



# Microsoft Azure Stack HCI on AMD-Based Lenovo ThinkSystem V3 Servers

## Solution Brief

### Accelerate Your Business

Deploying hyperconverged infrastructure (HCI) has become the de-facto standard for organizations looking to modernize their aging infrastructure. Large storage deployments are increasingly being replaced by HCI based solutions for most general-purpose workloads. HCI has proven to deliver better efficiency and price performance in the datacenter. Additionally, customers have been choosing a hybrid approach, migrating certain workloads to the cloud, while keeping other workloads on-premises.

Azure Stack HCI is Microsoft's HCI solution for customers that wish to run workloads on-premises and extend easily to Azure for hybrid capabilities such as back-up, site recovery, storage, cloud-based monitoring and more. Microsoft Azure Stack HCI with Azure Arc on Lenovo servers provides consistent management across the hybrid cloud solution and enables extension of the hybrid cloud to the edge.

Azure Stack HCI is a new HCI host operating system from Microsoft, delivered as an Azure service, providing the latest and up-to-date security, performance, and feature updates. Azure Stack HCI builds on the foundation of the Microsoft Windows Server Software Defined program and provides a certification path for Storage Spaces Direct solutions.

Lenovo has designed, tested, and validated ThinkSystem SR665 V3, SR655 V3, SR645 V3 and SR635 V3 Azure Stack HCI validated nodes to enable the quick deployment of a robust, high-performance hybrid cloud solution and rapidly solve your IT challenges.

### Reliability: Powered by Lenovo Servers

The Lenovo ThinkSystem SR635 V3 and the SR655 V3 servers are 1-socket servers in 1U and 2U rack form factors respectively that feature the AMD EPYC 9004 family of processors. With up to 128 processor cores and support for the new PCIe 5.0 standard for I/O, these servers offer the ultimate in one-socket server performance.

The Lenovo ThinkSystem SR645 V3 and the SR665 V3 servers are 2-socket servers in 1U and 2U rack form factors respectively that feature the AMD EPYC 9004 family of processors. With up to 128 processor cores and support for the new PCIe 5.0 standard for I/O, these servers offer the ultimate in two-socket server performance.

Modern IT applications like AI, software-defined and virtualization applications utilize a vast amount of data to operate seamlessly and require servers with the next era of solution performance and flexibility.

The new ThinkSystem SR6x5 V3 servers provide the performance to manage these next gen applications. With the 4th Generation AMD EPYC™ processors, up to 160 PCIe gen5 lanes for I/O speed, the latest TruDDR5 memory, and multiple drive options for agile storage, the SR6x5 V3 servers have the performance to tackle the complex workloads of today and tomorrow.

In addition to high performance, Lenovo ThinkSystem servers consistently rank high in customer satisfaction and have been rated #1 in x86 server reliability for 9 years running<sup>1</sup>.



ThinkSystem SR635 V3



ThinkSystem SR655 V3



ThinkSystem SR645 V3



ThinkSystem SR665 V3

## Excellent Value

Lenovo Azure Stack HCI offerings use the Microsoft Azure Stack HCI operating system on the host nodes, and optionally include Windows Server 2022 Datacenter in case you require unlimited guest OS virtual machine licenses. The Azure Stack HCI OS license provides the following benefits:

- **Storage Spaces Direct (S2D):** State of the art software-defined storage from Microsoft with multiple high-performance resiliency options, deduplication, compression and more.
- **Windows Admin Center (WAC):** A web-based management portal is included with the software at no extra cost. Deployment and update features in WAC make deployment extremely simple and easy to perform. Additionally, Lenovo's XClarity plugin allows you to deploy hardware as well as software from the same interface, enabling a single pane of management. Cluster-aware updating features make it easy to streamline software and firmware updates in a single maintenance window.
- **Hyper-V:** Hypervisor is included in the license
- **Software-Defined Networking:** Features such as virtual network encryption, firewall auditing, and virtual network peering allow you to get the benefits of a more secure software defined network with Azure Stack HCI.
- **Azure Stack HCI** is hybrid by design, and you can benefit from native integration with Azure ARC and Azure Monitor and connect to Azure for a variety of Azure hybrid services seamlessly. Fleet management for hosts and VMs allows you to monitor and manage clusters at scale.
- The Extended Security Update (ESU) program enables you to get important security patches for legacy Microsoft products that are past the end of support. There are several advantages to getting ESU through Azure, which extend to Azure Stack HCI:
  - **Free of charge:** You can get ESUs through Azure Stack HCI for free.
  - **Get an additional year of ESUs for Windows Server and SQL Server 2008 and 2008 R2 :** Or Azure and Azure Stack HCI only, ESUs for Windows Server and SQL Server 2008 and 2008 R2 will end on January 14, 2024 and July 12, 2023 respectively; a year longer than the usual three-year ESU programs.
  - Windows Server 2012 and Windows Server 2012 R2 will end on **October 10, 2023**. If your servers are on-premises or in a hosted environment, you can enroll your Windows Server 2012 and 2012 R2 or SQL Server 2012 machines for Extended Security Updates via the Azure portal, connect through Azure Arc, and you'll be billed monthly via your Azure subscription.

