

Lenovo ThinkSystem SD665 V3

Liquid cooling innovation for a
highly efficient data center



Innovative Design

The Lenovo ThinkSystem SD665 V3 dual-node tray is designed for High Performance Computing (HPC), large-scale cloud, heavy simulations and modeling.

It supports Lenovo Neptune™ Direct Water Cooling (DWC) technology as well as workloads from technical computing, grid deployments, analytics, and is ideally suited for fields such as research, life sciences, energy, simulation, and engineering.

The unique design of ThinkSystem SD665 V3 provides the optimal balance of serviceability, performance, and efficiency.

By using a standard rack with the ThinkSystem DW612S enclosure equipped with patented stainless steel drip-less quick connectors, the SD665 V3 provides easy serviceability and extreme density that is well suited for clusters ranging from small enterprises to the world's largest supercomputers.

The Lenovo Neptune™ direct liquid cooling doesn't use risky plastic retrofitting but custom designed copper water loops, so you have peace of mind implementing a platform with liquid cooling at the core of the design.

Compared to other technology, the ThinkSystem SD665 V3 direct water cooling:

- Reduces data center energy costs by up to 40%
- Increases system performance by up to 10%
- Delivers up to 95% heat removal efficiency
- Creates a quieter data center with its fan-less design
- Enables data center growth without adding computer room air conditioning

Maximum Performance, Simplified Management

Designed to run the highest core-count 5th Generation AMD EPYC™ Processor, the SD665 V3 powers through demanding HPC workloads. Because water cooling removes more heat constantly, CPUs can run in accelerated mode nonstop, getting up to 10% greater performance from the CPU.

Lenovo

The 5th Generation AMD EPYC™ Processors combine both superior memory bandwidth capacity and core-counts that are capable of increasing performance across all HPC workloads.

The 5th Generation AMD EPYC™ Processors excel in HPC application and workloads that are memory sensitive, scale well to multiple cores, and are not highly vectorized applications within the manufacturing/computer-aided engineering (CAE) and weather/climate verticals like OpenFOAM, ANSYS Fluent, ANSYS CFX, ANSYS LS-DYNA, Siemens STAR-CCM+, MOM5, and WRF.

For even greater system performance, the SD665 V3 uses 6400MHz DDR5 memory and supports NVMe storage, high-speed NDR InfiniBand.

The Lenovo ThinkSystem SD665 V3 is enabled with Lenovo HPC & AI Software Stack, so, you can support multiple users and scale within a single cluster environment.

Lenovo HPC & AI Software Stack provides our HPC customers you with a fully tested and supported open-source software stack to enable your administrators and users with for the most effective and environmentally sustainable consumption of Lenovo supercomputing capabilities.

Our Confluent management system and Lenovo Intelligent Computing Orchestration (LiCO) web portal provides 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.

Extreme Density

One 6U ThinkSystem DW612S enclosure accommodates up to 12 SD665 V3 compute nodes. With up to 6 chassis in a traditional 42U rack, the enclosure houses up to 144 processors, 216 TB of DDR5 Memory, and up to 144x PCIe Gen5 x16 adapters on just two data center floor tiles. The ThinkSystem SD665 V3 offers more than 3X the cores per U than the previous generation SD650 V2 server.

Savings and Efficiency

With up to 95% heat removal efficiency, the ThinkSystem SD665 V3 provides up to a 40% savings in data center energy expense including:

- 25% reduction in annual air conditioning use
- 5% energy savings by running cooler CPUs
- 5% savings by eliminating fans in the compute nodes
- 5% optimization from Energy Aware Runtime

A large supercomputing center reusing hot water from direct water cooling can save an estimated 45% in electricity costs.

Specifications

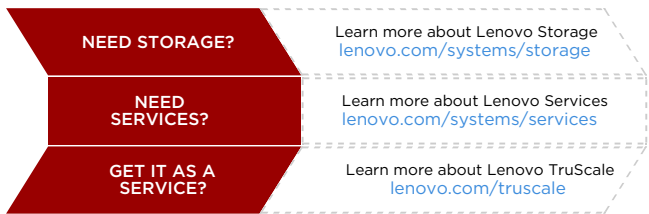
Form Factor	Full-wide 1U tray; 2 nodes per tray
Chassis	DW612S Enclosure (6U)
Processors	2x 5th Generation AMD EPYC™ Processors per node
Memory	Up to 3.0TB using 24x 128GB 6400 MHz TruDDR5 RDIMM slots per tray
I/O Expansion	Up to 2x PCIe Gen5 x16 low-profile adapter slots (2x supported without internal storage) per node for NDR InfiniBand. Shared I/O and SocketDirect supported.
Internal Storage	Up to 4x 2.5-inch NVMe SSDs (7mm height) or 2x 2.5-inch 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 50°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 ThinkSystem SD665 V3, contact your Lenovo representative or Business Partner or visit www.lenovo.com/thinksystem. For detailed specifications, consult the [SD665 V3 product guide](#).



§ Based on Lenovo internal testing.

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