Lenovo ThinkSystem SD650-I V3

Exascale technology made available at every scale.

Lenovo ThinkSystem SD650-I V3 is cooled by our fifth generation Lenovo Neptune™ direct water cooling technology. This server is powered by two 5th Gen Intel® Xeon® Scalable processors with the capability to be accelerated by four Intel Data center GPU Max, and NVIDIA HDR/NDR InfiniBand networking.

The combination of Intel acceleration technology with the market leading water cooling solution from Lenovo results in reliable performance in an extremely dense form factor. A single rack of Lenovo ThinkSystem SD650-I V3 provides up to 2.8 PetaFLOPS High Performance Computing (HPC) or 45 PetaFLOPS Artificial Intelligence (AI) peak performance on just $0.72m^2$ - less than 8 ft^2 - footprint.

Lenovo Neptune™: Leading water cooling technology

A decade of experience in direct water cooling sets Lenovo apart. With a meticulous focus on low-pressure drop and using high quality materials, Lenovo achieves the best-in-class reliability. The SD650-I V3 leverages copper and brazed connections to guarantee leak-free operations at scale even with higher pressure.

Another important differentiation is superior water loop design enabling up to 45°C inlet temperatures for the highest energy reuse efficiency. The new water loop design allows for optimized performance with increased frequency.

This ensures temperature uniformity to prevent thermal jitter for consistent application performance.

Water cooling is an end-to-end process that starts at manufacturing our manufacturing facilities. Through Helium and Nitrogen pressure tests from the node to the full rack build, the SD650-I V3 provides consistent quality at the highest standards. This approach also allows Lenovo to ship the systems pressurized without needing to send hazardous antifreeze-components to our customers.

Accelerating your applications

On the SD650-I V3, four Intel Max Series 1350/1550 X^e core GPU are interconnected through Xe Links. Delivering substantial performance improvements for HPC, AI training and inference workloads. The Max Series 1350/1550 supports the Lenovo HPC philosophy to enable customers From Exascale to Everyscale™. The SD650-I V3 equipped with the compute power of two 5th Gen Intel® Xeon® Scalable or CPU Max processors and accelerated by four Intel Max Series 1350/1550 X^e core GPUs and assisted by Intel OneAPI, the server can help you accelerate HPC applications and deep learning frameworks, for example:

- Deep Learning Frameworks such as TensorFlow, PyTorch, Apache MXNet, ONNX Runtime
- Molecular Dynamics codes such as GROMACS, NAMD, OpenMM, LAMMPS

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intel. XEON® PLATINUM

intel. XEON® MAX SERIES

intel. DATA CENTER GPU MAX SERIES

- Chemistry codes such as Quantum ESPRESSO and VASP
- Structural Finite Element Analysis codes such as Hexagon MSC Nastran and Dassault Systemes Simulia Abaqus
- Fluid Dynamics codes such as Ansys Fluent and Siemens STAR-CCM+

The Lenovo ThinkSystem SD650-I V3 also supports Lenovo Intelligent Computing Orchestration (LiCO) so that you can easily leverage oneAPI tools and templates optimized to run on Intel processors by it.

Solutions That Scale

Lenovo ThinkSystem SD650-I V3 is delivered fully integrated with the Lenovo Scalable Infrastructure (LeSI) solution. LeSI provides Best Recipe guides to warrant interoperability of hardware, software and firmware among a variety of Lenovo and third-party components. In addition to interoperability testing, LeSI hardware is pre-integrated, pre-cabled, pre-loaded with the best recipe and optionally an OS-image and tested at the rack level in manufacturing, to ensure a reliable delivery and minimize installation time in the customer data center.

Lenovo ThinkSystem SD650-I V3 is enabled with Lenovo HPC & AI Software Stack, you can support multiple users and scale within a single cluster environment. Lenovo HPC & AI Software Stack provides our HPC customers with a fully tested and supported open-source software stack to enable their administrators and users for the most effective and environmentally sustainable consumption of Lenovo Supercomputing capabilities.

Our Confluent management system and Lenovo Intelligent Computing Orchestration (LiCO) Web portal provide an interface designed to abstract the users from the complexity of HPC cluster orchestration and AI workloads management, making open-source HPC software consumable for every customer.

LiCO Web portal provides workflows for both AI and HPC, and supports multiple AI frameworks, allowing you to leverage a single cluster for diverse workload requirements.

Data Center Reliability Leader

At Lenovo, we take a customer-centric approach, which is why ThinkSystem servers consistently rank #1 in reliability. Also, Lenovo is the leading provider of Supercomputers according to TOP500.org. The ThinkSystem SD650-I V3 provides the latest in performance and reliability in a scalable solution for enterprise and research.
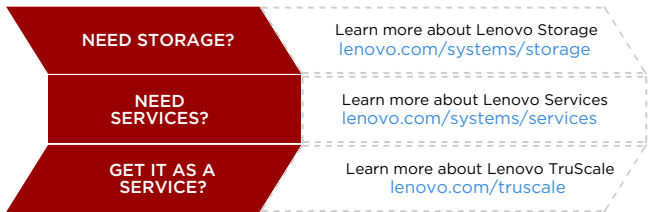
Specifications

Form Factor/Height	6U rack-mount with 6 trays
Processor	2x 5th Gen Intel® Xeon® Scalable processors per tray or 2x Intel® Xeon® CPU Max processors per tray
Memory	Up to 2.0TB using 16x 128GB 5600 MHz TruDDR5 RDIMMs per tray
Storage	Up to 4x E3.S or 4x 7mm or 2x 15mm U.2/SATA, no drive/backplane choice and 1 x liquid cooled M.2 NVMe SSD, providing both the boot drive and storage function SW RAID and Intel VROC for Intel drives only
NIC	2 x SFP28 25Gb LOM, NCSI (10Gb capable) 1x RJ45 1GbE, NCSI
PCIe	2x x16 PCIe Gen5 LP per tray
Power	Up to 9x air CFF v4 (2400W PT, 2600W TT) / Up to 3x Direct Water Cooled Power Supply (7200W) 80+ Titanium
Cooling	Direct Water Cooling with up to 45°C inlet water temperature
Management	Lenovo XClarity Controller (XCC) and Lenovo Intelligent Computing Orchestration (LiCO)
OS Support	Red Hat Enterprise Linux, SUSE Linux Enterprise Server
Acceleration	Four Intel Data Center GPU Max <=600W TDP

About Lenovo

Lenovo (HKSE: 992) (ADR: LNVGY) is a US$62 billion revenue global technology powerhouse, ranked #171 in the Fortune Global 500, employing 77,000 people around the world, and serving millions of customers every day in 180 markets. Focused on a bold vision to deliver smarter technology for all, Lenovo is expanding into new growth areas of infrastructure, mobile, solutions and services. This transformation is building a more inclusive, trustworthy, and sustainable digital society for everyone, everywhere.

For More Information

To learn more about the Lenovo ThinkSystem SD650-I V3, contact your Lenovo representative or Business Partner or visit www.lenovo.com/thinksystem. For detailed specs, consult the SD650-I V3 Product Guide

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