Lenovo ThinkSystem SR590 Server (Xeon SP Gen 1 / Gen 2)

Product Guide

Lenovo ThinkSystem SR590 is a 2-socket 2U rack server for small businesses up to large enterprises that need industry-leading reliability, management, and security, as well as balancing performance and expandability. The SR590 server is designed to handle a wide range of workloads, such as virtualization and cloud computing, IT infrastructure, enterprise applications, collaboration/email, and web serving.

Featuring the second generation of the Intel Xeon Processor Scalable Family (Xeon SP Gen 2), the SR590 server offers balanced performance, storage capacity, and I/O expansion. The SR590 server supports up to two processors, up to 1 TB of memory capacity, up to 16x 2.5-inch or 14x 3.5-inch drive bays with an extensive choice of drive technologies including NVMe SSDs, and flexible I/O expansion options with a LOM slot and up to 6x PCIe slots. The next-generation Lenovo XClarity Controller, which is built into the SR590 server, provides advanced service processor control, monitoring, and alerting functions.

The following figure shows the ThinkSystem SR590 server with 3.5-inch front hot-swap drives. Other drive configurations are also available.

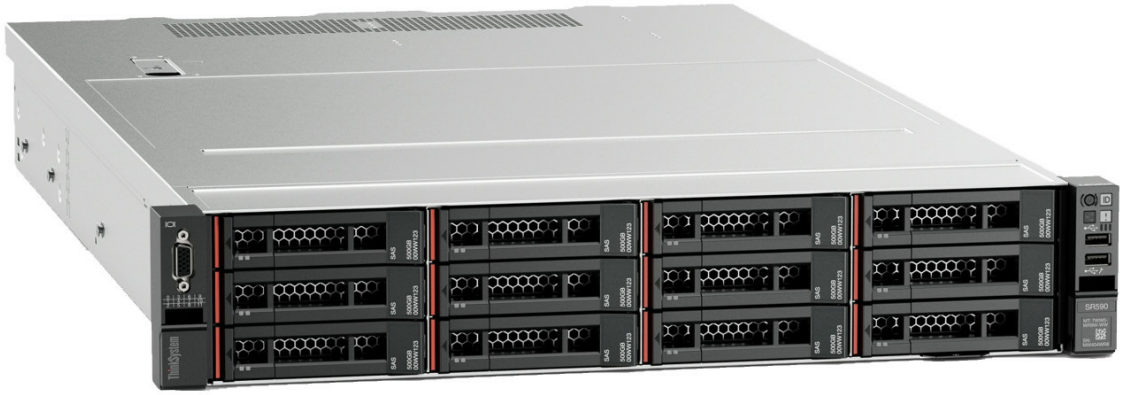


Figure 1. Lenovo ThinkSystem SR590 with 3.5-inch hot-swap drives

Did you know?

The SR590 server features a unique AnyBay design that allows a choice of drive interface types in the same drive bay: SAS drives, SATA drives, or U.2 NVMe PCIe drives.

The SR590 server offers onboard NVMe PCIe ports that allow direct connections to the U.2 NVMe PCIe SSDs, which frees up I/O slots and helps lower NVMe solution acquisition costs.

The SR590 server is designed to meet ASHRAE A4 standards (up to 45 °C) in select configurations, which enable customers to lower energy costs, while still maintaining world-class reliability.

Key features

The SR590 server offers a balance of processing power, storage capacity, and cost for small and medium businesses up to the large enterprise. Ease of use and comprehensive systems management tools help make deployment easier. Outstanding reliability, availability, and serviceability (RAS) and high-efficiency design improve your business environment and help save operational costs.

Scalability and performance

The SR590 server offers numerous features to boost performance, improve scalability, and reduce costs:

- Improves productivity by offering superior system performance with the second generation of the Intel Xeon Processor Scalable Family with up to 24-core processors, up to 35.75 MB of last level cache (LLC), up to 2933 MHz memory speeds, and up to 10.4 GT/s Ultra Path Interconnect (UPI) links.
    - Support for up to two processors, 48 cores, and 96 threads allows to maximize the concurrent execution of multithreaded applications.
    - Intelligent and adaptive system performance with energy efficient Intel Turbo Boost 2.0 Technology allows CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
    - Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.
    - Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better utilize the hardware for virtualization workloads.
    - Intel Speed Select Technology provides improvements in server utilization and guaranteed per-core performance service levels with more granular control over processor performance.
    - Intel Deep Learning Boost (Vector Neural Network Instruction set [VNNI]) is designed to deliver significant, more efficient Deep Learning (Inference) acceleration for high-performance Artificial Intelligence (AI) workloads.
    - Intel Advanced Vector Extensions 512 (AVX-512) enable acceleration of enterprise-class and high performance computing (HPC) workloads.
- Helps maximize system performance for data intensive applications with up to 2933 MHz memory speeds and up to 1 TB of memory capacity.
- Boosts the performance of data-intensive applications and delivers consistent service levels at scale for virtualized and cloud environments by using the innovative persistent memory technology that provides a unique combination of affordable large memory capacity and non-volatility for up to 2.75 TB of total server memory capacity, including RDIMMs and DCPMMs (DC persistent memory modules).
- Offers flexible and scalable internal storage in a 2U rack form factor with up to 16x 2.5-inch drives for performance-optimized configurations or up to 14x 3.5-inch drives for capacity-optimized configurations, providing a wide selection of SAS/SATA HDD/SSD and PCIe NVMe SSD types and capacities.
- Provides flexibility to use SAS, SATA, or NVMe PCIe drives in the same drive bays with a unique AnyBay design.
- Provides I/O scalability with the LOM slot and up to six PCI Express (PCIe) 3.0 I/O expansion slots in a 2U rack form factor.
- Reduces I/O latency and increases overall system performance with Intel Integrated I/O Technology that embeds the PCI Express 3.0 controller into the Intel Xeon Processor Scalable Family.

Availability and serviceability

The SR590 server provides many features to simplify serviceability and increase system uptime:

- Offers protection in the event of a non-correctable memory failure with Single Device Data Correction (SDDC, also known as Chipkill, requires x4-based DIMMs), Adaptive Double Device Data Correction (ADDDC, also known as Redundant Bit Steering [RBS], requires x4-based DIMMs and Intel Xeon Gold or Platinum processors), memory mirroring, and memory rank sparing.
- Provides easy access to upgrades and serviceable parts (such as processors, memory DIMMs, and adapter cards) with tool-less cover removal.
- Offers affordable data protection with software RAID and Simple Swap drives and advanced hardware RAID

data redundancy with hot-swap drives.

- Provides availability for business-critical applications with redundant hot-swap power supplies and redundant hot-swap fans.
- Simplifies servicing, speeds up problem resolution, and helps improve system availability with light path diagnostics.
- Allows preventive actions in advance of possible failure, thereby increasing server uptime and application availability with Proactive Platform Alerts (including PFA and SMART alerts) for processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, M.2 storage), fans, power supplies, RAID controllers, and server ambient and sub-component temperatures.
- Continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failure to minimize downtime with Built-in XClarity Controller (XCC).
- Provides quick access to system status, firmware, network, health, and alerts information via Virtual Operator Panel from the XClarity Mobile App running on the Android or iOS mobile device that is connected to the front USB port with XClarity Controller access.
- Speeds up troubleshooting tasks to reduce service time with diagnostics built into the XClarity Provisioning Manager.

Manageability and security

Powerful systems management features simplify local and remote management of the SR590 server and deliver enterprise-class data protection:

- Provides advanced service processor control, monitoring, and alerting functions with XClarity Controller, a next generation service processor.
- Improves Unified Extensible Firmware Interface (UEFI) system setup, configuration, updates, simplified error handling, and operating system deployment with the embedded XClarity Provisioning Manager.
- Offers XClarity Essentials software tools that can help you set up, use, and maintain the server.
- Increases uptime, reduces costs, and improves productivity through advanced server management capabilities with Lenovo XClarity Administrator that provides comprehensive hardware management.
- Provides on-the-go monitoring and management of devices in XClarity Administrator from anywhere with the Lenovo XClarity mobile app, which can help improve efficiency and reduce downtime risks.
- Centralizes infrastructure resource management with Lenovo XClarity Integrators for VMware vCenter and Microsoft System Center, extending XClarity Administrator features to virtualization management software tools and enabling users to deploy and manage infrastructure end-to-end.
- Offers advanced cryptographic functionality (such as digital signatures and remote attestation) with an integrated Trusted Platform Module (TPM) or optional Trusted Cryptographic Module (TCM) or Nationz TPM (available only in PRC).
- Keeps user data safe with Lenovo Business Vantage, a security software tool suite designed to work with the Trusted Cryptographic Module (available only in PRC).
- Offers enterprise-class data protection with advanced RAID and optional self-encrypting drives.
- Provides faster, stronger encryption with industry-standard AES NI support.
- Helps prevent certain classes of malicious buffer overflow attacks with Intel Execute Disable Bit functionality, when combined with a supporting operating system.
- Enhances security through hardware-based resistance to malicious software attacks with Intel Trusted Execution Technology, allowing an application to run in its own isolated space, protected from all other software running on a system.

Energy efficiency

The SR590 server offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Delivers impressive compute power per watt, featuring 80 PLUS Titanium and Platinum redundant power supplies.
- Enables customers to lower energy costs with design to meet ASHRAE A4 standards in select configurations.
- Reduces power drawn with Intel Intelligent Power Capability that powers individual processor elements on and off as needed.
- Helps reduce power consumption with variable speed fans.
- Helps achieve lower heat output and reduced cooling needs with Lenovo XClarity Energy Manager that provides advanced data center power notification, analysis, and policy-based management.

Components and connectors

The following figure shows the front of the SR590 server with up to 16x 2.5-inch drive bays.

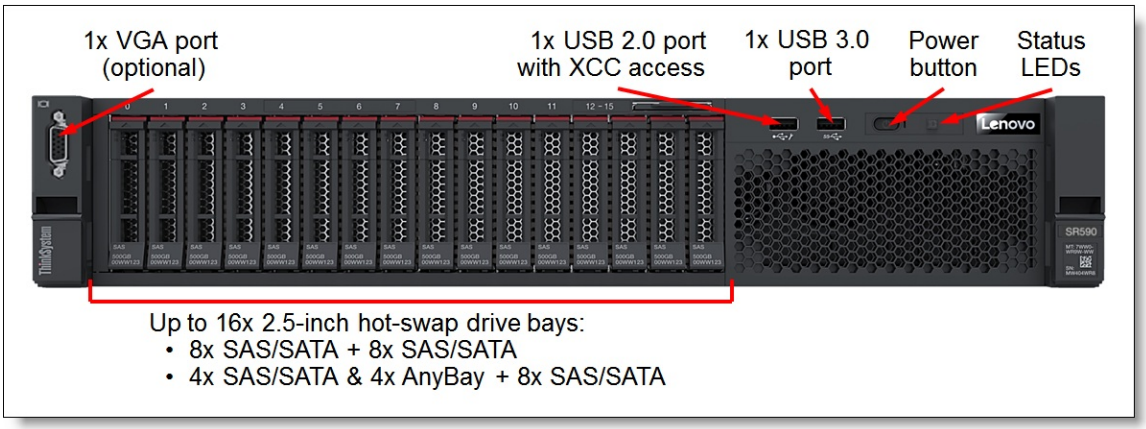


Figure 2. Front view of the SR590: Up to 16x 2.5-inch drive bays

The following figure shows the front of the SR590 server with 8x 3.5-inch drive bays.

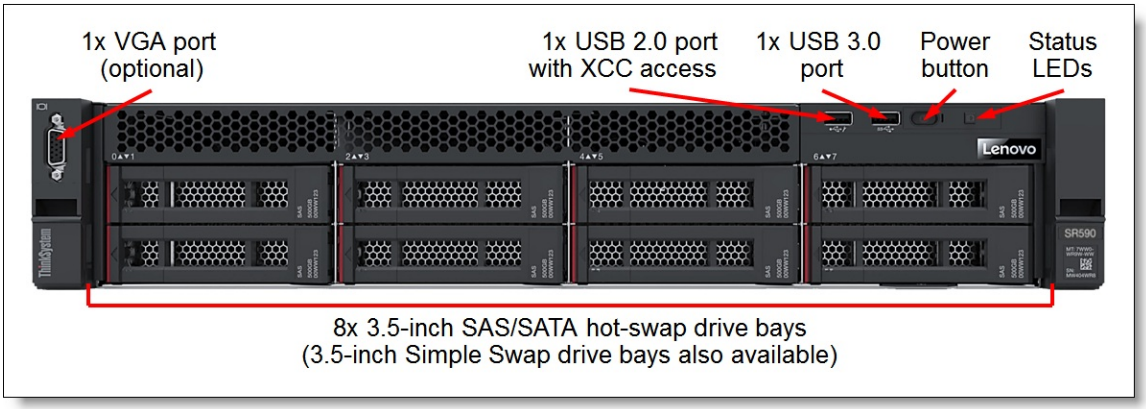


Figure 3. Front view of the SR590: 8x 3.5-inch drive bays

The following figure shows the front of the SR590 server with 12x 3.5-inch drive bays.

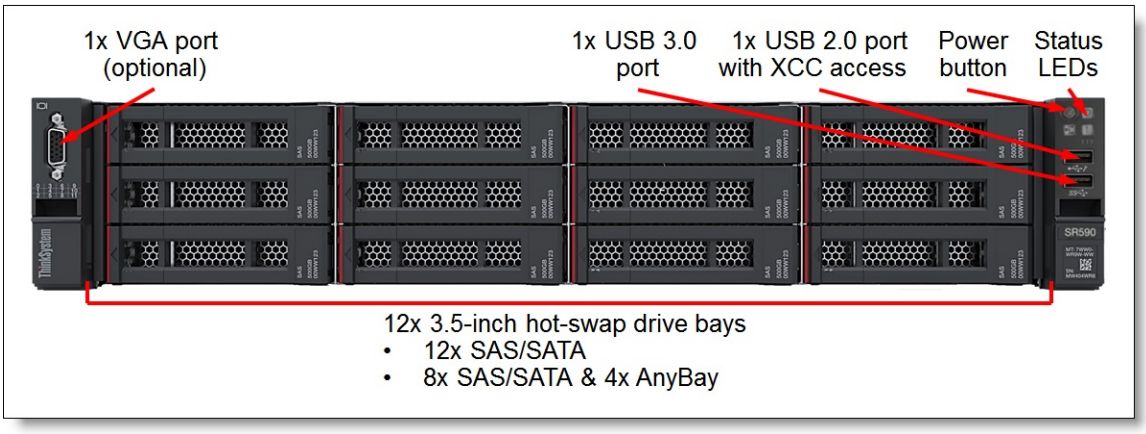


Figure 4. Front view of the SR590: 12x 3.5-inch drive bays

The front of the SR590 server includes the following components:

- Up to 16x 2.5-inch or 12x 3.5-inch hot-swap, or 8x 3.5-inch hot-swap or Simple Swap drive bays.
- One VGA port (optional).
- One USB 3.0 port.
- One USB 2.0 port with XClarity Controller access.
- Power button.
- Status LEDs.

The following figure shows the rear of the SR590 server.

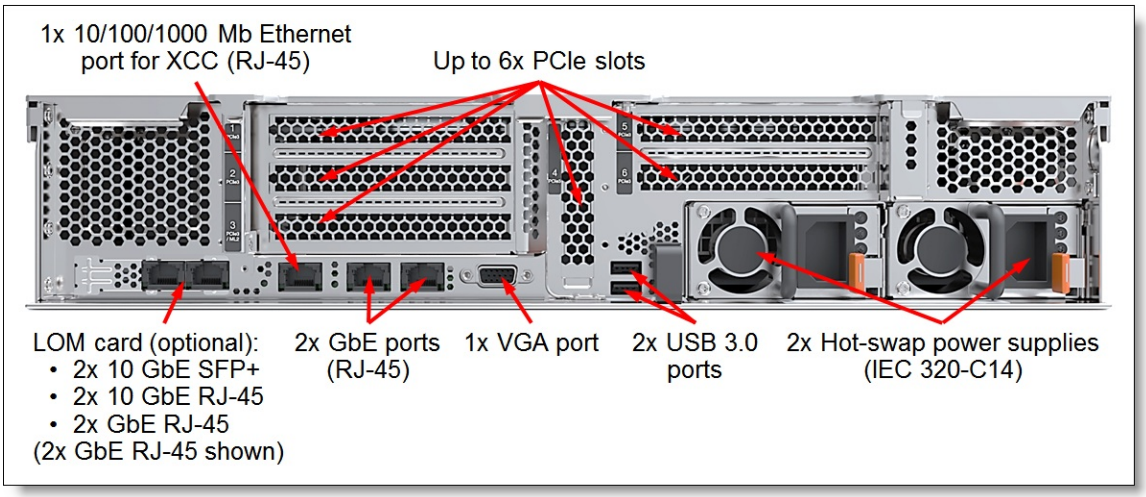


Figure 5. Rear view of the SR590

The rear of the SR590 server includes the following components:

- Up to six PCIe expansion slots (depending on the riser cards selected).
- One LOM card slot.
- Two 1 GbE onboard network ports.
- One 1 GbE port for XClarity Controller.
- One VGA port.
- Two USB 3.0 ports.
- Up to two hot-swap power supplies.

The following figure shows the locations of key components inside the SR590 server.

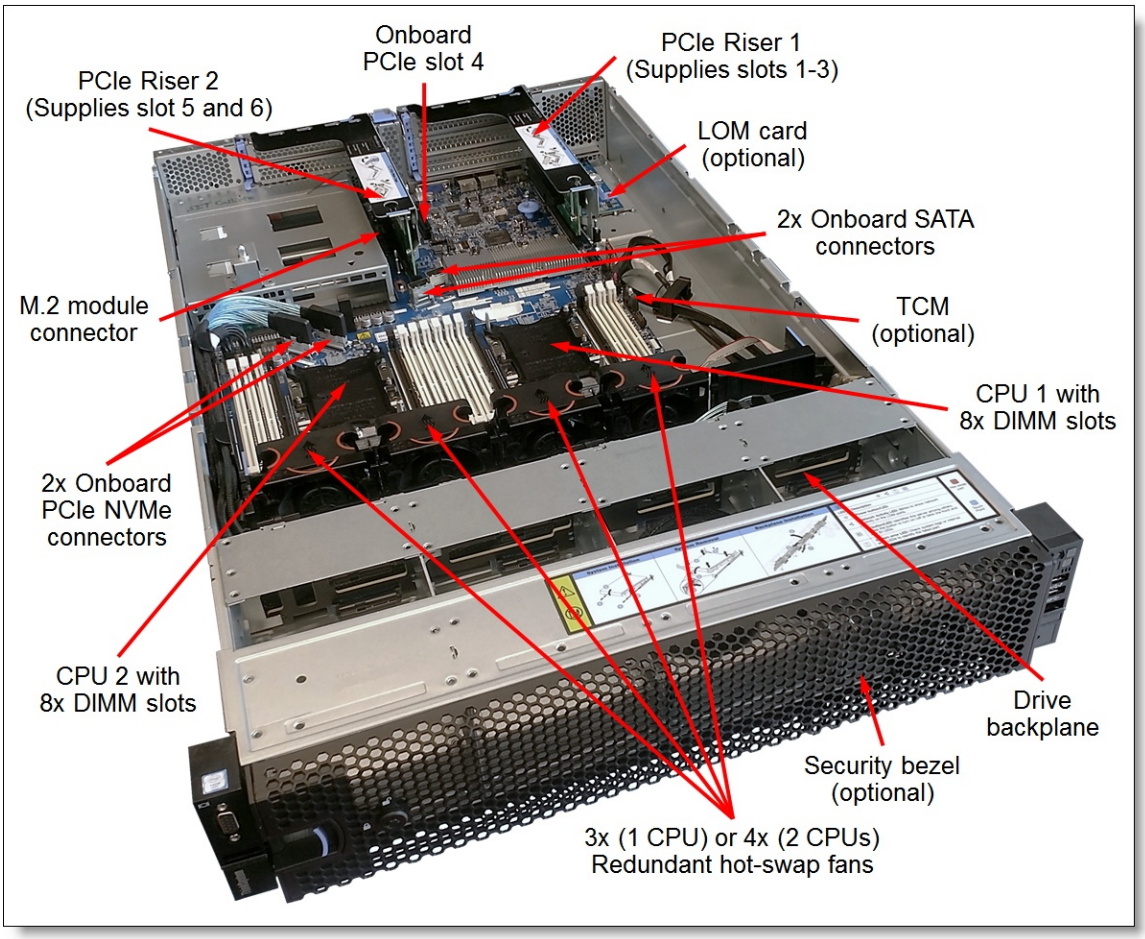


Figure 6. Internal view of the SR590

The following key components are located inside the SR590 server:

- Up to two processors.
- 16 DIMM slots (8 DIMM slots per processor).
- Drive backplanes.
- Two onboard NVMe PCIe connectors.
- One M.2 module connector.
- One LOM card connector.
- Two slots for PCIe riser cards.
- One TCM connector.
- Three (one processor) or four (two processors) hot-swap system fans.

System specifications

The following table lists the system specifications for the SR590 server.

Table 1. SR590 system specifications

Attribute	Specification
Machine types	7X98 - 1 year warranty 7X99 - 3 year warranty
Form factor	2U rack-mount.

Attribute	Specification
Processor	Up to two Intel Xeon Bronze, Silver, Gold, or Platinum Gen 2 processors of up to 150 W TDP: • Up to 24 cores (2.1 GHz core speeds). • Up to 3.8 GHz core speeds (4 cores). • Two UPI links up to 10.4 GT/s each. • Up to 35.75 MB cache. • Up to 2933 MHz memory speed. 1st Gen Intel Xeon processors are also supported.
Chipset	Intel C622.
Memory	Up to 16 DIMM sockets (8 DIMMs per processor; 6 memory channels per processor with one DIMM per channel for four channels and two DIMMs per channel for two channels). Support for RDIMMs or LRDIMMs. Memory types cannot be intermixed. Memory speed up to 2933 MHz depending on the processor selected.
Persistent memory	Up to 4x 128 GB, 256 GB, or 512 GB TruDDR4 2666 MHz DCPMMs in the DIMM slots. Not supported with 1st Gen Intel Xeon SP processors.

Memory capacity	• Memory DIMMs only: Up to 1 TB with up to 16x 64 GB RDIMMs (Up to 512 GB per processor).
	• Memory DIMMs and persistent memory modules:
	  ◦ App Direct Mode: Up to 2.75 TB with up to 12x 64 GB RDIMMs and up to 4x 512 GB DCPMMs (Up to 1.375 TB per processor).
	  ◦ Memory Mode: Up to 2 TB with up to 4x 512 GB DCPMMs (Up to 1 TB per processor).
	Note: Server configurations with more than 1 TB of memory capacity per socket (including DCPMMs and RDIMMs) require processors that support up to 4.5 TB (L-suffix) per socket.

