What's New - ThinkSystem V2 Servers
Article

Lenovo Infrastructure Solutions Group announces the next-generation Lenovo ThinkSystem servers showcasing a unique balance of performance, security and efficiency – all built on 3rd Gen Intel® Xeon® Scalable processors and PCIe Gen4.

As companies of all sizes continue to work on solving real-world challenges – they require powerful infrastructure solutions to help them gain faster insights and remain competitive. With this new generation of ThinkSystem solutions, Lenovo introduces innovations for real-world workloads including high performance computing (HPC), artificial intelligence (AI), modeling and simulation, cloud, virtual desktop infrastructure (VDI) and advanced analytics.

The new servers can be divided into two groups based on customer workload:

- Mainstream servers in rack, tower and blade form factor offering enhanced performance, reliability, flexibility and security:
    - ThinkSystem SR650 V2 - 2U rack server
    - ThinkSystem SR630 V2 - 1U rack server
    - ThinkSystem ST650 V2 - tower server
    - ThinkSystem SN550 V2 - blade server
- HPC/AI performance-optimized servers that provide massive computing power in minimal floor space with reduced energy consumption:
    - ThinkSystem SR670 V2 - 3U GPU-optimized air-cooled server
    - ThinkSystem SD650 V2 - water-cooled CPU-optimized server
    - ThinkSystem SD650-N V2 - water-cooled GPU-optimized server
    - ThinkSystem SD630 V2 - air-cooled 2U4N dense compute nodes

ThinkSystem V2 servers

Learn more about each of the new servers from Lenovo.

ThinkSystem SR650 V2

Ideal for scalability from SMB to large enterprises and managed cloud
service providers, the 2U two-socket server is engineered for speed
and expansion, with flexible storage and I/O for business-critical
workloads. It provides outstanding performance and memory capacity
supported by Intel Optane persistent memory 200 series for database
and virtual machine deployments, with support for PCIe Gen4 networking to reduce data bottlenecks.

Learn more:

- Product web page (US)
- Datasheet
- Product guide
- Interactive 3D Tour
- Walkthrough video

ThinkSystem SR630 V2

Built for business-critical versatility, the 1U two-socket server features
optimized performance and density for hybrid data center workloads
such as cloud, virtualization, analytics, computing and gaming. Like the
SR650 V2, it provides high performance and memory capacity with support for Intel Optane persistent
memory 200 series, and support PCIe Gen4 high-speed networking.

Learn more:

- Product web page (US)
- Datasheet
- Product guide
- Walkthrough video

ThinkSystem ST650 V2

A versatile mainstream tower server with enterprise manageability and redundancy, the
ST650 V2 includes the industry's latest technology best suited to remote offices, branch
offices (ROBO), technology and retail, while optimizing workloads. Support for up to 32x
2.5-inch drive bays or 16x 3.5-inch drive bays to maximize internal storage capacity. Can
be converted to a 4U rack is desired.

Learn more:

- Product web page (US)
- Datasheet
- Product guide
- Walkthrough video

ThinkSystem SN550 V2

Designed for enterprise performance and flexibility in a compact footprint, the newest building block in the Flex System family, this blade server node is optimized for performance, efficiency and security – designed to tackle business-critical workloads such as cloud, server virtualization, databases and VDI.

Learn more:

- Product web page (US)
- Datasheet
- Product guide

ThinkSystem SR670 V2

This highly versatile acceleration platform is designed for HPC and AI training workloads, supporting the NVIDIA Ampere datacenter GPU portfolio. With six base configurations that support four high-performance SXM4 GPUs or up to eight PCIe double-wide GPUs, the SR670 V2 allows customers the flexibility to GPUs and supporting I/O that they need. SXM4 configurations feature the Lenovo Neptune liquid-to-air heat exchanger that provides the benefits of liquid cooling without the adding plumbing.

Learn more:

- Product web page (US)
- Datasheet
- Product guide
- Interactive 3D Tour

ThinkSystem SD650 V2

Based on industry-acclaimed fourth generation, Lenovo Neptune cooling technology, utilizes a highly reliable copper loop and cold plate architecture removing up to 90% of the systems heat (1). The ThinkSystem SD650 V2 is built to tackle compute-intensive workloads such as HPC, AI, cloud, grid and advanced analytics.

Learn more:

- Product web page (US)
- Datasheet
- Product guide

ThinkSystem SD650-N V2

Expanding the Lenovo Neptune platform, direct water-cooling technology for GPUs, this server combines two 3rd Gen Intel Xeon Scalable processors with four NVIDIA A100 SXM4 GPUs to deliver maximum performance in a dense 1U package. A rack of Lenovo ThinkSystem SD650-N V2 delivers enough compute performance to place in the top 300 of the TOP500 list of supercomputers (2)

Learn more:

- Product web page (US)
- Datasheet
- Product guide
- Interactive 3D Tour

ThinkSystem SD630 V2

This ultra-dense, ultra-agile server handles twice the workloads per server rack unit of rack space vs. traditional 1U servers. By leveraging Lenovo Neptune Thermal Transfer Modules, the SD630 V2 supports processors up to 250W, driving 1.5 times the performance of the previous generation in the same rack space (3).

Learn more:

- Product web page (US)
- Datasheet
- Product guide

Additional resources

For additional resources about the new servers:

- ThinkSystem Server Comparison
- Intel Xeon Scalable Processor Reference for Lenovo ThinkSystem Servers
- ThinkSystem and ThinkAgile GPU Summary
- Lenovo Server Operating System Interoperability Guide (OSIG)
- ThinkSystem SSD Portfolio

See our partner page on Intel's launch page " How Wonderful Gets Done"?

ThinkSystem security

With the ThinkSystem V2 servers, Lenovo is now enhancing security aspects of the servers, both in the manfacturing supply chain and in the delivery of firmware updates.

Intel Transparent Supply Chain

With Intel ThinkSystem servers and Intel Transparent Supply Chain, you can 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.

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.

Platform Firmware Resiliency - Lenovo ThinkShield

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

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

PFR operates upon the following server components:

- UEFI image – the low-level server firmware that connects the operating system to the server hardware
- XCC image – the management "engine" software that controls and reports on the server status separate from the server operating system
- FPGA image – the code that runs the server's lowest level hardware controller on the motherboard

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

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

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

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

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

Table 1. Secure Boot options

Part number	Feature code	Description	Purpose

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

(1) Based on internal research by Lenovo - 90% heat removal via water. Jan-Mar 2021
(2) Avg Rmax Perf per node ~ 50TF * 36 Nodes (1 rack) = 1.8PF >1.79PF in position 297 on the November 2020 TOP500 list
(3) Intel Xeon 8360Y CPU has 36 cores with floating point (FP) results of 419 vs. Intel Xeon 8280 CPU has 28 cores with FP results of 270 = 1.55x FP performance improvement

Related product families

Product families related to this document are the following:

- ThinkSystem SD630 V2 Server
- ThinkSystem SD650 V2 server
- ThinkSystem SD650-N V2 server
- ThinkSystem SN550 V2 Server
- ThinkSystem SR630 V2 Server
- ThinkSystem SR650 V2 Server
- ThinkSystem SR670 V2 Server
- ThinkSystem ST650 V2 server

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