5 DWPD)				
4XB7A82289	BQ21	ThinkSystem 2.5" 5400 MAX 480GB Mixed Use SATA 6Gb HS SSD	Support	6
4XB7A82290	BQ24	ThinkSystem 2.5" 5400 MAX 960GB Mixed Use SATA 6Gb HS SSD	Support	6
4XB7A82291	BQ22	ThinkSystem 2.5" 5400 MAX 1.92TB Mixed Use SATA 6Gb HS SSD	Support	6
4XB7A82292	BQ23	ThinkSystem 2.5" 5400 MAX 3.84TB Mixed Use SATA 6Gb HS SSD	Support	6
4XB7A17125	BA7Q	ThinkSystem 2.5" S4620 480GB Mixed Use SATA 6Gb HS SSD	No	6
4XB7A17126	BA4T	ThinkSystem 2.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	No	6
4XB7A17127	BA4U	ThinkSystem 2.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	No	6
4XB7A17128	BK7L	ThinkSystem 2.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	No	6
2.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)				
4XB7A82258	BQ1Q	ThinkSystem 2.5" 5400 PRO 240GB Read Intensive SATA 6Gb HS SSD	Support	6
4XB7A82259	BQ1P	ThinkSystem 2.5" 5400 PRO 480GB Read Intensive SATA 6Gb HS SSD	Support	6
4XB7A82260	BQ1R	ThinkSystem 2.5" 5400 PRO 960GB Read Intensive SATA 6Gb HS SSD	Support	6
4XB7A82261	BQ1X	ThinkSystem 2.5" 5400 PRO 1.92TB Read Intensive SATA 6Gb HS SSD	Support	6
4XB7A82262	BQ1S	ThinkSystem 2.5" 5400 PRO 3.84TB Read Intensive SATA 6Gb HS SSD	Support	6
4XB7A82263	BQ1T	ThinkSystem 2.5" 5400 PRO 7.68TB Read Intensive SATA 6Gb HS SSD	Support	6
4XB7A17072	B99D	ThinkSystem 2.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	No	6
4XB7A17101	BA7G	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	No	6
4XB7A17102	BA7H	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	No	6
4XB7A17103	BA7J	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	No	6
4XB7A17104	BK77	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	No	6
4XB7A17105	BK78	ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	No	6

Table 21. 2.5-inch hot-swap PCIe 5.0 NVMe SSDs

Part number	Feature code	Description	SED support	Max Qty
2.5-inch SSDs - U.2 PCIe 5.0 NVMe - Read Intensive/Entry (<3 DWPD)				
4XB7A82366	BTPZ	ThinkSystem 2.5" U.3 PM1743 1.92TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	Support	6
4XB7A82367	BTQ0	ThinkSystem 2.5" U.3 PM1743 3.84TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	Support	6
4XB7A82368	BTQ1	ThinkSystem 2.5" U.3 PM1743 7.68TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	Support	6
4XB7A82369	BTQ2	ThinkSystem 2.5" U.3 PM1743 15.36TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	Support	6

Table 22. 2.5-inch hot-swap PCIe 4.0 NVMe SSDs

Part number	Feature code	Description	SED support	Max Qty
2.5-inch SSDs - U.2 PCIe 4.0 NVMe - Mixed Use/Mainstream (3-5 DDPD)				
4XB7A17129	BNEG	ThinkSystem 2.5" U.2 P5620 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A17130	BNEH	ThinkSystem 2.5" U.2 P5620 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A17133	BNEZ	ThinkSystem 2.5" U.2 P5620 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A17136	BA4V	ThinkSystem 2.5" U.2 P5620 12.8TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	Support	6
2.5-inch SSDs - U.3 PCIe 4.0 NVMe - Mixed Use/Mainstream (3-5 DDPD)				
4XB7A79639	BNF1	ThinkSystem 2.5" U.3 7450 MAX 800GB Mixed Use NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A13967	BNEJ	ThinkSystem 2.5" U.3 7450 MAX 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A13970	BNEY	ThinkSystem 2.5" U.3 7450 MAX 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A13971	BNEL	ThinkSystem 2.5" U.3 7450 MAX 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	Support	6
2.5-inch SSDs - U.2 PCIe 4.0 NVMe - Read Intensive/Entry (<3 DDPD)				
4XB7A13941	BMGD	ThinkSystem 2.5" U.2 P5520 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A13942	BMGE	ThinkSystem 2.5" U.2 P5520 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A13943	BNEF	ThinkSystem 2.5" U.2 P5520 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A13631	BNEQ	ThinkSystem 2.5" U.2 P5520 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	Support	6
2.5-inch SSDs - U.3 PCIe 4.0 NVMe - Read Intensive/Entry (<3 DDPD)				
4XB7A79646	BNF3	ThinkSystem 2.5" U.3 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A79647	BNF2	ThinkSystem 2.5" U.3 7450 PRO 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A79648	BNF5	ThinkSystem 2.5" U.3 7450 PRO 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	Support	6
4XB7A79649	BNF4	ThinkSystem 2.5" U.3 7450 PRO 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	Support	6

Table 23. M.2 SATA drives

Part number	Feature code	Description	SED support	Max Qty
M.2 SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)				
4XB7A82286	BQ1Z	ThinkSystem M.2 5400 PRO 240GB Read Intensive SATA 6Gb NHS SSD	Support	2
4XB7A82287	BQ1Y	ThinkSystem M.2 5400 PRO 480GB Read Intensive SATA 6Gb NHS SSD	Support	2
4XB7A82288	BQ20	ThinkSystem M.2 5400 PRO 960GB Read Intensive SATA 6Gb NHS SSD	Support	2

Table 24. M.2 PCIe 4.0 NVMe drives

Part number	Feature code	Description	SED support	Max Qty
M.2 SSDs - PCIe 4.0 NVMe - Read Intensive/Entry (<3 DWPD)				
4XB7A90102	BXMH	ThinkSystem M.2 PM9A3 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD	Support	2
4XB7A90103	BXMG	ThinkSystem M.2 PM9A3 1.92TB Read Intensive NVMe PCIe 4.0 x4 NHS SSD	Support	2
4XB7A90118	BYTD	ThinkSystem M.2 PM9A3 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD (with Heatsink)	Support	2
4XB7A90119	BYTE	ThinkSystem M.2 PM9A3 1.92TB Read Intensive NVMe PCIe 4.0 x4 NHS SSD (with Heatsink)	Support	2
4XB7A90120	BYTF	ThinkSystem M.2 PM9A3 3.84TB Read Intensive NVMe PCIe 4.0 x4 NHS SSD (with Heatsink)	Support	2
4XB7A83139	BS46	ThinkSystem M.2 7450 PRO 480GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD (with Heatsink)	Support	2
4XB7A82674	BQUJ	ThinkSystem M.2 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD (with Heatsink)	Support	2

I/O expansion options

The SD550 V3 has the following I/O slots for adapters:

- Optional riser with 1 or 2 slots, depending on the number of processors installed. Slots are PCIe x16 full-height half-length (FHHL) slots
- With two processors installed:
 - Slot 1: PCIe 4.0 x16, connects to CPU 2
 - Slot 2: PCIe 5.0 x16, connects to CPU 2
- With one processor installed:
 - Slot 1: PCIe 5.0 x16, connects to CPU 1 with only 2x NVMe drives; Not connected if 6x NVMe drives are required
 - Slot 2: Not connected
- Optional OCP 3.0 slot: PCIe 5.0 x16, connected to CPU 1

Both the OCP slot and Riser are optional, and ordering information is listed in the following table.

For riser slot field upgrades, two kits are available - one for a 2-CPU configuration (riser connects to CPU 2) or a 1-CPU configuration (riser connects to CPU 1). See the block diagram in the [System architecture](#) section to see the connections.

Tip: The only difference between the two option kits is the PCIe cable that connects the riser to the system board.

Ordering information is listed in the following table.

Table 25. OCP slot and PCIe slot riser

Part number	Feature code	Description	Purpose
4TA7A91724	BWJA	ThinkSystem SD550 V3 SD530 V3 Rear OCP Kit <ul style="list-style-type: none"> • Cable with OCP connector 	Enables the OCP slot
4TA7A91721	BWJJ	ThinkSystem SD550 V3 Riser Kit for 1 CPU configurations (Under75W) <ul style="list-style-type: none"> • Riser and riser cage • 2x PCIe slot covers • Power cable • PCIe cable to route the PCIe riser to CPU 1 	Adds PCIe Slot 1 for a 1-CPU configuration
4TA7A91720	BWJH	ThinkSystem SD550 V3 Riser Kit for 2 CPU configurations (Under 75W) <ul style="list-style-type: none"> • Riser and riser cage • 2x PCIe slot covers • Power cable • PCIe cable to route the PCIe riser to CPU 2 	Adds PCIe Slot 1 & 2 for a 2-CPU configuration

Configuration notes:

- The use of PCIe slot 2 requires two processors
- The OCP slot is optional but is supported with one or two processors
- With one processor installed, the server supports 2x NVMe drives with one PCIe slot, or 6x NVMe drives without a PCIe slot

Network adapters

The server supports network adapters installed in the OCP and PCIe slots.