## **Azure Arc**

Microsoft Azure Arc is a set of technologies that allows customers to view and manage both their on-premises and cloud resources with a single pane of glass. With Azure Arc you can manage both your VMs in Azure and VMs on-premises, apply security policies to both and provide tough governance easily through a self-service portal.

## Specifications

Standard specifications of SR665 V3 server as an example. For other servers, please see links to product guides at the bottom of the document.

Table 1. Lenovo ThinkSystem SR665 V3 Standard Specifications

Components	Specification
<b>Machine types</b>	7D9B - 1 year warranty 7D9A - 3 year warranty
<b>Form factor</b>	2U rack
<b>Processor</b>	One or two AMD EPYC 9004 Series processors. Processors support up to 128 cores, core speeds of up to 4.1 GHz, and TDP (thermal design power) ratings of up to 360W. Supports PCIe 5.0 for high performance I/O.
<b>Memory</b>	24 DIMM slots with two processors (12 DIMM slots per processor). Each processor has 12 memory channels, with 1 DIMM per channel (DPC). Lenovo TruDDR5 RDIMMs, 3DS RDIMMs, and 9x4 RDIMMs are supported, up to 4800 MHz/td>
<b>Memory maximum</b>	Up to 6TB with 24x 256GB 3DS RDIMMs
<b>Disk drive bays</b>	<p>Up to 20x 3.5-inch or 40x 2.5-inch hot-swap drive bays:</p> <ul style="list-style-type: none"> <li>• Front bays can be 3.5-inch (8 or 12 bays) or 2.5-inch (8, 16 or 24 bays)</li> <li>• Middle bays can be 3.5-inch (4 bays) or 2.5-inch (8 bays)</li> <li>• Rear bays can be 3.5-inch (2 or 4 bays) or 2.5-inch (4 or 8 bays)</li> <li>• Combinations of SAS/SATA, NVMe, or AnyBay (supporting SAS, SATA or NVMe) are available.</li> </ul> <p>The server also supports these drives for OS boot or drive storage:</p> <ul style="list-style-type: none"> <li>• Two 7mm drives at the rear of the server (optional RAID)</li> <li>• Internal M.2 module supporting up to two M.2 drives (optional)</li> </ul>
<b>Maximum internal storage</b>	<p>2.5-inch drives:</p> <ul style="list-style-type: none"> <li>• 1228.8TB using 40x 30.72TB 2.5-inch SAS/SATA SSDs</li> <li>• 491.52TB using 32x 15.36TB 2.5-inch NVMe SSDs</li> <li>• 96TB using 40x 2.4TB 2.5-inch HDDs Front bays can be 3.5-inch (8 or 12 bays) or 2.5-inch (8, 16 or 24 bays)</li> </ul> <p>3.5-inch drives</p> <ul style="list-style-type: none"> <li>• 400TB using 20x 20TB 3.5-inch HDDs</li> <li>• 307.2TB using 20x 15.36TB 3.5-inch SAS/SATA SSDs</li> <li>• 153.6TB using 12x 12.8TB 3.5-inch NVMe SSDs</li> </ul>

