

# Introducing the ThinkSystem V4 Servers with Intel Xeon 6 Processors

## Article

### Introducing Intel Xeon 6 with Performance Cores

Performance and Efficiency Without Compromise

Intel® Xeon® 6 processors introduce a robust computing platform that excels at both performance and efficiency, crucial for meeting the evolving demands of modern data centers. Addressing the broadest array of uses and workloads, from compute-intensive HPC & AI to traditional enterprise apps to scalable cloud-native applications, Intel Xeon 6 provides versatility for diverse operational and workload requirements.

Intel Xeon 6 processors provide a new generation of technology featuring options with new Efficient-core (E-core) and Performance-core (P-core) models enabling organizations to better meet their needs for efficiency at scale and performance than any other processor family.

- P-core processors: Optimized for performance in compute-intensive and AI workloads
- E-core processors: Optimized for efficiency in high-density and scale-out workloads

The performance per core of Intel Xeon 6 with P-cores provide the next level of compute capability for HPC, AI and other demanding enterprise workloads. P-core processors provide more than 2x higher performance vs previous generation for AI inference, HPC, and general compute workloads.

- Industry-leading P-cores are architected for compute-intensive workloads which benefit from multiple data elements being processed in parallel.
- Scale AI everywhere with AI acceleration in every core. Intel Advanced Matrix Extensions (Intel AMX) speed inferencing time for int8, BF16, and new support for FP16 trained models.
- Maximize throughput with the fastest DDR5 memory available, Multiplexed Rank DIMMs (MRDIMMs)
- Choose from a range of SKUs with up to 86 cores and base frequencies up to 4.0 GHz for higher overall performance.

Both E-cores and P-cores utilize a compatible architecture with a shared software stack and the largest ecosystem of hardware and software vendors, so you can find solutions to match any business need.

## New features with ThinkSystem V4

The ThinkSystem SR650 V4 and SR630 V4 are follow-ons to our popular SR650 V3 and SR630 V3 servers.



Figure 1. SR650 V4 with newly designed lockable front security bezel

With the V4 generation, we're introducing several new features:

- Intel Xeon 6 processors
  - P-core processors with up to 86 cores and 172 threads, TDP ratings to 350W
  - E-core processors with up to 144 cores and 330W TDP (SR630 V4 only)
- New high-performance memory options:
  - MRDIMMs up to 8000 MHz
  - CXL memory with high memory bandwidth, installed in E3.S drive bays
- Hot-swap M.2 drive bays, either front or rear, for improved resiliency and server uptime
- New E3.S 1T drive bay offerings, up to 32x drive bays in the SR650 V4, up to 16x in the SR630 V4, and 8x drive bays in the SR650a V4
- Two OCP slots are now standard, in addition to the PCIe slots (3x slots on SR630 V4, 10x slots on SR650 V4, 6x slots on SR650a V4). All slots are PCIe Gen5.
- New front slots in the SR650a V4 for GPUs, supporting four double-wide GPUs with NVLink connectivity
- New open-loop water cooling functionality with the Lenovo Compute Complex Neptune Core Module, which uses water to remove the heat from processors, memory, and voltage regulators, thereby removing up to 80% of heat using water to maximize data center energy savings

## Lenovo ThinkSystem SR650 V4

The Lenovo ThinkSystem SR650 V4 is an ideal 2-socket 2U rack server for customers that need industry-leading reliability, management, and security, as well as maximizing performance and flexibility for future growth. The SR650 V4 is based on two Intel Xeon 6 processors, with Performance-cores (P-cores).

The SR650 V4 is designed to handle a wide range of workloads, such as databases, virtualization and cloud computing, virtual desktop infrastructure (VDI), infrastructure security, systems management, enterprise applications, collaboration/email, streaming media, web, and HPC.



Figure 2. Lenovo ThinkSystem SR650 V4

Learn more about the SR650 V4 with these resources:

- [SR650 V4 product web page](#)
- [SR650 V4 product guide](#)
- [SR650 V4 datasheet](#)
- SR650 V4 interactive 3D tour (coming soon)
- [SR650 V4 walkthrough video](#)

## Lenovo ThinkSystem SR650a V4

The Lenovo ThinkSystem SR650a V4 is an ideal 2-socket 2U rack server for customers want to maximize GPU compute power while still retaining the traditional 2U rack form factor. With two Intel Xeon 6 processors with P-cores, plus support for four double-wide GPUs including the NVIDIA H100 NVL 94GB, the SR650a V4 is designed for high density and scale-out workloads.

The SR650a V4 is designed to handle a wide range of workloads, such as AI Lifecycle, VDI/Virtualization, Content Delivery, and Text/Media Analysis.



Figure 3. Lenovo ThinkSystem SR650a V4

Learn more about the SR650 V4 with these resources:

- [SR650a V4 product web page](#)
- [SR650a V4 product guide](#)
- [SR650a V4 datasheet](#)
- SR650a V4 interactive 3D tour (coming soon)
- [SR650a V4 walkthrough video](#)

## Lenovo ThinkSystem SR630 V4

The Lenovo ThinkSystem SR630 V4 is an ideal 2-socket 1U rack server for high-density and scale-out workloads in various customer segments including cloud service providers (CSPs).