The following table lists the supported OCP adapters.

Table 26. OCP network adapters

Part number	Feature code	Description	Maximum supported
Gigabit Ethernet			
4XC7A08277	B93E	ThinkSystem Intel I350 1GbE RJ45 4-port OCP Ethernet Adapter	1
10 Gb Ethernet			
4XC7A08236	B5ST	ThinkSystem Broadcom 57416 10GBASE-T 2-port OCP Ethernet Adapter	1
4XC7A08278	BCD5	ThinkSystem Intel X710-T2L 10GBASE-T 2-port OCP Ethernet Adapter	1
4XC7A80268	BPPY	ThinkSystem Intel X710-T4L 10GBase-T 4-Port OCP Ethernet Adapter	1
25 Gb Ethernet			

Part number	Feature code	Description	Maximum supported
4XC7A08237	BN2T	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1
4XC7A80567	BPPW	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-Port OCP Ethernet Adapter	1
4XC7A08294	BCD4	ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1
4XC7A80269	BP8L	ThinkSystem Intel E810-DA4 10/25GbE SFP28 4-Port OCP Ethernet Adapter	1
4XC7A62582	BE4T	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1
100 Gb Ethernet			
4XC7A08243	BPPX	ThinkSystem Broadcom 57508 100GbE QSFP56 2-Port OCP Ethernet Adapter	1

The following table lists the supported PCIe adapters.

Table 27. PCIe network adapters

Part number	Feature code	Description	Maximum supported
Gigabit Ethernet			
7ZT7A00535	AUZW	ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	2
10 Gb Ethernet			
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	2
4XC7A08245	B5SU	ThinkSystem Broadcom 57454 10GBASE-T 4-port PCIe Ethernet Adapter	2
4XC7A80266	BNWL	ThinkSystem Intel X710-T2L 10GBase-T 2-Port PCIe Ethernet Adapter	2
4XC7A79699	BMXB	ThinkSystem Intel X710-T4L 10GBase-T 4-Port PCIe Ethernet Adapter	2
25 Gb Ethernet			
4XC7A08238	BK1H	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter	2
4XC7A80566	BNWM	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-Port PCIe Ethernet Adapter	2
4XC7A08295	BCD6	ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	2
4XC7A80267	BP8M	ThinkSystem Intel E810-DA4 10/25GbE SFP28 4-Port PCIe Ethernet Adapter	2
4XC7A62580	BE4U	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	2
100 Gb Ethernet			
4XC7A08297	BK1J	ThinkSystem Broadcom 57508 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter	2
4XC7A08248	B8PP	ThinkSystem Mellanox ConnectX-6 Dx 100GbE QSFP56 2-port PCIe 4 Ethernet Adapter	2
4C57A14177	B4R9	ThinkSystem Mellanox ConnectX-6 HDR100/100GbE QSFP56 1-port PCIe VPI Adapter	2
200 Gb Ethernet			

Part number	Feature code	Description	Maximum supported
4C57A15326	B4RC	ThinkSystem Mellanox ConnectX-6 HDR/200GbE QSFP56 1-port PCIe 4 VPI Adapter	2
4XC7A81883	BQBN	ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 InfiniBand Adapter	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>

Fibre Channel host bus adapters

The following table lists the Fibre Channel HBAs supported by the SD550 V3.

Table 28. Fibre Channel host bus adapters

Part number	Feature code	Description	Maximum supported
16 Gb Fibre Chanel			
01CV840	ATZV	Emulex 16Gb Gen6 FC Dual-port HBA	2
32 Gb Fibre Chanel			
4XC7A76525	BJ3H	ThinkSystem Emulex LPe35002 32Gb 2-port PCIe Fibre Channel Adapter V2	2
4XC7A08276	BA1F	ThinkSystem QLogic QLE2772 32Gb 2-Port PCIe Fibre Channel Adapter	2

SAS adapters for external storage

The following table lists the SAS HBAs for external storage connectivity that are supported by the SD550 V3.

Table 29. SAS adapters for external storage

Part number	Feature code	Description	Maximum supported
4Y37A09724	B8P7	ThinkSystem 440-16e SAS/SATA PCIe Gen4 12Gb HBA	1

GPU adapters

The following table lists the GPUs supported by the SD550 V3.

Table 30. GPU adapters

Part number	Feature code	Description	Maximum supported
4X67A86130	BU00	ThinkSystem Intel Flex 140 12GB Gen4 Passive GPU	2
4X67A84824	BS2C	ThinkSystem NVIDIA L4 24GB PCIe Gen4 Passive GPU	2*

* Controlled GPU, not available in all markets. For CTO orders, see the [SD550 V3 models](#) section

Flash storage adapters

The SD550 V3 does not support Flash storage adapters.

Cooling

Each SD550 V3 has 3 simple-swap 60mm dual-rotor N+1 redundant fans which are used to cool all components. All fans are standard.

In addition, each power supply has its own integrated fan. All fans are located at the rear of the enclosure as shown in the [Components and connectors](#) section.

There is no ordering information for the fans. All fans are included with the base system.

Power supplies

The D3 Chassis supports three redundant hot-swap power supplies. The power supply choices are listed in the following table.

Power management is managed by the XCC2 service processor in one of the servers installed in the chassis (referred to as the "master node"). Management tasks include power supply sensor and fault reading, power policy, throttling in the event of a power supply failure, and power supply firmware updates. If the master node goes offline, another node in the chassis will automatically take on this role.

Tip: When configuring a server in the DCSC configurator, power consumption is calculated precisely by interfacing with Lenovo Capacity Planner. You can therefore select the appropriate power supply for your configuration. However, do consider future upgrades that may require additional power needs.

Table 31. Power supply options

Part number	Feature code	Description	Max qty	Connector	Markets
80 PLUS Titanium					
4P57A87628	BWJV	ThinkSystem 1300W 230V Titanium CRPS Hot-Swap Power Supply v1.1	3	C13	All markets
4P57A87750	C04Q	ThinkSystem 1600W 230V Titanium Hot-Swap CRPS Power Supply v1.1	3	C13	All markets
4P57A87629	BYF6	ThinkSystem 2700W 230V Titanium CRPS Hot-Swap Power Supply v1.1	3	C19	All markets
80 PLUS Platinum					
4P57A89327	BYF2	ThinkSystem 1300W 230V/115V Platinum CRPS Hot-Swap Power Supply v1.1	3	C13	All markets except UK and EU countries
4P57A89328	BYF3	ThinkSystem 1300W 230V/115V Platinum CRPS Hot-Swap Power Supply v1.2	3	C13	All markets except UK and EU countries
4P57A89329	BYF4	ThinkSystem 2700W 230V Platinum CRPS Hot-Swap Power Supply v1.1	3	C19	All markets except UK and EU countries
4P57A89330	BYF5	ThinkSystem 2700W 230V Platinum CRPS Hot-Swap Power Supply v1.2	3	C19	All markets except UK and EU countries

Supported power supplies support 200-240V AC 50/60 Hz input power. For China customers, all power supplies support 240V DC.

Configuration rules:

- Power supplies are available only in certain markets, as indicated in the table.
- All power supplies used in a chassis must be identical part numbers.
- Power supply options do not include a line cord. Configure-to-order models can be configured with or without power cords.

Power supply LEDs

The supported hot-swap power supplies have the following LEDs:

- Power input LED:
 - Green: The power supply is connected to the AC power source
 - Off: The power supply is disconnected from the AC power source or a power problem has occurred
- Power output LED:
 - Green: The server is on and the power supply is working normally
 - Blinking green: The power supply is in Zero-output/Standby mode (see below)
 - Off: The server is powered off, or the power supply is not working properly
- Power supply error LED:
 - Off: The power supply is working normally
 - Yellow: The power supply has failed

Zero-output mode: When Zero-output mode (also known as Standby mode or Cold Redundancy mode) is configured in XCC and the server power load is sufficiently low, one of the installed power supplies enters into the Standby state while the other one delivers entire load. When the power load increases, the standby power supply will switch to Active state to provide sufficient power to the server. Zero-output mode can be enabled or disabled in the XClarity Controller web interface, Server Configuration > Power Policy. If you select Disable, then both power supplies will be in the Active state.

Power cords

Line cords and rack power cables with C13 connectors can be ordered as listed in the following table.

Table 32. Power cords

Part number	Feature code	Description
Rack cables		
00Y3043	A4VP	1.0m, 10A/100-250V, C13 to C14 Jumper Cord
4L67A08367	B0N5	1.0m, 13A/100-250V, C13 to C14 Jumper Cord
39Y7937	6201	1.5m, 10A/100-250V, C13 to C14 Jumper Cord
4L67A08368	B0N6	1.5m, 13A/100-250V, C13 to C14 Jumper Cord
4L67A08365	B0N4	2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
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

Part number	Feature code	Description
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
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
81Y2375	6317	2.8m, 10A/250V, C13 to CNS 10917 (Taiwan) Line Cord
81Y2389	6531	4.3m, 10A/250V, 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
46M2592	A1RF	2.8m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord
4L67A08361	6373	4.3m, 10A/250V, C13 to NEMA 6-15P (US) Line Cord

Power cords (C19 connectors)

Line cords and rack power cables with C19 connectors can be ordered as listed in the following table.