Memory protection	• Processor's integrated memory controllers: Error correction code (ECC), SDDC (for x4-based memory DIMMs), ADDDC (for x4-based memory DIMMs, requires Intel Xeon Gold or Platinum processors), memory mirroring, memory rank sparing, patrol scrubbing, and demand scrubbing. • DCPMM's onboard memory controllers: ECC, SDDC, DDDC, patrol scrubbing, and demand scrubbing. **Note:** In the configurations with DCPMMs, memory mirroring is supported only in the App Direct mode (other DCPMM modes do not support memory mirroring) and applies only to the RDIMMs (DCPMMs are not mirrored). Memory sparing is not supported in the configurations with DCPMMs.

Drive bays	• Up to 16 SFF hot-swap drive bays:
	  ◦ 8x 2.5" SAS/SATA + 8x 2.5" SAS/SATA
	  ◦ 4x 2.5" SAS/SATA & 4x 2.5" AnyBay + 8x 2.5" SAS/SATA
	• 8 LFF SATA Simple Swap drive bays
	• 8 LFF SAS/SATA hot-swap drive bays
	• Up to 14 LFF hot-swap drive bays:
	  ◦ 12x 3.5" SAS/SATA (front) + 2x 3.5" SAS/SATA (rear)
	  ◦ 8x 3.5" SAS/SATA & 4x 3.5" AnyBay (front) + 2x 3.5" SAS/SATA (rear)

Internal storage capacity	• 2.5-inch drives:
	  ◦ 245.76TB using 16x 15.36TB 2.5-inch SAS SSDs
	  ◦ 32TB using 4x 8TB 2.5-inch NVMe SSDs
	  ◦ 38.4TB using 16x 2.4TB 2.5-inch HDDs
	• 3.5-inch drives:
	  ◦ 252TB using 14x 18TB 3.5-inch HDDs
	  ◦ 107.52TB using 14x 7.68TB 3.5-inch SAS/SATA SSDs

Attribute	Specification

Storage controller	6 Gbps SATA
	• Non-RAID: Onboard SATA AHCI
	• RAID 0/1/10/5: Onboard SATA RAID (Intel RSTe)
	
	12 Gbps SAS/6 Gbps SATA RAID
	• RAID 0/1/10: RAID 530-16i
	• RAID 0/1/10/5/50:
	  ◦ RAID 530-8i
	  ◦ RAID 730-8i 1GB Cache
	• RAID 0/1/10/5/50/6/60:
	  ◦ RAID 730-8i 2GB Flash
	  ◦ RAID 930-8i 2GB Flash
	  ◦ RAID 930-16i 4GB or 8GB Flash
	
	12 Gbps SAS/6 Gbps SATA non-RAID: 430-8i or 16i HBA
	
	NVMe PCIe non-RAID
	• Onboard NVMe (Requires the second processor); or
	• 1610-4P NVMe Switch Adapter (configurations with one processor only)

Optical drive bays	None. Support for an external USB DVD RW Optical Disk Drive (SeeOptical drives).

Network interfaces	• 2x Integrated 1 GbE RJ-45 ports (no 10/100 Mb support)
	• Onboard LOM slot for up to 4x 1/10 Gb Ethernet ports:
	  ◦ 2x 1 GbE RJ-45 ports (no 10/100 Mb support)
	  ◦ 2x 10 GbE RJ-45 ports (no 10/100 Mb support)
	  ◦ 2x 10 GbE SFP+ ports (no 10/100 Mb support)
	• Optional Mezzanine LOM (ML2) slot for dual-port 10 GbE cards with SFP+ or RJ-45 connectors.
	• 1x RJ-45 10/100/1000 Mb Ethernet systems management port.

I/O expansion slots	Up to six slots. Slot 4 is the fixed slots on the system planar, and the remaining slots depend on the riser cards installed. The slots are as follows: • Slot 1: PCIe 3.0 x16 or PCIe 3.0 x8; full-height, half-length (PCIe x16 slot is double-wide) • Slot 2: PCIe 3.0 x8; full-height, half-length (not present if the slot 1 is PCIe x16) • Slot 3: PCIe 3.0 x8 or ML2 x8; full-height, half-length • Slot 4: PCIe 3.0 x8; low profile (vertical slot on system planar) • Slot 5: PCIe 3.0 x16; full-height, half-length • Slot 6: PCIe 3.0 x8; full-height, half-length Slot 5 requires the second processor to be installed.
Ports	• Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.0 port. Optional 1x VGA port. • Rear: 2x USB 3.0 ports and 1x VGA port. Optional 1x DB-9 serial port.
Cooling	Three (one processor) or four (two processors) hot-swap system fans with N+1 redundancy.
Power supply	Up to two redundant hot-swap 550 W or 750 W (100 - 240 V) High Efficiency Platinum or 750 W (200 - 240 V) High Efficiency Titanium AC power supplies. HVDC support (PRC only).
Video	Matrox G200 with 16 MB memory integrated into the XClarity Controller. Maximum resolution is 1920x1200 at 60 Hz with 32 bits per pixel.
Hot-swap parts	Drives (select models), power supplies, and fans.
Systems management	XClarity Controller (XCC) Standard, Advanced, or Enterprise (Pilot 4 chip), proactive platform alerts, light path diagnostics, XClarity Provisioning Manager, XClarity Essentials, XClarity Administrator, XClarity Integrators for VMware vCenter and Microsoft System Center, XClarity Energy Manager, Capacity Planner.
Security features	Power-on password, administrator's password, secure firmware updates, Trusted Platform Module (TPM) 1.2 or 2.0 (configurable UEFI setting). Optional lockable front bezel. Optional Trusted Cryptographic Module (TCM) or Nationz TPM (available only in PRC). Optional Lenovo Business Vantage security software (available only in PRC).

Attribute	Specification
Operating systems	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi. See the Operating systems section for specifics.
Warranty	One-year (7X98) or three-year (7X99) customer-replaceable unit (CRU) and onsite limited warranty with 9x5 Next Business Day Parts Delivered.
Service and support	Optional service upgrades are available through Lenovo Services: 2-hour or 4-hour response time, 6-hour or 24-hour committed service repair, warranty extension up to 5 years, 1-year or 2-year post-warranty extensions, YourDrive Your Data, Enterprise Software Support, and Basic Hardware Installation Services.
Dimensions	Width: 445 mm (17.5 in.), height: 87 mm (3.4 in.), depth: 764 mm (30.1 in.). See Physical specifications for details.
Weight	Minimum configuration: 19 kg (41.9 lb), maximum: 26 kg (57.3 lb)

Models

ThinkSystem SR590 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 base CTO models are available for the SR590 as listed in the following table, CTO1WW and CTOLWW:

- The CTO1WW base CTO model is for general business and is selectable by choosing **General Purpose** mode in DCSC.
- The CTOLWW base model is 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 ThinkSystem Hardware** mode in DCSC. CTOLWW configurations can also be built using System x and Cluster Solutions Configurator (x-config).

Preconfigured server models may also be available for the SR590, 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 SR590 server.

Table 2. Base CTO models

Description	Machine Type/Model General purpose	Machine Type/Model for HPC and AI
ThinkSystem SR590 - 3 year Warranty	7X99CTO1WW	7X99CTOLWW
ThinkSystem SR590 - 1 year Warranty	7X98CTO1WW	7X98CTOLWW

The following table lists the base chassis for CTO models of the SR590 server.

Table 3. Base chassis for CTO models

Feature code	Description
AXEB	ThinkSystem SR590 3.5" Chassis with 8 or 12 Bays
AXEA	ThinkSystem SR590 2.5" Chassis with 8 or 16 Bays

All models of the SR590 server are shipped with the following items:

- *Rack Installation Guide*
- *Electronic Publications Flyer*

Models table conventions: The model tables shown in this section use the following conventions:

- Drive bays:
  - If the number is shown as "x", it represents the quantity of the SAS/SATA drive bays.
  - If the number is shown as "x+y", it represents the quantity of the SAS/SATA + AnyBay drive bays.
- XClarity Controller: "S" = Standard, "A" = Advanced, "E" = Enterprise.
- Front VGA port: "Y" = Included; "N" = Not included, optional.
- Tool-less Rail Kit: "Y" = Included; "N" = Not included, optional.
- Cable Management Arm (CMA): "Y" = Included; "N" = Not included, optional.
- Power cord:
  - "R1" = 1.5 m C13-C14 rack power cable.
  - "R2" = 2.8 m C13-C14 rack power cable.
  - "N" = Not included; see Power supplies and cables for the ordering information.

The following tables list the models of the SR590 server for the following regions:

- Brazil
- Latin America (except Brazil)
- Europe, Middle East, and Africa (EMEA)
- India
- Hong Kong, Taiwan, Korea
- Japan
- Association of Southeast Asian Nations (ASEAN)
- Australia and New Zealand

Table 4. SR590 server models: Brazil

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
Relationship models - Brazil													
7X99A08CBR	1x 4210 10C 85W 2.2GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	2x 10Gb RJ-45	4x PCIe x8	1x 750W Platinum	S	Y	Y	N	R2
7X99A08DBR	1x 4214 12C 85W 2.2GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	2x 10Gb RJ-45	4x PCIe x8	1x 750W Platinum	S	Y	Y	N	R2
7X99A08EBR	1x 4216 16C 100W 2.1GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	2x 10Gb RJ-45	4x PCIe x8	1x 750W Platinum	S	Y	Y	N	R2

* Processor details: Processor quantity and model, cores, thermal design power (TDP), and core speed.
^ The server supports one onboard PCIe slot 4 and up to five I/O slots on the riser cards. An internal PCIe storage controller occupies the PCIe slot 4. The onboard SATA storage controller does not consume a PCIe slot.

Table 5. SR590 server models: Latin America (except Brazil)

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
Relationship models - Brazil													
7X99A089LA	1x 4210 10C 85W 2.2GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	2x 10Gb RJ-45	4x PCIe x8	1x 750W Platinum	S	Y	Y	N	R2

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
7X99A08ALA	1x 4214 12C 85W 2.2GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	2x 10Gb RJ-45	4x PCIe x8	1x 750W Platinum	S	Y	Y	N	R2
7X99A08BLA	1x 4216 16C 100W 2.1GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	2x 10Gb RJ-45	4x PCIe x8	1x 750W Platinum	S	Y	Y	N	R2
TopSeller models - Brazil													
7X99100GLA	1x 4210R 10C 100W 2.4GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	2x 10Gb RJ-45 2x 1GbE RJ-45 I350	4x PCIe x8	1x 750W Platinum	S	Y	Y	N	R2

* Processor details: Processor quantity and model, cores, thermal design power (TDP), and core speed.
^ The server supports one onboard PCIe slot 4 and up to five I/O slots on the riser cards. An internal PCIe storage controller occupies the PCIe slot 4. The onboard SATA storage controller does not consume a PCIe slot.

Table 6. SR590 server models (3-year warranty): EMEA

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
Relationship models - EMEA													
7X99A08UEA	1x 3206R 8C 85W 1.9GHz	1x 16GB (x8) 2933MHz	None	No bays / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A08KEA	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A099EA	1x 4208 8C 85W 2.1GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A098EA	1x 4210R 10C 100W 2.4GHz	1x 32GB (x4) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A079EA	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2666MHz	None	No bays / 14 HS LFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A08LEA	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A078EA	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2666MHz	1x RAID 930-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A05MEA	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2666MHz	1x RAID 930-8i 2GB	8 / 16 HS SFF	3x 600GB 10K HDD	Open slot	1x PCIe x8	2x 750W Platinum	E	N	Y	N	R2
7X99A08TEA	1x 4210R 10C 100W 2.4GHz	1x 16GB (x8) 2933MHz	None	No bays / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A08VEA	1x 4210R 10C 100W 2.4GHz	1x 16GB (x8) 2933MHz	1x RAID 930-8i 2GB	8 / 16 HS SFF	3x 600GB 10K HDD	Open slot	1x PCIe x8	2x 750W Platinum	E	N	Y	N	R2
7X99A05LEA	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2666MHz	1x RAID 930-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A08SEA	1x 4215R 8C 130W 3.2GHz	1x 16GB (x8) 2933MHz	None	No bays / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A08WEA	1x 4215R 8C 130W 3.2GHz	1x 16GB (x8) 2933MHz	1x RAID 930-8i 2GB	8 / 16 HS SFF	3x 600GB 10K HDD	Open slot	1x PCIe x8	2x 750W Platinum	E	N	Y	N	R2

* Processor details: Processor quantity and model, cores, thermal design power (TDP), and core speed.
^ The server supports one onboard PCIe slot 4 and up to five I/O slots on the riser cards. An internal PCIe storage controller occupies the PCIe slot 4. The onboard SATA storage controller does not consume a PCIe slot.

Table 7. SR590 server models (3-year warranty): India

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
TopSeller models - India													
7X99A069SG	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A051SG	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A055SG	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A06ZSG	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A06XSG	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A05TSG	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A06KSG	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A05PSG	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A05VSG	1x 4215 8C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A058SG	1x 4215 8C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A059SG	1x 4216 16C 100W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A06QSG	1x 4216 16C 100W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A072SG	1x 5215 10C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A054SG	1x 5215 10C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A060SG	1x 5217 8C 115W 3.0GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A06RSG	1x 5217 8C 115W 3.0GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A077SG	1x 5218 16C 125W 2.3GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A05RSG	1x 5218 16C 125W 2.3GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A053SG	1x 5220 18C 125W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A05FSG	1x 5220 18C 125W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A074SG	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2
7X99A050SG	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	R2

* Processor details: Processor quantity and model, cores, thermal design power (TDP), and core speed.
^ The server supports one onboard PCIe slot 4 and up to five I/O slots on the riser cards. An internal PCIe storage controller occupies the PCIe slot 4. The onboard SATA storage controller does not consume a PCIe slot.

Table 8. SR590 server models (3-year warranty): Hong Kong, Taiwan, Korea

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
Relationship models - Hong Kong, Taiwan, Korea													
7X99A06FCN	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06PCN	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06ACN	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06HCN	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05CCN	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06SCN	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A070CN	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05ZCN	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05ECN	1x 4215 8C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05ACN	1x 4215 8C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05HCN	1x 4216 16C 100W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A061CN	1x 4216 16C 100W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06GCN	1x 5215 10C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A064CN	1x 5215 10C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06WCN	1x 5217 8C 115W 3.0GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05DCN	1x 5217 8C 115W 3.0GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06MCN	1x 5218 16C 125W 2.3GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06ECN	1x 5218 16C 125W 2.3GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06VCN	1x 5220 18C 125W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A052CN	1x 5220 18C 125W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07ACN	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A067CN	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N

* Processor details: Processor quantity and model, cores, thermal design power (TDP), and core speed.
^ The server supports one onboard PCIe slot 4 and up to five I/O slots on the riser cards. An internal PCIe storage controller occupies the PCIe slot 4. The onboard SATA storage controller does not consume a PCIe slot.

Table 9. SR590 server models (3-year warranty): Japan

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
Relationship models - Japan													
7X99A075JP	1x 3204 6C 85W 1.9GHz	1x 16GB (x4) 2666MHz	1x RAID 730-8i 2GB	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A05UJP	1x 3204 6C 85W 1.9GHz	1x 16GB (x4) 2666MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A068JP	1x 4208 8C 85W 2.1GHz	1x 16GB (x4) 2666MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A05GJP	1x 4210 10C 85W 2.2GHz	1x 16GB (x4) 2666MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A06CJP	1x 4210 10C 85W 2.2GHz	1x 16GB (x4) 2666MHz	1x RAID 930-16i 4GB	12 / 14 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A063JP	1x 4216 16C 100W 2.1GHz	1x 16GB (x4) 2666MHz	1x RAID 730-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A06DJP	1x 4216 16C 100W 2.1GHz	1x 16GB (x4) 2666MHz	1x RAID 930-16i 4GB	12 / 14 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A06BJP	1x 5222 4C 105W 3.8GHz	1x 16GB (x4) 2666MHz	1x RAID 930-8i 2GB	4+4 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A05KJP	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 930-8i 2GB	4+4 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A06NJP	1x 6252 24C 150W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 930-8i 2GB	4+4 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	N	Y	N	N
7X99A093JP	1x 4215R 8C 130W 3.2GHz	1x 16GB (x4) 2666MHz	None	No bays / 16 SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	A	N	Y	N	N
7X99A094JP	1x 5218R 20C 125W 2.1GHz	1x 16GB (x4) 2666MHz	None	No bays / 16 SFF	Open bay	Open slot	1x PCIe x8	1x 550W Platinum	A	N	Y	N	N
7X99A095JP	1x 5220R 24C 150W 2.2GHz	1x 16GB (x4) 2666MHz	None	No bays / 16 SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	A	N	Y	N	N
7X99A096JP	1x 6226R 16C 150W 2.9GHz	1x 16GB (x4) 2933MHz	None	No bays / 16 SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	A	N	Y	N	N
7X99A092JP	1x 6230R 26C 150W 2.1GHz	1x 16GB (x4) 2933MHz	None	No bays / 16 SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	A	N	Y	N	N
TopSeller models - Japan													
7X99A090JP	1x 3206R 8C 85W 1.9GHz	1x 16GB (x4) 2666MHz	None	No bays / 16 SFF	Open bay	Open slot	1x PCIe x8	1x 550W Platinum	A	N	Y	N	N
7X99A08ZJP	1x 4210R 10C 100W 2.4GHz	1x 16GB (x4) 2666MHz	None	No bays / 16 SFF	Open bay	Open slot	1x PCIe x8	1x 550W Platinum	A	N	Y	N	N
7X99A091JP	1x 4214R 12C 100W 2.4GHz	1x 16GB (x4) 2666MHz	None	No bays / 16 SFF	Open bay	Open slot	1x PCIe x8	1x 550W Platinum	A	N	Y	N	N

* Processor details: Processor quantity and model, cores, thermal design power (TDP), and core speed.
^ The server supports one onboard PCIe slot 4 and up to five I/O slots on the riser cards. An internal PCIe storage controller occupies the PCIe slot 4. The onboard SATA storage controller does not consume a PCIe slot.

Table 10. SR590 server models (3-year warranty): ASEAN

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
TopSeller models - ASEAN													
7X99A05WSG	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A04ZSG	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05BSG	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06USG	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A062SG	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06YSG	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A056SG	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05NSG	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A065SG	1x 4215 8C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06LSG	1x 4215 8C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05QSG	1x 4216 16C 100W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05SSG	1x 4216 16C 100W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A076SG	1x 5215 10C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A073SG	1x 5215 10C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A071SG	1x 5217 8C 115W 3.0GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06TSG	1x 5217 8C 115W 3.0GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05JSG	1x 5218 16C 125W 2.3GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05YSG	1x 5218 16C 125W 2.3GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05XSG	1x 5220 18C 125W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A057SG	1x 5220 18C 125W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A06JSG	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A066SG	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N

* Processor details: Processor quantity and model, cores, thermal design power (TDP), and core speed.
^ The server supports one onboard PCIe slot 4 and up to five I/O slots on the riser cards. An internal PCIe storage controller occupies the PCIe slot 4. The onboard SATA storage controller does not consume a PCIe slot.

Table 11. SR590 server models: Australia and New Zealand

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
Relationship models - Australia and New Zealand (1-year warranty)													
7X98A00PAU	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2666MHz	None	No bays / 14 HS LFF	Open bay	Open slot	None	1x 550W	S	Y	Y	N	R2
Relationship models - Australia and New Zealand (3-year warranty)													
7X99A07LAU	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07RAU	1x 3204 6C 85W 1.9GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07CAU	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07JAU	1x 4208 8C 85W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A079AU	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2666MHz	None	No bays / 14 HS LFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A07QAU	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07BAU	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A078AU	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2666MHz	1x RAID 930-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A05MAU	1x 4210 10C 85W 2.2GHz	1x 16GB (x8) 2666MHz	1x RAID 930-8i 2GB	8 / 16 HS SFF	3x 600GB 10K HDD	Open slot	1x PCIe x8	2x 750W Platinum	E	N	Y	N	R2
7X99A07UAU	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07WAU	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A05LAU	1x 4214 12C 85W 2.2GHz	1x 16GB (x8) 2666MHz	1x RAID 930-8i 2GB	8 / 16 HS SFF	Open bay	Open slot	1x PCIe x8	1x 750W Platinum	E	N	Y	N	R2
7X99A07XAU	1x 4215 8C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07YAU	1x 4215 8C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07NAU	1x 4216 16C 100W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07KAU	1x 4216 16C 100W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07GAU	1x 5215 10C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07PAU	1x 5215 10C 85W 2.5GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07EAU	1x 5217 8C 115W 3.0GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07FAU	1x 5217 8C 115W 3.0GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07DAU	1x 5218 16C 125W 2.3GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07VAU	1x 5218 16C 125W 2.3GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N

Model number	Intel Xeon processor* (2 max)	Memory RDIMM (16 max)	Storage controller	Drive bays (std / max)	Drives	Eth. LOM	I/O slots (6 max)^	Power supply (2 max)	XClarity Controller	Front VGA port	Tool-less Rail Kit	CMA	Power cord
7X99A07SAU	1x 5220 18C 125W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07MAU	1x 5220 18C 125W 2.2GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07TAU	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 8 HS LFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N
7X99A07HAU	1x 6230 20C 125W 2.1GHz	1x 16GB (x8) 2933MHz	1x RAID 530-8i	8 / 16 HS SFF	Open bay	Open slot	4x PCIe x8	1x 750W Platinum	S	Y	N	N	N

* Processor details: Processor quantity and model, cores, thermal design power (TDP), and core speed.
^ The server supports one onboard PCIe slot 4 and up to five I/O slots on the riser cards. An internal PCIe storage controller occupies the PCIe slot 4. The onboard SATA storage controller does not consume a PCIe slot.

Processors

The SR590 server supports one or two Intel Xeon Bronze, Silver, Gold, or Platinum Gen 2 processors of up to 150 W TDP. The following table lists the specifications of the processors for the SR590 server.

Processor support: Both 1st Gen and 2nd Gen Intel Xeon SP processors are supported. For supported 1st Gen processors, see the Continued support for 1st Gen Intel Xeon Scalable processors section.

