ThinkAgile MX650 V3 2U Integrated System and Certified Node (Intel Xeon SP Gen 4)
Product Guide

The Lenovo ThinkAgile MX650 V3 2U Integrated System and Certified Node are 2-socket 2U systems that are designed for deploying highly available, highly scalable hyper-converged infrastructure (HCI) and software-defined storage (SDS) from Microsoft on Lenovo enterprise platforms that feature 5th Generation Intel Xeon Scalable processors (formerly codenamed "Emerald Rapids) and 4th Generation Intel Xeon Scalable processors (formerly codenamed "Sapphire Rapids). The MX650 V3 systems delivers fully validated and integrated Lenovo hardware and firmware that is certified for Microsoft Azure Stack HCI solutions.

The MX650 V3 systems are available either as an Integrated System or Certified Node:

MX Integrated Systems deliver fully validated and integrated Lenovo hardware and firmware, certified and preloaded with licensed Microsoft Azure software. They also include ThinkAgile Premier support with one single point of contact for support of the hardware and software.

MX Certified Nodes deliver fully validated Lenovo hardware and firmware, certified and can be preloaded with Microsoft Azure software. Certified Nodes do not include licenses to Microsoft Azure software and enhanced software support.
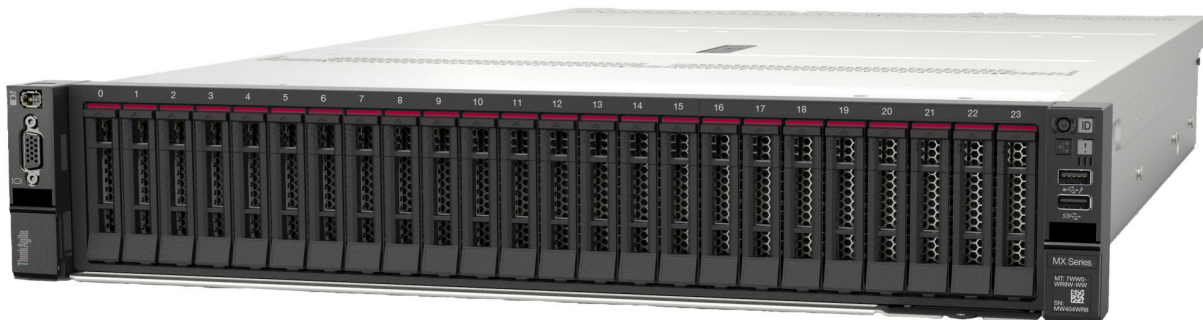

Figure 1. Lenovo ThinkAgile MX650 V3 2U Integrated System and Certified Node with 2.5-inch drive bays

Did you know?

The ThinkAgile MX650 V3 2U Integrated System and Certified Node are built on industry-leading Lenovo ThinkSystem servers that feature enterprise-class reliability, management, and security. They deliver fully validated and integrated hardware and firmware that is certified for Microsoft Azure Stack HCI solutions.

The MX650 V3 systems Integrated Systems offer ThinkAgile Premier Single Point of Support for quick 24/7 problem reporting and resolution.

Key features

Combining performance and flexibility, the MX650 V3 systems systems are a great choice for enterprises of all sizes. The systems offer a broad selection of processors, memory and drives, and offers high performance features that industries such as finance, healthcare and telco need. Outstanding reliability, availability, and serviceability (RAS) and high-efficiency design can improve your business environment and can help save operational costs.

ThinkAgile MX Series platforms offer the choice of Azure Stack HCI Integrated System (Appliance) or Azure Stack HCI Certified Node. These validated platforms help modernize on-premises infrastructure with pre-tested, pre-configured, and easy-to-order configurations, with seamless Azure integration. As a direct and indirect Microsoft Cloud Solution Provider, Lenovo offers cloud services and subscriptions through the Lenovo Cloud Marketplace, which enable HCI use cases with the ThinkAgile MX platforms.

- The integrated systems include the Azure Stack HCI operating system, which is delivered as an Azure subscription service via the Microsoft CSP program. It also includes ThinkAgile Premier support with one single point of contact for support of the hardware and warm-case transfer for software. Deployment and Update features in Windows Admin Center and tight integration with Lenovo XClarity make cluster management, hardware and software update management & enforcing site-wide policies easy for administrators. Azure hybrid by design, native integration with Azure services makes it easy for customers to adopt a hybrid cloud strategy for their workloads and use cases.
- The certified nodes deliver fully validated and integrated Lenovo hardware and firmware that is certified for Microsoft Azure Stack HCI solutions. These HCI Certified Nodes have the option of Windows Server 2019 Datacenter Edition for HCI functionality, and guest licenses are included.

Integrated System features

The ThinkAgile MX Integrated System offers the following key features:

- Quick and convenient path to implement a hyperconverged solution powered by the new Azure Stack HCI OS with Hyper-V virtualization, Microsoft Storage Spaces Direct (S2D), Software Defined Storage (SDS), and Software Defined Networking (SDN) network virtualization.
- Streamlined management of Azure Stack HCI with unified single-pane-of-glass for creating and managing VMs, S2D volumes, and virtual networks through Windows Admin Center.
- Consistent, low latency performance with hypervisor-embedded architecture, built-in read and write cache, and support for NVMe PCIe drives.
- Provides per-VM storage performance management with policy-driven Quality of Service (QoS) and continuous built-in monitoring and alerting with cluster-wide performance and capacity metrics.
- Can sustain drive, server, or component failures with built-in resiliency for continuous availability.
- GPU support to enable AI training, inferencing and data visualization scenarios, HPC workloads, virtual desktops and graphics intensive applications.
- Built on proven and reliable Lenovo ThinkSystem servers that provide compute power and space efficiency for a variety of edge workloads and applications.
- Provides comprehensive hardware management with advanced systems management capabilities with XClarity
- Delivers fully validated and integrated hardware and firmware that is certified for Microsoft Azure Stack HCI solutions.
- Ready for out-of-box deployment with the mandatory Azure Stack HCI OS preloaded, with the option to purchase a Windows Server 2019 Datacenter or Windows Server 2022 Datacenter license if unlimited guest OS VMs are desired.
- Includes Lenovo ThinkAgile Premier Single Point of Support for quick 24/7 problem reporting and resolution.

- Optional Lenovo deployment services to get customers up and running quickly.

Certified Node features

The ThinkAgile MX Certified Node offers the following key features:

- Quick and convenient path to implement a hyperconverged solution powered by Windows Server 2019 Datacenter or Windows Server 2022 Datacenter with Hyper-V virtualization, Microsoft Storage Spaces Direct (S2D), Software Defined Storage (SDS), and Software Defined Networking (SDN) network virtualization.
- Streamlined management of Azure Stack HCI with unified single-pane-of-glass for creating and managing VMs, S2D volumes, and virtual networks through Windows Admin Center.
- Consistent, low latency performance with hypervisor-embedded architecture, built-in read and write cache, and support for NVMe PCIe drives.
- Provides per-VM storage performance management with policy-driven Quality of Service (QoS) and continuous built-in monitoring and alerting with cluster-wide performance and capacity metrics.
- Can sustain drive, server, or component failures with built-in resiliency for continuous availability.
- GPU support to enable AI training, inferencing and data visualization scenarios, HPC workloads, virtual desktops and graphics intensive applications.
- Built on proven and reliable Lenovo ThinkSystem servers that provide compute power and space efficiency for a variety of edge workloads and applications.
- Provides comprehensive hardware management with advanced systems management capabilities.
- Delivers fully validated and integrated hardware and firmware that is certified for Microsoft Azure Stack HCI solutions.
- Ready for out-of-box deployment with the optional Windows Server 2019 Datacenter, Windows Server 2022 Datacenter, or Azure Stack HCI OS preload.
- Provide flexibility in using the existing Microsoft Windows Server 2019 or 2022 enterprise license agreements or purchasing new software licenses from Microsoft or Lenovo.
- Optional Lenovo deployment services to get customers up and running quickly.

Hardware features

The MX650 V3 systems are based on the SR650 V3 and have the following hardware features:

Scalability and performance

The MX650 V3 systems offer numerous features to boost performance, improve scalability and reduce costs:

- Supports one or two fifth-generation Intel Xeon Processor Scalable processors
  - Up to 64 cores and 128 threads
  - Core speeds of up to 3.9 GHz
  - TDP ratings of up to 350 W
- Supports one or two fourth-generation Intel Xeon Processor Scalable processors
  - Up to 60 cores and 120 threads
  - Core speeds of up to 3.7 GHz
  - TDP ratings of up to 350 W
- Support for DDR5 memory DIMMs to maximize the performance of the memory subsystem:
  - Up to 32 DDR5 memory DIMMs, 16 DIMMs per processor
  - 8 memory channels per processor (2 DIMMs per channel)
  - Supports 1 DIMM per channel operating at 5600 MHz (5th Gen processors) or 4800 MHz (4th Gen processors)

- Supports 2 DIMMs per channel operating at 4800 MHz (5th Gen processors) or 4400 MHz (4th Gen processors)
- Using 256GB 3DS RDIMMs, the server supports up to 8TB of system memory

- Supports up to eight single-width GPUs or four double-wide GPUs, for substantial processing power in a 2U system.

- Configurations with 2.5-inch drives support up to 24x hot-swap drives, all front or rear accessible

- Configurations with 3.5-inch drives support up to 12x 3.5-inch hot-swap front-accessible drives plus either 4x 3.5-inch or 4x 2.5-inch hot-swap rear-accessible drives

- Supports 16x NVMe drives without oversubscription of PCIe lanes (1:1 connectivity). The use of NVMe drives maximizes drive I/O performance, in terms of throughput and latency.