Table 33. Power cords (C19 connectors)

Part number	Feature code	Description
Rack cables		
4L67A86677	BPJ0	0.5m, 16A/100-250V, C19 to IEC 320-C20 Rack Power Cable
4L67A86678	B4L0	1.0m, 16A/100-250V, C19 to IEC 320-C20 Rack Power Cable
4L67A86679	B4L1	1.5m, 16A/100-250V, C19 to IEC 320-C20 Rack Power Cable
4L67A86680	B4L2	2.0m, 16A/100-250V, C19 to IEC 320-C20 Rack Power Cable
39Y7916	6252	2.5m, 16A/100-240V, C19 to IEC 320-C20 Rack Power Cable
4L67A86681	B4L3	4.3m, 16A/100-250V, C19 to IEC 320-C20 Rack Power Cable
Line cords		
40K9777	6276	4.3m, 220-240V, C19 to IRAM 2073 (Argentina) Line cord
40K9773	6284	4.3m, 220-240V, C19 to AS/NZS 3112 (Aus/NZ) Line cord
40K9775	6277	4.3m, 250V, C19 to NBR 14136 (Brazil) Line Cord
40K9774	6288	4.3m, 220-240V, C19 to GB2099.1 (China) Line cord
40K9769	6283	4.3m, 16A/230V, C19 to IEC 309-P+N+G (Den/Sws) Line Cord
40K9766	6279	4.3m, 220-240V, C19 to CEE7-VII (European) Line cord

Part number	Feature code	Description
40K9776	6285	4.3m, 220-240V, C19 to IS6538 (India) Line cord
40K9771	6282	4.3m, 220-240V, C19 to SI 32 (Israel) Line cord
40K9768	6281	4.3m, 220-240V, C19 to CEI 23-16 (Italy) Line cord
40K9770	6280	4.3m, 220-240V, C19 to SABS 164 (South Africa) Line cord
41Y9231	6289	4.3m, 15A/250V, C19 to KSC 8305 (S. Korea) Line Cord
81Y2391	6549	4.3m, 16A/230V, C19 to SEV 1011 (Sws) Line Cord
41Y9230	6287	4.3m, 16A/250V, C19 to CNS 10917-3 (Taiwan) Line Cord
40K9767	6278	4.3m, 220-240V, C19 to BS 1363/A w/13A fuse (UK) Line Cord
40K9772	6275	4.3m, 16A/208V, C19 to NEMA L6-20P (US) Line Cord
00D7197	A1NV	4.3m, 15A/250V, C19 to NEMA 6-15P (US) Line Cord

Systems management

The SD550 V3 contains an integrated service processor, XClarity Controller 2 (XCC2), which provides advanced control, monitoring, and alerting functions. The XCC2 is based on the AST2600 baseboard management controller (BMC) using a dual-core ARM Cortex A7 32-bit RISC service processor running at 1.2 GHz.

Topics in this section:

- [Local management](#)
- [External Diagnostics Handset](#)
- [System status with XClarity Mobile](#)
- [Remote management](#)
- [Shared connectivity for remote management](#)
- [XCC2 Platinum](#)
- [Lenovo XClarity Provisioning Manager](#)
- [Lenovo XClarity Administrator](#)
- [Lenovo XClarity Integrators](#)
- [Lenovo XClarity Essentials](#)
- [Lenovo XClarity Energy Manager](#)
- [Lenovo Capacity Planner](#)

Local management

The SD550 V3 offers a front operator panel with key LED status indicators:

- Power button with power status LED (green)
- System Error LED (yellow)
- System ID LED (blue)
- NMI button

These are shown in the following figure.

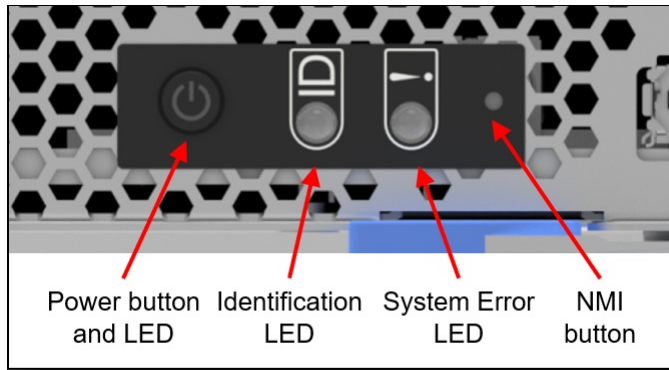


Figure 12. Operator panel

Light path diagnostics

The server offers light path diagnostics. If an environmental condition exceeds a threshold or if a system component fails, XCC lights LEDs inside the server to help you diagnose the problem and find the failing part. The server has fault LEDs next to the following components:

- Each memory DIMM
- Each drive bay
- Each power supply

Information pull-out tab

The front of the server also houses an information pull-out tab (also known as the network access tag). See [Figure 2](#) for the location. A label on the tab shows the network information (MAC address and other data) to remotely access the service processor.

External Diagnostics Handset

The SD550 V3 has a port to connect an External Diagnostics Handset as shown in the following figure.

The External Diagnostics Handset allows quick access to system status, firmware, network, and health information. The LCD display on the panel and the function buttons give you access to the following information:

- Active alerts
- Status Dashboard
- System VPD: machine type & mode, serial number, UUID string
- System firmware levels: UEFI and XCC firmware
- XCC network information: hostname, MAC address, IP address, DNS addresses
- Environmental data: Ambient temperature, CPU temperature, AC input voltage, estimated power consumption
- Active XCC sessions
- System reset action

The handset has a magnet on the back of it to allow you to easily mount it on a convenient place on any rack cabinet.

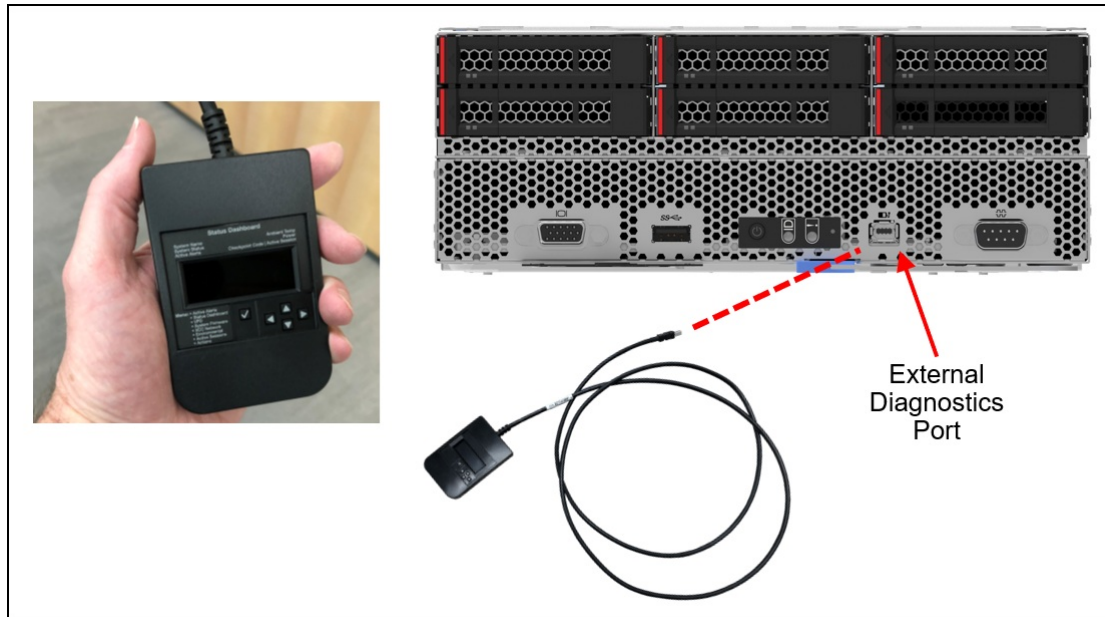


Figure 13. External Diagnostics Handset

Ordering information for the External Diagnostics Handset with is listed in the following table.


Table 34. External Diagnostics Handset ordering information

Part number	Feature code	Description
4TA7A64874	BEUX	ThinkSystem External Diagnostics Handset

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 server offers a dedicated RJ45 port at the rear of the server for remote management via the XClarity Controller management processor. The port supports 10/100/1000 Mbps speeds.

Remote server management is provided through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0

- Simple Network Management Protocol (SNMP) Version 3 (no SET commands; no SNMP 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

The OCP adapter slot also supports NC-SI to enable out-of-band systems management.

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 35. IPMI-over-LAN settings

Feature code	Description
B7XZ	Disable IPMI-over-LAN (default)
B7Y0	Enable IPMI-over-LAN

Shared connectivity for remote management

To reduce the number of Ethernet connections needed for remote management, the SD550 V3 supports an adapter that installs in the OCP slot that allows four servers to share the one Ethernet connection. The adapter implements a 5-port Gigabit switch based on the Microchip KSZ9896 switch chip. Ordering information is listed in the following table.