Processor specifications table abbreviations:

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

Table 12. Processor specifications

CPU model	Cores / threads	Core speed (Base / TB Max)	Cache	Max DDR4 speed	Max memory capacity per socket	UPI speed	TDP	HT	TB	VT-x	VT-d	SST-PP	FMA units	DCPMM	RAS
Intel Xeon Bronze processors															
3204	6 / 6	1.9 / 1.9 GHz	8.25 MB	2133 MHz	1 TB	9.6 GT/s	85 W	N	N	Y	Y	N	1	N	Std
3206R	8 / 8	1.9 / 1.9 GHz	11 MB	2133 MHz	1 TB	9.6 GT/s	85 W	N	N	Y	Y	N	1	N	Std
Intel Xeon Silver processors															
4208	8 / 16	2.1 / 3.2 GHz	11 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	N	1	N	Std
4209T	8 / 16	2.2 / 3.2 GHz	11 MB	2400 MHz	1 TB	9.6 GT/s	70 W	Y	Y	Y	Y	N	1	N	Std
4210	10 / 20	2.2 / 3.2 GHz	13.75 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	N	1	N	Std

CPU model	Cores / threads	Core speed (Base / TB Max)	Cache	Max DDR4 speed	Max memory capacity per socket	UPI speed	TDP	HT	TB	VT-x	VT-d	SST-PP	FMA units	DCPMM	RAS
4210R	10 / 20	2.4 / 3.2 GHz	13.75 MB	2400 MHz	1 TB	9.6 GT/s	100 W	Y	Y	Y	Y	N	1	N	Std
4214	12 / 24	2.2 / 3.2 GHz	16.5 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	N	1	N	Std
4214R	12 / 24	2.4 / 3.5 GHz	16.5 MB	2400 MHz	1 TB	9.6 GT/s	100 W	Y	Y	Y	Y	N	1	N	Std
4214Y	12 / 24	2.2 / 3.2 GHz	16.5 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	Y	1	N	Std
	10 / 20	2.3 / 3.2 GHz													
	8 / 16	2.4 / 3.2 GHz													
4215	8 / 16	2.5 / 3.5 GHz	11 MB	2400 MHz	1 TB	9.6 GT/s	85 W	Y	Y	Y	Y	N	1	Y	Std
4215R	8 / 16	3.2 / 4.0 GHz	11 MB	2400 MHz	1 TB	9.6 GT/s	130 W	Y	Y	Y	Y	N	1	Y	Std
4216	16 / 32	2.1 / 3.2 GHz	22 MB	2400 MHz	1 TB	9.6 GT/s	100 W	Y	Y	Y	Y	N	1	N	Std
Intel Xeon Gold processors															
5215	10 / 20	2.5 / 3.4 GHz	13.75 MB	2666 MHz	1 TB	10.4 GT/s	85 W	Y	Y	Y	Y	N	1	Y	Adv
5215L	10 / 20	2.5 / 3.4 GHz	13.75 MB	2666 MHz	4.5 TB	10.4 GT/s	85 W	Y	Y	Y	Y	N	1	Y	Adv
5217	8 / 16	3.0 / 3.7 GHz	11 MB	2666 MHz	1 TB	10.4 GT/s	115 W	Y	Y	Y	Y	N	1	Y	Adv
5218	16 / 32	2.3 / 3.9 GHz	22 MB	2666 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	1	Y	Adv
5218B	16 / 32	2.3 / 3.9 GHz	22 MB	2666 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	1	Y	Adv
5218R	20 / 40	2.1 / 4.0 GHz	27.5 MB	2666 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	1	Y	Adv
5218T	16 / 32	2.1 / 3.8 GHz	22 MB	2666 MHz	1 TB	10.4 GT/s	105 W	Y	Y	Y	Y	N	1	Y	Adv
5220	18 / 36	2.2 / 3.9 GHz	24.75 MB	2666 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	1	Y	Adv
5220R	24 / 48	2.2 / 4.0 GHz	35.75 MB	2666 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	1	Y	Adv
5220S	18 / 36	2.7 / 3.9 GHz	24.75 MB	2666 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	1	Y	Adv
5220T	18 / 36	1.9 / 3.9 GHz	24.75 MB	2666 MHz	1 TB	10.4 GT/s	105 W	Y	Y	Y	Y	N	1	Y	Adv
5222	4 / 8	3.8 / 3.9 GHz	16.5 MB	2933 MHz	1 TB	10.4 GT/s	105 W	Y	Y	Y	Y	N	2	Y	Adv
6208U	16 / 32	2.9 / 3.9 GHz	22 MB	2933 MHz	1 TB	N/A	150 W	Y	Y	Y	Y	N	2	Y	Adv
6209U	20 / 40	2.1 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	N/A	125 W	Y	Y	Y	Y	N	2	Y	Adv
6210U	20 / 40	2.5 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	N/A	150 W	Y	Y	Y	Y	N	2	Y	Adv
6222V	20 / 40	1.8 / 3.6 GHz	27.5 MB	2400 MHz	1 TB	10.4 GT/s	115 W	Y	Y	Y	Y	N	2	Y	Adv
6226	12 / 24	2.7 / 3.7 GHz	19.25 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	2	Y	Adv
6226R	16 / 32	2.9 / 3.9 GHz	22 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv
6230	20 / 40	2.1 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	2	Y	Adv
6230N	20 / 40	2.3 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	2	Y	Adv
6230R	26 / 52	2.1 / 4.0 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv
6230T	20 / 40	2.1 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	2	Y	Adv
6234	8 / 16	3.3 / 4.0 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	130 W	Y	Y	Y	Y	N	2	Y	Adv
6238	22 / 44	2.1 / 3.7 GHz	30.25 MB	2933 MHz	1 TB	10.4 GT/s	140 W	Y	Y	Y	Y	N	2	Y	Adv
6238L	22 / 44	2.1 / 3.7 GHz	30.25 MB	2933 MHz	4.5 TB	10.4 GT/s	140 W	Y	Y	Y	Y	N	2	Y	Adv
6238T	22 / 44	1.9 / 3.7 GHz	30.25 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	2	Y	Adv
6240	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv
6240L	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	4.5 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv
6240Y	18 / 36	2.6 / 3.9 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	Y	2	Y	Adv
	14 / 28	2.8 / 3.9 GHz													
	8 / 16	3.1 / 3.9 GHz													
6242	16 / 32	2.8 / 3.9 GHz	22 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv
6244	8 / 16	3.6 / 4.4 GHz	24.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv
6248	20 / 40	2.5 / 3.9 GHz	27.5 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv
6252	24 / 48	2.1 / 3.7 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv
6252N	24 / 48	2.3 / 3.6 GHz	35.75 MB	2933 MHz	1 TB	10.4 GT/s	150 W	Y	Y	Y	Y	N	2	Y	Adv

CPU model	Cores / threads	Core speed (Base / TB Max)	Cache	Max DDR4 speed	Max memory capacity per socket	UPI speed	TDP	HT	TB	VT-x	VT-d	SST-PP	FMA units	DCPMM	RAS
6262V	24 / 48	1.9 / 3.6 GHz	33 MB	2400 MHz	1 TB	10.4 GT/s	135 W	Y	Y	Y	Y	N	2	Y	Adv
Intel Xeon Platinum processors															
8253	16 / 32	2.2 / 3.0 GHz	22 MB	2933 MHz	1 TB	10.4 GT/s	125 W	Y	Y	Y	Y	N	2	Y	Adv
8256	4 / 8	3.8 / 3.9 GHz	16.5 MB	2933 MHz	1 TB	10.4 GT/s	105 W	Y	Y	Y	Y	N	2	Y	Adv

Configuration notes:

- The Intel Xeon Gold 5218 and 5218B processors have similar specifications; however, they use different silicon designs and cannot be mixed in the same system.
- The processors that support SST-PP offer three distinct operating points that are defined by a core count with a base speed associated with that core count. The operating point is static, it is selected during the boot process and cannot be changed at runtime.

For the SR590 server models that come standard with one processor, the second processor can be ordered, if required (see the following table for ordering information). The second processor must be of the same model as the first processor. The second processor option includes a processor and a heatsink; an additional system fan is not included and needs to be purchased with the second processor (see Cooling for details).

Note: The Intel Xeon Gold 6209U and 6210U processors are supported only in the uniprocessor configurations.

Table 13. Processor options

Part number	Feature code*	Description
Intel Xeon Bronze processors		
4XG7A37938	B4HU	SR550/SR590/SR650 Intel Xeon Bronze 3204 6C 85W 1.9GHz Processor w/o FAN
4XG7A37983	B7N3	SR550/SR590/SR650 Intel Xeon Bronze 3206R 8C 85W 1.9GHz Processor w/o FAN
Intel Xeon Silver processors		
4XG7A37935	B4HT	SR550/SR590/SR650 Intel Xeon Silver 4208 8C 85W 2.1GHz Processor w/o FAN
4XG7A37944	B4P4	SR550/SR590/SR650 Intel Xeon Silver 4209T 8C 70W 2.2GHz Processor w/o FAN
4XG7A37932	B4HS	SR550/SR590/SR650 Intel Xeon Silver 4210 10C 85W 2.2GHz Processor w/o FAN
4XG7A37981	B7N5	SR550/SR590/SR650 Intel Xeon Silver 4210R 10C 100W 2.4GHz Processor w/o FAN
4XG7A37929	B4HR	SR550/SR590/SR650 Intel Xeon Silver 4214 12C 85W 2.2GHz Processor w/o FAN
4XG7A37980	B7N6	SR550/SR590/SR650 Intel Xeon Silver 4214R 12C 100W 2.4GHz Processor w/o FAN
4XG7A37941	B4NW	SR550/SR590/SR650 Intel Xeon Silver 4214Y 12/10/8C 85W 2.2GHz Processor w/o FAN
4XG7A37926	B4HQ	SR550/SR590/SR650 Intel Xeon Silver 4215 8C 85W 2.5GHz Processor w/o FAN
4XG7A63274	BAZU	SR590/SR650 Intel Xeon Silver 4215R 8C 130W 3.2GHz Processor w/o FAN
4XG7A37923	B4HP	SR550/SR590/SR650 Intel Xeon Silver 4216 16C 100W 2.1GHz Processor w/o FAN
Intel Xeon Gold processors		
4XG7A37916	B4HN	SR550/SR590/SR650 Intel Xeon Gold 5215 10C 85W 2.5GHz Processor w/o FAN
4XG7A37910	B4P9	SR550/SR590/SR650 Intel Xeon Gold 5215L 10C 85W 2.5GHz Processor w/o FAN
4XG7A37919	B4HM	SR550/SR590/SR650 Intel Xeon Gold 5217 8C 115W 3.0GHz Processor w/o FAN
4XG7A37895	B4HL	SR550/SR590/SR650 Intel Xeon Gold 5218 16C 125W 2.3GHz Processor w/o FAN
4XG7A37958	B6BS	SR550/SR590/SR650 Intel Xeon Gold 5218B 16C 125W 2.3GHz Processor w/o FAN
4XG7A63272	BAZS	SR550/SR590/SR650 Intel Xeon Gold 5218R 20C 125W 2.1GHz Processor w/o FAN
4XG7A37955	B5S0	SR550/SR590/SR650 Intel Xeon Gold 5218T 16C 105W 2.1GHz Processor w/o FAN
4XG7A37892	B4HK	SR550/SR590/SR650 Intel Xeon Gold 5220 18C 125W 2.2GHz Processor w/o FAN

Part number	Feature code*	Description
4XG7A37974	B7N9	SR590/SR650 Intel Xeon Gold 5220R 24C 150W 2.2GHz Processor w/o FAN
4XG7A38019	B6CW	SR550/SR590/SR650 Intel Xeon Gold 5220S 18C 125W 2.7GHz Processor w/o FAN
4XG7A38005	B6CQ	SR550/SR590/SR650 Intel Xeon Gold 5220T 18C 105W 1.9GHz Processor w/o FAN
4XG7A37951	B5S1	SR550/SR590/SR650 Intel Xeon Gold 5222 4C 105W 3.8GHz Processor w/o FAN
None**	BAZV	Intel Xeon Gold 6208U 16C 150W 2.9GHz Processor
None**	B6CX	Intel Xeon Gold 6209U 20C 125W 2.1GHz Processor
None**	B5RX	Intel Xeon Gold 6210U 20C 150W 2.5GHz Processor
4XG7A38023	B6CV	SR550/SR590/SR650 Intel Xeon Gold 6222V 20C 115W 1.8GHz Processor w/o FAN
4XG7A38021	B6CL	SR550/SR590/SR650 Intel Xeon Gold 6226 12C 125W 2.7GHz Processor w/o FAN
4XG7A38082	BAZW	SR590/SR650 Intel Xeon Gold 6226R 16C 150W 2.9GHz Processor w/o FAN
4XG7A37889	B4HJ	SR550/SR590/SR650 Intel Xeon Gold 6230 20C 125W 2.1GHz Processor w/o FAN
4XG7A38028	B5RY	SR550/SR590/SR650 Intel Xeon Gold 6230N 20C 125W 2.3GHz Processor w/o FAN
4XG7A38081	BAZX	SR590/SR650 Intel Xeon Gold 6230R 26C 150W 2.1GHz Processor w/o FAN
4XG7A38006	B6CP	SR550/SR590/SR650 Intel Xeon Gold 6230T 20C 125W 2.1GHz Processor w/o FAN
4XG7A38001	B6CK	SR590/SR650 Intel Xeon Gold 6234 8C 130W 3.3GHz Processor w/o FAN
4XG7A38008	B6CJ	SR590/SR650 Intel Xeon Gold 6238 22C 140W 2.1GHz Processor w/o FAN
4XG7A38003	B6CR	SR590/SR650 Intel Xeon Gold 6238L 22C 140W 2.1GHz Processor w/o FAN
4XG7A37906	B4P2	SR550/SR590/SR650 Intel Xeon Gold 6238T 22C 125W 1.9GHz Processor w/o FAN
4XG7A37885	B4HH	SR590 Intel Xeon Gold 6240 18C 150W 2.6GHz Processor w/o FAN
4XG7A38015	B6CS	SR590/SR650 Intel Xeon Gold 6240L 18C 150W 2.6GHz Processor w/o FAN
4XG7A37903	B4NV	SR590/SR650 Intel Xeon Gold 6240Y 18/14/8C 150W 2.6GHz Processor w/o FAN
4XG7A37886	B4HG	SR590/SR650 Intel Xeon Gold 6242 16C 150W 2.8GHz Processor w/o FAN
4XG7A15874	B4HF	SR590/SR650 Intel Xeon Gold 6244 8C 150W 3.6GHz Processor w/o FAN
4XG7A15894	B4HE	SR590 Intel Xeon Gold 6248 20C 150W 2.5GHz Processor w/o FAN
4XG7A15891	B4HC	SR590 Intel Xeon Gold 6252 24C 150W 2.1GHz Processor w/o FAN
4XG7A38011	B6CT	SR590/SR650 Intel Xeon Gold 6252N 24C 150W 2.3GHz Processor w/o FAN
4XG7A38010	B6CU	SR590/SR650 Intel Xeon Gold 6262V 24C 135W 1.9GHz Processor w/o FAN
Intel Xeon Platinum processors		
4XG7A37898	B5RZ	SR550/SR590/SR650 Intel Xeon Platinum 8253 16C 125W 2.2GHz Processor w/o FAN
4XG7A37947	B5S2	SR550/SR590/SR650 Intel Xeon Platinum 8256 4C 105W 3.8GHz Processor w/o FAN

* For CTO configurations, the feature code represents a processor, and fans and heatsinks are derived by the configuration tool.
** Factory-installed only; no field upgrade. Supported in the uniprocessor configurations only.

Continued support for 1st Gen Intel Xeon Scalable processors

The SR590 also continues to support the 1st Gen Intel Xeon Scalable processors (formerly codenamed "Skylake") listed in the following table.

Table 14. Long-life 1st Gen Intel Xeon Scalable processors

Part number	Feature code	Description
4XG7A07259	AWEH	ThinkSystem SR590 Intel Xeon Bronze 3106 8C 85W 1.7GHz Processor Option Kit
4XG7A07262	AWET	ThinkSystem SR590 Intel Xeon Silver 4109T 8C 70W 2.0GHz Processor Option Kit
4XG7A07263	AWEE	ThinkSystem SR590 Intel Xeon Silver 4110 8C 85W 2.1GHz Processor Option Kit

Part number	Feature code	Description
4XG7A09076	AWES	Thinksystem SR590 Intel Xeon Silver 4114T 10C 85W 2.2GHz Processor Option Kit
4XG7A07264	AWER	ThinkSystem SR590 Intel Xeon Silver 4116 12C 85W 2.1GHz Processor Option Kit
4XG7A09077	AWEA	Thinksystem SR590 Intel Xeon Silver 4116T 12C 85W 2.1GHz Processor Option Kit
4XG7A09047	No CTO*	ThinkSystem SR590 Intel Xeon Gold 5115 10C 85W 2.4GHz Processor Option Kit
4XG7A07267	AWEP	ThinkSystem SR590 Intel Xeon Gold 5118 12C 105W 2.3GHz Processor Option Kit
4XG7A09075	AWEQ	Thinksystem SR590 Intel Xeon Gold 5119T 14C 85W 1.9GHz Processor Option Kit
4XG7A07268	AWE8	ThinkSystem SR590 Intel Xeon Gold 5120T 14C 105W 2.2GHz Processor Option Kit
4XG7A09037	AWEL	ThinkSystem SR590 Intel Xeon Gold 6126 12C 125W 2.6GHz Processor Option Kit
4XG7A07257	No CTO*	ThinkSystem SR590 Intel Xeon Gold 6126T 12C 125W 2.6GHz Processor Option Kit
4XG7A07258	AWEN	ThinkSystem SR590 Intel Xeon Gold 6130 16C 125W 2.1GHz Processor Option Kit
4XG7A07272	AWE4	ThinkSystem SR590 Intel Xeon Gold 6130T 16C 125W 2.1GHz Processor Option Kit
4XG7A09042	No CTO*	ThinkSystem SR590 Intel Xeon Gold 6134 8C 130W 3.2GHz Processor Option Kit
4XG7A07271	AWDZ	ThinkSystem SR590 Intel Xeon Gold 6138 20C 125W 2.0GHz Processor Option Kit
4XG7A07270	AWEM	ThinkSystem SR590 Intel Xeon Gold 6138T 20C 125W 2.0GHz Processor Option Kit
4XG7A09044	No CTO*	ThinkSystem SR590 Intel Xeon Gold 6140 18C 140W 2.3GHz Processor Option Kit
4XG7A09045	No CTO*	ThinkSystem SR590 Intel Xeon Gold 6142 16C 150W 2.6GHz Processor Option Kit
4XG7A09064	No CTO*	ThinkSystem SR590 Intel Xeon Platinum 8153 16C 125W 2.0GHz Processor Option Kit
4XG7A09071	No CTO*	ThinkSystem SR590 Intel Xeon Platinum 8156 4C 105W 3.6GHz Processor Option Kit
4XG7A09038	No CTO*	ThinkSystem SR590 Intel Xeon Platinum 8158 12C 150W 3.0GHz Processor Option Kit
4XG7A09039	No CTO*	ThinkSystem SR590 Intel Xeon Platinum 8160 24C 150W 2.1GHz Processor Option Kit
4XG7A09040	AWEK	ThinkSystem SR590 Intel Xeon Platinum 8160T 24C 150W 2.1GHz Processor Option Kit

* Only available as a field upgrade for existing customers. Not available in CTO (configure to order) configurations.

For specifications of these processors, see the Intel Xeon Scalable Processor Reference for Lenovo ThinkSystem Servers:
https://lenovopress.com/lp1262-intel-xeon-sp-processor-reference#term=SKL

Memory

The SR590 server supports up to 1 TB of memory capacity (up to 512 GB per processor) with up to 16 TruDDR4 memory RDIMMs when two processors are installed or up to 8 RDIMMs when one processor is installed. Each processor has six memory channels (two integrated memory controllers with three memory channels per memory controller), and there is a one DIMM per channel for four channels and two DIMMs per channel for two channels for a total of 8 DIMMs per processor.

Lenovo TruDDR4 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility tested and tuned on every ThinkSystem server to maximize performance and reliability.

TruDDR4 memory has a unique signature programmed into the DIMM, which enables Lenovo servers to verify whether the memory installed is qualified and supported. Lenovo qualified and supported TruDDR4 memory is covered by Lenovo warranty, and service and support provided worldwide.

The following memory protection technologies are supported by the processor's integrated memory controllers:

- ECC
- SDDC (for x4-based memory DIMMs)
- ADDDC (for x4-based memory DIMMs; Gold and Platinum processors only)
- Memory mirroring
- Memory rank sparing
- Patrol scrubbing
- Demand scrubbing

The following table lists memory options available for the server. The table also indicates which processor generation is supported for each memory option.

Table 15. Memory options

Part number	Feature code	Description	Maximum quantity*	Gen 1 CPU	Gen 2 CPU
RDIMMs - 2933 MHz					
4ZC7A08706	B4H1	ThinkSystem 8GB TruDDR4 2933MHz (1Rx8 1.2V) RDIMM	8 / 16	No	Yes
4ZC7A08707	B4LY	ThinkSystem 16GB TruDDR4 2933MHz (1Rx4 1.2V) RDIMM	8 / 16	No	Yes
4ZC7A08708	B4H2	ThinkSystem 16GB TruDDR4 2933MHz (2Rx8 1.2V) RDIMM	8 / 16	No	Yes
4ZC7A08709	B4H3	ThinkSystem 32GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	8 / 16	No	Yes
4ZC7A08710	B4H4	ThinkSystem 64GB TruDDR4 2933MHz (2Rx4 1.2V) RDIMM	8 / 16	No	Yes
RDIMMs - 2666 MHz					
7X77A01301	AUU1	ThinkSystem 8GB TruDDR4 2666 MHz (1Rx8 1.2V) RDIMM	8 / 16	Yes	No
7X77A01302	AUNB	ThinkSystem 16GB TruDDR4 2666 MHz (1Rx4 1.2V) RDIMM	8 / 16	Yes	Yes
7X77A01303	AUNC	ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	8 / 16	Yes	Yes
7X77A01304	AUND	ThinkSystem 32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	8 / 16	Yes	Yes
4ZC7A08716	AUW5	ThinkSystem 64GB TruDDR4 2666MHz (4Rx4, 1.2V) 3DS RDIMM	8 / 16	No	Yes
LRDIMMs - 2666 MHz					
7X77A01305	AUNE	ThinkSystem 64GB TruDDR4 2666 MHz (4Rx4 1.2V) LRDIMM	8 / 16	Yes	No

* The maximum quantity shown is with one processor / two processors.

Configuration notes:

- All DIMMs in the server operate at the same speed, which is determined as the lowest value of:
  - DIMM rated speed (2666 MHz or 2933 MHz).
  - Memory speed supported by the specific processor (2133 MHz, 2400 MHz, 2666 MHz, or 2933 MHz).
  - Memory speed for the selected quantity of DIMMs per channel:
    - One DIMM per channel (1 DPC): 2933 MHz.
    - Two DIMMs per channel (2 DPC): 2666 MHz.