- Supports 12x SATA drives using the onboard SATA controller (no additional adapter needed), enabling lower cost, high capacity storage solution for cold or archival storage workloads.

- Supports high-speed HBA controllers providing 12 Gb SAS connectivity to the drive backplanes.

- Supports up to two externally accessible 7mm hot-swap drives with RAID functionality for operating system boot functions.

- Supports M.2 drives for convenient operating system boot functions. Available M.2 adapters support two M.2 drives in a RAID 1 configuration for performance and reliability.

- The server has a dedicated industry-standard OCP 3.0 small form factor (SFF) slot, with a PCIe 4.0 x16 interface, supporting a variety of Ethernet network adapters. A simple-swap mechanism with a thumbscrew and pull-tab enables tool-less installation and removal of the adapter. The adapter supports shared BMC network sideband connectivity to enable out-of-band systems management.

- The server offers PCI Express 5.0 I/O expansion capabilities that doubles the theoretical maximum bandwidth of PCIe 4.0 (32GT/s in each direction for PCIe Gen 5, compared to 16 GT/s with PCIe Gen 4 and 8 GT/s with PCIe Gen 3). A PCIe 5.0 x16 slot provides 128 GB/s bandwidth, enough to support a dual-port 200GbE network connection.

- The server offers up to eight PCIe 5.0 slots, all with rear access, plus an internal bay for a cabled HBA, plus a slot dedicated to the OCP adapter.

Availability and serviceability

The MX650 V3 systems provide many features to simplify serviceability and increase system uptime:

- The server offers Single Device Data Correction (SDDC, also known as Chipkill), Adaptive Double-Device Data Correction (ADDDC, also known as Redundant Bit Steering or RBS), and memory mirroring for redundancy in the event of a non-correctable memory failure. Note: ADDDC in not supported with 9x4 RDIMMs.

- The server offers hot-swap drives, providing greater system uptime.

- Available internal M.2 RAID Boot Adapters support RAID-1 which can enable two SATA or two NVMe M.2 drives to be configured as a redundant pair.

- A pair of rear-accessible 7mm hot-swap boot drives can be accessed without removing the cover or powering down the server.

- The server has up to two hot-swap redundant power supplies and up to six hot-swap redundant fans to provide availability for business-critical applications.

- The light path diagnostics feature uses LEDs to lead the technician to failed (or failing) components, which simplifies servicing, speeds up problem resolution, and helps improve system availability.

- Solid-state drives (SSDs) offer more reliability and performance than traditional mechanical HDDs for greater uptime.

- Proactive Platform Alerts (including PFA and SMART alerts): Processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, M.2 storage, flash storage adapters), fans, power supplies, server ambient and subcomponent temperatures. Alerts can be

surfaced through the XClarity Controller 2 to managers such as Lenovo XClarity Administrator and Microsoft System Center. These proactive alerts let you take appropriate actions in advance of possible failure, thereby increasing server uptime and application availability.

- The built-in XClarity Controller 2 continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failures to minimize downtime.
- Built-in diagnostics in UEFI, using Lenovo XClarity Provisioning Manager, speed up troubleshooting tasks to reduce service time.
- Lenovo XClarity Provisioning Manager supports diagnostics and can save service data to a USB key drive or remote CIFS share folder for troubleshooting and reduce service time.
- Auto restart in the event of a momentary loss of AC power (based on power policy setting in the XClarity Controller 2 service processor)
- Offers a diagnostics port on the front of the server to allow you to attach an external diagnostics handset for enhanced systems management capabilities.
- Support for the XClarity Administrator Mobile app running on a supported smartphone or tablet and connected to the server through the service-enabled USB port, enables additional local systems management functions.
- Three-year or one-year customer-replaceable unit and onsite limited warranty (varies by geography), 9 x 5 next business day. Optional service upgrades are available.

Manageability and security

Systems management features simplify local and remote management of the MX650 V3 systems:

- The server includes an XClarity Controller 2 (XCC2) to monitor server availability. Optional upgrade to XCC Platinum to provide remote control (keyboard video mouse) functions, support for the mounting of remote media files (ISO and IMG image files), boot capture, power capping and new XCC2 Platinum features. New XCC2 Platinum features include System Guard, new security modes including a CNSA-compliant mode, FIPS 140-3 and NIST 800-193 support, and a new Neighbor Group feature.
- Lenovo XClarity Administrator offers comprehensive hardware management tools that help to increase uptime, reduce costs and improve productivity through advanced server management capabilities.
- UEFI-based Lenovo XClarity Provisioning Manager, accessible from F1 during boot, provides system inventory information, graphical UEFI Setup, platform update function, operating system installation function, and diagnostic functions.
- Support for Lenovo XClarity Energy Manager, which captures real-time power and temperature data from the server and provides automated controls to lower energy costs.
- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Support for industry standard management protocols, IPMI 2.0, SNMP 3.0, Redfish REST API, serial console via IPMI
- An integrated hardware Trusted Platform Module (TPM) supporting TPM 2.0 enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Administrator and power-on passwords help protect from unauthorized access to the server.
- Supports Secure Boot to ensure only a digitally signed operating system can be used. Supported with HDDs and SSDs, as well as 7mm and M.2 drives.
- Industry-standard Advanced Encryption Standard (AES) NI support for faster, stronger encryption.
- Intel Execute Disable Bit functionality can prevent certain classes of malicious buffer overflow attacks when combined with a supported operating system.

- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space, protected from all other software running on a system.
- Additional physical security features are an available chassis intrusion switch and available lockable front bezel.

Energy efficiency

The MX650 V3 systems offer the following energy-efficiency features to save energy, reduce operational costs, and increase energy availability:

- Energy-efficient system board components help lower operational costs.
- Carbon offset is available at click of button. You can project the carbon emissions per device for an average lifecycle (up to 5 years). That information is available **here**
- High-efficiency power supplies with 80 PLUS Platinum and Titanium certifications
- Solid-state drives (SSDs) consume as much as 80% less power than traditional spinning 2.5-inch HDDs.
- The server uses hexagonal ventilation holes, which can be grouped more densely than round holes, providing more efficient airflow through the system and thus keeping your system cooler.
- Optional Lenovo XClarity Energy Manager provides advanced data center power notification, analysis, and policy-based management to help achieve lower heat output and reduced cooling needs.

Components and connectors

The ThinkAgile MX650 V3 2U Integrated System and Certified Node are based on the ThinkSystem SR650 V3 server.

The following figure shows the front of the MX650 V3 systems with 2.5-inch drives.
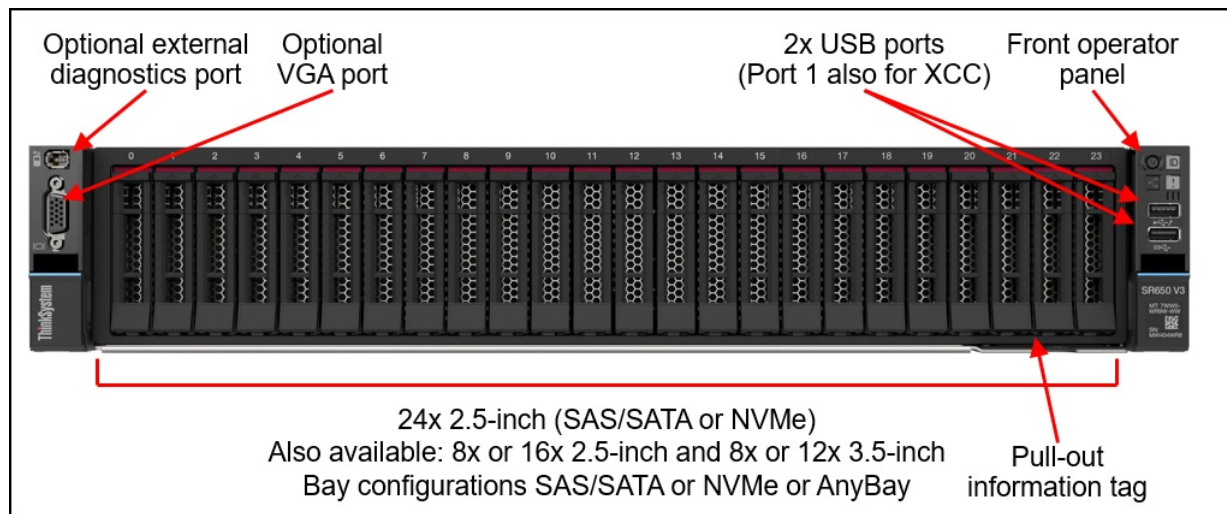
Figure 2. Front view of the MX650 V3 systems with 2.5-inch drives

The following figure shows the front of the MX650 V3 systems with 3.5-inch drives.
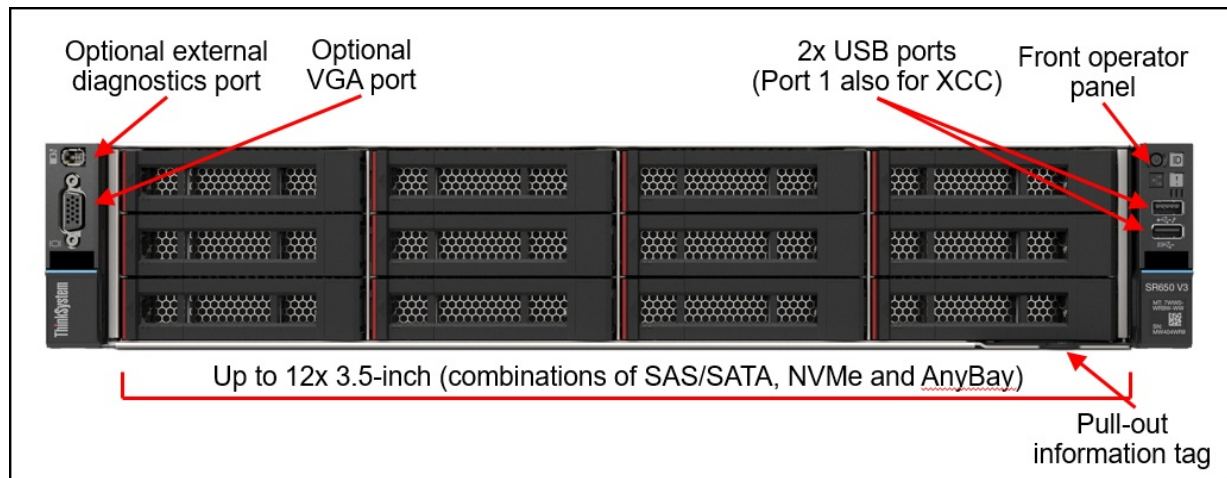
Figure 3. Front view of the MX650 V3 systems with 3.5-inch drives