Planned support: The support of this adapter in the SD550 V3 is planned for 2Q/2024.

Table 36. Ordering information

Part number	Feature code	Description
4XC7A90299	BZGE	ThinkSystem OCP 4 to 1 Management Port Consolidation Adapter

The adapter is installed in the OCP slot of one of the four servers, as shown in the figure below. The adapter connects to the remote management port of the other three server via an Ethernet cable.

The adapter can connect to any of the servers supported in the D3 Chassis (SD530 V3, SD550 V3 and SD535 V3). Mixing is supported and connections can be made to servers in another D3 Chassis if desired.

The OCP slot in the other three servers can be used for network connectivity, if desired.

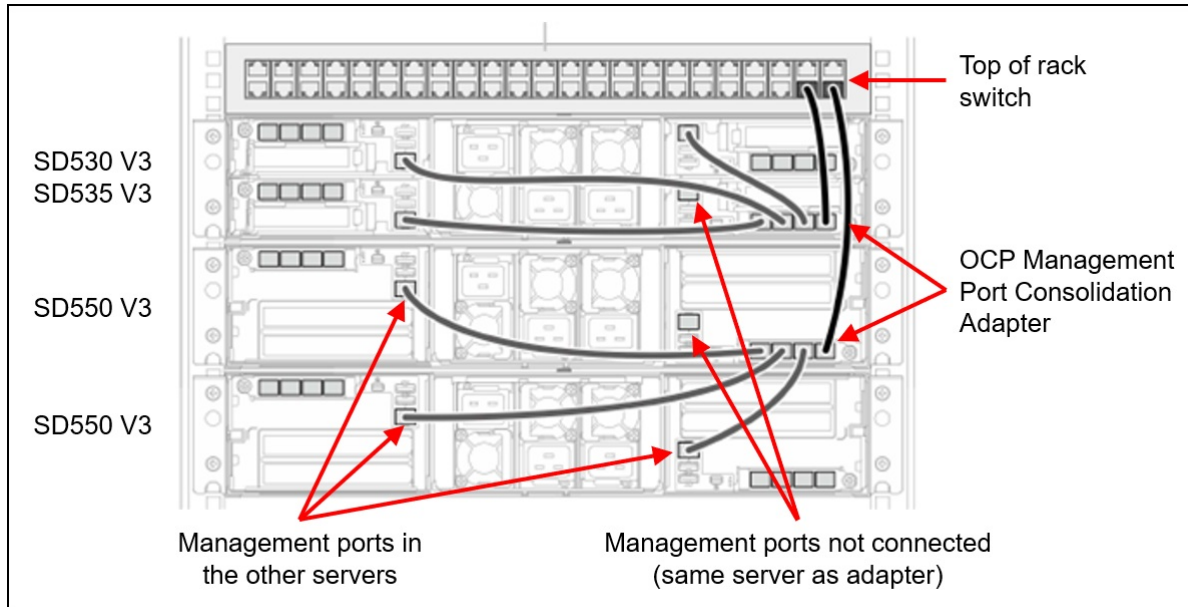


Figure 14. Connections to the ThinkSystem OCP 4 to 1 Management Port Consolidation Adapter

For field upgrades, the adapter requires that the OCP slot be cabled. If the server doesn't already have the OCP slot cabled, you will need to order the cable kit listed in the following table.

Table 37. OCP slot cable kit

Part number	Description
4TA7A91724	ThinkSystem SD550 V3 SD530 V3 Rear OCP Kit

Tip: The ThinkSystem OCP 4 to 1 Management Port Consolidation Adapter uses the OCP connector only for power.

XCC2 Platinum

The XCC2 service processor in the SD550 V3 supports an upgrade to the Platinum level of features. Compared to the XCC functions of ThinkSystem V2 and earlier systems, Platinum adds the same features as Enterprise and Advanced levels in ThinkSystem V2, plus additional features.

XCC2 Platinum adds the following Enterprise and Advanced 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
- International keyboard mapping support
- Syslog alerting
- Redirecting serial console via SSH
- Component replacement log (Maintenance History log)
- Access restriction (IP address blocking)
- Lenovo SED security key management
- Displaying graphics for real-time and historical power usage data and temperature
- Boot video capture and crash video capture
- Virtual console collaboration - Ability for up to 6 remote users to be log into the remote session simultaneously
- Remote console Java client
- Mapping the ISO and image files located on the local client as virtual drives for use by the server
- Mounting the remote ISO and image files via HTTPS, SFTP, CIFS, and NFS

- Power capping
- System utilization data and graphic view
- Single sign on with Lenovo XClarity Administrator
- Update firmware from a repository
- License for XClarity Energy Manager

XCC2 Platinum also adds the following features that are new to XCC2:

- System Guard - Monitor hardware inventory for unexpected component changes, and simply log the event or prevent booting
- Enterprise Strict Security mode - Enforces CNSA 1.0 level security
- Neighbor Group - Enables administrators to manage and synchronize configurations and firmware level across multiple servers

Ordering information is listed in the following table. XCC2 Platinum is a software license upgrade - no additional hardware is required.

Table 38. XCC2 Platinum license upgrade

Part number	Feature code	Description
7S0X000KWW	SBCV	Lenovo XClarity Controller 2 (XCC2) Platinum Upgrade

With XCC2 Platinum, for CTO orders, you can request that System Guard be enabled in the factory and the first configuration snapshot be recorded. To add this to an order, select feature code listed in the following table. The selection is made in the Security tab of the DCSC configurator.

Table 39. Enable System Guard in the factory (CTO orders)

Feature code	Description
BUT2	Install System Guard

For more information about System Guard, see https://pubs.lenovo.com/xcc2/NN1ia_c_systemguard

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 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. It 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 is an optional software component for the SD550 V3. The software can be downloaded and used at no charge to discover and monitor the SD550 V3 and to manage firmware upgrades.

If software support is required for Lenovo XClarity Administrator, or premium features such as configuration management and operating system deployment are required, Lenovo XClarity Pro software subscription should be ordered. Lenovo XClarity Pro is licensed on a per managed system basis, that is, each managed Lenovo system requires a license.

The following table lists the Lenovo XClarity software license options.

Table 40. Lenovo XClarity Pro ordering information

Part number	Feature code	Description
00MT201	1339	Lenovo XClarity Pro, per Managed Endpoint w/1 Yr SW S&S
00MT202	1340	Lenovo XClarity Pro, per Managed Endpoint w/3 Yr SW S&S
00MT203	1341	Lenovo XClarity Pro, per Managed Endpoint w/5 Yr SW S&S
7S0X000HWW	SAYV	Lenovo XClarity Pro, per Managed Endpoint w/6 Yr SW S&S
7S0X000JWW	SAYW	Lenovo XClarity Pro, per Managed Endpoint w/7 Yr SW S&S

Lenovo XClarity Administrator offers the following standard features that are available at no charge:

- Auto-discovery and monitoring of Lenovo systems
- Firmware updates and compliance enforcement
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-2 compliant cryptographic standards between the management solution and managed endpoints
- Integration into existing higher-level management systems such as cloud automation and orchestration tools through REST APIs, providing extensive external visibility and control over hardware resources
- An intuitive, easy-to-use GUI
- Scripting with Windows PowerShell, providing command-line visibility and control over hardware resources

Lenovo XClarity Administrator offers the following premium features that require an optional Pro license:

- Pattern-based configuration management that allows to define configurations once and apply repeatedly without errors when deploying new servers or redeploying existing servers without disrupting the fabric
- Bare-metal deployment of operating systems and hypervisors to streamline infrastructure provisioning

For more information, refer to the Lenovo XClarity Administrator Product Guide:

<http://lenovopress.com/tips1200>

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 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 Energy Manager

Lenovo XClarity Energy Manager (LXEM) is a power and temperature management solution for data centers. It is an agent-free, web-based console that enables you to monitor and manage power consumption and temperature in your data center through the management console. It enables server density and data center capacity to be increased through the use of power capping.

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

Table 41. Lenovo XClarity Energy Manager

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

For more information about XClarity Energy Manager, see the following resources:

- Lenovo Support page:
<https://datacentersupport.lenovo.com/us/en/solutions/Invo-lxem>
- Lenovo Information Center:
https://sysmgmt.lenovofiles.com/help/topic/LXEM/lxem_overview.html?cp=4

Lenovo Capacity Planner

Lenovo Capacity Planner is a power consumption evaluation tool that enhances data center planning by enabling IT administrators and pre-sales professionals to understand various power characteristics of racks, servers, and other devices. Capacity Planner can dynamically calculate the power consumption, current, British Thermal Unit (BTU), and volt-ampere (VA) rating at the rack level, improving the planning efficiency for large scale deployments.