  Note: Maximum memory speed can be achieved when Max performance mode is enabled in UEFI.
- Mixing RDIMMs of different ranks (single- or dual-rank), DRAM chip types (x4 or x8), speeds (2666 MHz or 2933 MHz), and capacities (8 GB, 16 GB, 32 GB, or 64 GB) is supported in the independent channel mode (the default operational mode).
- The maximum quantity of DIMMs supported is reduced by the quantity of DC Persistent Memory Modules used in the configuration.
- Server configurations with more than 1 TB of memory capacity per socket (including DCPMMs and RDIMMs) require processors that support up to 4.5 TB (L-suffix) per socket.
- For server configurations with memory protection, the following rules apply:
  - Single Device Data Correction (SDDC) works only in the independent channel mode and supports only x4-based memory DIMMs.
  - Adaptive Double Device Data Correction (ADDDC) works with x4-based memory DIMMs and requires two DIMM ranks per channel, Intel Xeon Gold or Platinum processors, and the Closed Page memory access mode.
  - If memory mirroring is used, then DIMMs must be installed in quantities of 2 or 4 per processor for mirroring across two memory channels, or in quantities of 3 or 6 per processor for mirroring across three memory channels. Mixing two- and three-channel mirroring in the server is allowed (one processor uses two-channel mirroring, and another processor uses three-channel mirroring). All DIMMs in the server must be identical in type and size.
  - If memory rank sparing is used, then a minimum of two ranks must be installed per populated channel (a least one dual-rank or quad-rank DIMM; single-rank DIMMs are not supported). With rank

sparing, one rank in each populated channel is reserved as spare memory for other ranks on the same channel. All DIMMs in the server must be identical in type and size.

- SDDC, memory mirroring, and memory rank sparing modes are mutually exclusive. Only one operational memory mode can be enabled on the server.
- In the configurations with DCPMMs, memory mirroring is supported only in the App Direct mode (other DCPMM modes do not support memory mirroring) and applies only to the RDIMMs (DCPMMs are not mirrored). Memory sparing is not supported in the configurations with DCPMMs.

Persistent memory

Intel Optane DC persistent memory is an innovative technology that delivers a unique combination of affordable large memory capacity and persistence (non-volatility). The persistent memory technology can help boost the performance of data-intensive applications, such as in-memory analytics, databases, content delivery networks, and high performance computing (HPC), as well as deliver consistent service levels at scale with higher virtual machine and container density.

The SR590 server supports up to two TruDDR4 DC Persistent Memory Modules (DCPMMs) when one processor is installed and up to four DCPMMs when two processors are installed (up to one DCPMM per processor's memory channel with two DIMM slots per channel) for a total of up to 2 TB of persistent memory capacity. The DCPMMs are installed in the same memory DIMM slots on the system board that are used for installing RDIMMs.

2nd Gen processors only: Persistent Memory is only supported with 2nd Generation Intel Xeon SP processors. Not supported with 1st Generation processors.

The DCPMMs support the following modes of operation:

- Memory Mode

  Memory Mode seamlessly brings large memory capacity at affordable cost points to legacy applications. In this mode, DCPMMs provide volatile memory that behaves much like traditional RDIMMs (the data will not be saved in case of a power loss) and is transparent to the operating system and applications. DCPMMs provide memory capacity and RDIMMs provide cache memory that is managed by the processor's memory controller. The total memory capacity that is seen by the operating system is the capacity of the DCPMMs; the capacity of the RDIMMs is hidden and does not appear as a memory resource in the operating system. This mode is considered particularly suited for virtualized database deployments and big-data analytics applications.

- App Direct Mode

  App Direct Mode brings persistency to the data and structures (the data will be saved in case of a power loss). This mode requires operating system and application awareness of two types of system memory: Persistent (DCPMMs) and DRAM (RDIMMs). The total memory capacity that is seen by the operating system includes the capacity of the DCPMMs and RDIMMs. This mode is considered particularly suited for in-memory databases, in-memory analytics frameworks, and ultrafast storage applications.

- Mixed Memory Mode

  Mixed Memory Mode is a combination of Memory Mode and App Direct Mode, where a portion of the capacity of the DCPMMs is used for the Memory Mode operations, and the remaining capacity of the DCPMMs is used for the App Direct Mode operations.

The following memory protection technologies are supported by the DCPMM's onboard memory controllers:

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

The following table lists DCPMM options available for the SR590 server.

Table 16. DCPMM options

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

* The maximum quantity shown is with one processor / two processors.

The following table lists supported combinations of the DCPMMs and RDIMMs available for the SR590 server.

Table 17. Supported DCPMM and memory DIMM combinations

DCPMM mode	DCPMM quantity*	Supported DCPMM sizes	Memory DIMM quantity*	Supported memory DIMM sizes
App Direct Mode	- / 1	128 GB, 256 GB, 512 GB	6 / 12	16 GB, 32 GB, 64 GB
	1 / 2	128 GB, 256 GB, 512 GB	6 / 12	16 GB, 32 GB, 64 GB
	2 / 4	128 GB, 256 GB, 512 GB	6 / 12	16 GB, 32 GB, 64 GB
Memory Mode	2 / 4	256 GB	6 / 12	16 GB
	2 / 4	512 GB	6 / 12	16 GB, 32 GB
Mixed Memory Mode	2 / 4	256 GB	6 / 12	16 GB
	2 / 4	512 GB	6 / 12	16 GB, 32 GB

* The supported exact quantity shown is with one processor / two processors.

Configuration notes:

- All DCPMMs in the server must be of the same capacity (the same part number or feature code).
- The RDIMMs are required in the configurations with DCPMMs, and all RDIMMs must be of the same type, rank, and capacity (the same part number or feature code).
- The DCPMMs cannot be mixed with the 8GB TruDDR4 2933 MHz RDIMM (4ZC7A08706).
- For Mixed Memory Mode, the volatile (Memory) portion of the total capacity of DCPMMs is configured in increments of 32 GB multiplied by the number of DCPMMs in the server, and the remaining capacity is allocated to the persistent (App Direct) portion. The ratio of the total capacity of RDIMMs to the total capacity of the volatile portion of DCPMMs should be between 1 to 4 and 1 to 16.
- Server configurations with more than 1 TB of memory capacity per socket (including DCPMMs and RDIMMs) require processors that support up to 4.5 TB (L-suffix) per socket.

For more information, refer to the Intel Optane DC Persistent Memory (DCPMM) Product Guide:
http://lenovopress.com/LP1066

Internal storage

The SR590 server supports the following internal drive bay configurations:

1. Up to 16 SFF hot-swap drive bays:
   a. 8x 2.5" SAS/SATA + 8x 2.5" SAS/SATA
   b. 4x 2.5" SAS/SATA & 4x 2.5" AnyBay + 8x 2.5" SAS/SATA
2. 8 LFF SATA Simple Swap drive bays
3. 8 LFF SAS/SATA hot-swap drive bays
4. Up to 14 LFF hot-swap drive bays:
   a. 12x 3.5" SAS/SATA (front) + 2x 3.5" SAS/SATA (rear)
   b. 8x 3.5" SAS/SATA & 4x 3.5" AnyBay (front) + 2x 3.5" SAS/SATA (rear)

In addition, the SR590 server models can be configured with one or two internal M.2 SATA SSDs. The server also supports configurations without drive bays.

The following figure shows the internal drive bay configurations.

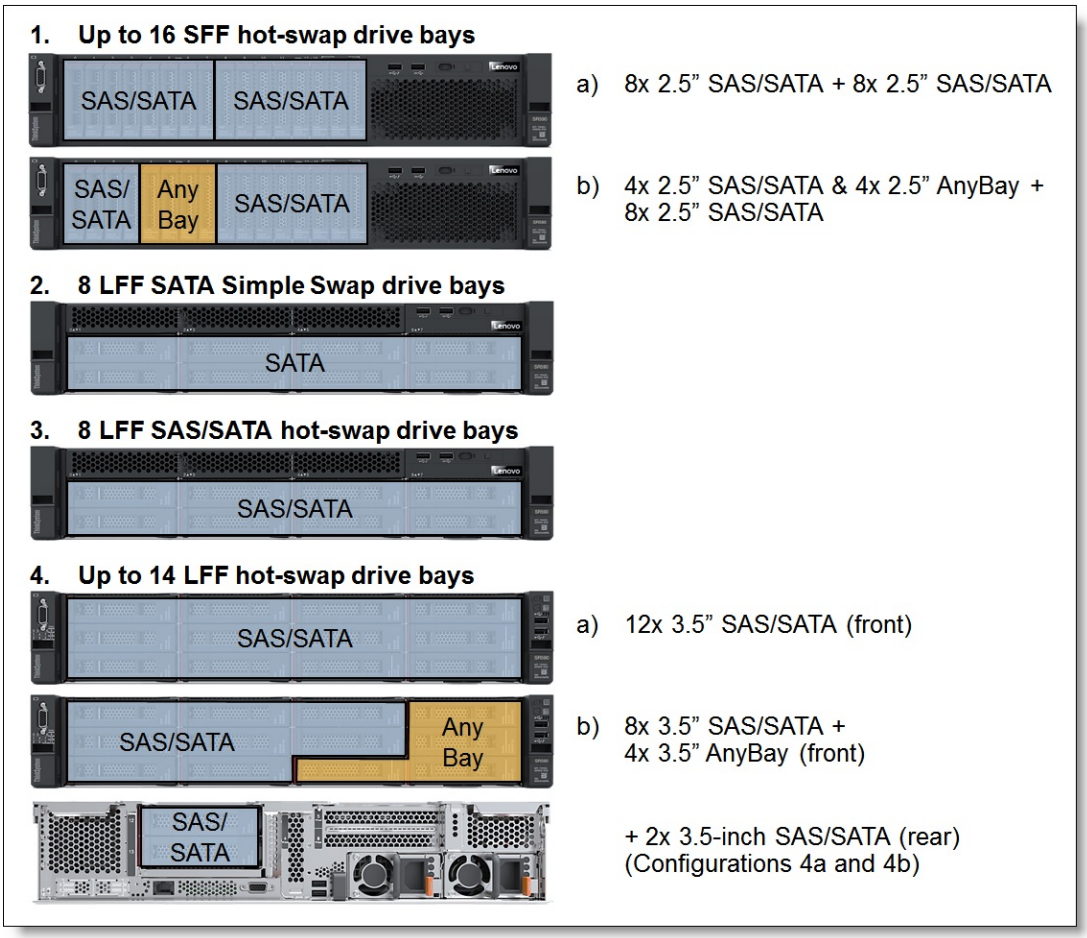


Figure 7. Internal drive bay configurations

The following table lists the internal storage options for the SR590 server.

Table 18. Internal storage options

Description	Part number	Feature code	Maximum quantity
Factory-installed backplane kits			
ThinkSystem 2U/Twr 2.5" SATA/SAS 8-Bay Backplane	None*	AURA	2
ThinkSystem 2U/Twr 2.5" AnyBay 8-Bay Backplane	None*	AUR5	1
ThinkSystem 2U 3.5" SATA/SAS 8-Bay Backplane	None*	AUR6	1
ThinkSystem 2U 3.5" SATA/SAS 12-Bay Backplane	None*	AUR9	1
ThinkSystem 2U 3.5" AnyBay 12-Bay Backplane	None*	AUR8	1
ThinkSystem SR590/SR650 3.5" Rear HDD/SSD Kit	7XH7A06253	AURZ	1
ThinkSystem SR590/SR650 Rear HDD Kit - Fanless (PRC only)	4XB7A64318	BFK0	1
Backplane kit field upgrade options			
SR590 2.5" SATA/SAS 8-Bay Backplane Upgrade Kit	4XH7A08763	None**	2
SR590 2.5" AnyBay 8-Bay Backplane Upgrade Kit	4XH7A08764	None**	1
SR550/SR590/SR650 3.5" SATA/SAS 8-Bay Backplane Upgrade Kit	4XH7A08770	None**	1
SR550/SR590/SR650 3.5" SATA/SAS 12-Bay Backplane Upgrade Kit	4XH7A08771	None**	1
SR590/SR650 3.5" AnyBay 12-Bay Backplane Upgrade Kit	4XH7A08785	None**	1
ThinkSystem SR590/SR650 3.5" Rear HDD/SSD Kit	7XH7A06253	AURZ	1
ThinkSystem SR590/SR650 Rear HDD Kit - Fanless (PRC only)	4XB7A64318	BFK0	1
M.2 enablement kits			
ThinkSystem M.2 Enablement Kit	7Y37A01092	AUMU	1
ThinkSystem M.2 with Mirroring Enablement Kit	7Y37A01093	AUMV	1

* These backplane kits can be factory-installed in standard or custom (CTO or Special Bid) models, and they might not have an option part number assigned.
** Field upgrade only.

Configuration notes:

- The 2.5" SATA/SAS 8-Bay Backplane Kit (4XH7A08763) adds 8x 2.5" SAS/SATA hot-swap drive bays to the previously configured models that support drive bay expansion capabilities.
- The 2.5" AnyBay 8-Bay Backplane Kit (4XH7A08764) adds 4x 2.5" SAS/SATA & 4x 2.5" AnyBay hot-swap drive bays to the previously configured models that support drive bay expansion capabilities.
- Models without any drive bays that are based on the 16x 2.5" chassis (feature code AXEA) support adding drive bays by using the 2.5" SAS/SATA 8-bay backplane kit (4XH7A08763) or 2.5" AnyBay 8-bay backplane kit (4XH7A08764).
- Models without any drive bays that are based on the 12x 3.5" chassis (feature code AXEB) include the Right EIA Latch with FIO (USB ports, status LEDs, and a power button). These models support adding drive bays by using the 3.5" 8-bay backplane kit (4XH7A08770), 3.5" 12-bay backplane kit (4XH7A08771), or 3.5" AnyBay 12-bay backplane kit (4XH7A08785).
- The backplane upgrade kits include drive backplanes and required SAS cables, power cables, and drive bay fillers; storage controllers are not included.
- For customers in China, the ThinkSystem SR590/SR650 Rear HDD Kit - Fanless option lets add rear drives without additional fans under the following conditions:
  - Processor TDP cannot exceed 125 W
  - Ambient temperature up to 30 °C (86 °F)
  - The acoustic noise may increase

- 2x 3.5-inch rear drives are supported only on the models with 12x 3.5-inch hot-swap drive bays.
  - The 3.5" Rear HDD/SSD Kit is connected to a separate port on the internal storage controller.
  - The 3.5" Rear HDD/SSD Kit is installed in place of the PCIe Riser Card 1; PCIe slots 1, 2, and 3 are not present.
  - The 3.5" Rear HDD/SSD Kit is supported in the configurations with one processor of up to 105 W TDP or two processors of up to 125 W TDP.
- Lenovo AnyBay allows a choice of drive interface types in the same drive bay: SAS drives, SATA drives, or U.2 NVMe PCIe drives.
- U.2 NVMe PCIe SSDs in the AnyBay drive bays require either the second processor (enables the onboard NVMe controller) or the 1610-4P NVMe Switch Adapter to be installed.
  Note: The 1610-4P NVMe Switch Adapter is supported only in the configurations with one processor.
- Models with 12x 3.5-inch drive bays and an 8-port SAS RAID controller or HBA support only NVMe drives in the AnyBay drive bays.
- The M.2 Enablement Kit (7Y37A01092) supports up to one M.2 SATA SSD which is connected to the SATA port on the Intel Platform Controller Hub (PCH).
- The M.2 with Mirroring Enablement Kit (7Y37A01093) is connected to the Intel PCH via the PCIe link, and the kit supports up to two M.2 SATA SSDs that can be configured in a RAID-1 or RAID-0 drive group, or they can operate as separate drives.

The following tables list supported internal storage configurations with the SAS/SATA and AnyBay backplanes.

Table 19. Internal storage configurations: 2.5-in. drive bays

Drive bay configuration	Backplane kit type and quantity		Storage controller type and quantity*
	2.5" SATA/SAS 8-Bay	2.5" AnyBay 8-Bay	
16x 2.5" chassis (Feature code AXEA)			
8x 2.5-in. SAS/SATA hot-swap (front)	1	0	1x RAID 530/730/930-8i (8)
			1x RAID 530/930-16i (8)
			1x 430-8i/16i HBA (8)
4x 2.5-in. SAS/SATA + 4x 2.5-in. AnyBay hot-swap (front)	0	1	1x RAID 530/730/930-8i (8) + Onboard NVMe (4)**
			1x RAID 530/930-16i (8) + Onboard NVMe (4)**
			1x RAID 530/730/930-8i (8) + 1x 1610-4P NVMe (4)^
			1x 430-8i/16i HBA (8) + Onboard NVMe (4)**
			1x 430-8i HBA (8) + 1x 1610-4P NVMe (4)^
16x 2.5-in. SAS/SATA hot-swap (front)	2	0	1x RAID 530/930-16i (16)
			1x 430-16i HBA (16)
			1x RAID 530/730-8i (8) + 1x 430-8i HBA (8)
			2x RAID 530/730/930-8i (8+8)
			2x 430-8i HBA (8+8)
12x 2.5-in. SAS/SATA + 4x 2.5-in. AnyBay hot-swap (front)	1	1	1x RAID 530/930-16i (16) + Onboard NVMe (4)**
			1x RAID 530/930-16i (16) + 1x 1610-4P NVMe (4)^
			1x 430-16i HBA (16) + Onboard NVMe (4)**

Drive bay configuration	Backplane kit type and quantity		Storage controller type and quantity*
	2.5" SATA/SAS 8-Bay	2.5" AnyBay 8-Bay	
			1x 430-16i HBA (16) + 1x 1610-4P NVMe (4)^

* The numbers in brackets (x or x+y) specify the quantity of drive bays connected to each of the controllers.
** The onboard NVMe controller requires the second processors to be installed.
^ The 1610-4P NVMe Switch Adapter is supported only in the configurations with one processor.

Table 20. Internal storage configurations: 3.5-in. drive bays

Drive bay configuration	Backplane kit type and quantity				Storage controller type and quantity*
	3.5" SATA/SAS 8-Bay	3.5" SATA/SAS 12-Bay	3.5" AnyBay 12-Bay	3.5" Rear HDD	
12x 3.5" chassis (Feature code AXEB)					
8x 3.5-in. SATA Simple Swap	0	0	0	0	Onboard AHCI (non-RAID) / Intel RSTe (RAID) (8)
8x 3.5-in. SAS/SATA hot-swap (front)	1	0	0	0	1x RAID 530/730/930-8i (8)
					1x 430-8i HBA (8)
12x 3.5-in. SAS/SATA hot-swap (front)	0	1	0	0	1x RAID 530/930-16i (12)
					1x 430-16i HBA (12)
8x 3.5-in. SAS/SATA + 4x 3.5-in. AnyBay hot-swap (front)	0	0	1	0	1x RAID 530/930-16i (12) + Onboard NVMe (4)**
					1x RAID 530/930-16i (12) + 1x 1610-4P NVMe (4)^
					1x 430-16i HBA (12) + Onboard NVMe (4)**
					1x 430-16i HBA (12) + 1x 1610-4P NVMe (4)^
8x 3.5-in. SAS/SATA + 4x 3.5-in. AnyBay (NVMe only) hot-swap (front)	0	0	1	0	1x RAID 530/730/930-8i (8) + Onboard NVMe (4)**
					1x 430-8i HBA (8) + Onboard NVMe (4)**
12x 3.5-in. SAS/SATA hot-swap (front) + 2x 3.5-in. SAS/SATA hot-swap (rear)	0	1	0	1	1x RAID 530/930-16i (14)
					1x 430-16i HBA (14)
8x 3.5-in. SAS/SATA + 4x 3.5-in. AnyBay hot-swap (front) + 2x 3.5-in. SAS/SATA hot-swap (rear)	0	0	1	1	1x RAID 530/930-16i (14) + Onboard NVMe (4)**
					1x RAID 530/930-16i (14) + 1x 1610-4P NVMe (4)^
					1x 430-16i HBA (14) + Onboard NVMe (4)**
					1x 430-16i HBA (14) + 1x 1610-4P NVMe (4)^

* The number in brackets (x) specifies the quantity of drive bays connected to each of the controllers.
** The onboard NVMe controller requires the second processors to be installed.
^ The 1610-4P NVMe Switch Adapter is supported only in the configurations with one processor.

SED encryption key management with ISKLM

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 21. 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

Controllers for internal storage

The following table lists the storage controllers and options for internal storage of the SR590 server.

Table 22. RAID controllers and HBAs for internal storage

Part number	Feature code	Description	Maximum quantity	I/O slots supported
6 Gbps SATA controllers				
Onboard*	Onboard*	Onboard AHCI (non-RAID) / Intel RSTe (RAID)	1	-
12 Gb SAS/SATA RAID controllers				
7Y37A01082	AUNG	ThinkSystem RAID 530-8i PCIe 12Gb Adapter	2	4, 1, 2, 6, 5, 3
4Y37A09727	B6CE	ThinkSystem RAID 530-16i PCIe 12Gb Adapter	1	4, 1, 2, 6, 5, 3
7Y37A01083	AUNH	ThinkSystem RAID 730-8i 1GB Cache PCIe 12Gb Adapter	2	4, 1, 2, 6, 5, 3
4Y37A09722	B4RQ	ThinkSystem RAID 730-8i 2GB Flash PCIe 12Gb Adapter	2	4, 1, 2, 6, 5, 3
7Y37A01084	AUNJ	ThinkSystem RAID 930-8i 2GB Flash PCIe 12Gb Adapter	2	4, 1, 2, 6, 5, 3
7Y37A01085	AUNK	ThinkSystem RAID 930-16i 4GB Flash PCIe 12Gb Adapter	1	4, 1, 2, 6, 5, 3
4Y37A09721	B31E	ThinkSystem RAID 930-16i 8GB Flash PCIe 12Gb Adapter	1	4, 1, 2, 6, 5, 3
12 Gb SAS/SATA non-RAID HBAs				
7Y37A01088	AUNL	ThinkSystem 430-8i SAS/SATA 12Gb HBA	2	4, 1, 2, 6, 5, 3
7Y37A01089	AUNM	ThinkSystem 430-16i SAS/SATA 12Gb HBA	1	4, 1, 2, 6, 5, 3
NVMe PCIe interfaces (non-RAID)				
None	None	Onboard NVMe interface (4-port)	1	-
7Y37A01081	AUV2	ThinkSystem 1610-4P NVMe Switch Adapter	1	1

* The onboard SATA controller integrated into the Intel C622 Platform Controller Hub (PCH) supports non-RAID (JBOD) AHCI mode or a hardware-assist, software RAID feature (Intel Rapid Storage Technology Enterprise [RSTe]).