The following figure shows the components visible from the rear of the system. The figure shows one configuration, with eight PCIe slots, however there are additional rear configurations which include 3.5-inch drive bays, 2.5-inch drive bays, or 7mm drive bays.
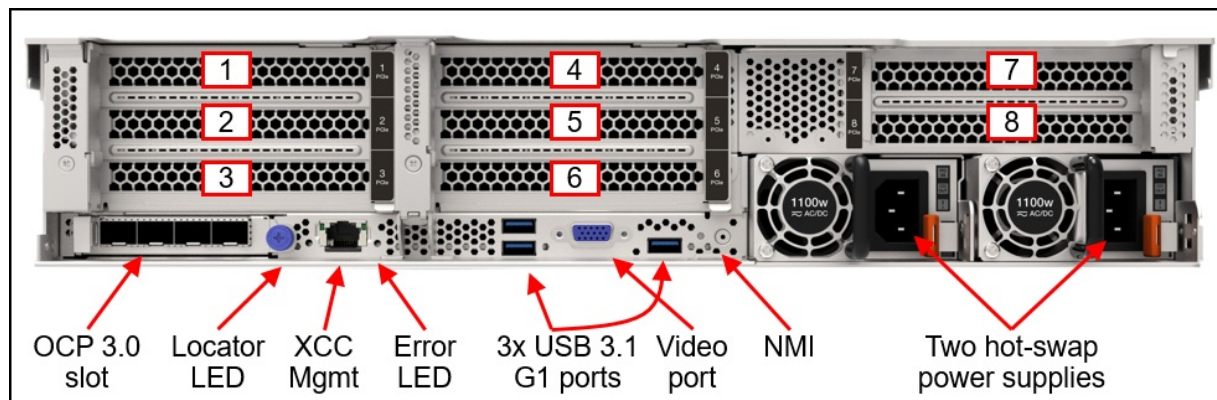
Figure 4. Rear view of the MX650 V3 systems (configuration with eight PCIe slots)

The following figure shows the locations of key components inside the systems.

Figure 5. Internal view of the MX650 V3 systems

Standard specifications

The ThinkAgile MX650 V3 2U Integrated System and Certified Node are based on the ThinkSystem SR650 V3 server.

The following table provides an overview comparison between the MX systems.

Table 1. Comparison of features

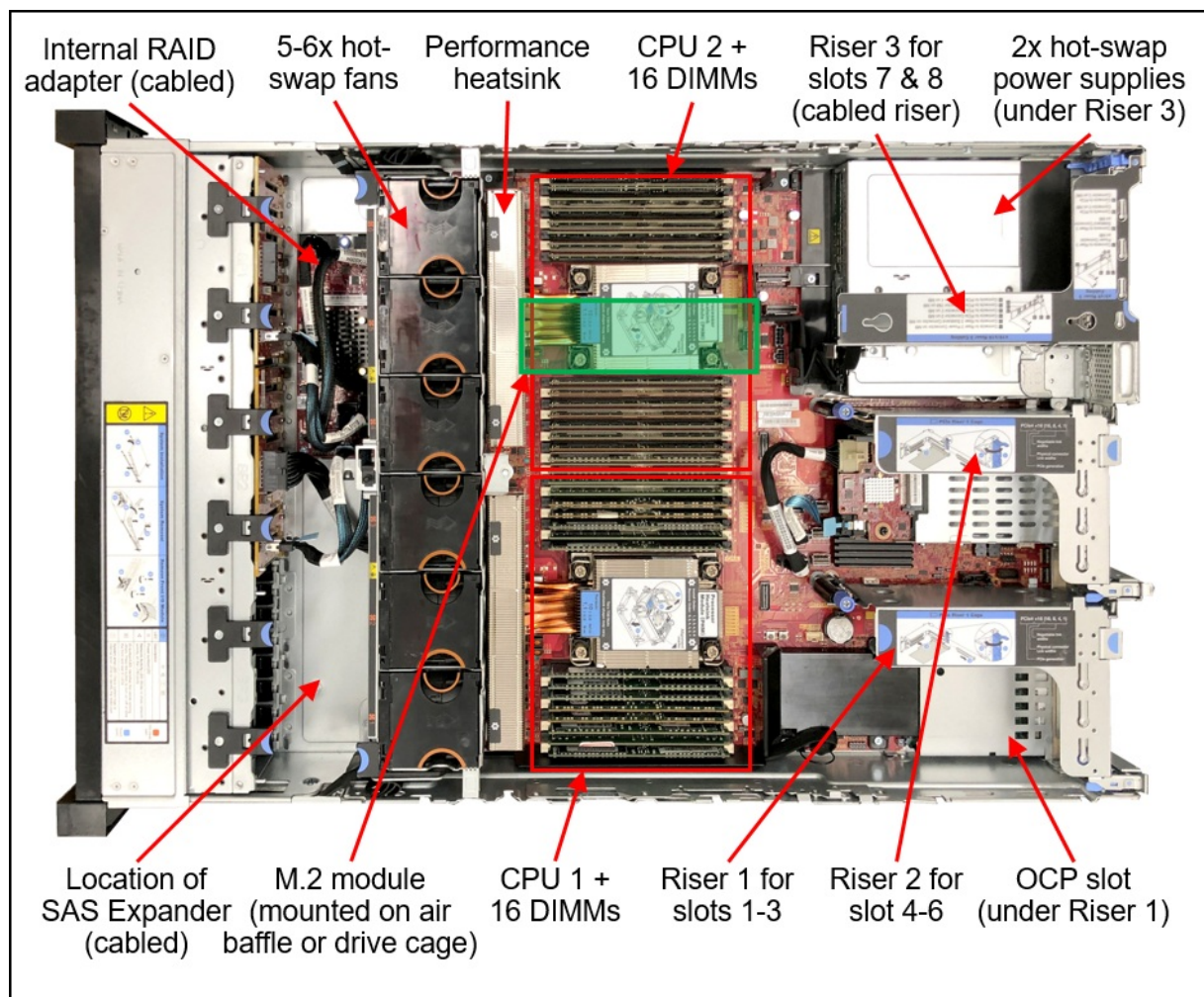|	MX650 V3 Integrated System	MX 650 V3 Certified Node
MX offering type	Integrated System	Certified Node
Target workloads	Database, VDI	Database, VDI, stretched cluster, AI/ML
Base MTM	7D6SCTO1WW	7D6SCTO2WW
Form Factor	2U	2U
Base platform	SR650 V3	SR650 V3
CPU	1x or 2x Intel Xeon SP Gen 5 (Emerald Rapids) or Gen 4 (Sapphire Rapids)	1x or 2x Intel Xeon SP Gen 5 (Emerald Rapids) or Gen 4 (Sapphire Rapids)
Memory	32x DDR 5 5600 MHz (8TB maximum)	32x DDR 5 5600 MHz (8TB maximum)
Drive Bays	- Front bay choices: 12x 3.5" SAS/SATA 16x 2.5" SAS/SATA - Rear bay choices 4x or 8x 2.5" SAS/SATA	- Front bay choices: 12x 3.5" SAS/SATA 16x 2.5" SAS/SATA - Rear bay choices 4x or 8x 2.5" SAS/SATA
Drive configurations	All Flash or Hybrid	All Flash or Hybrid
HBA	440-8i HBA 440-16i HBA	440-8i HBA 440-16i HBA
Boot drives	2x M.2 non-hot-swap SATA 2x 7mm hot-swap drives	2x M.2 non-hot-swap SATA 2x 7mm hot-swap drives
OCP networking	1x OCP 3.0 adapter: 1Gb, 10Gb, 25Gb	1x OCP 3.0 adapter: 1Gb, 10Gb, 25Gb
PCIe networking	Up to 8x adapters: 1Gb, 10Gb, 25Gb, 100Gb	Up to 8x adapters: 1Gb, 10Gb, 25Gb, 100Gb, 200Gb, 400Gb
GPUs	3x DW GPU up to 300W each 8x SW GPU up to 75W each 6x SW GPU up to 150W each	3x DW GPU up to 300W each 8x SW GPU up to 75W each 6x SW GPU up to 150W each
Hypervisor	- Azure Stack HCI OS preloaded - Windows Server 2019 Datacenter optional - Windows Server 2022 Datacenter optional	- Windows Server 2019 Datacenter optional - Windows Server 2022 Datacenter optional - Azure Stack HCI OS optional

The following table lists the standard specifications.