For more information, refer to the Capacity Planner web page:
<http://datacentersupport.lenovo.com/us/en/solutions/Invo-lcp>

Security

Topics in this section:

- [Security features](#)
- [Platform Firmware Resiliency - Lenovo ThinkShield](#)
- [Intel Transparent Supply Chain](#)
- [Security standards](#)

Security features

The SD550 V3 server offers the following electronic security features:

- Secure Boot function of the Intel Xeon processor
- Support for Platform Firmware Resiliency (PFR) hardware Root of Trust (RoT) - see the [Platform Firmware Resiliency](#) section
- Firmware signature processes compliant with FIPS and NIST requirements
- System Guard (part of [XCC Platinum](#)) - Proactive monitoring of hardware inventory for unexpected component changes
- Administrator and power-on password
- Integrated Trusted Platform Module (TPM) supporting TPM 2.0
- Self-encrypting drives (SEDs) with support for enterprise key managers - see the [SED encryption key management](#) section

The server is NIST SP 800-147B compliant.

Platform Firmware Resiliency - Lenovo ThinkShield

Lenovo's ThinkShield Security is a transparent and comprehensive approach to security that extends to all dimensions of our data center products: from development, to supply chain, and through the entire product lifecycle.

The ThinkSystem SD550 V3 includes Platform Firmware Resiliency (PFR) hardware Root of Trust (RoT) which enables the system to be NIST SP800-193 compliant. This offering further enhances key platform subsystem protections against unauthorized firmware updates and corruption, to restore firmware to an integral state, and to closely monitor firmware for possible compromise from cyber attacks.

PFR operates upon the following server components:

- UEFI image – the low-level server firmware that connects the operating system to the server hardware
- XCC image – the management “engine” software that controls and reports on the server status separate from the server operating system

- FPGA image – the code that runs the server’s lowest level hardware controller on the motherboard

The Lenovo Platform Root of Trust Hardware performs the following three main functions:

- Detection – Measures the firmware and updates for authenticity
- Recovery – Recovers a corrupted image to a known-safe image
- Protection – Monitors the system to ensure the known-good firmware is not maliciously written

These enhanced protection capabilities are implemented using a dedicated, discrete security processor whose implementation has been rigorously validated by leading third-party security firms. Security evaluation results and design details are available for customer review – providing unprecedented transparency and assurance.

The SD550 V3 includes support for Secure Boot, a UEFI firmware security feature developed by the UEFI Consortium that ensures only immutable and signed software are loaded during the boot time. The use of Secure Boot helps prevent malicious code from being loaded and helps prevent attacks, such as the installation of rootkits. Lenovo offers the capability to enable secure boot in the factory, to ensure end-to-end protection. Alternatively, Secure Boot can be left disabled in the factory, allowing the customer to enable it themselves at a later point, if desired.

The following table lists the relevant feature code(s).

Table 42. Secure Boot options

Part number	Feature code	Description	Purpose
CTO only	BPKQ	TPM 2.0 with Secure Boot	Configure the system in the factory with Secure Boot enabled.
CTO only	BPKR	TPM 2.0	Configure the system without Secure Boot enabled. Customers can enable Secure Boot later if desired.

Tip: If Secure Boot is not enabled in the factory, it can be enabled later by the customer. However once Secure Boot is enabled, it cannot be disabled.

Intel Transparent Supply Chain

Add a layer of protection in your data center and have peace of mind that the server hardware you bring into it is safe authentic and with documented, testable, and provable origin.

Lenovo has one of the world’s best supply chains, as ranked by Gartner Group, backed by extensive and mature supply chain security programs that exceed industry norms and US Government standards. Now we are the first Tier 1 manufacturer to offer Intel® Transparent Supply Chain in partnership with Intel, offering you an unprecedented degree of supply chain transparency and assurance.

To enable Intel Transparent Supply Chain for the Intel-based servers in your order, add the following feature code in the [DCSC configurator](#), under the Security tab.

Table 43. Intel Transparent Supply Chain ordering information

Feature code	Description
BB0P	Intel Transparent Supply Chain

For more information on this offering, see the paper *Introduction to Intel Transparent Supply Chain on Lenovo ThinkSystem Servers*, available from <https://lenovopress.com/lp1434-introduction-to-intel-transparent-supply-chain-on-thinksystem-servers>.

Security standards

The SD550 V3 supports the following security standards and capabilities:

- **Industry Standard Security Capabilities**

- Intel CPU Enablement
 - AES-NI (Advanced Encryption Standard New Instructions)
 - CBnT (Converged Boot Guard and Trusted Execution Technology)
 - CET (Control flow Enforcement Technology)
 - Hardware-based side channel attack resilience enhancements
 - MKTME/TME (Multi-Key Total Memory Encryption)
 - SGX (Software Guard eXtensions)
 - SGX-TEM (Trusted Environment Mode)
 - TDX (Trust Domain Extensions)
 - TXT (Trusted eXecution Technology)
 - VT (Virtualization Technology)
 - XD (eXecute Disable)
- Microsoft Windows Security Enablement
 - Credential Guard
 - Device Guard
 - Host Guardian Service
- TCG (Trusted Computing Group) TPM (Trusted Platform Module) 2.0
- UEFI (Unified Extensible Firmware Interface) Forum Secure Boot

- **Hardware Root of Trust and Security**

- Independent security subsystem providing platform-wide NIST SP800-193 compliant Platform Firmware Resilience (PFR)
- Management domain RoT supplemented by the Secure Boot features of XCC

- **Platform Security**

For more information on platform security, see the paper “How to Harden the Security of your ThinkSystem Server and Management Applications” available from <https://lenovopress.com/lp1260-how-to-harden-the-security-of-your-thinksystem-server>.

- Boot and run-time firmware integrity monitoring with rollback to known-good firmware (e.g., “self-healing”)
- Non-volatile storage bus security monitoring and filtering
- Resilient firmware implementation, such as to detect and defeat unauthorized flash writes or SMM (System Management Mode) memory incursions
- Patented IPMI KCS channel privileged access authorization (USPTO Patent# 11,256,810)
- Host and management domain authorization, including integration with CyberArk for enterprise password management
- KMIP (Key Management Interoperability Protocol) compliant, including support for IBM SKLM and Thales KeySecure
- Reduced “out of box” attack surface
- Configurable network services
- FIPS 140-3 (in progress) validated cryptography for XCC
- CNSA Suite 1.0 Quantum-resistant cryptography for XCC
- Lenovo System Guard

- **Standards Compliance and/or Support**

- NIST SP800-131A rev 2 “Transitioning the Use of Cryptographic Algorithms and Key Lengths”
- NIST SP800-147B “BIOS Protection Guidelines for Servers”

- NIST SP800-193 “Platform Firmware Resiliency Guidelines”
- ISO/IEC 11889 “Trusted Platform Module Library”
- Common Criteria TCG Protection Profile for “PC Client Specific TPM 2.0”
- European Union Commission Regulation 2019/424 (“ErP Lot 9”) “Ecodesign Requirements for Servers and Data Storage Products” Secure Data Deletion
- Optional FIPS 140-2 validated Self-Encrypting Disks (SEDs) with external KMIP-based key management
- **Product and Supply Chain Security**
 - Suppliers validated through Lenovo’s Trusted Supplier Program
 - Developed in accordance with Lenovo’s Secure Development Lifecycle (LSDL)
 - Continuous firmware security validation through automated testing, including static code analysis, dynamic network and web vulnerability testing, software composition analysis, and subsystem-specific testing, such as UEFI security configuration validation
 - Ongoing security reviews by US-based security experts, with attestation letters available from our third-party security partners
 - Digitally signed firmware, stored and built on US-based infrastructure and signed on US-based Hardware Security Modules (HSMs)
 - Manufacturing transparency via Intel Transparent Supply Chain (for details, see <https://lenovopress.com/lp1434-introduction-to-intel-transparent-supply-chain-on-lenovo-thinksystem-servers>)
 - TAA (Trade Agreements Act) compliant manufacturing, by default in Mexico for North American markets with additional US and EU manufacturing options
 - US 2019 NDAA (National Defense Authorization Act) Section 889 compliant

Rack installation

The D3 Chassis can be installed in a 19-inch rack cabinet. Ordering information for the rail kit is listed in the following table.

Table 44. Rail installation kit

Part number	Feature code	Description
4M17A61253	BAFD	ThinkSystem DA240 Static Rail Kit

The rail kit has the specifications listed in the following table.

Table 45. Rail kit specifications

Feature	ThinkSystem DA240 Static Rail Kit
Part number	4M17A61253
Rail type	Static (fixed, no slide)
Toolless installation	Yes
Cable Management Arm (CMA) support	No support
In-rack server maintenance	No
1U PDU support	Yes
0U PDU support	Limited*
Rack type	Lenovo and IBM 4-post, IEC standard-compliant
Mounting holes	Square or round
Mounting flange thickness	2 mm - 3.3 mm (0.08 - 0.13 in.)
Supported rack range	559 mm - 914 mm (22 - 36 in.)
Rail length***	600 mm (23.6 in.)

* For 0U PDU support, the rack must be at least 1100 mm (43.31 in.) deep.

*** Measured when mounted on the rack, from the front surface of the front mounting flange to the rearmost point of the rail.

Supported rack cabinets are listed in the [Rack cabinets](#) section.