Configuration notes:

- Low profile SAS RAID controllers and HBAs for internal storage are supported in the PCIe x8 slot 4 on the system board and full-high PCIe x8 and x16 slots supplied by the riser cards 1 and 2.
- The onboard NVMe interface provides 4x PCIe 3.0 x4 ports for JBOD (non-RAID) connectivity to U.2 NVMe PCIe SSDs in the AnyBay drive bays, and it requires the second processor to be installed.
- The 1610-4P NVMe Switch Adapter provides 4x PCIe 3.0 x4 ports for JBOD (non-RAID) connectivity to U.2

NVMe PCIe SSDs in the AnyBay drive bays, and it is supported in the PCIe x16 slot 1 supplied by the x16/x8 riser card 1 in the configurations with one processor only.

- A combination of the RAID 530-8i, 730-8i 1GB, 730-8i 2GB, and 930-8i controllers is not allowed in the server configuration; if two PCIe RAID 8i controllers are used in the server configuration, both RAID controllers must be of the same model.

The following table summarizes features of supported SAS/SATA storage controllers.

Table 23. Storage controller features and specifications (LP = Low profile)

Feature	Intel RSTe	RAID 530-8i	RAID 530-16i	RAID 730-8i 1GB	RAID 730-8i 2GB	RAID 930-8i	RAID 930-16i	430-8i HBA	430-16i HBA
Form factor	Onboard	PCIe LP		PCIe LP	PCIe LP			PCIe LP	
SAS controller	None	SAS3408	SAS3416	SAS3108	SAS3108	SAS3508	SAS3516	SAS3408	SAS3416
Host interface	PCH	PCIe 3.0 x8		PCIe 3.0 x8	PCIe 3.0 x8			PCIe 3.0 x8	
Port interface	6 Gb SATA	12 Gb SAS		12 Gb SAS	12 Gb SAS			12 Gb SAS	
Number of ports	8	8	16	8	8	8	16	8	16
Connector type	SATA x4	SFF-8643 x4		SFF-8643 x4	SFF-8643 x4			SFF-8643 x4	
Number of connectors	2	2	4	2	2	2	4	2	4
Drive interface	SATA	SAS, SATA		SAS, SATA	SAS, SATA			SAS, SATA	
Drive type	HDD	HDD, SSD, SED		HDD, SSD	HDD, SSD, SED			HDD, SSD, SED*	
Hot-swap drive support	No	Yes		Yes	Yes			Yes	
Number of drives	8	8	16	8	8	8	16	8	16
RAID levels	0/1/10/5	0/1/10/5/50	0/1/10	0/1/10/5/50	0/1/10/5/50/6/60			None	
JBOD mode	Yes	Yes		Yes	Yes			Yes	
Cache	None	None		1 GB	2 GB	2 GB	4 GB; 8 GB	None	
Cache protection	None	None		None	Flash backup (Included)			None	
SED key management (SafeStore)	No	Yes		No	Yes			No	
SSD I/O acceleration (FastPath)	No	Yes		No	Yes			No	
SSD Caching (CacheCade Pro 2.0)	No	No		No	No			No	
Consistency check	Yes	Yes		Yes	Yes			No	
Patrol read	Yes	Yes		Yes	Yes			No	
Online capacity expansion	Yes	Yes		Yes	Yes			No	
Online RAID level migration	Yes	Yes		Yes	Yes			No	
Global Hot Spare	Yes	Yes		Yes	Yes			No	
Auto-rebuild	Yes	Yes		Yes	Yes			No	

* HBAs do not support key management for SEDs; third-party host software is responsible for managing the keys.

Important: The onboard Intel RSTe is not supported by virtualization hypervisors, including VMware vSphere (ESXi), Linux KVM, Xen, and Microsoft Hyper-V.

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

- RAID adapters
  http://lenovopress.com/servers/options/raid#rt=product-guide
- Host bus adapters
  http://lenovopress.com/servers/options/hba#rt=product-guide

Drives for internal storage

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

2.5-inch hot-swap drives:

- 2.5-inch hot-swap 12 Gb SAS HDDs
- 2.5-inch hot-swap 6 Gb SATA HDDs
- 2.5-inch hot-swap 12 Gb SAS SSDs
- 2.5-inch hot-swap 6 Gb SATA SSDs
- 2.5-inch hot-swap PCIe 4.0 NVMe SSDs
- 2.5-inch hot-swap PCIe 3.0 NVMe SSDs

3.5-inch hot-swap drives:

- 3.5-inch hot-swap 12 Gb SAS HDDs
- 3.5-inch hot-swap 6 Gb SATA HDDs
- 3.5-inch hot-swap 12 Gb SAS SSDs
- 3.5-inch hot-swap 6 Gb SATA SSDs

Simple-swap drives:

- 3.5-inch simple-swap 6 Gb SATA HDDs

M.2 drives:

- M.2 SATA drives

M.2 drive support: The use of M.2 drives requires an additional adapter as described in the Internal storage section.

PCIe 4.0 NVMe drive support: When installed in this server, PCIe 4.0 NVMe drives will operate at PCIe 3.0 speeds.

Table 24. 2.5-inch hot-swap 12 Gb SAS HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 12 Gb SAS 10K			
7XB7A00024	AULY	ThinkSystem 2.5" 300GB 10K SAS 12Gb Hot Swap 512n HDD	16
7XB7A00025	AULZ	ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD	16
7XB7A00026	AUM0	ThinkSystem 2.5" 900GB 10K SAS 12Gb Hot Swap 512n HDD	16
7XB7A00027	AUM1	ThinkSystem 2.5" 1.2TB 10K SAS 12Gb Hot Swap 512n HDD	16
7XB7A00028	AUM2	ThinkSystem 2.5" 1.8TB 10K SAS 12Gb Hot Swap 512e HDD	16
7XB7A00069	B0YS	ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD	16
2.5-inch hot-swap HDDs - 12 Gb SAS 15K			
7XB7A00021	AULV	ThinkSystem 2.5" 300GB 15K SAS 12Gb Hot Swap 512n HDD	16
7XB7A00022	AULW	ThinkSystem 2.5" 600GB 15K SAS 12Gb Hot Swap 512n HDD	16
7XB7A00023	AULX	ThinkSystem 2.5" 900GB 15K SAS 12Gb Hot Swap 512e HDD	16
2.5-inch hot-swap HDDs - 12 Gb NL SAS			
7XB7A00034	AUM6	ThinkSystem 2.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD	16
7XB7A00035	AUM7	ThinkSystem 2.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD	16
2.5-inch hot-swap SED HDDs - 12 Gb SAS 10K			
7XB7A00030	AUM4	ThinkSystem 2.5" 300GB 10K SAS 12Gb Hot Swap 512n HDD SED	16
7XB7A00031	AUM5	ThinkSystem 2.5" 600GB 10K SAS 12Gb Hot Swap 512n HDD SED	16

Table 25. 2.5-inch hot-swap 6 Gb SATA HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gb NL SATA			
7XB7A00036	AUUE	ThinkSystem 2.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	16
7XB7A00037	AUUJ	ThinkSystem 2.5" 2TB 7.2K SATA 6Gb Hot Swap 512e HDD	16

Table 26. 2.5-inch hot-swap 12 Gb SAS SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 12 Gb SAS - Write Intensive/Performance (10+ DWPD)			
4XB7A70006	BG07	ThinkSystem 2.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD	16
4XB7A70005	BG06	ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD	16
4XB7A70004	BG05	ThinkSystem 2.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD	16
4XB7A70003	BG04	ThinkSystem 2.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD	16
4XB7A10219	B4Y4	ThinkSystem 2.5" SS530 400GB Performance SAS 12Gb Hot Swap SSD	16
4XB7A10230	B4Y5	ThinkSystem 2.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	16
4XB7A10232	B4Y7	ThinkSystem 2.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	16
2.5-inch hot-swap SSDs - 12 Gb SAS - Mixed Use/Mainstream (3-5 DWPD)			
4XB7A17062	B8HU	ThinkSystem 2.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	16
4XB7A17063	B8J4	ThinkSystem 2.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	16
4XB7A17064	B8JD	ThinkSystem 2.5" PM1645a 3.2TB Mainstream SAS 12Gb Hot Swap SSD	16
4XB7A17065	B8JA	ThinkSystem 2.5" PM1645a 6.4TB Mainstream SAS 12Gb Hot Swap SSD	16
4XB7A13655	B4A2	ThinkSystem 2.5" PM1645 3.2TB Mainstream SAS 12Gb Hot Swap SSD	16
2.5-inch hot-swap SSDs - 12 Gb SAS - Read Intensive/Entry/Capacity (<3 DWPD)			
4XB7A38175	B91A	ThinkSystem 2.5" PM1643a 960GB Entry SAS 12Gb Hot Swap SSD	16
4XB7A38176	B91B	ThinkSystem 2.5" PM1643a 1.92TB Entry SAS 12Gb Hot Swap SSD	16
4XB7A17054	B91C	ThinkSystem 2.5" PM1643a 3.84TB Entry SAS 12Gb Hot Swap SSD	16
4XB7A17055	B91D	ThinkSystem 2.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	16
4XB7A17056	BC4R	ThinkSystem 2.5" PM1643a 15.36TB Entry SAS 12Gb Hot Swap SSD	16
2.5-inch hot-swap SED SSDs - 12 Gb SAS - Write Intensive/Performance (10+ DWPD)			
4XB7A70007	BFZZ	ThinkSystem 2.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD SED	16

Table 27. 2.5-inch hot-swap 6 Gb SATA SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 6 Gb SATA - Mixed Use/Mainstream (3-5 DWPD)			
4XB7A17125	BA7Q	ThinkSystem 2.5" S4620 480GB Mixed Use SATA 6Gb HS SSD	16
4XB7A17126	BA4T	ThinkSystem 2.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	16
4XB7A17127	BA4U	ThinkSystem 2.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	16
4XB7A17128	BK7L	ThinkSystem 2.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	16
4XB7A17087	B8J1	ThinkSystem 2.5" 5300 240GB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A17088	B8HY	ThinkSystem 2.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	16

Part number	Feature	Description	Maximum supported
4XB7A17089	B8J6	ThinkSystem 2.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A17090	B8JE	ThinkSystem 2.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A17091	B8J7	ThinkSystem 2.5" 5300 3.84TB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A13633	B49L	ThinkSystem 2.5" Intel S4610 240GB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A13634	B49M	ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A13635	B49N	ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A13636	B49P	ThinkSystem 2.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A13637	B49Q	ThinkSystem 2.5" Intel S4610 3.84TB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A10237	B488	ThinkSystem 2.5" 5200 240GB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A10240	B48B	ThinkSystem 2.5" 5200 1.92TB Mainstream SATA 6Gb Hot Swap SSD	16
4XB7A10241	B48C	ThinkSystem 2.5" 5200 3.84TB Mainstream SATA 6Gb Hot Swap SSD	16
2.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)			
4XB7A17072	B99D	ThinkSystem 2.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	16
4XB7A17101	BA7G	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	16
4XB7A17102	BA7H	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	16
4XB7A17103	BA7J	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	16
4XB7A17104	BK77	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	16
4XB7A17105	BK78	ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	16
4XB7A38271	BCTC	ThinkSystem 2.5" Multi Vendor 240GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A38272	BCTD	ThinkSystem 2.5" Multi Vendor 480GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A38273	BCTE	ThinkSystem 2.5" Multi Vendor 960GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A38274	BCTF	ThinkSystem 2.5" Multi Vendor 1.92TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A38275	BCTG	ThinkSystem 2.5" Multi Vendor 3.84TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A17075	B8HV	ThinkSystem 2.5" 5300 240GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A17076	B8JM	ThinkSystem 2.5" 5300 480GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A17077	B8HP	ThinkSystem 2.5" 5300 960GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A17078	B8J5	ThinkSystem 2.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A17079	B8JP	ThinkSystem 2.5" 5300 3.84TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A17080	B8J2	ThinkSystem 2.5" 5300 7.68TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A38185	B9AC	ThinkSystem 2.5" 5210 960GB Entry SATA 6Gb Hot Swap QLC SSD	16
4XB7A38144	B7EW	ThinkSystem 2.5" 5210 1.92TB Entry SATA 6Gb Hot Swap QLC SSD	16
4XB7A38145	B7EX	ThinkSystem 2.5" 5210 3.84TB Entry SATA 6Gb Hot Swap QLC SSD	16
4XB7A38146	B7EY	ThinkSystem 2.5" 5210 7.68TB Entry SATA 6Gb Hot Swap QLC SSD	16
4XB7A10247	B498	ThinkSystem 2.5" Intel S4510 240GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10248	B499	ThinkSystem 2.5" Intel S4510 480GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10249	B49A	ThinkSystem 2.5" Intel S4510 960GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A13622	B49B	ThinkSystem 2.5" Intel S4510 1.92TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A13623	B49C	ThinkSystem 2.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10195	B34H	ThinkSystem 2.5" PM883 240GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10196	B34J	ThinkSystem 2.5" PM883 480GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10197	B34K	ThinkSystem 2.5" PM883 960GB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10198	B34L	ThinkSystem 2.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10199	B34M	ThinkSystem 2.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	16

Part number	Feature	Description	Maximum supported
4XB7A10200	B4D2	ThinkSystem 2.5" PM883 7.68TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10155	B2X4	ThinkSystem 2.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	16
4XB7A10157	B2X6	ThinkSystem 2.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	16

Table 28. 2.5-inch hot-swap PCIe 4.0 NVMe SSDs (operate at PCIe 3.0 speeds in this server)

Part number	Feature	Description	Maximum supported
2.5-inch SSDs - U.2 PCIe 4.0 NVMe - Mixed Use/Mainstream (3-5 DWPD)			
4XB7A17152	BCFV	ThinkSystem U.2 Intel P5600 1.6TB Mainstream NVMe PCIe 4.0 x4 Hot Swap SSD	4
4XB7A17153	BCFR	ThinkSystem U.2 Intel P5600 3.2TB Mainstream NVMe PCIe 4.0 x4 Hot Swap SSD	4
4XB7A17154	BCFS	ThinkSystem U.2 Intel P5600 6.4TB Mainstream NVMe PCIe 4.0 x4 Hot Swap SSD	4
2.5-inch SSDs - U.3 PCIe 4.0 NVMe - Mixed Use/Mainstream (3-5 DWPD)			
4XB7A64175	BE03	ThinkSystem U.3 Kioxia CM6-V 800GB Mainstream NVMe PCIe 4.0 x4 Hot Swap SSD	4
4XB7A17112	B96Z	ThinkSystem U.3 Kioxia CM6-V 1.6TB Mainstream NVMe PCIe4.0 x4 Hot Swap SSD	4
4XB7A17113	B96T	ThinkSystem U.3 Kioxia CM6-V 3.2TB Mainstream NVMe PCIe4.0 x4 Hot Swap SSD	4
4XB7A17114	B96P	ThinkSystem U.3 Kioxia CM6-V 6.4TB Mainstream NVMe PCIe4.0 x4 Hot Swap SSD	4
2.5-inch SSDs - U.2 PCIe 4.0 NVMe - Read Intensive/Entry (<3 DWPD)			
4XB7A17145	BCFT	ThinkSystem U.2 Intel P5500 1.92TB Entry NVMe PCIe 4.0 x4 Hot Swap SSD	4
4XB7A17146	BCFW	ThinkSystem U.2 Intel P5500 3.84TB Entry NVMe PCIe 4.0 x4 Hot Swap SSD	4
4XB7A17147	BCFU	ThinkSystem U.2 Intel P5500 7.68TB Entry NVMe PCIe 4.0 x4 Hot Swap SSD	4

Table 29. 2.5-inch hot-swap PCIe 3.0 NVMe SSDs

Part number	Feature	Description	Maximum supported
2.5-inch SSDs - U.2 PCIe 3.0 NVMe - Mixed Use/Mainstream (3-5 DWPD)			
4XB7A08516	B21W	ThinkSystem U.2 Toshiba CM5-V 800GB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A08517	B21X	ThinkSystem U.2 Toshiba CM5-V 1.6TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A08518	B21Y	ThinkSystem U.2 Toshiba CM5-V 3.2TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A08519	B2XJ	ThinkSystem U.2 Toshiba CM5-V 6.4TB Mainstream NVMe PCIe 3.0 x4 Hot Swap SSD	4
2.5-inch SSDs - U.2 PCIe 3.0 NVMe - Read Intensive/Entry (<3 DWPD)			
4XB7A10204	B58G	ThinkSystem U.2 Intel P4510 2.0TB Entry NVMe PCIe3.0 x4 Hot Swap SSD	4
4XB7A10175	B34N	ThinkSystem U.2 PM983 1.92TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A10176	B34P	ThinkSystem U.2 PM983 3.84TB Entry NVMe PCIe 3.0 x4 Hot Swap SSD	4
4XB7A10177	B4D3	ThinkSystem U.2 PM983 7.68TB Entry NVMe PCIe3.0 x4 Hot Swap SSD	4

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

Table 30. 3.5-inch hot-swap 12 Gb SAS HDDs

Part number	Feature	Description	Maximum supported
3.5-inch hot-swap HDDs - 12 Gb SAS 10K			
7XB7A00063	B1JJ	ThinkSystem 3.5" 300GB 10K SAS 12Gb Hot Swap 512n HDD	14
3.5-inch hot-swap HDDs - 12 Gb SAS 15K			
7XB7A00038	AUU2	ThinkSystem 3.5" 300GB 15K SAS 12Gb Hot Swap 512n HDD	14
7XB7A00039	AUU3	ThinkSystem 3.5" 600GB 15K SAS 12Gb Hot Swap 512n HDD	14
7XB7A00040	AUUC	ThinkSystem 3.5" 900GB 15K SAS 12Gb Hot Swap 512e HDD	14
3.5-inch hot-swap HDDs - 12 Gb NL SAS			
7XB7A00041	AUU4	ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD	14
7XB7A00042	AUU5	ThinkSystem 3.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD	14
7XB7A00043	AUU6	ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512n HDD	14
7XB7A00044	AUU7	ThinkSystem 3.5" 6TB 7.2K SAS 12Gb Hot Swap 512e HDD	14
7XB7A00045	B0YR	ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD	14
7XB7A00046	AUUG	ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD	14
7XB7A00067	B117	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD	14
4XB7A13906	B496	ThinkSystem 3.5" 14TB 7.2K SAS 12Gb Hot Swap 512e HDD	14
4XB7A13911	B7EZ	ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD	14
4XB7A38266	BCFP	ThinkSystem 3.5" 18TB 7.2K SAS 12Gb Hot Swap 512e HDD	14
3.5-inch hot-swap SED HDDs - 12 Gb NL SAS			
7XB7A00047	AUUH	ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512n HDD FIPS	14

Table 31. 3.5-inch hot-swap 6 Gb SATA HDDs

Part number	Feature	Description	Maximum supported
3.5-inch hot-swap HDDs - 6 Gb NL SATA			
7XB7A00049	AUUF	ThinkSystem 3.5" 1TB 7.2K SATA 6Gb Hot Swap 512n HDD	14
7XB7A00050	AUUD	ThinkSystem 3.5" 2TB 7.2K SATA 6Gb Hot Swap 512n HDD	14
7XB7A00051	AUU8	ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512n HDD	14
7XB7A00052	AUUA	ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD	14
7XB7A00053	AUU9	ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD	14
7XB7A00054	AUUB	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD	14
7XB7A00068	B118	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD	14
4XB7A13907	B497	ThinkSystem 3.5" 14TB 7.2K SATA 6Gb Hot Swap 512e HDD	14
4XB7A13914	B7F0	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD	14
4XB7A38130	BCFH	ThinkSystem 3.5" 18TB 7.2K SATA 6Gb Hot Swap 512e HDD	14

Table 32. 3.5-inch hot-swap 12 Gb SAS SSDs

Part number	Feature	Description	Maximum supported
3.5-inch hot-swap SSDs - 12 Gb SAS - Write Intensive/Performance (10+ DWPD)			
4XB7A70011	BG03	ThinkSystem 3.5" Nytro 3732 400GB Performance SAS 12Gb Hot Swap SSD	14
4XB7A70010	BG02	ThinkSystem 3.5" Nytro 3732 800GB Performance SAS 12Gb Hot Swap SSD	14
4XB7A70009	BG01	ThinkSystem 3.5" Nytro 3732 1.6TB Performance SAS 12Gb Hot Swap SSD	14
4XB7A70008	BG00	ThinkSystem 3.5" Nytro 3732 3.2TB Performance SAS 12Gb Hot Swap SSD	14
4XB7A10234	B4Y8	ThinkSystem 3.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	14
4XB7A10236	B4YA	ThinkSystem 3.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	14
3.5-inch hot-swap SSDs - 12 Gb SAS - Mixed Use/Mainstream (3-5 DWPD)			
4XB7A17066	B8HT	ThinkSystem 3.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	14
4XB7A17043	B8JN	ThinkSystem 3.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	14
4XB7A17067	B8JK	ThinkSystem 3.5" PM1645a 3.2TB Mainstream SAS 12Gb Hot Swap SSD	14
4XB7A17068	B8JG	ThinkSystem 3.5" PM1645a 6.4TB Mainstream SAS 12Gb Hot Swap SSD	14
4XB7A13659	B4A5	ThinkSystem 3.5" PM1645 3.2TB Mainstream SAS 12Gb Hot Swap SSD	14
3.5-inch hot-swap SSDs - 12 Gb SAS - Read Intensive/Entry/Capacity (<3 DWPD)			
4XB7A17058	B91E	ThinkSystem 3.5" PM1643a 3.84TB Entry SAS 12Gb Hot Swap SSD	14
4XB7A17059	BEVK	ThinkSystem 3.5" PM1643a 7.68TB Entry SAS 12Gb Hot Swap SSD	14

Table 33. 3.5-inch hot-swap 6 Gb SATA SSDs

Part number	Feature	Description	Maximum supported
3.5-inch hot-swap SSDs - 6 Gb SATA - Mixed Use/Mainstream (3-5 DWPD)			
4XB7A17137	BA4W	ThinkSystem 3.5" S4620 480GB Mixed Use SATA 6Gb HS SSD	14
4XB7A17138	BA4X	ThinkSystem 3.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	14
4XB7A17139	BA4Y	ThinkSystem 3.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	14
4XB7A17140	BK7P	ThinkSystem 3.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	14
4XB7A17096	B8JL	ThinkSystem 3.5" 5300 240GB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A17097	B8JF	ThinkSystem 3.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A17098	B8J0	ThinkSystem 3.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A17099	B8HR	ThinkSystem 3.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A17100	B8HX	ThinkSystem 3.5" 5300 3.84TB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A13639	B49R	ThinkSystem 3.5" Intel S4610 240GB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A13640	B49S	ThinkSystem 3.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A13641	B49T	ThinkSystem 3.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A13642	B49U	ThinkSystem 3.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A13643	B49V	ThinkSystem 3.5" Intel S4610 3.84TB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A10242	B48D	ThinkSystem 3.5" 5200 240GB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A10245	B48G	ThinkSystem 3.5" 5200 1.92TB Mainstream SATA 6Gb Hot Swap SSD	14
4XB7A10246	B48H	ThinkSystem 3.5" 5200 3.84TB Mainstream SATA 6Gb Hot Swap SSD	14
3.5-inch hot-swap SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)			
4XB7A17118	BA7K	ThinkSystem 3.5" S4520 240GB Read Intensive SATA 6Gb HS SSD	14
4XB7A17119	BA7L	ThinkSystem 3.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	14