Table 2. Standard specifications

Components	Specification
Machine types	7D6S - 3 year warranty
Form factor	2U rack

Components	Specification
Processor	Supports one or two 5th generation Intel Xeon Scalable processor (formerly codenamed "Emerald Rapids") or 4th-generation Intel Xeon Scalable processor (formerly codenamed "Sapphire Rapids"). Supports up to 64 cores per 5th generation processor and up to 60 cores per 4th generation processor, core speeds of up to 3.9 GHz, and TDP ratings of up to 350 W.
Chipset	Intel C741 "Emmitsburg" chipset, part of the platform codenamed "Eagle Stream"
Memory	32 DIMM slots with two processors (16 DIMM slots per processor). Each processor has 8 memory channels, with 2 DIMMs per channel (DPC). Lenovo TruDDR5 RDIMMs, 9x4 RDIMMs, and 3DS RDIMMs are supported. DIMM slots are shared between standard system memory and persistent memory. DIMMs operate at up to 5600 MHz at 1 DPC and up to 4400 MHz at 2 DPC.
Memory maximum	With RDIMMs: Up to 8TB by using 32x 256GB 3DS RDIMMs
Memory protection	ECC, SDDC (for x4-based memory DIMMs), ADDDC (for x4-based memory DIMMs excluding 9x4 RDIMMs, requires Platinum or Gold processors), and memory mirroring.
Disk drive bays	Front drive bays: • 12x 3.5" SAS/SATA or 12x 3.5" AnyBay • 16x 2.5" SAS/SATA/NVMe or 16x 2.5" SAS/SATA + 8x AnyBay Rear drive bays: • 4x or 8x 2.5" SAS/SATA • 4x or 8x 2.5-inch NVMe OS boot support: • Internal M.2 module supporting up to two M.2 SATA drives • Rear accessible 2x 7mm hot-swap drives, SATA or NVMe

Storage controller	• Onboard NVMe ports (RAID not supported)
	• 12 Gb SAS/SATA non-RAID:
	    ○ 440-8i
	    ○ 440-16i

Network interfaces	Dedicated OCP 3.0 SFF slot with PCIe 5.0 x16 host interface. 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 support.
PCIe slots	Up to 8x PCIe 5.0 slots, all full height slots and with rear access, plus a slot dedicated to the OCP adapter. Slot availability is based on riser selection and rear drive bay selection. Slots 4, 5, and 6 (riser 2) require two processors. Slots are configured using three 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) is cabled to ports on the system board. 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.
GPU support	Supports up to 8x single-wide GPUs or up to 4x double-wide GPUs

Components	Specification
Ports	Front: 1x USB 3.1 G1 (5 Gb/s) port, 1x USB 2.0 port (also for XCC local management), External diagnostics port, optional VGA port. Rear: 3x USB 3.1 G1 (5 Gb/s) ports, 1x VGA video port, 1x RJ-45 1GbE systems management port for XCC remote management. Optional DB-9 COM serial port (installs in slot 3). Internal: 1x USB 3.1 G1 connector for operating system or license key purposes
Cooling	6x (with two processors installed) or 5x (with one processor installed) dual-rotor hot swap 60 mm fans, configuration dependent. Fans are N+1 redundant, tolerating a single-rotor failure. One fan integrated in each power supply.
Power supply	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 2600W AC options, 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.
Video	Embedded graphics with 16 MB memory with 2D hardware accelerator, integrated into the XClarity Controller 2 management controller. Maximum resolution is 1920x1200 32bpp at 60Hz.
Hot-swap parts	Drives, power supplies, and fans.
Systems management	Operator panel with status LEDs. Optional External Diagnostics Handset with LCD display. Models with 8x or 16x 2.5-inch front drive bays can optionally support an Integrated Diagnostics Panel. XClarity Controller 2 (XCC2) embedded management controller, XClarity Administrator centralized infrastructure delivery, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XClarity Controller Platinum to enable remote control and other functions.
Security features	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.
Software	• Integrated System: Azure Stack HCI OS preloaded • Certified Nodes: Windows Server 2019 Datacenter, Windows Server 2022 Datacenter, Azure Stack HCI OS (all optional)
Hardware warranty	• Integrated System: Three-, four-, or five-year customer-replaceable unit and onsite limited hardware warranty with ThinkAgile Premier Support and selectable service levels: 9x5 next business day (NBD) parts delivered, 9x5 NBD onsite response, 24x7 coverage with 2-hour or 4-hour onsite response, or 6-hour or 24-hour committed repair (select areas). • Certified Nodes: Three, four, or five-year customer-replaceable unit and onsite limited warranty with selectable service levels: 9x5 coverage with next business day (NBD) parts delivered (base warranty), 9x5 coverage with NBD onsite response (Foundation Service), 24x7 coverage with 4-hour onsite response or 24-hour committed repair (select areas) (Essential Service), or 24x7 coverage with 2-hour onsite response or 6-hour committed repair (select areas) (Advanced Service). Also available are 1-year and 2-year post-warranty extensions, YourDrive YourData, and Enterprise Software Support.
Software maintenance	Three-, four-, or five-year software support and subscription (matches the duration of the selected warranty period).
Dimensions	Width: 445 mm (17.5 in.), height: 87 mm (3.4 in.), depth: 764 mm (30.1 in.)
Weight	Maximum: 38.8 kg (85.5 lb)

Models

Factory-integrated models of the integrated systems and certified nodes are configured by using the Lenovo Data Center Solution Configurator (DCSC), http://dcsc.lenovo.com

To ensure that the controlled GPUs and accelerators are only sold in the supported markets, the following configure-to-order base machine-type models (CTO MTMs) are selectable in DCSC:

- **Standard Open models** are available in all markets worldwide. Controlled GPUs cannot be configured using these models. These are CTO1WW models.

- **GPU Controlled models** are used to order any of the controlled GPUs and accelerators. Controlled models are not available in affected markets. If you start from a controlled model, your configuration must include a controlled GPUs.

Note:

- For all models listed in the GPU **Controlled models** column, one of the controlled GPUs *must* be selected in the DCSC configurator. DCSC will display an error if you configuration does not include one of the controlled GPUs.

- It is highly recommended to engage a Lenovo representative early in a project that includes the ThinkAgile MX Series Integrated Systems and Certified Nodes

The following table lists the base CTO models.

Table 3. CTO base models

Server model	Standard Open models	GPU Controlled models
	These CTO models are available in all markets. Configurations based on these MTMs cannot include controlled GPUs.	These CTO models are not available in affected markets. Configurations based on these MTMs must include controlled GPUs.
ThinkAgile MX650 V3 Integrated System	7D6SCTO1WW	7D6SCTOAWW
ThinkAgile MX650 V3 Certified Node	7D6SCTO2WW	7D6SCTOBWW

Comparison with the ThinkSystem SR650 V3

The ThinkAgile MX650 V3 2U Integrated System and Certified Node are based on the ThinkSystem SR650 V3 server, however there are key differences:

- No persistent memory support
- No onboard SATA controller support
- No RAID adapter support for data drives
- No VROC RAID support for boot drives
- No mid-chassis drive bay support
- No SED drive support
- Fibre Channel support for data migration only
- No InfiniBand support

For details about the ThinkSystem SR650 V3, see the SR650 V3product guide:
https://lenovopress.com/lp1601-thinksystem-sr650-v3-server

Only certain network adapters have been certified for particular network traffic types in the Azure Stack HCI operating system. For details regarding which available network adapters can be used for each network traffic type, see Lenovo Certified Configurations for Azure Stack HCI – V2 Servers:
https://lenovopress.com/lp1520

To verify what specific hardware components are supported with the MX650 V3 systems, see the DCSC configurator:
https://dcsc.lenovo.com

Processors

The MX650 V3 systems supports processors in either the 5th Gen Intel Xeon Scalable Processor family or the 4th Gen Intel Xeon Scalable Processor family.

Topics in this section:

- 5th Gen Intel Xeon Scalable processors
- 4th Gen Intel Xeon Scalable processors

5th Gen Intel Xeon Scalable processors

The MX650 V3 systems systems support the following processors.

For details about these options, including configuration rules, see the SR650 V3 product guide:
https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#processors

Table 4. Processor choices

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
None	BYW3	Intel Xeon Silver 4509Y 8C 125W 2.6GHz Processor	2	2
None	BYW4	Intel Xeon Silver 4510 12C 150W 2.4GHz Processor	2	2
None	BYVS	Intel Xeon Silver 4510T 12C 115W 2.0GHz Processor	2	2
None	BYVP	Intel Xeon Silver 4514Y 16C 150W 2.0GHz Processor	2	2
None	BYW6	Intel Xeon Silver 4516Y+ 24C 185W 2.2GHz Processor	2	2

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
None	BYVW	Intel Xeon Gold 5515+ 8C 165W 3.2GHz Processor	2	2
None	BYW7	Intel Xeon Gold 5520+ 28C 205W 2.2GHz Processor	2	2
None	BYVX	Intel Xeon Gold 6526Y 16C 195W 2.8GHz Processor	2	2
None	BYWK	Intel Xeon Gold 6530 32C 270W 2.1GHz Processor	2	2
None	BYW0	Intel Xeon Gold 6534 8C 195W 3.9GHz Processor	2	2
None	BYVQ	Intel Xeon Gold 6538N 32C 205W 2.1GHz Processor	2	2
None	BYW8	Intel Xeon Gold 6538Y+ 32C 225W 2.2GHz Processor	2	2
None	BYVY	Intel Xeon Gold 6542Y 24C 250W 2.9GHz Processor	2	2
None	BYW1	Intel Xeon Gold 6544Y 16C 270W 3.6GHz Processor	2	2
None	BYVR	Intel Xeon Gold 6548N 32C 250W 2.8GHz Processor	2	2
None	BYVZ	Intel Xeon Gold 6548Y+ 32C 250W 2.5GHz Processor	2	2
None	BYW9	Intel Xeon Gold 6554S 36C 270W 2.2GHz Processor	2	2
None	BYW5	Intel Xeon Platinum 8558 48C 330W 2.1GHz Processor	2	2
None	BYWA	Intel Xeon Platinum 8558P 48C 350W 2.7GHz Processor	2	2
None	BYW2	Intel Xeon Platinum 8562Y+ 32C 300W 2.8GHz Processor	2	2
None	BYWF	Intel Xeon Platinum 8568Y+ 48C 350W 2.3GHz Processor	2	2
None	BYWG	Intel Xeon Platinum 8570 56C 350W 2.1GHz Processor	2	2
None	BYWH	Intel Xeon Platinum 8580 60C 350W 2.0GHz Processor	2	2
None	BYWJ	Intel Xeon Platinum 8592+ 64C 350W 1.9GHz Processor	2	2
None	BYWB	Intel Xeon Platinum 8592V 64C 330W 2.0GHz Processor	2	2
None	BYVU	Intel Xeon Gold 5512U 28C 185W 2.1GHz Processor	1*	1*
None	BYWE	Intel Xeon Platinum 8558U 48C 300W 2.0GHz Processor	1*	1*
None	BYWD	Intel Xeon Platinum 8571N 52C 300W 2.4GHz Processor	1*	1*
None	BYWC	Intel Xeon Platinum 8581V 60C 270W 2.0GHz Processor	1*	1*

* These processors are single-socket capable processors and are only available in configure-to-order builds or in pre-configured models. Not available as option part numbers.

