Lenovo ThinkSystem SD665-N V3

Exascale technology made available at every scale

Lenovo Neptune™ accelerated

Lenovo ThinkSystem SD665-N V3 is based on our fifth generation Lenovo Neptune™ direct water cooling platform and on two 5th Generation AMD EPYC™ Processors with NVIDIA HGX™ H100 or H200 4-GPU acceleration and NVIDIA NDR InfiniBand networking.

The combination of market leading NVIDIA acceleration technology with the market leading water cooling solution from Lenovo results in extreme performance in an extreme dense packaging. A single rack of Lenovo ThinkSystem SD665-N V3 nodes is more than doubles the performance of the previous generation with up to 5.8 PetaFLOPS High Performance Computing (HPC) or almost 200 PetaFLOPS Artificial Intelligence (AI) peak performance, occupying only 0.72m^2 (less than 8 ft^2) of data center floor space.

Accelerating your applications

On the SD665-N V3, four NVIDIA H100 or H200 Tensor Core GPU are interconnected through NVLink, delivering substantial performance improvements for HPC, AI training, and inference workloads. The H100 or H200 supports the Lenovo HPC philosophy to enable customers From Exascale to Everyscale™. Together with NVIDIA InfiniBand networking, it scales efficiently to thousands of GPUs or, with NVIDIA Multi-Instance GPU (MIG) technology, can be partitioned into seven GPU instances to accelerate smaller workloads.

With NVIDIA® CUDA® the most widely used parallel computing platform and programming model for GPUs is available free of charge to help you accelerate the more than 700 supported HPC applications and every major deep learning framework, for example:

- Chemistry like Gaussian and GROMACS
- Finite Elements like LS-DYNA and Simulia Abaqus
- Fluid Dynamics like OpenFOAM and ANSYS Fluent
- Molecular Dynamics like NAMD and AMBER
- Weather and Climate like WRF and ICON

The Lenovo ThinkSystem SD665-N V3 also supports NVIDIA® NGC™ providing pre-trained models, training scripts, optimized framework containers and inference engines for popular deep learning models.

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 highest quality materials, Lenovo achieves the best-in-class reliability.

The SD665-N V3 leverages copper and brazed connections guaranteeing leak-free operations at extreme scale, even at high pressure.

ThinkSystem

NVIDIA

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 optimizes performance with increased frequency while ensuring temperature uniformity, preventing Thermal Jitter for consistent application performance.

Water cooling is an end-to-end process that starts at manufacturing. Through Helium and Nitrogen pressure tests from the node to the completed rack, the SD665-N 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.

Solutions That Scale

Lenovo ThinkSystem SD665-N V3 is delivered as fully integrated 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, and pre-loaded with the best recipe and, optionally, an OS image. It is then tested at the rack level in manufacturing, to ensure a reliable delivery and minimize installation time in the customer data center.

Lenovo ThinkSystem SD665-N V3 is enabled with Lenovo HPC & AI Software Stack, where 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.

The 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 in the TOP500. The ThinkSystem SD665-N V3 provides the latest in performance and reliability in a scalable solution for enterprise and research.
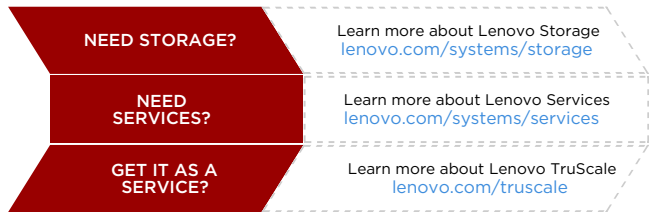
Specifications

Form Factor	Full-wide 1U tray; 1 node+GPUs per tray
Chassis	DW612S Enclosure (6U)
Processor	1x or 2x 5th Generation AMD EPYC™ Processors per node
Memory	Up to 3.0TB using 24x 128GB 6400 MHz TruDDR5 RDIMM slots per tray
I/O Expansion	NVIDIA ConnectX-7 4-chip VPI PCIe Gen5 Mezz Board for GPUdirect I/O
Acceleration	NVIDIA HGX™ H100 or H200 4-GPU with 4x NVLink connected SXM5 GPUs
Storage	Up to 2x 2.5″ NVMe SSDs (7mm height) or 1x 2.5″ NVMe SSDs (15mm height) per node Up to 1x liquid cooled M.2 NVMe SSD for both operating system boot and storage functions
RAID Support	OS Software RAID
Network Interfaces	Two onboard Ethernet interfaces: 2x 25GbE SFP28 LOM (1Gb, 10Gb or 25Gb capable; supports NC-SI) and 1x 1GbE RJ45 (supports NC-SI)
Power Management	Rack-level power capping and management via open-source management software Confluent and application-level energy optimization through Energy Aware Runtime (EAR)
Systems Management	Systems management using Lenovo HPC&AI Software stack with Lenovo Intelligent Computing Orchestration (LiCO) portal and XClarity Controller (XCC). Supports TPM 2.0 for advanced cryptographic functionality. SMM management module in the enclosure, supports daisy chaining to reduce cabling requirements
Front access	All adapters and drives are accessible from the front of the server. Front ports include KVM breakout connector and External Diagnostics Handset port for local management.
Rear access	2x RJ45 on the SMM management module in the enclosure for XCC with daisy chain support; USB 2.0 for SMM FFDC log collection
Power Supply	Up to 9x hot-swap air-cooled power supplies (2400W Platinum, 2600W Titanium), or Up to 3x hot-swap direct-water-cooled power supplies (7200W Titanium) Supports up to N+1 redundancy
Cooling Design	Direct Water Cooling at the heat source with up to 45°C inlet water temperature
OS Support	Red Hat, SUSE, Rocky Linux (with LeSI support); Visit lenovopress.com/osig for more information.
Limited Warranty	3-year customer replaceable unit and onsite limited warranty, next business day 9x5, service upgrades available

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 SD665-N V3, contact your Lenovo representative or Business Partner or visit lenovo.com/thinksystem For detailed specifications, consult the SD665-N V3 product guide .

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