Part number	Feature	Description	Maximum supported
4XB7A17120	BA7M	ThinkSystem 3.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	14
4XB7A17121	BA7N	ThinkSystem 3.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	14
4XB7A17122	BK7F	ThinkSystem 3.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	14
4XB7A17123	BK7G	ThinkSystem 3.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	14
4XB7A38276	BCTH	ThinkSystem 3.5" Multi Vendor 240GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A38277	BCTJ	ThinkSystem 3.5" Multi Vendor 480GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A38278	BCTK	ThinkSystem 3.5" Multi Vendor 960GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A38279	BCTL	ThinkSystem 3.5" Multi Vendor 1.92TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A38281	BCTM	ThinkSystem 3.5" Multi Vendor 3.84TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17081	B8JB	ThinkSystem 3.5" 5300 240GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17082	B8J9	ThinkSystem 3.5" 5300 480GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17083	B8JC	ThinkSystem 3.5" 5300 960GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17084	B8HZ	ThinkSystem 3.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17085	B8HQ	ThinkSystem 3.5" 5300 3.84TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17086	B8J3	ThinkSystem 3.5" 5300 7.68TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A13625	B49D	ThinkSystem 3.5" Intel S4510 240GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A13626	B49E	ThinkSystem 3.5" Intel S4510 480GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A13627	B49F	ThinkSystem 3.5" Intel S4510 960GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A13628	B49G	ThinkSystem 3.5" Intel S4510 1.92TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A13629	B49H	ThinkSystem 3.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17176	B6TM	ThinkSystem 3.5" PM883 240GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17177	B6TN	ThinkSystem 3.5" PM883 480GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17178	B6TP	ThinkSystem 3.5" PM883 960GB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17179	B6JY	ThinkSystem 3.5" PM883 1.92TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A17180	B6JZ	ThinkSystem 3.5" PM883 3.84TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A10160	B2X9	ThinkSystem 3.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	14
4XB7A10162	B2XB	ThinkSystem 3.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	14

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

Table 35. 3.5-inch simple-swap 6 Gb SATA HDDs

Part number	Feature	Description	Maximum supported
3.5-inch simple-swap HDDs - 6 Gb NL SATA			
7XB7A00055	AUZS	ThinkSystem 1TB 7.2K 6Gbps SATA 3.5" Simple Swap 512n HDD	8
7XB7A00056	AUZT	ThinkSystem 2TB 7.2K 6Gbps SATA 3.5" Simple Swap 512n HDD	8
7XB7A00057	AUZU	ThinkSystem 4TB 7.2K 6Gbps SATA 3.5" Simple Swap 512n HDD	8
7XB7A00058	AXC7	ThinkSystem 6TB 7.2K 6Gbps SATA 3.5" Simple Swap 512e HDD	8
7XB7A00059	AXC6	ThinkSystem 8TB 7.2K 6Gbps SATA 3.5" Simple Swap 512e HDD	8
7XB7A00060	AXC8	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Simple Swap 512e HDD	8

Table 37. M.2 SATA drives

Part number	Feature	Description	Maximum supported
M.2 SSDs - 6 Gb SATA - Read Intensive/Entry (<3 DWPD)			
7N47A00129	AUUL	ThinkSystem M.2 32GB SATA 6Gbps Non-Hot Swap SSD	2
7N47A00130	AUUV	ThinkSystem M.2 128GB SATA 6Gbps Non-Hot Swap SSD	2
4XB7A17071*	B8HS	ThinkSystem M.2 5300 240GB SATA 6Gbps Non-Hot Swap SSD	2
4XB7A17073*	B919	ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	2

* The 5100 and 5300 M.2 drives may require the SSD Thermal Kit, 4XH7A08791. See the Cooling section for details.

Optical drives

The server supports the external USB optical drive listed in the following table.

Table 38. External optical drive

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

The drive is based on the Lenovo Slim DVD Burner DB65 drive and supports the following formats: DVD-RAM, DVD-RW, DVD+RW, DVD+R, DVD-R, DVD-ROM, DVD-R DL, CD-RW, CD-R, CD-ROM.

I/O expansion

The SR590 server supports one LOM card slot and up to six PCIe slots: one PCIe slot on the system planar and up to five PCIe slots with different riser cards installed into two riser sockets on the system planar (one riser socket supports installation of one riser card).

The slot form factors are as follows:

- LOM card slot
- Slot 1: PCIe 3.0 x16 or PCIe 3.0 x8; full-height, half-length (PCIe x16 slot is double-wide) (x16 physical connector)
- Slot 2: PCIe 3.0 x8; full-height, half-length (not present if the slot 1 is PCIe x16) (x16 physical connector)
- Slot 3: PCIe 3.0 x8 or ML2 x8; full-height, half-length (x16 physical connector except ML2 which is x8)
- Slot 4: PCIe 3.0 x8; low profile (vertical slot on system planar)
- Slot 5: PCIe 3.0 x16; full-height, half-length
- Slot 6: PCIe 3.0 x8; full-height, half-length (x16 physical connector)

Notes:

- Slot 5 requires the second processor to be installed.
- Slot 4 is not present if the COM Port Upgrade Kit is installed.

The locations of the PCIe slots are shown in the following figure.

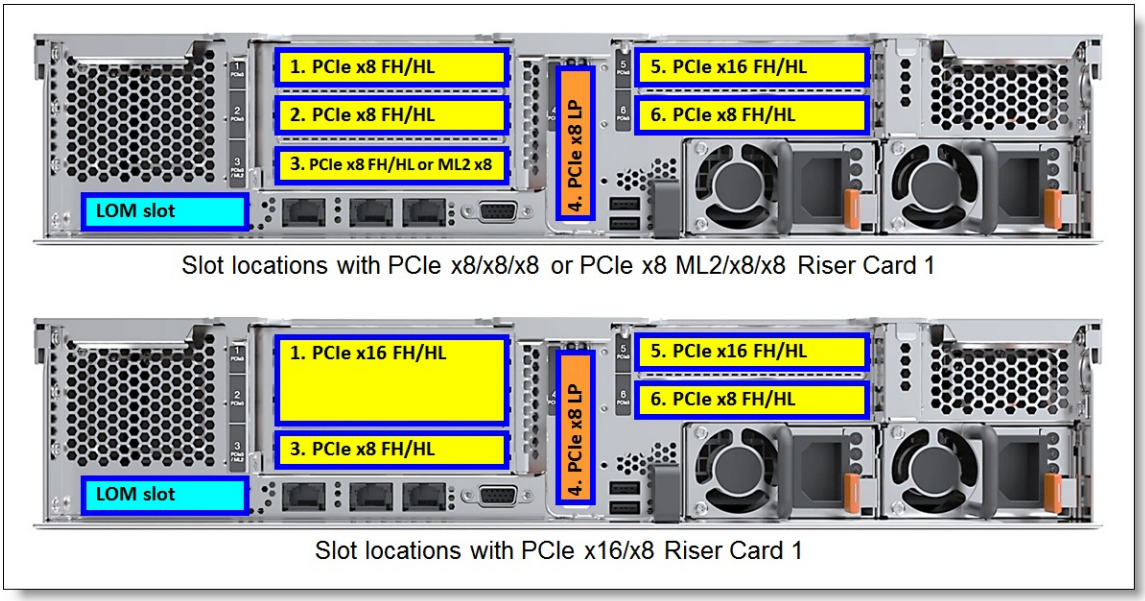


Figure 8. Slot locations

Riser 1 supplies slots 1, 2, and 3, and Riser 2 supplies slots 5 and 6. The slots that are available for use depend on the number of riser cards that are installed and whether the second processor is installed, as shown in the following table.

Table 39. Slots available for use

Riser Card 1	Riser Card 2	Slots available for use	
		Processor 1	Processor 2
None	None	LOM, 4	-
None	PCIe x16/x8	LOM, 4, 6	5
PCIe x8/x8/x8 or PCIe x8 ML2/x8/x8	None	LOM, 1, 2, 3, 4	-
PCIe x8/x8/x8 or PCIe x8 ML2/x8/x8	PCIe x16/x8	LOM, 1, 2, 3, 4, 6	5
PCIe x16/x8	None	LOM, 1, 3, 4	-
PCIe x16/x8	PCIe x16/x8	LOM, 1, 3, 4, 6	5

The following table lists available PCIe riser card options.

Table 40. PCIe riser cards and miscellaneous options

Part number	Feature code	Description	Maximum quantity
x8 Riser Card 1 options (Riser card supplies slots 1, 2, and 3)			
4XH7A08777	B261	ThinkSystem SR590 x8/x8/x8 PCIe Riser 1 (x16/x16/x16 physical connectors)	1
4XH7A08778	B263	ThinkSystem SR590 x8 ML2/x8/x8 PCIe Riser 1 (x8/x16/x16 physical connectors)	1
x16 Riser Card 1 option (Riser card supplies slots 1 and 3)			
4XH7A08779	B260	ThinkSystem SR590 x16/x8 PCIe Riser 1 (x16/x16 physical connectors)	1
Riser Card 2 option (Riser card supplies slots 5 and 6)			
4XH7A08780	B262	ThinkSystem SR590 x16/x8 PCIe Riser 2 (x16/x16 physical connectors)	1
Serial port upgrade kit			
7Z17A02577	AUSL	ThinkSystem COM Port Upgrade Kit	1

The COM Port Upgrade Kit, part number 7Z17A02577, is used for mounting the external serial port on the rear of the SR590. This option includes the bracket and the cable. The COM Port option is mounted in place of the PCIe slot 4, and the PCIe slot 4 cannot be used.

Network adapters

The SR590 server has two onboard 1 GbE ports (no 10/100 Mb support) and up to two additional onboard 1/10 GbE network ports (no 10/100 Mb support) with optional LOM cards. Onboard ports and LOM cards use the Intel Ethernet Connection X722 1/10 GbE technology integrated into the Intel C622 Platform Controller Hub (PCH). The server also supports ML2 adapters that are installed in the custom ML2 slot provided by an ML2 riser card. The LOM cards support direct connectivity to the XClarity Controller via the Network Controller Sideband Interface (NSCI) for out-of-band systems management.

Note: ML2 network adapters do not support NSCI when used in the SR590 server.

The integrated Intel Ethernet Connection X722 has the following features:

- Two 1 Gb Ethernet ports (no 10/100 Mb Ethernet support)
- Two 1/10 Gb Ethernet capable ports (no 10/100 Mb Ethernet support)
- NIC Teaming (load balancing and failover)
- Data Center Bridging
- iWARP (RDMA over IP)
- VMDq and SR-IOV virtualization (10 Gb speeds only, 4 PFs, 128 VFs per device)
- IEEE 802.1q Virtual Local Area Networks (VLANs)
- NVGRE, VXLAN, IPinGRE, and MACinUDP network virtualization
- IEEE 802.1Qbg Edge Virtual Bridging
- TCP, IP, and UDP checksum offload
- Large Send Offload (LSO) and Generic Send Offload (GSO)
- Receive Side Scaling (RSS) for TCP and UDP traffic
- Jumbo frames up to 9.5 Kbytes

The following table lists the network adapters that are supported with the SR590 server.

Table 41. Network adapters

Part number	Feature code	Description	Max qty#	I/O slots supported
LOM cards - 1 Gb Ethernet				
7ZT7A00544	AUKG	ThinkSystem 1Gb 2-port RJ45 LOM	1	LOM slot
LOM cards - 10 Gb Ethernet				
7ZT7A00548	AUKL	ThinkSystem 10Gb 2-port Base-T LOM	1	LOM slot
7ZT7A00546	AUKJ	ThinkSystem 10Gb 2-port SFP+ LOM	1*	LOM slot
ML2 adapters - Gigabit Ethernet				
7ZT7A00536	AUKW	ThinkSystem Intel I350-T4 ML2 1Gb 4-Port RJ45 Ethernet Adapter	1	3 (ML2)
ML2 adapters - 10 Gb Ethernet				
7ZT7A00497	AUKQ	Broadcom NX-E ML2 10Gb 2-Port Base-T Ethernet Adapter	1	3 (ML2)
01CV770	AU7Z	Emulex VFA5.2 ML2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	1*	3 (ML2)
00JY940	ATRH	Intel X710-DA2 ML2 2x10GbE SFP+ Adapter	1*	3 (ML2)
PCIe Low Profile adapters - 1 Gb Ethernet				
7ZT7A00482	AUZX	Broadcom 5720 1GbE RJ45 2-Port PCIe Ethernet Adapter	5 / 6	4, 2, 3, 6, 1, 5
7ZT7A00484	AUZV	Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter	5 / 6	4, 2, 3, 6, 1, 5
7ZT7A00533	AUZZ	ThinkSystem I350-F1 PCIe 1Gb 1-Port SFP Ethernet Adapter	5 / 6	4, 1, 2, 3, 5, 6
7ZT7A00534	AUZY	ThinkSystem I350-T2 PCIe 1Gb 2-Port RJ45 Ethernet Adapter	5 / 6	4, 2, 3, 6, 1, 5
7ZT7A00535	AUZW	ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	5 / 6	4, 2, 3, 6, 1, 5
4XC7A62589†	BE8A†	SiNEAD I350-C4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	5 / 6	4, 2, 3, 6, 1, 5

Part number	Feature code	Description	Max qty#	I/O slots supported
PCIe Low Profile adapters - 10 Gb Ethernet				
7ZT7A00496	AUKP	Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	5 / 6	4, 2, 3, 6, 1, 5
00AG570	AT7S	Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter	5 / 6*	4, 1, 2, 3, 5, 6
00AG580	AT7T	Emulex VFA5.2 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW	5 / 6*	4, 1, 2, 3, 5, 6
00MM860	ATPX	Intel X550-T2 Dual Port 10GBase-T Adapter	5 / 6	4, 2, 3, 6, 1, 5
7ZT7A00537	AUKX	Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	5 / 6*	4, 1, 2, 3, 5, 6
4XC7A08225	B31G	QLogic QL41134 PCIe 10Gb 4-Port Base-T Ethernet Adapter	5 / 6	4, 2, 3, 6, 1, 5
PCIe Full Height adapters - 10 Gb Ethernet				
7ZT7A00493	AUKN	Emulex OCe14104B-NX PCIe 10Gb 4-Port SFP+ Ethernet Adapter	4 / 5*	1, 2, 3, 5, 6
PCIe Low Profile adapters - 25 Gb Ethernet				
7ZT7A00505	AUKS	Broadcom 57412 10/25GbE SFP28 1-Port PCIe Ethernet Adapter	5 / 6*	4, 1, 2, 3, 5, 6
4XC7A08238	B5T0	Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter	5 / 6*	4, 1, 2, 3, 5, 6
4XC7A08228	B21R	QLogic QL41262 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	5 / 6*	4, 1, 2, 3, 5, 6

The maximum quantity shown is with one processor / two processors (this does not apply to LOM cards and ML2 adapters).
* The adapter comes without transceivers or cables; for ordering transceivers or cables, see the adapter product guide for details.
† The SiNEAD I350-C4 adapter is only available for customers in Mainland China (PRC). Not supported installed with Intel I350 adapters.

Configuration notes:

- ML2 network adapters are supported in the ML2 x8 slot 3 supplied by the x8 ML2/x8/x8 Riser Card 1 (4XH7A08778).
- PCIe full-height network adapters are supported in the full-height PCIe x8 and x16 slots supplied by the riser cards 1 and 2.
- PCIe Low Profile network adapters are supported in the low profile PCIe x8 slot 4 on the system board and full-height PCIe x8 and x16 slots supplied by the riser cards 1 and 2.
- Some adapters require supported transceivers or DAC cables to be purchased for the adapter. The maximum number of transceivers or cables that are supported per adapter equals the quantity of the adapter ports, and all adapter ports must have the same type of the transceiver or cable selected.

For more information, see the list of Product Guides in the Ethernet adapters category:
http://lenovopress.com/servers/options/ethernet#rt=product-guide

SAS adapters for external storage

The following table lists SAS RAID controllers and HBAs for external storage attachments that are supported by the SR590 server.

Table 42. SAS RAID adapters and HBAs for external storage

Part number	Feature code	Description	Maximum quantity*	I/O slots supported
12 Gbps SAS RAID adapters				
7Y37A01087	AUNQ	ThinkSystem RAID 930-8e 4GB Flash PCIe 12Gb Adapter	3 / 3	4, 1, 2, 3, 5
12 Gbps SAS HBAs				
7Y37A01090	AUNR	ThinkSystem 430-8e SAS/SATA 12Gb HBA	4 / 5	4, 1, 2, 3, 5
7Y37A01091	AUNN	ThinkSystem 430-16e SAS/SATA 12Gb HBA	4 / 5	4, 1, 2, 3, 5

* The maximum quantity shown is with one processor / two processors.

Configuration notes:

- Low profile SAS RAID controllers and HBAs for external storage are supported in the low profile PCIe x8 slot 4 on the system board and full-high PCIe x8 and x16 slots supplied by the riser cards 1 and 2.
- The total quantity of the RAID 730-8i 2GB, 930-8i, 930-16i, and 930-8e controllers in the server must not exceed 3 (up to 3 supercapacitors can be mounted in the server).

The following table summarizes features of supported RAID controllers and HBAs for external storage.

Table 43. Features and specifications of the RAID controllers and HBAs for external storage

Feature	RAID 930-8e	430-8e HBA	430-16e HBA
Form factor	PCIe LP	PCIe LP	PCIe LP
SAS controller chip	SAS3516	SAS3408	SAS3416
Host interface	PCIe 3.0 x8	PCIe 3.0 x8	PCIe 3.0 x8
Port interface	12 Gb SAS	12 Gb SAS	12 Gb SAS
Number of ports	8	8	16
Connector type	SFF-8644 x4	SFF-8644 x4	SFF-8644 x4
Number of connectors	2	2	4
Drive interface	SAS, SATA	SAS, SATA	SAS, SATA
Drive type	HDD, SSD, SED	HDD, SSD, SED*	HDD, SSD, SED*
Hot-swap drive support	Yes	Yes	Yes
Number of devices	240	1024	1024
RAID levels	0/1/10/5/50/6/60	None	None
JBOD mode	Yes	Yes	Yes
Cache	4 GB	None	None
Cache protection	Flash backup (Included)	None	None
SED key management (SafeStore)	Yes	No	No
SSD I/O acceleration (FastPath)	Yes	No	No
SSD Caching (CacheCade Pro 2.0)	No**	No	No
Consistency check	Yes	No	No
Patrol read	Yes	No	No
Online capacity expansion	Yes	No	No
Online RAID level migration	Yes	No	No
Global Hot Spare	Yes	No	No
Auto-rebuild	Yes	No	No

* HBAs do not support key management for SEDs; third-party host software is responsible for managing the keys.
** The SSD caching feature has been phased out in the new generation of advanced RAID controllers.

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

- RAID adapters
  http://lenovopress.com/servers/options/raid#rt=product-guide
- Host bus adapters
  http://lenovopress.com/servers/options/hba#rt=product-guide

Fibre Channel host bus adapters

The following table lists Fibre Channel HBAs supported by the SR590 server.

Table 44. Fibre Channel HBAs

Part number	Feature code	Description	Maximum quantity*	I/O slots supported
16 Gb Fibre Channel - PCIe				
01CV830	ATZU	Emulex 16Gb Gen6 FC Single-port HBA	5 / 6	4, 1, 2, 3, 5, 6
01CV840	ATZV	Emulex 16Gb Gen6 FC Dual-port HBA	5 / 6	4, 1, 2, 3, 5, 6
01CV750	ATZB	QLogic 16Gb Enhanced Gen5 FC Single-port HBA	5 / 6	4, 1, 2, 3, 5, 6
01CV760	ATZC	QLogic 16Gb Enhanced Gen5 FC Dual-port HBA	5 / 6	4, 1, 2, 3, 5, 6
8 Gb Fibre Channel - PCIe (available only in PRC and Asia Pacific)				
4XC7A08221	B0X0	Emulex LPe12002-M8-L PCIe 8Gb 2-Port SFP+ FC HBA	5 / 6	4, 1, 2, 3, 5, 6

* The maximum quantity shown is with one processor / two processors.

Configuration note: FC HBAs are supported in the low profile PCIe x8 slot 4 on the system board and full-high PCIe x8 and x16 slots supplied by the riser cards 1 and 2.

For more information, see the list of Product Guides in the Host bus adapters category:
http://lenovopress.com/servers/options/hba#rt=product-guide

Flash storage adapters

The SR590 server supports the flash storage adapters listed in the following table.

Table 45. Flash storage adapters

Part number	Feature code	Description	Maximum quantity*	I/O slots supported
Mainstream Flash Adapters - PM1735				
4XB7A14075	B8JH	ThinkSystem HHHL PM1735 1.6TB Mainstream NVMe PCIe4.0 x4 Flash Adapter	5 / 6	4, 2, 3, 6, 1, 5
4XB7A14076	B8HW	ThinkSystem HHHL PM1735 3.2TB Mainstream NVMe PCIe4.0 x4 Flash Adapter	5 / 6	4, 2, 3, 6, 1, 5
4XB7A14077	B96M	ThinkSystem HHHL PM1735 6.4TB Mainstream NVMe PCIe4.0 x4 Flash Adapter	5 / 6	4, 2, 3, 6, 1, 5
Mainstream Flash Adapters - CM5-V				
4XB7A38234	BCGJ	CM5-V 1.6TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter	5 / 6	4, 2, 3, 6, 1, 5
4XB7A38237	BCGK	CM5-V 3.2TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter	5 / 6	4, 2, 3, 6, 1, 5
4XB7A38240	BCGL	CM5-V 6.4TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter	5 / 6	4, 2, 3, 6, 1, 5

* The maximum quantity shown is with one processor / two processors.

Configuration note: Flash storage adapters are supported in the low profile PCIe x8 slot 4 on the system board and full-high PCIe x8 and x16 slots supplied by the riser cards 1 and 2.

For more information, see the list of Product Guides in the Flash storage adapters category:
http://lenovopress.com/servers/options/ssdadapter#rt=product-guide

Cooling

The SR590 server supports up to four hot-swap system fans that provide N+1 cooling redundancy. Models with one processor include three system fans, and Models with two processors include four system fans.