4th Gen Intel Xeon Scalable processors

The MX650 V3 systems systems support the following processors.

For details about these options, including configuration rules, see the SR650 V3 product guide: https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#processors

Table 5. Processor choices

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
None	BQ64	Intel Xeon Silver 4410T 10C 150W 2.7GHz Processor	2	2
None	BQ67	Intel Xeon Silver 4410Y 12C 150W 2.0GHz Processor	2	2
None	BQ69	Intel Xeon Silver 4416+ 20C 165W 2.0GHz Processor	2	2

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
None	BQ63	Intel Xeon Gold 5415+ 8C 150W 2.9GHz Processor	2	2
None	BQ6L	Intel Xeon Gold 5416S 16C 150W 2.0GHz Processor	2	2
None	BQ6H	Intel Xeon Gold 5418N 24C 165W 1.8GHz Processor	2	2
None	BQ66	Intel Xeon Gold 5418Y 24C 185W 2.0GHz Processor	2	2
None	BQ65	Intel Xeon Gold 5420+ 28C 205W 2.0GHz Processor	2	2
None	BQ6C	Intel Xeon Gold 6416H 18C 165W 2.2GHz Processor	2	2
None	BQ6B	Intel Xeon Gold 6418H 24C 185W 2.1GHz Processor	2	2
None	BPQF	Intel Xeon Gold 6426Y 16C 185W 2.5GHz Processor	2	2
None	BQ6F	Intel Xeon Gold 6428N 32C 185W 1.8GHz Processor	2	2
None	BPPC	Intel Xeon Gold 6430 32C 270W 2.1GHz Processor	2	2
None	BPQC	Intel Xeon Gold 6434 8C 195W 3.7GHz Processor	2	2
None	BQ6E	Intel Xeon Gold 6434H 8C 195W 3.7GHz Processor	2	2
None	BQ6K	Intel Xeon Gold 6438M 32C 205W 2.2GHz Processor	2	2
None	BQ6D	Intel Xeon Gold 6438N 32C 205W 2.0GHz Processor	2	2
None	BQ62	Intel Xeon Gold 6438Y+ 32C 205W 2.0GHz Processor	2	2
None	BPQE	Intel Xeon Gold 6442Y 24C 225W 2.6GHz Processor	2	2
None	BPQB	Intel Xeon Gold 6444Y 16C 270W 3.6GHz Processor	2	2
None	BQ6A	Intel Xeon Gold 6448H 32C 250W 2.4GHz Processor	2	2
None	BPQD	Intel Xeon Gold 6448Y 32C 225W 2.1GHz Processor	2	2
None	BPPM	Intel Xeon Gold 6454S 32C 270W 2.2GHz Processor	2	2
None	BPPH	Intel Xeon Platinum 8444H 16C 270W 2.9GHz Processor	2	2
None	BPPG	Intel Xeon Platinum 8450H 28C 250W 2.0GHz Processor	2	2
None	BPPB	Intel Xeon Platinum 8452Y 36C 300W 2.0GHz Processor	2	2
None	BPPF	Intel Xeon Platinum 8454H 32C 270W 2.1GHz Processor	2	2
None	BPPT	Intel Xeon Platinum 8458P 44C 350W 2.7GHz Processor	2	2
None	BPPN	Intel Xeon Platinum 8460H 40C 330W 2.2GHz Processor	2	2
None	BPPQ	Intel Xeon Platinum 8460Y+ 40C 300W 2.0GHz Processor	2	2
None	BPQA	Intel Xeon Platinum 8462Y+ 32C 300W 2.8GHz Processor	2	2
None	BPPU	Intel Xeon Platinum 8468 48C 350W 2.1GHz Processor	2	2
None	BPPE	Intel Xeon Platinum 8468H 48C 330W 2.1GHz Processor	2	2
None	BPPP	Intel Xeon Platinum 8468V 48C 330W 2.4GHz Processor	2	2
None	BN0N	Intel Xeon Platinum 8470 52C 350W 2.0GHz Processor	2	2
None	BPPJ	Intel Xeon Platinum 8470N 52C 300W 1.7GHz Processor	2	2
None	BN0M	Intel Xeon Platinum 8480+ 56C 350W 2.0GHz Processor	2	2
None	BPPS	Intel Xeon Platinum 8490H 60C 350W 1.9GHz Processor	2	2
None	BYQH	Intel Xeon 6423N 28C 195W 2.0GHz Processor	1*	1*
None	BYQJ	Intel Xeon 6433N 32C 205W 2.0GHz Processor	1*	1*
None	BYQG	Intel Xeon 6443N 32C 195W 1.6GHz Processor	1*	1*
None	BQ6J	Intel Xeon Gold 5411N 24C 165W 1.9GHz Processor	1*	1*
None	BU1V	Intel Xeon Gold 5412U 24C 185W 2.1GHz Processor	1*	1*

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
None	BPPD	Intel Xeon Gold 6414U 32C 250W 2.0GHz Processor	1*	1*
None	BQ6G	Intel Xeon Gold 6421N 32C 185W 1.8GHz Processor	1*	1*
None	BPPK	Intel Xeon Platinum 8461V 48C 300W 2.2GHz Processor	1*	1*
None	BPPR	Intel Xeon Platinum 8471N 52C 300W 1.8GHz Processor	1	1

* These processors are single-socket capable processors and are only available in configure-to-order builds or in pre-configured models. Not available as option part numbers.

Memory

5th Generation Memory options

The MX650 V3 systems systems support the following memory options.

For details about these options, including configuration rules, see the SR650 V3 product guide: https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#memory-options

Table 6. Memory options

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
4X77A88049	BWHW	ThinkSystem 32GB TruDDR5 5600MHz (1Rx4) 10x4 RDIMM	32	32
4X77A88639	BX8Y	ThinkSystem 48GB TruDDR5 5600MHz (1Rx4) 10x4 RDIMM	32	32
4X77A88052	BWHS	ThinkSystem 64GB TruDDR5 5600MHz (2Rx4) 10x4 RDIMM	32	32
4X77A88058	BWHV	ThinkSystem 96GB TruDDR5 5600MHz (2Rx4) RDIMM	32	32
4X77A88087	BWJE	ThinkSystem 16GB TruDDR5 5600MHz (1Rx8) RDIMM	32	32
4X77A88056	BWSL	ThinkSystem 24GB TruDDR5 5600MHz (1Rx8) RDIMM	32	32
4X77A88051	BWJC	ThinkSystem 32GB TruDDR5 5600MHz (2Rx8) RDIMM	32	32
4X77A88057	BWJD	ThinkSystem 48GB TruDDR5 5600MHz (2Rx8) RDIMM	32	32
4X77A90991	BZ4U	ThinkSystem 32GB TruDDR5 Performance+ 5600MHz (2Rx8) RDIMM	32	32
4X77A90992	BZ4V	ThinkSystem 64GB TruDDR5 Performance+ 5600MHz (2Rx4) 10x4 RDIMM	32	32
3DS RDIMMs - 5600 MHz				
4X77A88054	BWHU	ThinkSystem 128GB TruDDR5 5600MHz (4Rx4) 3DS RDIMM	32	32

4th Generation Memory options

The MX650 V3 systems systems support the following memory options.