Operating system support

The server supports the following operating systems:

- Microsoft Windows Server 2019
- Microsoft Windows Server 2022
- Red Hat Enterprise Linux 8.8
- Red Hat Enterprise Linux 8.9
- Red Hat Enterprise Linux 9.2
- Red Hat Enterprise Linux 9.3
- SUSE Linux Enterprise Server 15 SP5
- SUSE Linux Enterprise Server 15 Xen SP5
- Ubuntu 22.04 LTS 64-bit
- VMware ESXi 7.0 U3
- VMware ESXi 8.0 U2

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=sd550-v3-7dd2>

Virtualization support: The onboard SATA drives 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 46. VMware ESXi preload

Part number	Feature code	Description
CTO only	BMEY	VMware ESXi 7.0 U3 (Factory Installed)
CTO only	BYC7	VMware ESXi 8.0 U2 (Factory Installed)

Configuration rule:

- An ESXi preload cannot be selected if the configuration includes an NVIDIA GPU (ESXi preload cannot include the NVIDIA driver)

Physical and electrical specifications

Up to four SD550 V3 are installed in the D3 Chassis. Each SD550 V3 has the following dimensions:

- Width: 222 mm (8.7 inches)
- Height: 82 mm (3.2 inches)
- Depth: 898 mm (35.4 inches)

The D3 Chassis has the following overall physical dimensions, excluding components that extend outside the standard chassis, such as EIA flanges, front security bezel (if any), and power supply handles:

- Width: 448 mm (17.6 inches)
- Height: 87 mm (3.4 inches)
- Depth: 900 mm (35.4 inches)

The following table lists the detailed dimensions. See the figure below for the definition of each dimension.

Table 47. Detailed dimensions

Dimension	Description
488 mm	X_a = Width, to the outsides of the front EIA flanges
448 mm	X_b = Width, to the rack rail mating surfaces
448 mm	X_c = Width, to the outer most chassis body feature
87 mm	Y_a = Height, from the bottom of chassis to the top of the chassis
852 mm	Z_a = Depth, from the rack flange mating surface to the rearmost I/O port surface
852 mm	Z_b = Depth, from the rack flange mating surface to the rearmost feature of the chassis body
883 mm	Z_c = Depth, from the rack flange mating surface to the rearmost feature such as power supply handle
48 mm	Z_d = Depth, from the forwardmost feature on front of EIA flange to the rack flange mating surface
58 mm	Z_e = Depth, from the front of security bezel (if applicable) or forwardmost feature to the rack flange mating surface

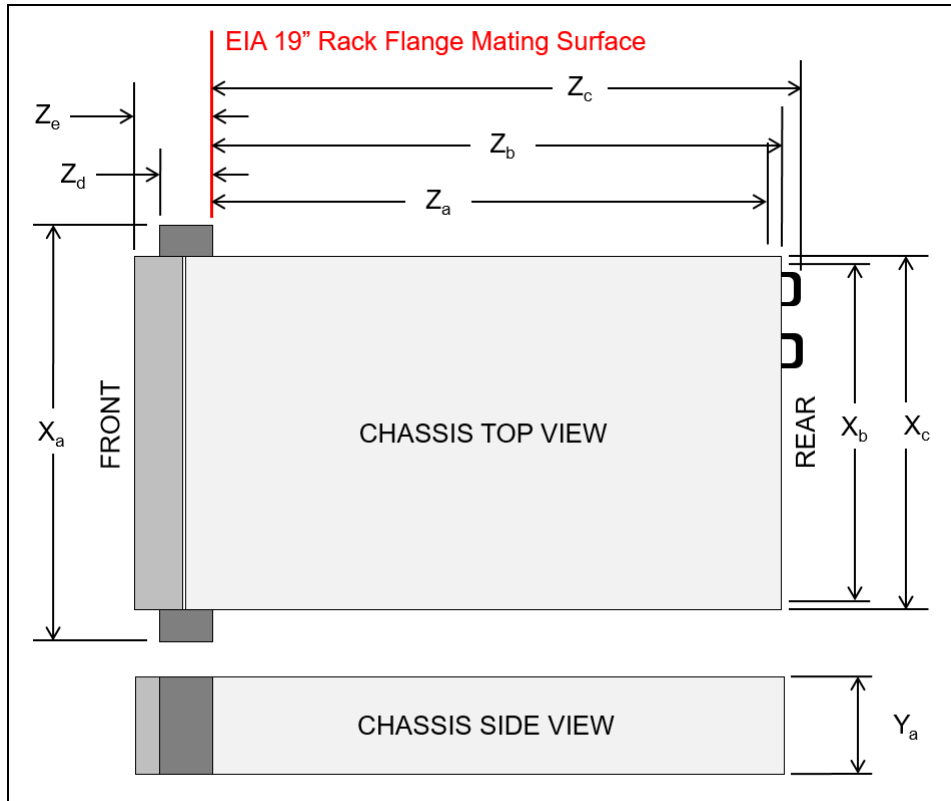


Figure 15. Server dimensions

The shipping dimensions (cardboard packaging) of the SD550 V3 are as follows:

- Width: 343 mm (13.5 inches)
- Height: 218 mm (8.6 inches)
- Depth: 1067 mm (42.0 inches)

The shipping dimensions (cardboard packaging) of the D3 Chassis are as follows:

- Width: 596 mm (23.5 inches)
- Height: 298 mm (11.7 inches)
- Depth: 1180 mm (46.5 inches)

The SD550 V3 has the following weight:

- Maximum: 11.76 kg (25.93 lb)

The D3 Chassis has the following weight:

- Empty (without servers and power supplies): 11.8 kg (26.1 lb)
- Maximum (4x 1U servers and 3x power supplies): 47.8 kg (105.4 lbs)

The enclosure has the following electrical specifications for AC input power supplies:

- Input voltage:
 - 200 to 240 (nominal) Vac, 50 Hz or 60 Hz
 - 180 to 300 Vdc (China only)
- Inlet current:
 - 1300W power supply: 7.3 A
 - 1600W power supply: 9.0 A
 - 2700W power supply: 15.4 A

Operating environment

The SD550 V3 and D3 Chassis comply with ASHRAE Class A2 specifications with most configurations, and depending on the hardware configuration, also complies with ASHRAE Class H1 specifications.

Depending on the hardware configuration, the SD550 V3 server also complies with ASHRAE Class H1 specification. System performance may be impacted when operating temperature is outside ASHRAE H1 specification.

Topics in this section:

- [Ambient temperature requirements](#)
- [Temperature and humidity](#)
- [Acoustical noise emissions](#)
- [Particulate contamination](#)

Ambient temperature requirements

Adjust ambient temperature when specific components are installed.

Note: To avoid throttling, make sure to adopt passive Direct Attach cables when network adapters with 100GbE or higher speed are installed.

Keep the ambient temperature to **35°C** or lower with the following configurations.

- **One 350W TDP processor** with:
 - Up to eight 128 GB DIMMs
 - Up to two M.2 boot drives
 - One OCP module
 - One of the following:
 1. Up to six 2.5-inch drives
 2. Up to two 2.5-inch drives with one PCIe or GPU adapter
- **Two 350W TDP processors** (Processor 2 with performance heat sink) with:
 - Up to sixteen 64 GB DIMMs
 - Up to two M.2 boot drives
 - One OCP module
 - Up to two 2.5-inch drives
- **Two 300W TDP processors** (Processor 2 with performance heat sink) or **Two 250W TDP processors** with:
 - Up to sixteen 96 GB DIMMs
 - Up to six 2.5-inch drives
 - Up to two PCIe adapters
 - Up to two M.2 boot drives
 - One OCP module

Keep the ambient temperature to **30°C** or lower with the following system configurations.

- **Two 350W TDP processors** (Processor 2 with performance heat sink) with:
 - Up to sixteen 96 GB DIMMs
 - Up to six 2.5-inch drives
 - Up to two PCIe adapters
 - Up to two M.2 boot drives
 - One OCP module
- **Two 300W TDP processors** (Processor 2 with performance heat sink) with:
 - Up to six 2.5-inch drives

- Up to two M.2 boot drives
- One OCP module
- One of the following:
 1. Up to sixteen 128 GB DIMMs with up to two PCIe adapters
 2. Up to sixteen 96 GB DIMMs with up to two GPU adapters
- **Two 250W TDP processors** with:
 - Up to sixteen 96 GB DIMMs
 - Up to two L4/Flex 140 GPU adapters with GPU air duct
 - Up to six 2.5-inch drives
 - Up to two M.2 boot drives
 - One OCP module

Keep the ambient temperature to **25°C** or lower with the following system configuration.

