Five Highlights of the Lenovo ThinkSystem SD535 V3 Server

Article

The Lenovo ThinkSystem SD535 V3 is an economical single socket server node in a 1U half-width form factor. Combining the efficiency and density of blades with the value and simplicity of rack-based servers, the SD535 V3 delivers a cost-efficient scale out platform that is thermally designed to deliver maximum performance in the smallest footprint.

The solution consists of the 2U ThinkSystem D3 Chassis containing up to four SD535 V3 nodes, all with front access. Each node incorporates an AMD EPYC 9005 "Turin" or EPYC 9004 “Genoa” processor.

The SD535 V3 is well suited for workloads ranging from cloud, to AI and high-performance computing applications like Computer Aided Engineering (CAE) or Electronic Design Automation (EDA).

Figure 1. ThinkSystem SD535 V3

1. Performance and Efficiency

Compute requirements are increasing, while data center space is not. The Lenovo ThinkSystem SD535 V3, powered by an AMD EPYC 9005 "Turin" or EPYC 9004 “Genoa” processor, offers incredible core density and performance. The SD535 V3 innovative server design drives new levels of value for the data center.

- Performance: Each SD535 V3 node supports a high-performance AMD EPYC 9005 processor up to 500W and 192 cores, up to 1.5TB of DDR5 memory, and six hot-swap SAS/SATA/NVMe SSD drives per node for demanding workloads.
- Optional Lenovo Neptune Direct Water Cooling , which is much more efficient than traditional air cooling and provides maximum performance while dramatically improving energy efficiency.
- Density: Incredible density with up to 4 nodes and 4 CPUs in a 1U form factor provides flexible and robust IO options – 1Gb, 10Gb, 25Gb, or 100Gb Ethernet. A low-profile PCIe Gen 5 x16 expansion slot and one OCP NIC 3.0 slot per node.
- Efficiency: Designed with power and cost efficiency in mind, the SD535 V3 reduces power consumption with a shared power design, leveraging redundant power supplies up to 2700W Titanium level high-efficiency (96%) power supplies (Full redundancy is based on configuration and application load).

2. Multi-node Chassis

The 2U Lenovo ThinkSystem D3 Chassis supports up to 4 nodes. The chassis holds four 1U V3 nodes or two 2U V3 nodes with a combination of SD535 V3, SD530 V3 and SD550 V3 Node installed together. The chassis supports up to 3 CRPS power supplies that are shared among the nodes installed in the chassis. All system management is performed by each of the nodes. An optional OCP NIC 3.0 management port consolidation adapter is available. This adapter offers up to 4 to 1 management port consolidation.

When installing nodes in the chassis, the nodes on the left side are installed right-side up and the nodes on the right are installed upside-down. The nodes and especially the phase change heatsinks have been specifically designed to work equally well in either orientation.

Figure 2. Front View - SD535 V3 Nodes installed in D3 Chassis

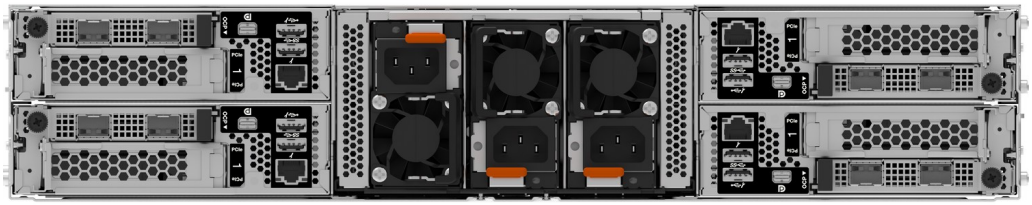

Figure 3. Rear View - SD535 V3 Nodes installed in D3 Chassis (with 2 PSUs)

Figure 4. Front View - two SD535 V3 Nodes and two SD530 V3 Nodes installed in D3 Chassis

The advantages of the D3 Enclosure design include:

- Density - up to four 1U nodes or two 2U nodes in 2U rack space.
- Simple Management – No chassis management, all management is performed by the nodes.
- Shared Power Supplies - Shared rear access power supplies support up to 4 nodes.
- Redundancy – 3 PSUs with 2+1 with oversubscription, 2 PSUs with 1+1 without over-subscription or 2 PSUs with over-subscription
- Serviceability – all service is performed from the front on individual nodes
- Fans – Fans are part of each Node. Fan reliability only impacts one node vs the entire chassis
- Efficiency – Only nodes with a heavy workload ramp up their fans saving overall fan power
- Only one set of nodes, not a left and right version for each node simplifying logistics for self-servicers
- Allows for mixing of 1U and 2U nodes within the same chassis.

3. SD535 V3 I/O

The SD535 V3 provides an ample amount of I/O.

- One XCC2 system management port on the rear to connect to a systems-management network. This RJ-45 connector is dedicated for the Lenovo XClarity Controller
- Two or four Ethernet ports on a selection of OCP NIC 3.0 Ethernet adapters
- One PCIe Gen5 x16 HHHL slot
- Up to two USB ports on the rear of server.
- Mini Display port on rear of server

Figure 5. Front – ThinkSystem SD535 V3

Figure 6. Rear – ThinkSystem SD535 V3 (air cooled)

Figure 7. Rear – ThinkSystem SD535 V3 (water cooled)

4. Enhanced Security

The SD535 V3 includes many security features including Lenovo ThinkShield. This is a collection of secure software design, deployment and operational methods, ThinkShield prevents, detects and remediates against attacks, providing security in the supply chain, below the OS in the server, and from the OS to the cloud. The XClarity system manager simplifies infrastructure processes, handling faults, and adding new servers to the network. It also adds security by monitoring log events.

The SD535 V3 server offers the following electronic security features:

- Secure Boot function of the Intel Xeon processor
- Support for Platform Firmware Resiliency (PFR) with a Lenovo hardware Root of Trust (RoT)
- Firmware signature processes compliant with FIPS and NIST requirements
- Administrator and power-on passwords
- Integrated Trusted Platform Module (TPM) supporting TPM 2.0
- Chassis intrusion software notice

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. This includes Platform Firmware Resiliency (PFR) hardware Root of Trust (RoT) which enables the system to be NIST SP800-193 compliant.

5. XClarity Administrator

Lenovo XClarity Administrator is a centralized resource-management solution designed to reduce complexity, speed response, and enhance the availability of Lenovo ThinkSystem servers.

The XClarity Administrator enables you to define and control pools of infrastructure from your choice of interface, including an intuitive web-based GUI, XClarity Mobile app, Windows PowerShell, Python, or using your own external IT applications by running XClarity Integrator software or integrating with open REST APIs.

XClarity benefits:

- Simplify - Save administrator time by reducing complexity of infrastructure tasks:
- Accelerate - Automate hardware delivery and maintenance:
- Integrate - Integrates into external IT applications, providing the flexibility to manage Lenovo infrastructure without leaving the console of the software that you use regularly:
- Reduce IT Costs - Increase IT staff productivity and efficiency by automating complex, repetitive tasks:

XClarity key features:

- Define servers with reusable, scalable configuration patterns
- Discover, track, and manage hardware inventory
- Monitor hardware and handle alerts, events, and logs, including calling home to open problem records and alert IT staff to a problem
- Manage firmware levels and updates via policies
- Install hypervisors and operating systems to bare metal servers

About the Author

Randall Lundin is a Senior Product Manager in the Lenovo Infrastructure Solution Group. He is responsible for planning and managing ThinkSystem servers. Randall has also authored and contributed to numerous Lenovo Press publications on ThinkSystem products.

Related product families

Product families related to this document are the following:

- Multi-Node Servers
- ThinkSystem SD535 V3 Server

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