For details about these options, including configuration rules, see the SR650 V3 product guide:
https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#memory-options

Table 7. Memory options

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
RDIMMs				
4X77A77483	BNW5	ThinkSystem 32GB TruDDR5 4800MHz (1Rx4) 9x4 RDIMM	32	32
4X77A77033	BKTN	ThinkSystem 64GB TruDDR5 4800MHz (2Rx4) 9x4 RDIMM	32	32
4X77A77029	BKTL	ThinkSystem 16GB TruDDR5 4800MHz (1Rx8) RDIMM	32	32
4X77A77031	BKTM	ThinkSystem 32GB TruDDR5 4800MHz (2Rx8) RDIMM	32	32
4X77A77030	BNF6	ThinkSystem 32GB TruDDR5 4800MHz (1Rx4) 10x4 RDIMM	32	32
4X77A77032	BNF9	ThinkSystem 64GB TruDDR5 4800MHz (2Rx4) 10x4 RDIMM	32	32
3DS RDIMMs				
4X77A77034	BNFC	ThinkSystem 128GB TruDDR5 4800MHz (4Rx4) 3DS RDIMM	32	32
4X77A77035	BNF8	ThinkSystem 256GB TruDDR5 4800MHz (8Rx4) 3DS RDIMM	32	32

Internal storage

Internal storage configurations of the MX650 V3 systems are as follows. All drives are hot-swap and are accessible from the front or rear of the system:

In this section:

- MX650 V3 IS and CN Hybrid
- MX650 V3 IS and CN All Flash
- Backplanes
- Boot drive enablement

MX650 V3 IS and CN Hybrid

- Front drive bays:
    - 12x 3.5-inch SAS/SATA
- Rear drive bays:
    - 4x 2.5-inch (optional)

Configuration rules are as follows:

- All Hybrid storage configurations are two-tier, cache tier and capacity tier
- Drive type choices are as follows:
    - HDDs for capacity
    - SAS/SATA or NVMe SSDs for cache
- For cache drives, a minimum of 2 and maximum of 6 drives is required
- For capacity drives, a minimum of 4 drives is required
- For configurations with 2.5-inch rear drives, the rear drives are for cache and the front drives are for capacity
- The total Cache storage must be a minimum of 10% of the total Capacity storage

For OS boot functionality, the server supports either:

- One or two M.2 SATA drives, installed in an M.2 adapter internal to the server.
- One or two 7mm hot-swap SATA or NVMe drives, accessible from the rear of the server.

MX650 V3 IS and CN All Flash

- Front drive bays:
    - 16x 2.5-inch SAS/SATA + 8x 2.5 inch AnyBay
- Rear drive bays:
    - 4x 2.5-inch (optional)

Configuration rules are as follows:

- All-flash configurations can be single-tier or two-tier storage:
- To select a single-tier configuration in DCSC, select the drive you wish to use (from either the capacity or cache lists) and ensure that all other drive selections are set to None
- To select a two-tier configuration in DCSC, select a quantity of cache drives and a quantity of capacity drives
- Drive choices for a single-tier configuration are as follows:
  - Drives can be either SAS SSDs, SATA SDDs or NVMe SSDs
  - All drives must be the same feature code
  - A minimum of 4 drives is required
- Drive choices for a two-tier configuration are as follows:
  - The following combinations are supported:
    - SAS SSD for cache and SAS/SATA SSD for capacity
    - NVMe SSD for both cache & capacity
    - NVMe SSD for cache and SAS/SATA SSD for capacity
  - All cache drives must be the same feature code and all capacity drives must be the same feature code
  - A minimum of 2 cache drives and a minimum of 4 capacity drives is required
  - The total cache storage must be a minimum of 10% of the total capacity storage

For OS boot functionality, the server supports either:

- One or two M.2 SATA drives, installed in an M.2 adapter internal to the server.
- One or two 7mm hot-swap SATA or NVMe drives, accessible from the rear of the server.

Backplanes

The choice of backplanes supported varies by system, as listed in the following table.

For details about these options, including configuration rules, see the SR650 V3 product guide:
https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#internal-storage

Table 8. Drive backplanes

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
Front 3.5-inch drive backplanes				
None	B8LT	ThinkSystem 2U 12x3.5" SAS/SATA Backplane	1	1
Front 2.5-inch drive backplanes				
None	B8LU	ThinkSystem 2U 8x2.5" SAS/SATA Backplane	3	3
None	BH8D	ThinkSystem 2U/4U 8x2.5" NVMe Backplane	3	3
None	BH8B	ThinkSystem 2U/4U 8x2.5" AnyBay Backplane	3	3
Rear 3.5-inch drive backplanes				
None	B8L3	ThinkSystem 1U/2U 4x3.5" SAS/SATA Backplane	1	1
None	BAG7	ThinkSystem 2U 2x3.5" SAS/SATA Rear Backplane	1	1
Rear 2.5-inch drive backplanes				
None	B8LV	ThinkSystem 2U 4x2.5" SAS/SATA Backplane	1	1
None	BSE3	ThinkSystem 4x2.5" AnyBay Gen5 Backplane	1	1
Backplane - 7mm drives				
None	BU0N	ThinkSystem 7mm SATA/NVMe 2-Bay Rear Enablement Kit v2	1	1
None	BS9U	7mm NVMe Array 1 RAID 1	1	1

Boot drive enablement

For OS boot functions, the systems also support one or two 7mm hot-swap drives at the rear of the server, or one or two M.2 drives installed on an adapter internal to the server. The following table lists the supported controllers/enablement kits for M.2 and 7mm boot drives.

For details about these options, including configuration rules, see the SR650 V3 product guide: https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#internal-storage

Configuration Note: For ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit (4Y37A79663):

- For SATA RAID use ThinkSystem M.2 SATA/x4 NVMe 2-Bay Enablement Kit and ThinkSystem RAID 5350-8i for M.2 SATA Boot Enablement

Table 9. Boot drive enablement

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
M.2 enablement kits				
4Y37A79663	BM8X	ThinkSystem M.2 SATA/x4 NVMe 2-Bay Adapter	1	1
4Y37A09750	B8P9	ThinkSystem M.2 NVMe 2-Bay RAID Adapter	1	1
Controllers for RAID support of M.2 Drives				
None	BVL1	ThinkSystem RAID 5350-8i for M.2 SATA Boot Enablement	1	1
4Y37A90063	BYFF	ThinkSystem M.2 RAID B540i-2i SATA/NVMe Adapter	1	1
7mm enablement kits				
None	B8P3	ThinkSystem 2U 7mm Drive Kit w/ NVMe RAID	1	1
Controllers for RAID support of 7mm drives				
None	BVL4	ThinkSystem Raid 540-8i for 7MM NVMe boot Enablement	1	1

Controllers for internal storage

The MX650 V3 systems support the following internal storage controllers.

For details about these options, see the SR650 V3 product guide:
https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#controllers-for-internal-storage

Table 10. Controllers for internal storage

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
SAS/SATA HBA - PCIe 3.0				
4Y37A72481	BJHJ	ThinkSystem 4350-16i SAS/SATA 12Gb HBA	2	2
4Y37A72480	BJHH	ThinkSystem 4350-8i SAS/SATA 12Gb HBA	4	4
SAS/SATA HBA - PCIe 4.0				
4Y37A78602	BM50	ThinkSystem 440-16i SAS/SATA PCIe Gen4 12Gb HBA	2	2
4Y37A78601	BM51	ThinkSystem 440-8i SAS/SATA PCIe Gen4 12Gb HBA	4	4
4Y37A09725	B8P1	ThinkSystem 440-16i SAS/SATA PCIe Gen4 12Gb Internal HBA	1	1
SAS Expander				
4Y37A09736	B8P6	ThinkSystem 48 port 12Gb Internal Expander	1	1
NVMe adapters				
4C57A65446	B98C	ThinkSystem 4-Port PCIe Gen4 NVMe Retimer Adapter	3	3

Internal drive options

This section lists the supported drives:

- Boot drives
- Internal drives for MX650 V3 Integrated System
- Internal drives for MX650 V3 Certified Node

Boot drives

The MX650 V3 systems systems support the following drive for boot functions.

Table 11. Boot drives

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
M.2 SATA drives				
4XB7A82287	BQ1Y	ThinkSystem M.2 5400 PRO 480GB Read Intensive SATA 6Gb NHS SSD	2	2
4XB7A82288	BQ20	ThinkSystem M.2 5400 PRO 960GB Read Intensive SATA 6Gb NHS SSD	2	2
M.2 NVME drives				
4XB7A90102	BXMH	ThinkSystem M.2 PM9A3 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD	2	2
7mm NVME drives				
4XB7A82853	BPZ4	ThinkSystem 7mm U.3 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 HS SSD	2	2
4XB7A82855	BPZ5	ThinkSystem 7mm U.3 7450 PRO 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	2	2
4XB7A82856	BPZ6	ThinkSystem 7mm U.3 7450 PRO 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	2	2
4XB7A90096	BXMN	ThinkSystem 7mm U.2 PM9A3 960GB Read Intensive NVMe PCIe 4.0 x4 HS SSD	2	2
4XB7A90097	BXMM	ThinkSystem 7mm U.2 PM9A3 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	2	2
4XB7A90098	BXML	ThinkSystem 7mm U.2 PM9A3 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	2	2

Internal drives for MX650 V3 Integrated System

The following table lists the drives support in the MX650 V3 Integrated System. The drives are classified as either Cache drives, Capacity drives, or both. The quantities listed in the table are the maximum supported for each drive option. For cache drives, a minimum of 2 and maximum of 4 drives is required.