In the case of a system fan failure, performance might be impacted if any of the following processors are installed:

- 2nd Gen processors: Intel Xeon Gold 6210U, 6240, 6242, 6248, or 6252 processors are installed with 12x 3.5-inch drive bays
- 1st Gen processors: Intel Xeon 5122, 6140, 6152, 8156, 8158, 8160, or 8164 processors with 12x 3.5-inch drive bays

The installation of a 2nd processor requires an extra cooling fan be installed. For CTO orders, fans are derived by the configurator. For field upgrades, 1st Gen Xeon processor option part numbers include this fan however 2nd Gen Xeon processor options do not included the fan and it must be ordered separately using the SR590 Fan Option Kit (4F17A12351).

Table 46. Cooling options

Part number	Feature code	Description	Maximum quantity
4F17A12351	AXE9	ThinkSystem SR590 Fan Option Kit (for 2nd Gen processors only) Contains 1 system fan	1
4XH7A08791	B31F	ThinkSystem SR650/SR550/SR590 M.2 Thermal Kit	1

Configuration notes:

- The ThinkSystem SR650/SR550/SR590 M.2 Thermal Kit (4XH7A08791) is required in the configurations with at least one M.2 5100 or 5300 SSD is installed in the server with 12x LFF front drive bays.
- The M.2 SSD Thermal Kit is derived by the configurator if M.2 5100 or 5300 SSDs are selected in the initial configurations for server models with 12x LFF front drive bays. For field upgrades, the M.2 SSD Thermal Kit should be purchased with M.2 5100 or 5300 SSDs for server models with 12x LFF front drive bays.

Power supplies and cables

The SR590 server supports up to two redundant power supplies and is capable of N+N redundancy depending on the configuration. A second power supply can be added to the models that come with one power supply.

The following table lists the power supply options.

Table 47. Power supplies

Part number	Feature code	Description	Maximum quantity
7N67A00882	AXE8	ThinkSystem 550W (230V/115V) Platinum Hot-Swap Power Supply	2
7N67A00883	AXE6	ThinkSystem 750W (230/115V) Platinum Hot-Swap Power Supply	2
7N67A00884	AXE7	ThinkSystem 750W (230V) Titanium Hot-Swap Power Supply	2

Configuration notes:

- Minimum of 1 and maximum of 2 power supplies per system.
- If 2 are installed, power supplies must be identical.
- Power supplies support AC (Worldwide) and HVDC (PRC only) power sources.

Important: The Standalone Solution Configuration Tool (SSCT) and Lenovo Data Center Solution Configurator (DCSC) power supply selection rules allow a subset of possible configurations due to power restrictions. Configurations that cannot be built in SSCT or DCSC due to power restrictions may still be supported. To verify support and ensure that the right power supply is chosen for optimal performance, you should always validate your server configuration using the latest version of the Lenovo Capacity Planner: http://datacentersupport.lenovo.com/us/en/solutions/lnvo-lcp

Power cords

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

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

Table 48. Power cords

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

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

Systems management

The SR590 supports the following systems management tools:

- Lenovo XClarity Controller
- Light path diagnostics
- Lenovo XClarity Provisioning Manager
- Lenovo XClarity Essentials
- Lenovo XClarity Administrator
- Lenovo XClarity Integrators
- Lenovo XClarity Energy Manager
- Lenovo Capacity Planner

Lenovo XClarity Controller

The S590 server contains Lenovo XClarity Controller (XCC), which provides advanced service-processor control, monitoring, and alerting functions. XClarity Controller offers three functional levels: Standard, Advanced, and Enterprise.

By default, the SR590 server includes XClarity Controller Standard features, and it can be upgraded to Advanced or Enterprise functionality by using the Features on Demand (FoD) upgrades.

XClarity Controller Standard offers the following capabilities:

- Gathering and viewing system information and inventory
- Monitoring system status and health
- Alerting and notifications
- Event logging
- Configuring network connectivity
- Configuring security
- Updating system firmware
- Configuring server settings and devices
- Real-time power usage monitoring
- Remotely controlling server power (Power on, Power off, Restart)
- Managing FoD activation keys

- Redirecting serial console via IPMI
- Capturing the video display contents when an operating system hang condition is detected

XClarity Controller Advanced Upgrade adds the following functionality to the Standard features:

- Remotely viewing video with the following graphics resolutions:
  - Up to 1600x1200 with up to 23 bits per pixel; or
  - Up to 1920x1200 with up to 15 bits per pixel
- Remotely accessing the server using the keyboard and mouse from a remote client
- Remotely deploying an operating system
- Syslog alerting
- Redirecting serial console via SSH
- Displaying graphics for real-time and historical power usage data and temperature

XClarity Controller Enterprise Upgrade adds the following functionality to the Advanced features:

- Capping power usage
- 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
- Collaborating across up to six users of the virtual console
- Controlling quality and bandwidth usage

The XClarity Controller provides remote server management through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Data Center Manageability Interface (DCMI) Version 1.5
- Redfish REpresentational State Transfer (REST) API
- Web browser with HTML5 support
- Command-line interface
- Virtual Operator Panel with XClarity Mobile App via the front USB port with XClarity Controller access

Virtual Operator Panel provides quick access to system status, firmware, network, health, and alerts information. With proper authentication, it also allows to configure systems management and network settings and to control system power (Power on, Power off, Restart). The Virtual Operator Panel can be accessed from the XClarity Mobile App running on the Android or iOS mobile device that is connected to the front USB port with XClarity Controller access (See Components and connectors).

Note: Depending on the system settings, the front USB port can be assigned to XClarity Controller for management functions, or to the system as a regular USB 2.0 port, or switched between two functions by using the system ID button.

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 49. IPMI-over-LAN settings

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

The following table lists the XClarity Controller FoD upgrades.

Table 50. XClarity Controller FoD upgrades

Description	Part number	Feature code	Maximum quantity
ThinkSystem XClarity Controller Standard to Advanced Upgrade	4L47A09132	AVUT	1
ThinkSystem XClarity Controller Standard to Enterprise Upgrade	None*	AUPW	1
ThinkSystem XClarity Controller Advanced to Enterprise Upgrade	4L47A09133	None**	1

* Factory-installed only.
** Field upgrade only.

Configuration notes:

- For factory-installed upgrades, either Standard to Advanced Upgrade (feature AVUT) or Standard to Enterprise Upgrade (feature AUPW) can be selected, but not both.
- For field upgrades, the Advanced to Enterprise Upgrade (4L47A09133) requires the Standard to Advanced Upgrade to be activated on the server previously with either the factory-installed feature AVUT or field upgrade 4L47A09132.

Light path diagnostics

All SR590 server models include basic light path diagnostics, which provides the system error LED on the Operator information panel on the front of the server and the LEDs near the monitored components (for example, the DIMM error LEDs on the system board).

Lenovo XClarity Provisioning Manager

Lenovo XClarity Provisioning Manager is a UEFI-embedded GUI application that combines the functions of configuring system setup settings, configuring RAID, and updating applications and firmware. It also enables you to install the supported operating systems and associated device drivers, run diagnostics, and collect service data.

Lenovo XClarity Provisioning Manager has the following features:

- Automatic hardware detection
- Collecting and viewing system inventory information
- Configuring UEFI system setup settings
- Updating the system firmware
- Configuring RAID by using the RAID Setup Wizard or Advanced mode
- Installing an operating system and device drivers automatically or manually
- Running diagnostics and collecting service data

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 XClarity Essentials OneCLI
  OneCLI is a collection of server management tools that utilize 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 setting, and update system firmware and drivers.
- Lenovo XClarity 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 XClarity Essentials Bootable Media Creator
  The Bootable Media Creator (BOMC) tool is used to create bootable media for offline firmware update.

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

Lenovo XClarity Administrator

Lenovo XClarity is a centralized systems management solution that helps administrators deliver infrastructure faster. This solution integrates easily with Lenovo x86 servers, RackSwitch switches, and DS Series storage, providing automated agent-less discovery, monitoring, firmware updates, configuration management, and bare metal deployment of operating systems and hypervisors across multiple servers.

Lenovo XClarity Administrator is an optional software component for the SR590 server which can be downloaded and used at no charge to discover and monitor the SR590 and manage firmware upgrades for them.

If software support is required for Lenovo XClarity Administrator, or Lenovo XClarity Administrator premium features (such as configuration management and operating system deployment) are required, or both, 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 geo-specific Lenovo XClarity software license options.

Table 51. Lenovo XClarity software options

Description	Part number (NA, AP, Japan)*	Part number (EMEA, LA)**	Maximum quantity
Lenovo XClarity Pro, per Managed Endpoint w/1 Yr SW S&S	00MT201	00MT207	1
Lenovo XClarity Pro, per Managed Endpoint w/3 Yr SW S&S	00MT202	00MT208	1
Lenovo XClarity Pro, per Managed Endpoint w/5 Yr SW S&S	00MT203	00MT209	1

* NA = North America; AP = Asia Pacific
** EMEA = Europe, Middle East, Africa; LA = Latin America

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

- Auto-discovery and monitoring of Lenovo x86 servers, RackSwitch switches, Flex System chassis, and DS Series storage 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 offers at no charge (if software support is required, a Lenovo XClarity Pro software subscription license should be ordered) two software plug-in modules, Lenovo XClarity Integrators, to manage physical infrastructure from leading external virtualization management software tools from Microsoft and VMware:

- Lenovo XClarity Integrator for Microsoft System Center
- Lenovo XClarity Integrator for VMware vCenter

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 XClarity Integrators, refer to the Lenovo Systems Management web page:
https://www.lenovo.com/us/en/data-center/software/management/

Lenovo XClarity Energy Manager

Lenovo XClarity Energy Manager provides a stand-alone, web-based agent-less power management console that provides real time data and enables you to observe, plan and manage power and cooling for Lenovo servers. Using built-in intelligence, it identifies server power consumption trends and ideal power settings and performs cooling analysis so that you can define and optimize power-saving policies.

Lenovo XClarity Energy Manager offers the following capabilities:

- Monitors room, row, rack, and device levels in the data center
- Reports vital information, such as power, temperature and resource utilization
- Monitors inlet temperature to locate hot spots, reducing the risk of data or device damage
- Provides finely-grained controls to limit platform power in compliance with IT policy
- Generates alerts when a user-defined threshold is reached

Lenovo XClarity Energy Manager is an optional software component for the SR590 server that is licensed on a per managed node basis, that is, each managed server requires a license. The 1-node Energy Manager license is included in the XClarity Controller Enterprise upgrade.

To manage systems without XClarity Controller Enterprise licenses, a node license pack should be purchased. The following table lists the geo-specific Lenovo XClarity Energy Manager software license options.

Table 52. Lenovo XClarity Energy Manager software options

Description	Part number (NA,AP, Japan)*	Part number (EMEA, LA)**	Quantity
Lenovo XClarity Energy Manager, 1 Node w/ 1 Yr S&S	01DA225	01DA228	1

* NA = North America; AP = Asia Pacific.
** EMEA = Europe, Middle East, Africa; LA = Latin America.

For more information, refer to the Lenovo XClarity Energy Manager web page:
http://datacentersupport.lenovo.com/us/en/solutions/lnvo-lxem

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/lnvo-lcp

Security

The SR590 server offers the following security features:

- Power-on password
- Administrator's password
- Secure firmware updates
- Onboard Trusted Platform Module (TPM) version 1.2 or 2.0 (configurable UEFI system setting)
- Trusted Cryptographic Module (TCM) (optional; available in PRC only)
- Nationz Trusted Platform Module v2.0 (optional; available in PRC only)
- Lockable front bezel (optional)
- Self-encrypting drives (SEDs) with support for enterprise key managers - see the SED encryption key management section
- Lenovo Business Vantage security software (optional; available in PRC only)

The server is NIST SP 800-147B compliant.

The following table lists the security options that are available for the SR590 server.

Table 53. Security options

Part number	Feature code	Description	Maximum quantity
Lockable front bezel			
7Z17A02580	AURX	ThinkSystem 2U Security Bezel	1
Trusted Cryptographic Module (PRC only)			
None*	AVKE	ThinkSystem Trusted Cryptographic Module	1
Trusted Platform Module (PRC only)			
None*	B22N	ThinkSystem Nationz Trusted Platform Module v2.0	1

* Factory-installed only; no field upgrade.

Lenovo Business Vantage is a security software tool suite (available only in PRC) designed to work with the TCM or Nationz TPM for enhanced security, to keep user data safe, and to erase confidential data completely from a drive.

Lenovo Business Vantage provides the following features:

- Encrypts files to ensure data safety by using the TCM or Nationz TPM.
- Erases confidential data from a hard disk.
- Prohibits unauthorized access to the USB port of devices.
- Encrypts files to ensure data security on a USB storage device.

For more information, refer to the Lenovo Business Vantage web page:
http://support.lenovo.com.cn/lenovo/wsi/es/es.html

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 54. 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.

Rack installation

The following table lists the rack installation options that are available for the SR590 server.

Table 55. Rack installation options

Part number	Feature code	Description	Maximum quantity
4-post rail kits			
7M27A05702	AXCA	ThinkSystem Tool-less Slide Rail	1
7M27A05700	AXCH	ThinkSystem Tool-less Slide Rail Kit with 2U CMA	1
4M17A07274	AXFN	ThinkSystem Screw-in Slide Rail	1
4M17A07280	B0TD	ThinkSystem Screw-in Slide Rail Kit with 2U CMA	1
4M17A07273	BK7W	ThinkSystem Toolless Friction Rail v2	1
Cable management arm (CMA) upgrade			
7M27A05698	B135	ThinkSystem 2U CMA Upgrade Kit for Tool-less Slide Rail	1*
4M17A07275	AXFU	ThinkSystem 2U CMA Upgrade Kit for Screw-in Slide Rail	1**
Front VGA port			
7Z17A02578	AUS8	ThinkSystem SR550/SR590/SR650 EIA Latch w/ VGA Upgrade Kit	1

* The CMA Upgrade Kit for Tool-less Slide Rail is supported with the Tool-less Slide Rail (7M27A05702) only.
** The CMA Upgrade Kit for Screw-in Slide Rail is supported with the Screw-in Slide Rail (4M17A07274) only.

The following table summarizes the rail kit features and specifications.

Table 56. Rail kit features and specifications summary

Feature	Tool-less Slide Rail		Screw-in Slide Rail		Tool-less Friction Rail
	Without CMA	With CMA	Without CMA	With CMA	
Part number	7M27A05702	7M27A05700	4M17A07274	4M17A07280	4M17A07273
CMA	7M27A05698	Included	4M17A07275	Included	No support
Rail length	730 mm (28.74 in.)	807 mm (31.8 in.)	836.8 mm (32.9 in.)	836.8 mm (32.9 in.)	728.1 mm (28.7 in.)
Rail type	Full-out slide (ball bearing)		Full-out slide (ball bearing)		Half-out slide (friction)
Tool-less installation	Yes		No		Yes
In-rack server maintenance	Yes		Yes		No
1U PDU support	Yes		Yes		Yes
0U PDU support	Limited*		Limited*		Limited**
Rack type	IBM and Lenovo 4-post, IEC standard-compliant		IBM and Lenovo 4-post, IEC standard-compliant		IBM and Lenovo 4-post, IEC standard-compliant
Mounting holes	Square or round		Square, round, or threaded		Square or round

Feature	Tool-less Slide Rail		Screw-in Slide Rail		Tool-less Friction Rail
	Without CMA	With CMA	Without CMA	With CMA	
Mounting flange thickness	2 mm (0.08 in.) – 3.3 mm (0.13 in.)		2 mm (0.08 in.) – 3.3 mm (0.13 in.)		2 mm (0.08 in.) – 3.3 mm (0.13 in.)
Distance between front and rear mounting flanges^	609.6 mm (24 in.) – 863.6 mm (34 in.)		609.6 mm (24 in.) – 812.8 mm (32 in.)		609.6 mm (24 in.) – 863.6 mm (34 in.)

* If a 0U PDU is used, the rack cabinet must be at least 1100 mm (43.31 in.) deep if no CMA is used, or at least 1200 mm (47.24 in.) deep if a CMA is used.
** If a 0U PDU used, the rack must be at least 1000 mm (39.37 in.) deep.
^ Measured when mounted on the rack, from the front surface of the front mounting flange to the rear most point of the rail.

Operating systems

The server with 2nd Gen processors supports the following operating systems:

- Microsoft Windows Server 2016
- Microsoft Windows Server 2019
- Microsoft Windows Server 2022
- Red Hat Enterprise Linux 7.6
- Red Hat Enterprise Linux 7.7
- Red Hat Enterprise Linux 7.8
- Red Hat Enterprise Linux 7.9
- Red Hat Enterprise Linux 8.0
- Red Hat Enterprise Linux 8.1
- Red Hat Enterprise Linux 8.2
- Red Hat Enterprise Linux 8.3
- Red Hat Enterprise Linux 8.4
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 12 SP5
- SUSE Linux Enterprise Server 12 Xen SP4
- SUSE Linux Enterprise Server 12 Xen SP5
- SUSE Linux Enterprise Server 15
- SUSE Linux Enterprise Server 15 SP1
- SUSE Linux Enterprise Server 15 SP2
- SUSE Linux Enterprise Server 15 SP3
- SUSE Linux Enterprise Server 15 Xen
- SUSE Linux Enterprise Server 15 Xen SP1
- SUSE Linux Enterprise Server 15 Xen SP2
- SUSE Linux Enterprise Server 15 Xen SP3
- VMware ESXi 6.5 U2
- VMware ESXi 6.5 U3
- VMware ESXi 6.7 U1
- VMware ESXi 6.7 U2
- VMware ESXi 6.7 U3
- VMware ESXi 7.0
- VMware ESXi 7.0 U1
- VMware ESXi 7.0 U2
- VMware ESXi 7.0 U3

The server with 1st Gen processors supports the following operating systems:

- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Microsoft Windows Server 2019
- Microsoft Windows Server 2022
- Microsoft Windows Server, version 1709
- Red Hat Enterprise Linux 6.10 x64
- Red Hat Enterprise Linux 6.9 x64
- Red Hat Enterprise Linux 7.4
- Red Hat Enterprise Linux 7.5

- Red Hat Enterprise Linux 7.6
- Red Hat Enterprise Linux 7.7
- Red Hat Enterprise Linux 7.8
- Red Hat Enterprise Linux 7.9
- Red Hat Enterprise Linux 8.0
- Red Hat Enterprise Linux 8.1
- Red Hat Enterprise Linux 8.2
- Red Hat Enterprise Linux 8.3
- Red Hat Enterprise Linux 8.4
- SUSE Linux Enterprise Server 11 Xen x64 SP4
- SUSE Linux Enterprise Server 11 x64 SP4
- SUSE Linux Enterprise Server 12 SP3
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 12 SP5
- SUSE Linux Enterprise Server 12 Xen SP3
- SUSE Linux Enterprise Server 12 Xen SP4
- SUSE Linux Enterprise Server 12 Xen SP5
- SUSE Linux Enterprise Server 15
- SUSE Linux Enterprise Server 15 SP1
- SUSE Linux Enterprise Server 15 SP2
- SUSE Linux Enterprise Server 15 SP3
- SUSE Linux Enterprise Server 15 Xen
- SUSE Linux Enterprise Server 15 Xen SP1
- SUSE Linux Enterprise Server 15 Xen SP2
- SUSE Linux Enterprise Server 15 Xen SP3
- VMware ESXi 6.0 U3
- VMware ESXi 6.5 U1
- VMware ESXi 6.5 U2
- VMware ESXi 6.5 U3
- VMware ESXi 6.7
- VMware ESXi 6.7 U1
- VMware ESXi 6.7 U2
- VMware ESXi 6.7 U3
- VMware ESXi 7.0
- VMware ESXi 7.0 U1
- VMware ESXi 7.0 U2
- VMware ESXi 7.0 U3

For a complete list of supported, certified and tested operating systems, plus additional details and links to relevant web sites, see the Operating System Interoperability Guide: https://lenovopress.com/osig#servers=sr590-7x98-7x99-sp-gen-2

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 57. VMware ESXi preload

Part number	Feature code	Description
CTO only	B3VW	VMware ESXi 6.5 U2 (Factory Installed)
CTO only	B6U0	VMware ESXi 6.5 U3 (factory installed)
CTO only	B3VX	VMware ESXi 6.7 (Factory Installed)
CTO only	B4XA	VMware ESXi 6.7 U1 (Factory Installed)
CTO only	B6U1	VMware ESXi 6.7 U2 (factory installed)
CTO only	B88T	VMware ESXi 6.7 U3 (factory installed)
CTO only	BBZG	VMware ESXi 7.0 (Factory Installed)
CTO only	BE5E	VMware ESXi 7.0 U1 (Factory Installed)
CTO only	BHSR	VMware ESXi 7.0 U2 (Factory Installed)

Physical and electrical specifications

The SR590 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: 445 mm (17.5 inches)
- Height: 87 mm (3.4 inches)
- Depth: 764 mm (30.1 inches)

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

Table 58. Detailed dimensions

Dimension	Description
482 mm	X_a = Width, to the outsides of the front EIA flanges
435 mm	X_b = Width, to the rack rail mating surfaces
445 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
698 mm	Z_a = Depth, from the rack flange mating surface to the rearmost I/O port surface
730 mm	Z_b = Depth, from the rack flange mating surface to the rearmost feature of the chassis body
727 mm	Z_c = Depth, from the rack flange mating surface to the rearmost feature such as power supply handle
34 mm	Z_d = Depth, from the forwardmost feature on front of EIA flange to the rack flange mating surface
47 mm	Z_e = Depth, from the front of security bezel (if applicable) or forwardmost feature to the rack flange mating surface

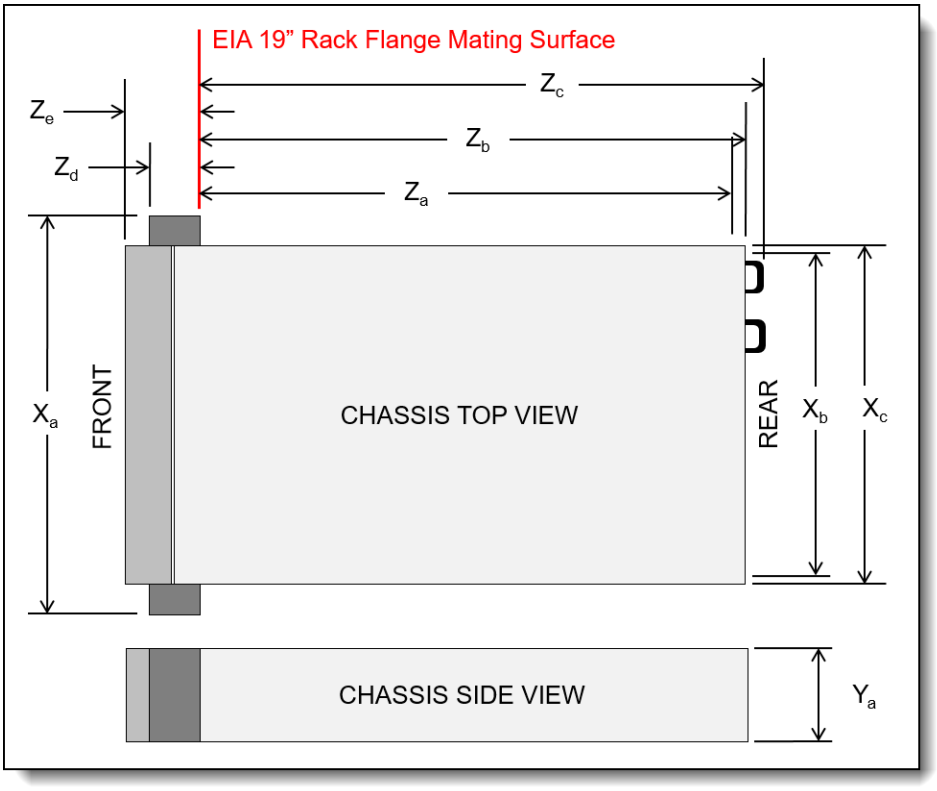


Figure 9. Server dimensions

The shipping dimensions (cardboard packaging) of the SR590 are as follows:

- Width: 592 mm (23.3 inches)
- Height: 282 mm (11.1 inches)
- Depth: 992 mm (39.1 inches)

The server has the following weight:

- Minimum configuration: 19 kg (41.9 lb)
- Maximum configuration: 26 kg (57.3 lb)

Electrical specifications for AC power supplies:

- 100 - 127 (nominal) V AC; 50 Hz / 60 Hz
- 200 - 240 (nominal) V AC; 50 Hz / 60 Hz
- 180 - 300 V DC (HVDC; supported in PRC only)

Power load and inlet current

The following table lists the maximum system power load, rated inlet current, and system heat output based on the power supply and source voltage.