Components	Specification
<b>Storage controller</b>	<ul style="list-style-type: none"> <li>● Up to 20x Onboard SATA ports (non-RAID)</li> <li>● Up to 20x Onboard NVMe ports (non-RAID)</li> <li>● NVMe Retimer Adapter (PCIe 4.0 or PCIe 5.0)</li> <li>● 12 Gb SAS/SATA RAID adapters <ul style="list-style-type: none"> <li>○ 8, 16 or 32 ports</li> <li>○ Up to 8GB flash-backed cache</li> <li>○ PCIe 4.0 or PCIe 3.0 host interface</li> </ul> </li> <li>● 12 Gb SAS/SATA HBA (non-RAID) <ul style="list-style-type: none"> <li>○ 8-port and 16-port</li> <li>○ PCIe 4.0 or PCIe 3.0 host interface</li> </ul> </li> </ul>
<b>Network interfaces</b>	Dedicated OCP 3.0 SFF slot with PCIe 5.0 x16 host interface, either at the rear of the server (rear-accessible) or the front of the server (front-accessible). Supports a variety of 2-port and 4-port adapters with 1GbE, 10GbE and 25GbE network connectivity. One port can optionally be shared with the XClarity Controller 2 (XCC2) management processor for Wake-on-LAN and NC-SI (network controller sideband interface) support. Additional PCIe network adapters supported in PCIe slots.
<b>PCI expansion slots</b>	<p>Up to 12x PCIe slots (10x rear, 2x front), plus a slot dedicated to an OCP 3.0 adapter. 2.5-inch drive configurations also support an additional internal bay for a cabled RAID adapter or HBA.</p> <p>Rear: Up to 10x PCIe slots, plus a slot dedicated to the OCP adapter. Slots are either PCIe 5.0 or 4.0 depending on riser selection and rear drive bay selection. The use of some slots requires two processors.</p> <p>Slots are configured using four riser cards. Riser 1 (slots 1-3) and Riser 2 (slots 4-6) are installed in slots in the system board, Riser 3 (slots 7-8) and Riser 4 (9-10) are cabled to ports on the system board. A variety of riser cards are available.</p> <p>Front: The server also supports slots at the front of the server (configurations with up to 16 drive bays): 2x PCIe x16 full-height half-length slots, plus 1x OCP 3.0 slot</p> <p><i>Internal:</i> For 2.5-inch front drive configurations, the server supports the installation of a RAID adapter or HBA in a dedicated area that does not consume any of the PCIe slots.</p>
<b>Power supply</b>	Up to two hot-swap redundant AC power supplies, 80 PLUS Platinum or 80 PLUS Titanium certification. 750 W, 1100 W, 1800 W, 2400 W, and 2600 W AC, supporting 220 V AC. 750 W and 1100 W options also support 110V input supply. In China only, all power supply options support 240 V DC. Also available is a 1100W power supply with a -48V DC input.
<b>Systems management</b>	Operator panel with status LEDs. Optional External Diagnostics Handset with LCD display. Models with 16x 2.5-inch front drive bays can optionally support an Integrated Diagnostics Panel. XClarity Controller 2 (XCC2) embedded management based on the ASPEED AST2600 baseboard management controller (BMC). Dedicated rear Ethernet port for XCC2 remote access for management. Optional 2nd redundant XCC2 remote port supported, installs in the OCP slot. XClarity Administrator for centralized infrastructure management, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XCC Platinum to enable remote control functions and other features.
<b>Security features</b>	Chassis intrusion switch, Power-on password, administrator's password, Root of Trust module supporting TPM 2.0 and Platform Firmware Resiliency (PFR). Optional lockable front security bezel.
<b>Service and support</b>	Optional service upgrades are available through Lenovo Services: 4-hour or 2-hour response time, 6-hour fix time, 1-year or 2-year warranty extension, software support for Lenovo hardware and some third-party applications.
<b>Dimensions</b>	Width: 445 mm (17.5 in.), height: 87 mm (3.4 in.), depth: 766 mm (30.1 in.)
<b>Weight</b>	Maximum: 38.8 kg (85.5 lb)

## As Much Help As You Need

Lenovo and Lenovo partners have a comprehensive portfolio of professional services that supports the full life cycle of your infrastructure. At every stage—from planning to deployment, optimization, support, and end of life—extra help is available to accelerate meeting your business objectives.

## Lenovo and Microsoft

With co-located engineering organizations and a history of technical collaboration, Microsoft and Lenovo consistently deliver innovative joint solutions for the data center. Lenovo's leadership in reliability, customer satisfaction, and performance, combined with Microsoft's leadership in software and cloud services, continues to deliver innovative data center solutions and lower TCO for our joint customers.

## Why Lenovo

Lenovo is a leading provider of x86 servers for the data center. Featuring rack, tower, blade, dense and converged systems, the Lenovo server portfolio provides excellent performance, reliability and security. Lenovo also offers a full range of storage, software, solutions, and comprehensive services supporting business needs throughout the IT lifecycle.

## For More Information

To learn more about ThinkSystem SR635 V3, SR645 V3, SR655 V3 and SR665 V3 servers contact your Lenovo representative or Business Partner, or visit:

[Lenovo ThinkSystem SR635 Product Guide](#)

[Lenovo ThinkSystem SR645 Product Guide](#)

[Lenovo ThinkSystem SR655 Product Guide](#)

[Lenovo ThinkSystem SR665 Product Guide](#)

[Microsoft Azure Stack HCI catalog](#)

<sup>1</sup>ITIC Global Reliability Study, [lenovopress.lenovo.com/lp1117](http://lenovopress.lenovo.com/lp1117).

## Related product families

Product families related to this document are the following:

- [Microsoft Alliance](#)
- [ThinkSystem SR635 V3 Server](#)
- [ThinkSystem SR645 V3 Server](#)
- [ThinkSystem SR655 V3 Server](#)
- [ThinkSystem SR665 V3 Server](#)

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