Like its SR650 V4 2U counterpart, the SR630 V4 offers industry-leading performance, reliability, management, and security. The SR630 V4 is based on two Intel Xeon 6 processors with P-cores, but unlike its 2U counterpart, it also supports the Intel Xeon 6 processors Efficient-cores (E-cores).



Figure 4. Lenovo ThinkSystem SR630 V4

Learn more about the SR630 V4 with these resources:

- [SR630 V4 product web page](#)
- [SR630 V4 product guide](#)
- [SR630 V4 datasheet](#)
- [SR630 V4 interactive 3D tour](#)
- [SR630 V4 walkthrough video](#)

## New options for ThinkSystem V4 servers

As part of the ThinkSystem V4 launch, we've also announced several new server options.

The following new drive families have been announced:

- ThinkSystem PM897a Mixed Use SATA 6Gb SSDs
- ThinkSystem PM9D3a Read Intensive NVMe PCIe 5.0 x4 SSDs
- ThinkSystem E3.S CD8P Mixed Use NVMe PCIe 5.0 x4 SSDs

The following OCP network adapters have been announced:

- ThinkSystem Broadcom 57412 10GBase-T 4-Port OCP Ethernet Adapter, 4XC7A95696
- ThinkSystem Broadcom 57608 2x200/1x400GbE QSFP112 OCP Ethernet Adapter(Generic FW)), 4XC7A95695
- ThinkSystem Intel E610-T2 10GBase-T 2-Port OCP Ethernet Adapter(Generic FW), 4XC7A96732
- ThinkSystem Intel E830-XXVDA2 10/25GbE SFP28 2-Port OCP Ethernet Adapter(Generic FW), 4XC7A96736
- ThinkSystem Nvidia ConnectX-6 Dx 100GbE QSFP56 2-port OCP Ethernet Adapter(Generic), 4XC7A99190

The following PCIe network adapters have been announced:

- ThinkSystem Broadcom 57412 10GBase-T 4-Port PCIe Ethernet Adapter, 4XC7A95697
- ThinkSystem Intel E610-T4 10GBase-T 4-Port PCIe Ethernet Adapter(Generic FW), 4XC7A96733
- ThinkSystem Intel E830-XXVDA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter(Generic FW), 4XC7A96735
- ThinkSystem Nvidia ConnectX-7 10/25GbE SFP28 4-Port PCIe Ethernet Adapter(Generic), 4XC7A99191
- ThinkSystem NVIDIA ConnectX-8 8180 800Gbs IB /400GbE OSFP 1-Port PCIe Gen6 x16 (Generic FW), C9AP
- ThinkSystem NVIDIA ConnectX-8 8240 400Gbs IB /400GbE QSFP112 2-Port PCIe Gen6 x16 (Generic FW), C9AQ

The following Fibre Channel storage adapters have been announced:

- ThinkSystem Emulex LPe38102 64Gb 2-Port PCIe Fibre Channel Adapter, 4XC7A96458
- ThinkSystem Emulex LPe37102 32Gb 2-Port PCIe Fibre Channel Adapter, 4XC7A96457
- ThinkSystem QLogic QLE2872 64Gb 2-Port PCIe Fibre Channel Adapter(Generic FW), 4XC7A96744

The following RAID adapter has been announced:

- ThinkSystem RAID 545-8i PCIe Gen4 12Gb Adapter, 4Y37A93012

The following GPU has been announced:

- ThinkSystem NVIDIA RTX 4000 Ada 20GB PCIe Active GPU, 4X67A97287

For details, see the respective product guides for these new options:

- [Drive families](#)
- [Network adapters](#)
- [Fibre Channel adapters](#)
- [RAID adapters](#)
- [GPU adapters](#)

## New drives for ThinkSystem V3

Along with all the new announcements for ThinkSystem V4 servers, we continue to enhance the ThinkSystem V3 server offerings.

We have also announced the following new drive families for ThinkSystem V3 and V2 servers. They'll also be supported on V4 systems soon.

- ThinkSystem PS1010 Read Intensive NVMe PCIe 5.0 x4 SSD
- ThinkSystem PS1030 Mixed Use NVMe PCIe 5.0 x4 SSD
- ThinkSystem BM1743 Read Intensive NVMe PCIe 5.0 x4 SSD
- ThinkSystem E3.S CD8P Read Intensive NVMe PCIe 5.0 x4 SSD
- ThinkSystem E3.S CD8P Mixed Use NVMe PCIe 5.0 x4 SSD

For details, see the respective product guides for these new options:

- [Drive families](#)

## Related product families

Product families related to this document are the following:

- [ThinkSystem SR630 V4 Server](#)
- [ThinkSystem SR650 V4 Server](#)
- [ThinkSystem SR650a V4 Server](#)

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This document, LP2165, was created or updated on February 25, 2025.

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