- **Two 350W TDP processors** (Processor 2 with performance heat sink) with:
 - Up to six 2.5-inch drives
 - Up to two M.2 boot drives
 - One OCP module
 - One of the following:
 1. Up to sixteen 128 GB DIMMs with up to two PCIe adapters
 2. Up to sixteen 96 GB DIMMs with up to two GPU adapters

Temperature and humidity

The server is supported in the following environment:

- Air temperature:
 - Operating
 - ASHRAE Class A2: 10°C to 35°C (50°F to 95°F); the maximum ambient temperature decreases by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft).
 - ASHRAE Class H1: 5°C to 25°C (41°F to 77°F); the maximum ambient temperature decreases by 1°C for every 300 m (984 ft) increase in altitude above 900 m (2,953 ft).
 - Server off: 5°C to 45°C (41°F to 113°F)
 - Shipment/storage: -40°C to 60°C (-40°F to 140°F)
- Maximum altitude: 3,050 m (10,000 ft)
- Relative Humidity (non-condensing):
 - Operating
 - ASHRAE Class A2: 8% to 80%; maximum dew point: 21°C (70°F)
 - ASHRAE Class H1: 8% to 80%; maximum dew point: 17°C (62.6°F)
 - Shipment/storage: 8% to 90%

Acoustical noise emissions

The server has the following acoustic noise emissions declaration:

- Sound power level ($L_{WA(d)}$)
 - Idling: 6.9 Bel (Typical), 7.4 Bel (Max.)
 - Operating 1: 6.9 Bel (Typical), 7.4 Bel (Max.)
 - Operating 2: 7.5 Bel (Typical), 8.3 Bel (Max.)
- Sound pressure level (L_{pAm}):
 - Idling: 51.2 dBA (Typical), 57.1 dBA (Max.)
 - Operating 1: 51.2 dBA (Typical), 57.1 dBA (Max.)
 - Operating 2: 57.1 dBA (Typical), 65.8 dBA (Max.)

Notes:

- These sound levels were measured in controlled acoustical environments according to procedures

specified by ISO7779 and are reported in accordance with ISO 9296.

- Idle mode is the steady state in which the server is powered on but not operating any intended function. Operating mode 1 is 50% of CPU TDP. Operating Mode 2 is 100% of CPU TDP.
- The declared acoustic sound levels are based on the below-specified configurations, which may change depending on configuration/conditions. (With two SD550 V3 nodes installed in the chassis):
 - Typical: two 330-watt processors, sixteen 32 GB DIMMs, two GPU adapters, two 1GB OCP modules, and two 1300-watt CRPS PSUs
 - Maximum: four 350-watt processors, thirty-two 64 GB DIMMs, twelve 2.5-inch drives, two 1GB OCP modules, four GPU adapters, two CFF RAID adapters, and three 2700-watt CRPS PSUs
- Government regulations (such as those prescribed by OSHA or European Community Directives) may govern noise level exposure in the workplace and may apply to you and your server installation. The actual sound pressure levels in your installation depend upon a variety of factors, including the number of racks in the installation; the size, materials, and configuration of the room; the noise levels from other equipment; the room ambient temperature, and employee's location in relation to the equipment. Further, compliance with such government regulations depends on a variety of additional factors, including the duration of employees' exposure and whether employees wear hearing protection. Lenovo recommends that you consult with qualified experts in this field to determine whether you are in compliance with the applicable regulations.

Particulate contamination

Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might damage the system that might cause the system to malfunction or stop working altogether.

The following specifications indicate the limits of particulates that the system can tolerate:

- Reactive gases:
 - The copper reactivity level shall be less than 200 Angstroms per month ($\text{\AA}/\text{month}$)
 - The silver reactivity level shall be less than 200 $\text{\AA}/\text{month}$
- Airborne particulates:
 - The room air should be continuously filtered with MERV 8 filters.
 - Air entering a data center should be filtered with MERV 11 or preferably MERV 13 filters.
 - The deliquescent relative humidity of the particulate contamination should be more than 60% RH
 - Environment must be free of zinc whiskers

For additional information, see the Specifications section of the documentation for the server, available from the Lenovo Documents site, <https://pubs.lenovo.com/>

Warranty and Support

The SD550 V3 and D3 Chassis have a 1 year or 3 year warranty, based on the machine type:

- ThinkSystem SD550 V3 (7DD2) - 3 year warranty
- ThinkSystem SD550 V3 (7DD9) - 1 year warranty
- ThinkSystem D3 Chassis (7DD0) - 3 year warranty
- ThinkSystem D3 Chassis (7DD7) - 1 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 markets). Bundled with YourDrive YourData.
- **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select markets). Bundled with YourDrive YourData.

- **Managed Services**

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

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

- **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 spare 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://lenovocator.com/>

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

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

Services

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

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

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

- **Asset Recovery Services**

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

- **Assessment Services**

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

- **Design Services**

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

- **Basic Hardware Installation**

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

- **Deployment Services**

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

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

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

Regulatory compliance

The SD550 V3 conforms to the following standards:

- ANSI/UL 62368-1
- IEC 62368-1 (CB Certificate and CB Test Report)
- CSA C22.2 No. 62368-1
- Argentina IEC 60950-1
- Mexico NOM-019
- Germany GS
- TUV-GS (EN62368-1, and EK1-ITB2000)
- Brazil INMETRO
- South Africa NRCS LOA
- Ukraine UkrCEPRO
- Morocco CMIM Certification (CM)
- Russia, Belorussia and Kazakhstan, TP EAC 037/2016 (for RoHS)
- CE, UKCA Mark (EN55032 Class A, EN62368-1, EN55035, EN61000-3-11, EN61000-3-12, (EU) 2019/424, and EN IEC 63000 (RoHS))
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 7, Class A
- CISPR 32, Class A, CISPR 35
- Korea KN32, Class A, KN35
- Japan VCCI, Class A
- Taiwan BSMI CNS15936, Class A; Section 5 of CNS15663
- Australia/New Zealand AS/NZS CISPR 32, Class A; AS/NZS 62368.1
- UL Green Guard, UL2819
- Energy Star 4.0
- EPEAT (NSF/ ANSI 426) Bronze
- Japanese Energy-Saving Act
- EU2019/424 Energy Related Product (ErP Lot9)
- 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 48. External drive enclosures

Model	Description
4587HC1	Lenovo Storage D1212 Disk Expansion Enclosure (2U enclosure with 12x LFF drive bays)
4587HC2	Lenovo Storage D1224 Disk Expansion Enclosure (2U enclosure with 24x SFF drive bays)
6413HC1	Lenovo Storage D3284 High Density Expansion Enclosure (5U enclosure with 84x LFF drive bays)
7DAHCTO1WW	Lenovo ThinkSystem D4390 Direct Attached Storage (4U enclosure with 90x LFF drive bays)

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

- Lenovo Storage D1212 and D1224
<http://lenovopress.lenovo.com/lp0512>
- Lenovo Storage D3284
<http://lenovopress.lenovo.com/lp0513>
- Lenovo ThinkSystem D4390
<https://lenovopress.lenovo.com/lp1681>

External storage systems

Lenovo offers the ThinkSystem DE Series and ThinkSystem DM Series external storage systems for high-performance storage. See the DE Series and DM Series product guides for specific controller models, expansion enclosures and configuration options:

- ThinkSystem DE Series Storage
<https://lenovopress.com/storage/thinksystem/de-series#rt=product-guide>
- ThinkSystem DM Series Storage
<https://lenovopress.com/storage/thinksystem/dm-series#rt=product-guide>
- ThinkSystem DG Series Storage
<https://lenovopress.com/storage/thinksystem/dg-series#rt=product-guide>

External backup units

The following table lists the external backup options that are offered by Lenovo.

Table 49. External backup options

Part number	Description
External RDX USB drives	
4T27A10725	ThinkSystem RDX External USB 3.0 Dock
External SAS tape backup drives	
6160S7E	IBM TS2270 Tape Drive Model H7S
6160S8E	IBM TS2280 Tape Drive Model H8S
6160S9E	IBM TS2290 Tape Drive Model H9S
External SAS tape backup autoloaders	
6171S7R	IBM TS2900 Tape Autoloader w/LTO7 HH SAS
6171S8R	IBM TS2900 Tape Autoloader w/LTO8 HH SAS
6171S9R	IBM TS2900 Tape Autoloader w/LTO9 HH SAS
External tape backup libraries	
6741A1F	IBM TS4300 3U Tape Library-Base Unit
6741A3F	IBM TS4300 3U Tape Library-Expansion Unit
Full High 8 Gb Fibre Channel for TS4300	
01KP938	LTO 7 FH Fibre Channel Drive
01KP954	LTO 8 FH Fibre Channel Drive
02JH837	LTO 9 FH Fibre Channel Drive
Half High 8 Gb Fibre Channel for TS4300	
01KP936	LTO 7 HH Fibre Channel Drive
01KP952	LTO 8 HH Fibre Channel Drive
02JH835	LTO 9 HH Fibre Channel Drive
Half High 6 Gb SAS for TS4300	
01KP937	LTO 7 HH SAS Drive
01KP953	LTO 8 HH SAS Drive
02JH836	LTO 9 HH SAS Drive

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

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

Fibre Channel SAN switches

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

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

Uninterruptible power supply units

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

Table 50. Uninterruptible power supply units

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

† Only available in China and the Asia Pacific market.