Table 59. Rated system power, inlet current, and system heat output

Power supply	Source voltage	Maximum power load per system (two power supplies)	Rated current per inlet	System heat output
550 W Platinum	100 - 127 V AC	722 W	6.2 A	2463 BTU/hour
	200 - 240 V AC	704 W	3 A	2402 BTU/hour
	180 - 300 V DC	702 W	2.5 A	2395 BTU/hour
750 W Platinum	100 - 127 V AC	984 W	8.4 A	3357 BTU/hour
	200 - 240 V AC	958 W	4.1 A	3269 BTU/hour
	180 - 300 V DC	958 W	3.5 A	3269 BTU/hour
750 W Titanium	200 - 240 V AC	949 W	4.1 A	3238 BTU/hour
	180 - 300 V DC	948 W	3.5 A	3235 BTU/hour

Operating environment

The SR590 server complies with ASHRAE class A2 specifications. The server performance might be impacted when the operating temperature is outside the ASHRAE A2 specifications. Some server models comply with ASHRAE class A3 and class A4 specifications, provided the following hardware configuration requirements are met at the same time:

- Two power supplies installed
- Persistent memory modules not installed
- NVMe drives not installed
- Rear HDD kit not installed
- No system fan failure
- Intel Xeon Gold 6210U, 6240, 6242, 6248, or 6252 processors not installed

Configuration note: If an M.2 kit is installed the server models with 12x 3.5-inch drive bays, the operating environment should not exceed ASHRAE A3 specifications.

Temperature and humidity

The SR590 server is supported in the following environment:

- Air temperature:
  - Operating:
    - ASHRAE Class A4: 5 °C - 45 °C (41 °F - 113 °F); for altitudes above 900 m (2,953 ft),

decrease the maximum ambient temperature by 1 °C for every 125-m (410-ft) increase in altitude
        - ASHRAE Class A3: 5 °C - 40 °C (41 °F - 104 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 175-m (574-ft) increase in altitude
        - ASHRAE Class A2: 10 °C - 35 °C (50 °F - 95 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 300-m (984-ft) increase in altitude
    - Non-operating: 5 °C - 45 °C (41 °F - 113 °F)
    - Storage: -40 °C - +60 °C (-40 °F - 140 °F)
- Maximum altitude: 3,050 m (10,000 ft)
- Humidity:
    - Operating:
        - ASHRAE Class A4: 8% - 90% (non-condensing); maximum dew point: 24 °C (75 °F)
        - ASHRAE Class A3: 8% - 85% (non-condensing); maximum dew point: 24 °C (75 °F)
        - ASHRAE Class A2: 8% - 80% (non-condensing); maximum dew point: 21 °C (70 °F)
    - Storage: 8% - 90% (non-condensing)

Acoustical noise emissions

The server has the following acoustic noise emissions declaration:

- Minimum configuration:
    - Operating: 4.6 bels
    - Idle: 4.7 bels
- Maximum configuration:
    - Operating: 5.8 bels
    - Idle: 5.9 bels

Shock and vibration

The server has the following vibration and shock limits:

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

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 reactivity rate of copper coupons shall be less than 200 Angstroms per month (Å/month)
    - The reactivity rate of silver coupons shall be less than 200 Å/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
    - Data centers must be free of zinc whiskers

For additional information, see the Specifications section of the Setup Guide for the server, available from the Lenovo ThinkSystem Information Center, https://thinksystem.lenovofiles.com/help/index.jsp

Warranty and support

The SR590 server has a one-year (7X98) or three-year (Machine Type 7X99) customer-replaceable unit (CRU) and onsite limited (for field-replaceable units [FRUs] only) warranty with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered.

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

The following Lenovo support services are available:

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

  Quarterly reviews check error logs, verify firmware and operating system device driver levels, and software as needed. Lenovo will also maintain records of latest patches, critical updates, and firmware levels, to ensure customer's systems are providing business value through optimized performance.
- **Technical Account Management (TAM)**
  A Lenovo Technical Account Manager helps customers optimize operations of their data centers based on a deep understanding of customer's business. Customers gain direct access to a Lenovo TAM, who serves as their single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. Also, a TAM helps proactively make service recommendations and manage service relationship with Lenovo to make certain that customer's needs are met.
- **Enterprise Software Support**
  Lenovo Enterprise Software Support is an additional support service that provides 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 compatibility and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

- **YourDrive YourData**
  Lenovo's YourDrive YourData service is a multi-drive retention offering that ensures that customer's data is always under their control, regardless of the number of drives that are installed in their Lenovo server. In the unlikely event of a drive failure, customers retain possession of their drive while Lenovo replaces the failed drive part. Customer's data stays safely on customer premises, in their hands. The YourDrive YourData service can be purchased in convenient bundles with Foundation, Essential, or Advanced Service upgrades and extensions.
- **Health Check**
  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that customer systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

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

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

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

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

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

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

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

Services

Lenovo Services is a dedicated partner to customer success. Lenovo's goal for customers is to reduce capital outlays, mitigate IT risks, and accelerate time to productivity.

Here is a more in-depth look at what Lenovo can do for their customers:

- **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 customers. For more information, see the ARS page, http://lenovopress.com/lp1266.

- **Assessment Services**
  An assessment helps solve customer IT challenges through an onsite, multi-day session with a Lenovo technology expert. Lenovo performs 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, no matter how large or small, get a better return on their IT investment and overcome challenges in the ever-changing technology landscape.

- **Design Services**
  Professional Services consultants perform infrastructure design and implementation planning to support customer's 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 customer's server, storage, or networking hardware. Working at a time convenient for the customer (business hours or off shift), the technician will unpack and inspect the systems on customer 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 customers to focus on other priorities.

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

- **Integration, Migration, and Expansion Services**
  Integration, Migration, and Expansion Services allow to move existing physical and virtual workloads easily, or to determine technical requirements to support increased workloads while maximizing performance. These services include tuning, validation, and documenting ongoing run processes, and they leverage migration assessment planning documents to perform necessary migrations.

Some service options may not be available in every region. For more information about Lenovo service offerings that are available in a specific region, contact a local Lenovo sales representative or business partner.

Regulatory compliance

The ThinkSystem SR590 server conforms to the following regulations:

- United States: FCC Part 15, Class A; UL 60950-1
- Canada: ICES-003/NMB-03, Class A; CAN/CSA-C22.2 60950-1
- Mexico: NOM-19
- Argentina: IEC60950-1
- European Union: CE Mark (EN55022 Class A, IEC/EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- Germany: TUV-GS (IEC/EN 60950-1, EK1-ITB2000)
- Russia, Kazakhstan, Belarus: EAC (TR CU 004/2011, TR CU 020/2011)
- China: CCC GB4943.1, GB9254 Class A, GB17625.1
- India: BIS
- Japan: VCCI, Class A
- Taiwan: BSMI CNS13438, Class A; CNS14336-1
- Korea: KN22, Class A; KN24
- Australia/New Zealand: AS/NZS CISPR 22 Class A
- Reduction of Hazardous Substances (ROHS)
- Energy Star 3.0 (excluding configurations with Bronze 3204, Gold 5222, or Platinum 8256 processors)

Note: For more information on the Energy Star 3.0 certification, refer to the *Energy Star 3.0 Certifications for ThinkSystem Servers* publication:
http://lenovopress.com/lp1230

External drive enclosures

The following table lists the 12 Gbps SAS external drive enclosures that are offered by Lenovo that can be used with the SR590 for storage expansion.

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 60. External drive enclosures

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

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

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

External storage systems

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

External backup units

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

Table 61. External backup options

Part number	Description
External RDX USB drives	
4T27A10725	ThinkSystem RDX External USB 3.0 Dock
External SAS tape backup drives	
6160S6E	IBM TS2260 Tape Drive Model H6S
6160S7E	IBM TS2270 Tape Drive Model H7S
6160S8E	IBM TS2280 Tape Drive Model H8S
External SAS tape backup autoloaders	
6171S5R	IBM TS2900 Tape Autoloader w/LTO5 HH SAS
6171S6R	IBM TS2900 Tape Autoloader w/LTO6 HH SAS
6171S7R	IBM TS2900 Tape Autoloader w/LTO7 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	
01KP954	LTO 8 FH Fibre Channel Drive
01KP938	LTO 7 FH Fibre Channel Drive
01KP935	LTO 6 FH Fibre Channel Drive
Half High 8 Gb Fibre Channel for TS4300	
01KP952	LTO 8 HH Fibre Channel Drive
01KP936	LTO 7 HH Fibre Channel Drive
01KP933	LTO 6 HH Fibre Channel Drive
Half High 6 Gb SAS for TS4300	
01KP953	LTO 8 HH SAS Drive
01KP937	LTO 7 HH SAS Drive
01KP934	LTO 6 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

Rack cabinets

The following table lists the rack cabinets that are currently offered by Lenovo that can be used for mounting the ThinkSystem SR590 servers and other IT infrastructure building blocks.

Table 62. Rack cabinets

Description	Part number
12U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 1YR Warranty	7D2B0001WW
12U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 3YR Warranty	7D2N0001WW
18U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 1YR Warranty	7D2C0001WW
18U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 3YR Warranty	7D2P0001WW
25U S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072RX
25U Static S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072PX
42U S2 Standard Rack (1000 mm deep; 6 sidewall compartments)	93074RX
42U 1100mm Enterprise V2 Dynamic Rack (6 sidewall compartments)	93634PX
42U 1100mm Enterprise V2 Dynamic Expansion Rack (6 sidewall compartments)	93634EX
42U 1200mm Deep Dynamic Rack (6 sidewall compartments)	93604PX
42U 1200mm Deep Static Rack (6 sidewall compartments)	93614PX
42U Enterprise Rack (1105 mm deep; 4 sidewall compartments)	93084PX
42U Enterprise Expansion Rack (1105 mm deep; 4 sidewall compartments)	93084EX

For more information, see the list of Product Guides in the Rack cabinets category:
http://lenovopress.com/servers/options/racks#rt=product-guide

KVM switches and consoles

The following table lists the KVM switches and consoles that are offered by Lenovo that can be used for providing console access to the ThinkSystem SR590 servers.

Table 63. KVM switch and console options

Description	Part number
Consoles	
1U 18.5" Standard Console (without keyboard)	17238BX
Console keyboards	
ThinkSystem Keyboard w/ Int. Pointing Device USB - Arabic 253 RoHS v2	7ZB7A05469
ThinkSystem Keyboard w/ Int. Pointing Device USB - Belg/UK 120 RoHS v2	7ZB7A05468
ThinkSystem Keyboard w/ Int. Pointing Device USB - Czech 489 RoHS v2	7ZB7A05206
ThinkSystem Keyboard w/ Int. Pointing Device USB - Danish 159 RoHS v2	7ZB7A05207
ThinkSystem Keyboard w/ Int. Pointing Device USB - Dutch 143 RoHS v2	7ZB7A05208
ThinkSystem Keyboard w/ Int. Pointing Device USB - Fr/Canada 445 RoHS v2	7ZB7A05210
ThinkSystem Keyboard w/ Int. Pointing Device USB - French 189 RoHS v2	7ZB7A05209
ThinkSystem Keyboard w/ Int. Pointing Device USB - German 129 RoHS v2	7ZB7A05211
ThinkSystem Keyboard w/ Int. Pointing Device USB - Greek 219 RoHS v2	7ZB7A05212
ThinkSystem Keyboard w/ Int. Pointing Device USB - Hebrew 212 RoHS v2	7ZB7A05213
ThinkSystem Keyboard w/ Int. Pointing Device USB - Hungarian 208 RoHS v2	7ZB7A05214
ThinkSystem Keyboard w/ Int. Pointing Device USB - Italian 141 RoHS v2	7ZB7A05215
ThinkSystem Keyboard w/ Int. Pointing Device USB - Japanese 194 RoHS v2	7ZB7A05216
ThinkSystem Keyboard w/ Int. Pointing Device USB - Korean 413 RoHS v2	7ZB7A05217

Description	Part number
ThinkSystem Keyboard w/ Int. Pointing Device USB - LA Span 171 RoHS v2	7ZB7A05218
ThinkSystem Keyboard w/ Int. Pointing Device USB - Norwegian 155 RoHS v2	7ZB7A05219
ThinkSystem Keyboard w/ Int. Pointing Device USB - Polish 214 RoHS v2	7ZB7A05220
ThinkSystem Keyboard w/ Int. Pointing Device USB - Portugese 163 RoHS v2	7ZB7A05221
ThinkSystem Keyboard w/ Int. Pointing Device USB - Russian 441 RoHS v2	7ZB7A05222
ThinkSystem Keyboard w/ Int. Pointing Device USB - Slovak 245 RoHS v2	7ZB7A05223
ThinkSystem Keyboard w/ Int. Pointing Device USB - Slovenian 234 RoHS v2	7ZB7A05231
ThinkSystem Keyboard w/ Int. Pointing Device USB - Spanish 172 RoHS v2	7ZB7A05224
ThinkSystem Keyboard w/ Int. Pointing Device USB - Swed/Finn 153 RoHS v2	7ZB7A05225
ThinkSystem Keyboard w/ Int. Pointing Device USB - Swiss F/G 150 RoHS v2	7ZB7A05226
ThinkSystem Keyboard w/ Int. Pointing Device USB - Thai 191 RoHS v2	7ZB7A05227
ThinkSystem Keyboard w/ Int. Pointing Device USB - Trad Chinese/US 467 RoHS v2	7ZB7A05467
ThinkSystem Keyboard w/ Int. Pointing Device USB - Turkish 179 RoHS v2	7ZB7A05228
ThinkSystem Keyboard w/ Int. Pointing Device USB - UK Eng 166 RoHS v2	7ZB7A05229
ThinkSystem Keyboard w/ Int. Pointing Device USB - US Eng 103P RoHS v2	7ZB7A05470
ThinkSystem Keyboard w/ Int. Pointing Device USB - US Euro 103P RoHS v2	7ZB7A05230
Console switches and cables - ThinkSystem Digital KVM	
ThinkSystem Digital 2x1x16 KVM Switch (DVI video output port)	1754D1T
ThinkSystem VGA to DVI Conversion Cable	4X97A11108
ThinkSystem Single-USB Conversion Cable for Digital KVM	4X97A11109
ThinkSystem Dual-USB Conversion Cable for Digital KVM	4X97A11107
Console switches and cables - ThinkSystem Analog KVM	
ThinkSystem Analog 1x8 KVM Switch (DVI video output port)	1754A1T
ThinkSystem VGA to DVI Conversion Cable	4X97A11108
ThinkSystem USB Conversion Cable for Analog KVM	4X97A11106
Console switches and cables - Global Console Managers	
Global 2x2x16 Console Manager (GCM16) (VGA video output port)	1754D1X
Global 4x2x32 Console Manager (GCM32) (VGA video output port)	1754D2X
Virtual Media Conversion Option Gen2 (VCO2)	46M5383
Serial Conversion Option (SCO)	46M5382
Console switches and cables - Local Console Managers	
Local 1x8 Console Manager (LCM8) (VGA video output port)	1754A1X
Local 2x16 Console Manager (LCM16) (VGA video output port)	1754A2X
Virtual Media Conversion Option Gen2 (VCO2)	46M5383

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

Power distribution units

The following table lists the power distribution units (PDUs) that are currently offered by Lenovo that can be used for distributing electrical power to the ThinkSystem SR590 servers and other IT infrastructure building blocks mounted in a rack cabinet.

Table 64. Power distribution units

Description	Part number
0U Basic PDUs	
0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord	00YJ776
0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord	00YJ777
0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 line cord	00YJ778
0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord	00YJ779
Switched and Monitored PDUs	
0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P line cord	00YJ781
0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 line cord	00YJ780
0U 18 C13/6 C19 Switched / Monitored 32A/200-240V/346-415V/3Ph PDU w/ IEC60309 532P6 cord	00YJ782
0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 line cord	00YJ783
1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)	46M4002
1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord	46M4003
1U 12 C13 Switched and Monitored DPI PDU (without line cord)	46M4004
1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord	46M4005
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
Ultra Density Enterprise C19/C13 PDU Module (without line cord)	71762NX
Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord	71763NU
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
DPI C13 Enterprise PDU+ (without line cord)	39M2816
DPI Single Phase C13 Enterprise PDU (without line cord)	39Y8941
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
DPI Single Phase C19 Enterprise PDU (without line cord)	39Y8948
DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord	39Y8923
Front-end PDUs (3x IEC 320 C19 outlets)	
DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord	39Y8938
DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord	39Y8939
DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8934
DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8940
DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8935
Universal PDUs (7x IEC 320 C13 outlets)	
DPI Universal 7 C13 PDU (with 2 m IEC 320-C19 to C20 rack power cord)	00YE443
NEMA PDUs (6x NEMA 5-15R outlets)	
DPI 100-127V PDU with fixed NEMA L5-15P line cord	39Y8905
Line cords for PDUs that ship without a line cord	
DPI 30a Line Cord (NEMA L6-30P)	40K9614
DPI 32a Line Cord (IEC 309 P+N+G)	40K9612
DPI 32a Line Cord (IEC 309 3P+N+G)	40K9611
DPI 60a Cord (IEC 309 2P+G)	40K9615
DPI 63a Cord (IEC 309 P+N+G)	40K9613
DPI Australian/NZ 3112 Line Cord (32A)	40K9617
DPI Korean 8305 Line Cord (30A)	40K9618

For more information, see the list of Product Guides in the PDU category:
http://lenovopress.com/servers/options/pdu#rt=product-guide

Uninterruptible power supply units

The following table lists the power distribution units (PDUs) that are currently offered by Lenovo that can be used for distributing electrical power to the ThinkSystem SR590 servers and other IT infrastructure building blocks mounted in a rack cabinet.

Table 65. Uninterruptible power supply units

Description	Part number
Worldwide models	
RT1.5kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA 5-15R 12A outlets)	55941AX
RT1.5kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A outlets)	55941KX
RT2.2kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA 5-20R 16A outlets)	55942AX
RT2.2kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets)	55942KX
RT3kVA 2U Rack or Tower UPS (100-125VAC) (6x NEMA 5-20R 16A, 1x NEMA L5-30R 24A outlets)	55943AX
RT3kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets)	55943KX
RT5kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets)	55945KX
RT6kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets)	55946KX
RT8kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets)	55948KX
RT11kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets)	55949KX
RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets)	55948PX
RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets)	55949PX
ASEAN, HTK, INDIA, and PRC models	
ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)	55943KT
ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)	55943LT
ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)	55946KT
ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)	5594XKT

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category:
http://lenovopress.com/servers/options/ups#rt=product-guide

Lenovo Financial Services

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

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

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

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

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

For your region specific offers please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website:
http://www.lenovo.com/us/en/landingpage/lenovo-financial-services

Related publications and links

For more information, see these resources:

- ThinkSystem SR590 product page
  https://www.lenovo.com/us/en/data-center/servers/racks/ThinkSystem-SR590/p/77XX7SRSR59
- Datasheet for the ThinkSystem SR590:
  https://lenovopress.com/ds0016-lenovo-thinksystem-sr590
- 3D Interactive Tour of the ThinkSystem SR590:
  https://lenovopress.com/lp0813-3d-tour-thinksystem-sr590-server
- Walkthrough Video for the ThinkSystem SR590:
  https://lenovopress.com/lp0857-lenovo-thinksystem-sr590-server-video-walkthrough
- User Manuals for the ThinkSystem SR590:
  https://thinksystem.lenovofiles.com/help/topic/7X98/introduction.html?cp=4_5
  - Quick Start Guide
  - Setup Guide
  - Rack Installation Guides
  - Maintenance Manual
  - Messages and Codes Reference
  - UEFI Manual
- Lenovo Data Center Support Downloads - ThinkSystem SR590:
  http://datacentersupport.lenovo.com/products/servers/thinksystem/sr590/7x98/downloads
  http://datacentersupport.lenovo.com/products/servers/thinksystem/sr590/7x99/downloads
- Lenovo Hardware Installation & Removal Videos on the ThinkSystem SR590:
  - YouTube: https://www.youtube.com/playlist?list=PLYV5R7hVcs-CWR-jaBNs-3tuilrybHfUJ
  - Youku: https://list.youku.com/albumlist/show/id_51276393
- Lenovo Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com

Related product families

Product families related to this document are the following:

- 2-Socket Rack Servers
- ThinkSystem SR590 Server

Notices

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

Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

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

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

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

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

© Copyright Lenovo 2021. All rights reserved.

This document, LP1048, was created or updated on August 30, 2021.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  https://lenovopress.com/LP1048
- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at https://lenovopress.com/LP1048.

Trademarks

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

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

The following terms are trademarks of other companies:

Intel®, Intel Optane™, and Xeon® are trademarks of Intel Corporation or its subsidiaries.

Linux® is the trademark of Linus Torvalds in the U.S. and other countries.

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

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