Table 12. Drives supported in the MX650 V3 Integrated System

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
2.5-inch hot-swap 24 Gb SAS SSDs						
4XB7A80318	BNWC	ThinkSystem 2.5" PM1653 960GB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80319	BNWE	ThinkSystem 2.5" PM1653 1.92TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80320	BNWF	ThinkSystem 2.5" PM1653 3.84TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80321	BP3E	ThinkSystem 2.5" PM1653 7.68TB Read Intensive SAS 24Gb HS SSD	No	40	No	No

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
4XB7A80322	BP3J	ThinkSystem 2.5" PM1653 15.36TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80323	BP3D	ThinkSystem 2.5" PM1653 30.72TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80340	BNW8	ThinkSystem 2.5" PM1655 800GB Mixed Use SAS 24Gb HS SSD	40	40	40	No
4XB7A80341	BNW9	ThinkSystem 2.5" PM1655 1.6TB Mixed Use SAS 24Gb HS SSD	40	40	40	No
4XB7A80342	BNW6	ThinkSystem 2.5" PM1655 3.2TB Mixed Use SAS 24Gb HS SSD	40	40	40	No
4XB7A80343	BP3K	ThinkSystem 2.5" PM1655 6.4TB Mixed Use SAS 24Gb HS SSD	40	40	40	No
2.5-inch hot-swap 6 Gb SAS SSDs						
4XB7A82289	BQ21	ThinkSystem 2.5" 5400 MAX 480GB Mixed Use SATA 6Gb HS SSD	No	No	No	40
4XB7A82290	BQ24	ThinkSystem 2.5" 5400 MAX 960GB Mixed Use SATA 6Gb HS SSD	No	No	No	40
4XB7A82291	BQ22	ThinkSystem 2.5" 5400 MAX 1.92TB Mixed Use SATA 6Gb HS SSD	No	No	No	40
4XB7A82292	BQ23	ThinkSystem 2.5" 5400 MAX 3.84TB Mixed Use SATA 6Gb HS SSD	No	No	No	40
4XB7A17125	BA7Q	ThinkSystem 2.5" S4620 480GB Mixed Use SATA 6Gb HS SSD	No	40	No	No
4XB7A17126	BA4T	ThinkSystem 2.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	No	40	No	No
4XB7A17127	BA4U	ThinkSystem 2.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	No	40	No	No
4XB7A17128	BK7L	ThinkSystem 2.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	No	40	No	No
4XB7A82259	BQ1P	ThinkSystem 2.5" 5400 PRO 480GB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A82260	BQ1R	ThinkSystem 2.5" 5400 PRO 960GB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A82261	BQ1X	ThinkSystem 2.5" 5400 PRO 1.92TB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A82262	BQ1S	ThinkSystem 2.5" 5400 PRO 3.84TB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A82263	BQ1T	ThinkSystem 2.5" 5400 PRO 7.68TB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A72439	BM8A	ThinkSystem 2.5" PM893 960GB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A72441	BM88	ThinkSystem 2.5" PM893 3.84TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A87525	BWKM	ThinkSystem 2.5" PM893a 960GB Read Intensive SATA 6Gb HS SSD	No	40	No	No

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
4XB7A87526	BWKL	ThinkSystem 2.5" PM893a 1.92TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A87527	BWKK	ThinkSystem 2.5" PM893a 3.84TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17101	BA7G	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17102	BA7H	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17103	BA7J	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17104	BK77	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17105	BK78	ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
2.5-inch hot-swap PCIe 4.0 NVMe SSDs						
4XB7A17159	BKKZ	ThinkSystem 2.5" U.2 P5800X 800GB Write Intensive NVMe PCIe 4.0 x4 HS SSD	24	24	No	No
4XB7A17160	BMM8	ThinkSystem 2.5" U.2 P5800X 1.6TB Write Intensive NVMe PCIe 4.0 x4 HS SSD	24	24	No	No
4XB7A13941	BMGD	ThinkSystem 2.5" U.2 P5520 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A13942	BMGE	ThinkSystem 2.5" U.2 P5520 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A13943	BNEF	ThinkSystem 2.5" U.2 P5520 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A13631	BNEQ	ThinkSystem 2.5" U.2 P5520 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A17129	BNEG	ThinkSystem 2.5" U.2 P5620 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	24	24	No
4XB7A17130	BNEH	ThinkSystem 2.5" U.2 P5620 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	24	24	No
4XB7A17133	BNEZ	ThinkSystem 2.5" U.2 P5620 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	24	24	No
4XB7A17136	BA4V	ThinkSystem 2.5" U.2 P5620 12.8TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	24	24	No
4XB7A79639	BNF1	ThinkSystem 2.5" U.3 7450 MAX 800GB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	24	No
4XB7A13967	BNEJ	ThinkSystem 2.5" U.3 7450 MAX 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	24	No
4XB7A13970	BNEY	ThinkSystem 2.5" U.3 7450 MAX 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	24	No
4XB7A13971	BNEL	ThinkSystem 2.5" U.3 7450 MAX 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	24	No
4XB7A79646	BNF3	ThinkSystem 2.5" U.3 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
4XB7A79647	BNF2	ThinkSystem 2.5" U.3 7450 PRO 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A79648	BNF5	ThinkSystem 2.5" U.3 7450 PRO 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A79649	BNF4	ThinkSystem 2.5" U.3 7450 PRO 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
3.5-inch hot-swap 12 Gb SAS HDDs						
7XB7A00043	AUU6	ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512n HDD	No	No	No	20
7XB7A00044	AUU7	ThinkSystem 3.5" 6TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00045	B0YR	ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00046	AUUG	ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00067	B117	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
4XB7A13906	B496	ThinkSystem 3.5" 14TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
4XB7A13911	B7EZ	ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
3.5-inch hot-swap 6 Gb SAS HDDs						
7XB7A00051	AUU8	ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512n HDD	No	No	No	20
7XB7A00052	AUUA	ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00053	AUU9	ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00054	AUUB	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00068	B118	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
4XB7A13907	B497	ThinkSystem 3.5" 14TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
4XB7A13914	B7F0	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
3.5-inch hot-swap 24 Gb SAS SSDs						
4XB7A80344	BNW7	ThinkSystem 3.5" PM1655 800GB Mixed Use SAS 24Gb HS SSD	No	No	20	No
4XB7A80345	BNWA	ThinkSystem 3.5" PM1655 1.6TB Mixed Use SAS 24Gb HS SSD	No	No	20	No
4XB7A80346	BNWB	ThinkSystem 3.5" PM1655 3.2TB Mixed Use SAS 24Gb HS SSD	No	No	20	No
4XB7A80347	BP3G	ThinkSystem 3.5" PM1655 6.4TB Mixed Use SAS 24Gb HS SSD	No	No	20	No

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
3.5-inch hot-swap PCIe 4.0 NVMe SSDs						
4XB7A17141	BNEK	ThinkSystem 3.5" U.2 P5620 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A17143	BNEM	ThinkSystem 3.5" U.2 P5620 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A17144	BNEN	ThinkSystem 3.5" U.2 P5620 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A17148	BNEP	ThinkSystem 3.5" U.2 P5620 12.8TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A17162	BMM5	ThinkSystem 3.5" U.2 P5800X 800GB Write Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A77070	BMM6	ThinkSystem 3.5" U.2 P5800X 1.6TB Write Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	12	No

Internal drives for MX650 V3 Certified Node

The following table lists the drives support in the MX650 V3 Certified Node. The drives are classified as either Cache drives, Capacity drives, or both. The quantities listed in the table are the maximum supported for each drive option. For cache drives, a minimum of 2 and maximum of 4 drives is required.

Table 13. Drives supported in the MX650 V3 Certified Node

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
2.5-inch hot-swap 24 Gb SAS SSDs						
4XB7A80318	BNWC	ThinkSystem 2.5" PM1653 960GB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80319	BNWE	ThinkSystem 2.5" PM1653 1.92TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80320	BNWF	ThinkSystem 2.5" PM1653 3.84TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80321	BP3E	ThinkSystem 2.5" PM1653 7.68TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80322	BP3J	ThinkSystem 2.5" PM1653 15.36TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80323	BP3D	ThinkSystem 2.5" PM1653 30.72TB Read Intensive SAS 24Gb HS SSD	No	40	No	No
4XB7A80340	BNW8	ThinkSystem 2.5" PM1655 800GB Mixed Use SAS 24Gb HS SSD	40	40	40	No
4XB7A80341	BNW9	ThinkSystem 2.5" PM1655 1.6TB Mixed Use SAS 24Gb HS SSD	40	40	40	No
4XB7A80342	BNW6	ThinkSystem 2.5" PM1655 3.2TB Mixed Use SAS 24Gb HS SSD	40	40	40	No
4XB7A80343	BP3K	ThinkSystem 2.5" PM1655 6.4TB Mixed Use SAS 24Gb HS SSD	40	40	40	No

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
2.5-inch hot-swap 6 Gb SAS SSDs						
4XB7A82289	BQ21	ThinkSystem 2.5" 5400 MAX 480GB Mixed Use SATA 6Gb HS SSD	No	No	No	40
4XB7A82290	BQ24	ThinkSystem 2.5" 5400 MAX 960GB Mixed Use SATA 6Gb HS SSD	No	No	No	40
4XB7A82291	BQ22	ThinkSystem 2.5" 5400 MAX 1.92TB Mixed Use SATA 6Gb HS SSD	No	No	No	40
4XB7A82292	BQ23	ThinkSystem 2.5" 5400 MAX 3.84TB Mixed Use SATA 6Gb HS SSD	No	No	No	40
4XB7A17125	BA7Q	ThinkSystem 2.5" S4620 480GB Mixed Use SATA 6Gb HS SSD	No	40	No	No
4XB7A17126	BA4T	ThinkSystem 2.5" S4620 960GB Mixed Use SATA 6Gb HS SSD	No	40	No	No
4XB7A17127	BA4U	ThinkSystem 2.5" S4620 1.92TB Mixed Use SATA 6Gb HS SSD	No	40	No	No
4XB7A17128	BK7L	ThinkSystem 2.5" S4620 3.84TB Mixed Use SATA 6Gb HS SSD	No	40	No	No
4XB7A82259	BQ1P	ThinkSystem 2.5" 5400 PRO 480GB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A82260	BQ1R	ThinkSystem 2.5" 5400 PRO 960GB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A82261	BQ1X	ThinkSystem 2.5" 5400 PRO 1.92TB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A82262	BQ1S	ThinkSystem 2.5" 5400 PRO 3.84TB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A82263	BQ1T	ThinkSystem 2.5" 5400 PRO 7.68TB Read Intensive SATA 6Gb HS SSD	No	No	No	40
4XB7A72439	BM8A	ThinkSystem 2.5" PM893 960GB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A72441	BM88	ThinkSystem 2.5" PM893 3.84TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A87525	BWKM	ThinkSystem 2.5" PM893a 960GB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A87526	BWKL	ThinkSystem 2.5" PM893a 1.92TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A87527	BWKK	ThinkSystem 2.5" PM893a 3.84TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17101	BA7G	ThinkSystem 2.5" S4520 480GB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17102	BA7H	ThinkSystem 2.5" S4520 960GB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17103	BA7J	ThinkSystem 2.5" S4520 1.92TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
4XB7A17104	BK77	ThinkSystem 2.5" S4520 3.84TB Read Intensive SATA 6Gb HS SSD	No	40	No	No