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

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

Power distribution units

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

Table 51. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
00YJ776	ATZY	0U 36 C13/6 C19 24A 1 Phase PDU	N	Y	Y	N	N	N	N	N	N	Y	Y	Y	N
0U Switched and Monitored PDUs															
00YJ783	AU04	0U 12 C13/12 C19 Switched and Monitored 48A 3 Phase PDU	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
00YJ781	AU03	0U 20 C13/4 C19 Switched and Monitored 24A 1 Phase PDU	N	N	Y	N	Y	N	Y	N	N	Y	Y	Y	N
1U Switched and Monitored PDUs															
4PU7A81117	BNDV	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - ETL	N	N	N	N	N	N	N	N	N	N	N	Y	N

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
4PU7A77467	BLC4	1U 18 C19/C13 Switched and Monitored 80A 3P Delta PDU	N	N	N	N	N	N	N	N	N	Y	N	Y	N
4PU7A77469	BLC6	1U 12 C19/C13 switched and monitored 60A 3P Delta PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7A77468	BLC5	1U 12 C19/C13 switched and monitored 32A 3P WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A81118	BNDW	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
1U Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)															
71763NU	6051	Ultra Density Enterprise C19/C13 PDU 60A/208V/3PH	N	N	Y	N	N	N	N	N	N	Y	Y	Y	N
71762NX	6091	Ultra Density Enterprise C19/C13 PDU Module	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U C13 Enterprise PDUs (12x IEC 320 C13 outlets)															
39Y8941	6010	DPI C13 Enterprise PDU Module (WW)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U Front-end PDUs (3x IEC 320 C19 outlets)															
39Y8938	6002	DPI Single-phase 30A/120V Front-end PDU (US)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8939	6003	DPI Single-phase 30A/208V Front-end PDU (US)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8934	6005	DPI Single-phase 32A/230V Front-end PDU (International)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8940	6004	DPI Single-phase 60A/208V Front-end PDU (US)	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N
39Y8935	6006	DPI Single-phase 63A/230V Front-end PDU (International)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U NEMA PDUs (6x NEMA 5-15R outlets)															
39Y8905	5900	DPI 100-127V NEMA PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Line cords for 1U PDUs that ship without a line cord															
40K9611	6504	4.3m, 32A/380-415V, EPDU/IEC 309 3P+N+G 3ph wye (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	4.3m, 63A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	4.3m, 60A/208V, EPDU to IEC 309 2P+G (US) Line Cord	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
40K9617	6505	4.3m, 32A/230V, Souriau UTG Female to AS/NZ 3112 (Aus/NZ) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9618	6506	4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

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

Rack cabinets

The following table lists the supported rack cabinets.

Table 52. Rack cabinets

Part number	Description
93072RX	25U Standard Rack (1000mm)
93072PX	25U Static S2 Standard Rack (1000mm)
7D6DA007WW	ThinkSystem 42U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6DA008WW	ThinkSystem 42U Pearl Primary Heavy Duty Rack Cabinet (1200mm)
93604PX	42U 1200mm Deep Dynamic Rack
93614PX	42U 1200mm Deep Static Rack
93634PX	42U 1100mm Dynamic Rack
93634EX	42U 1100mm Dynamic Expansion Rack
93074RX	42U Standard Rack (1000mm)
7D6EA009WW	ThinkSystem 48U Onyx Primary Heavy Duty Rack Cabinet (1200mm)
7D6EA00AWW	ThinkSystem 48U Pearl Primary Heavy Duty Rack Cabinet (1200mm)

For specifications about these racks, see the Lenovo Rack Cabinet Reference, available from: <https://lenovopress.com/lp1287-lenovo-rack-cabinet-reference>

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

KVM switches and consoles

The following table lists the supported KVM consoles.

Table 53. KVM console

Part number	Description
4XF7A84188	ThinkSystem 18.5" LCD Console (with US English keyboard)

The following table lists the available KVM switches and the options that are supported with them.

Table 55. KVM switches and options

Part number	Description
KVM Console switches	
1754D2X	Global 4x2x32 Console Manager (GCM32)
1754D1X	Global 2x2x16 Console Manager (GCM16)
1754A2X	Local 2x16 Console Manager (LCM16)
1754A1X	Local 1x8 Console Manager (LCM8)
Cables for GCM and LCM Console switches	
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>

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

Seller training courses

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

1. Intel Transparent Supply Chain on Lenovo Servers 2024-01-29 | 12 minutes | Employees and Partners

This course introduces the Intel Transparent Supply Chain (TSC) program, explains how the program works, and discusses the benefits of the Intel TSC program to customers. Adding the Intel TSC feature to an order is explained.

Course objectives:

- Describe the Intel® Transparent Supply Chain program
- Explain how the Intel® Transparent Supply Chain program works
- Discuss the benefits of the Intel® Transparent Supply Chain program to Lenovo customers
- Explain how to add Intel® Transparent Supply Chain program feature to an order

Published: 2024-01-29

Length: 12 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW1230

2. Family Portfolio: Storage Controller Options
2024-01-23 | 25 minutes | Employees and Partners

This course covers the storage controller options available for use in Lenovo servers. The classes of storage controller are discussed, along with a discussion of where they are used, and which to choose.

After completing this course, you will be able to:

- Describe the classes of storage controllers
- Discuss where each controller class is used
- Describe the available options in each controller class

Published: 2024-01-23

Length: 25 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW1111

3. Lenovo-Intel Sustainable Solutions QH
2024-01-22 | 10 minutes | Employees and Partners

This Quick Hit explains how Lenovo and Intel are committed to sustainability, and introduces the Lenovo-Intel joint sustainability campaign. You will learn how to use this campaign to show customers what that level of commitment entails, how to use the campaign's unsolicited proposal approach, and how to use the campaign as a conversation starter which may lead to increased sales.

Published: 2024-01-22

Length: 10 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW2524a

4. Family Portfolio Intel Multi-Node Servers
2024-01-12 | 15 minutes | Employees and Partners

This course covers the Intel-based 2U4N server family, formerly part of the Dense server family. After completing this course about the Intel® multi-node server family, you will be able to identify products and features within the family, describe the customer benefits of this product family, and recognize when a specific product or products should be selected.

Published: 2024-01-12

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW2518

5. FY24Q3 Intel Servers Update
2023-12-11 | 15 minutes | Employees and Partners

This update is designed to help you discuss the features and customer benefits of Lenovo servers that use the 5th Gen Intel® Xeon® processors. Lenovo has also introduced a new server, the ThinkSystem SD650-N V3, which expands the supercomputer server family. Reasons to call your customer and talk about refreshing their infrastructure are also included as a guideline.

Published: 2023-12-11

Length: 15 minutes

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo Partner Learning](#)

Course code: SXXW2522a

6. Lenovo Data Center Product Portfolio
2023-07-21 | 15 minutes | Employees and Partners

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

Published: 2023-07-21
Length: 15 minutes
Employee link: [Grow@Lenovo](#)
Partner link: [Lenovo Partner Learning](#)
Course code: SXXW1110r6

7. Partner Technical Webinar - Data Center Limits and ISG TAA Compliance
2023-05-16 | 60 minutes | Employees and Partners

In this 60-minute replay, we had two topics. First Vinod Kamath, Lenovo Distinguished Engineer for Data Center Cooling presented on the Systems Configuration and Data Center Ambient Limits. Second, Shama Patari, Lenovo Trade Council, and Glenn Johnson, Lenovo Principal Engineer for Supply Chain presented on ISG TAA Compliance.

Published: 2023-05-16
Length: 60 minutes
Employee link: [Grow@Lenovo](#)
Partner link: [Lenovo Partner Learning](#)
Course code: 051223

8. Lenovo Sustainable Computing
2022-09-16 | 4 minutes | Employees and Partners

This Quick Hit describes the Lenovo sustainable computing program, and the many ways in which Lenovo strives to respect and protect the environment.

Published: 2022-09-16
Length: 4 minutes
Employee link: [Grow@Lenovo](#)
Partner link: [Lenovo Partner Learning](#)
Course code: SXXW2504a

Related publications and links

For more information, see these resources:

- ThinkSystem SD550 V3 product page
<https://www.lenovo.com/us/en/p/servers-storage/servers/multi-node/thinksystem-sd550-v3-multi-node-server/len21ts0027>
- ThinkSystem SD550 V3 datasheet
<https://lenovopress.lenovo.com/datasheet/ds0176-lenovo-thinksystem-sd550-v3>
- Interactive 3D Tour of the ThinkSystem SD550 V3:
<https://lenovopress.lenovo.com/lp1846-3d-tour-thinksystem-sd550-v3>
- ThinkSystem SD550 V3 drivers and support
<http://datacentersupport.lenovo.com/products/servers/thinksystem/sd550v3/7dd2/downloads>
- Lenovo ThinkSystem SD550 V3 product publications:
<https://pubs.lenovo.com/sd550-v3/>
 - User Guide, which includes:
 - System Configuration Guide
 - Hardware Maintenance Guide
 - Rack Installation Guides
 - Messages and Codes Reference
 - UEFI Manual for ThinkSystem Servers
- User Guides for options:
<https://serveroption.lenovo.com>
- ServerProven hardware compatibility:
<http://serverproven.lenovo.com>

Related product families

Product families related to this document are the following:

- [Multi-Node Servers](#)
- [ThinkSystem SD550 V3 Server](#)

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This document, LP1854, was created or updated on February 23, 2024.

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