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
4XB7A17105	BK78	ThinkSystem 2.5" S4520 7.68TB Read Intensive SATA 6Gb HS SSD	No	40	No	No
2.5-inch hot-swap PCIe 4.0 NVMe SSDs						
4XB7A17159	BKKZ	ThinkSystem 2.5" U.2 P5800X 800GB Write Intensive NVMe PCIe 4.0 x4 HS SSD	24	24	No	No
4XB7A17160	BMM8	ThinkSystem 2.5" U.2 P5800X 1.6TB Write Intensive NVMe PCIe 4.0 x4 HS SSD	24	24	No	No
4XB7A13941	BMGD	ThinkSystem 2.5" U.2 P5520 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A13942	BMGE	ThinkSystem 2.5" U.2 P5520 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A13943	BNEF	ThinkSystem 2.5" U.2 P5520 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A13631	BNEQ	ThinkSystem 2.5" U.2 P5520 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A17129	BNEG	ThinkSystem 2.5" U.2 P5620 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	24	24	No
4XB7A17130	BNEH	ThinkSystem 2.5" U.2 P5620 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	24	24	No
4XB7A17133	BNEZ	ThinkSystem 2.5" U.2 P5620 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	24	24	No
4XB7A17136	BA4V	ThinkSystem 2.5" U.2 P5620 12.8TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	24	24	No
4XB7A79639	BNF1	ThinkSystem 2.5" U.3 7450 MAX 800GB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	24	No
4XB7A13967	BNEJ	ThinkSystem 2.5" U.3 7450 MAX 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	24	No
4XB7A13970	BNEY	ThinkSystem 2.5" U.3 7450 MAX 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	24	No
4XB7A13971	BNEL	ThinkSystem 2.5" U.3 7450 MAX 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	24	No
4XB7A79646	BNF3	ThinkSystem 2.5" U.3 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A79647	BNF2	ThinkSystem 2.5" U.3 7450 PRO 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A79648	BNF5	ThinkSystem 2.5" U.3 7450 PRO 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
4XB7A79649	BNF4	ThinkSystem 2.5" U.3 7450 PRO 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	No	24	No	No
3.5-inch hot-swap 12 Gb SAS HDDs						
7XB7A00043	AUU6	ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512n HDD	No	No	No	20
7XB7A00044	AUU7	ThinkSystem 3.5" 6TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
7XB7A00045	B0YR	ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00046	AUUG	ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00067	B117	ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
4XB7A13906	B496	ThinkSystem 3.5" 14TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
4XB7A13911	B7EZ	ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD	No	No	No	20
3.5-inch hot-swap 6 Gb SAS HDDs						
7XB7A00051	AUU8	ThinkSystem 3.5" 4TB 7.2K SATA 6Gb Hot Swap 512n HDD	No	No	No	20
7XB7A00052	AUUA	ThinkSystem 3.5" 6TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00053	AUU9	ThinkSystem 3.5" 8TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00054	AUUB	ThinkSystem 3.5" 10TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
7XB7A00068	B118	ThinkSystem 3.5" 12TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
4XB7A13907	B497	ThinkSystem 3.5" 14TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
4XB7A13914	B7F0	ThinkSystem 3.5" 16TB 7.2K SATA 6Gb Hot Swap 512e HDD	No	No	No	20
3.5-inch hot-swap 24 Gb SAS SSDs						
4XB7A80344	BNW7	ThinkSystem 3.5" PM1655 800GB Mixed Use SAS 24Gb HS SSD	No	No	20	No
4XB7A80345	BNWA	ThinkSystem 3.5" PM1655 1.6TB Mixed Use SAS 24Gb HS SSD	No	No	20	No
4XB7A80346	BNWB	ThinkSystem 3.5" PM1655 3.2TB Mixed Use SAS 24Gb HS SSD	No	No	20	No
4XB7A80347	BP3G	ThinkSystem 3.5" PM1655 6.4TB Mixed Use SAS 24Gb HS SSD	No	No	20	No
3.5-inch hot-swap PCIe 4.0 NVMe SSDs						
4XB7A17141	BNEK	ThinkSystem 3.5" U.2 P5620 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A17143	BNEM	ThinkSystem 3.5" U.2 P5620 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A17144	BNEN	ThinkSystem 3.5" U.2 P5620 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A17148	BNEP	ThinkSystem 3.5" U.2 P5620 12.8TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	No	No	12	No
4XB7A17162	BMM5	ThinkSystem 3.5" U.2 P5800X 800GB Write Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	12	No

Part number	Feature	Description	All Flash Storage		Hybrid Storage	
			Cache	Capacity	Cache	Capacity
4XB7A77070	BMM6	ThinkSystem 3.5" U.2 P5800X 1.6TB Write Intensive NVMe PCIe 4.0 x4 HS SSD	No	No	12	No

Network adapters

The MX650 V3 systems systems support the following networking options.

Only certain network adapters have been certified for particular network traffic types in the Azure Stack HCI operating system. For details regarding which available network adapters can be used for each network traffic type, see Lenovo Certified Configurations for Azure Stack HCI – V2 Servers: https://lenovopress.com/lp1520

For details about these options, including configuration rules, see the SR650 V3 product guide:
https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#i-o-expansion
https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#network-adapters

Table 14. OCP network adapters

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
10 Gb Ethernet - 10GBASE-T				
4XC7A08236	B5ST	ThinkSystem Broadcom 57416 10GBASE-T 2-port OCP Ethernet Adapter	1	1
4XC7A08240	B5T4	ThinkSystem Broadcom 57454 10GBASE-T 4-port OCP Ethernet Adapter	1	1
4XC7A08278	BCD5	ThinkSystem Intel X710-T2L 10GBASE-T 2-port OCP Ethernet Adapter	1	1
4XC7A80268	BPPY	ThinkSystem Intel X710-T4L 10GBase-T 4-Port OCP Ethernet Adapter	1	1
4XC7A08237	BN2T	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1	1
25 Gb Ethernet				
4XC7A08294	BCD4	ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1	1
4XC7A80269	BP8L	ThinkSystem Intel E810-DA4 10/25GbE SFP28 4-Port OCP Ethernet Adapter	1	1
4XC7A62582	BE4T	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-Port OCP Ethernet Adapter	1	1
4XC7A80567	BPPW	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-Port OCP Ethernet Adapter	1	1

Table 15. PCIe network adapters

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
10GBASE-T Ethernet				
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	8	8
4XC7A08245	B5SU	ThinkSystem Broadcom 57454 10GBASE-T 4-port PCIe Ethernet Adapter	8	8
25 Gb Ethernet				
4XC7A08295	BCD6	ThinkSystem Intel E810-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	8	8
4XC7A62580	BE4U	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	8	8
4XC7A80267	BP8M	ThinkSystem Intel E810-DA4 10/25GbE SFP28 4-Port PCIe Ethernet Adapter	6	6
100 Gb Ethernet				
4XC7A08248	B8PP	ThinkSystem Mellanox ConnectX-6 Dx 100GbE QSFP56 2-port PCIe Ethernet Adapter	6	6

GPU adapters

The MX650 V3 systems systems support the following GPU options.

For details about these options, including configuration rules, see the SR650 V3 product guide: https://lenovopress.com/lp1601-thinksystem-sr650-v3-server#gpu-adapters

Table 16. GPU adapters

Part number	Feature	Description	Maximum supported	
			MX650 V3 IS	MX650 V3 CN
Double-wide GPUs				
4X67A76715	BLK1	ThinkSystem NVIDIA A100 80GB PCIe Gen4 Passive GPU	3	3
CTO only	BQZP	ThinkSystem NVIDIA A100 80GB PCIe Gen4 Passive GPU w/o CEC	3	3
4X67A72593	BQZQ	ThinkSystem NVIDIA A40 48GB PCIe Gen4 Passive GPU w/o CEC	3	3
4X67A76581	BJHG	ThinkSystem NVIDIA A30 24GB PCIe Gen4 Passive GPU	3	3
CTO only	BQZR	ThinkSystem NVIDIA A30 24GB PCIe Gen4 Passive GPU w/o CEC	3	3
4X67A76727	BNFE	ThinkSystem NVIDIA A16 64GB Gen4 PCIe Passive GPU	3	3
CTO only	BQZU	ThinkSystem NVIDIA A16 64GB Gen4 PCIe Passive GPU w/o CEC	3	3
Single-wide GPUs				
CTO only	BQZT	ThinkSystem NVIDIA A2 16GB PCIe Gen4 Passive GPU w/o CEC	3	3
4X67A81547	BP05	ThinkSystem NVIDIA A2 16GB PCIe Gen4 Passive GPU	8	8
4X67A72593	BEL4	ThinkSystem NVIDIA A40 48GB PCIe Gen4 Passive GPU	3	3

Software

The MX Integrated Systems include the preloaded Azure Stack HCI operating system only and requires activation via a CSP such as Lenovo Cloud Marketplace, with the option to purchase a Windows Server 2019 Datacenter or Windows Server 2022 Datacenter license if unlimited guest OS VMs are desired.

The MX Certified Nodes can optionally have Windows Server 2019 Datacenter, Windows Server 2022 Datacenter, or Azure Stack HCI OS preinstalled. Customers can use existing Windows Server Datacenter software licenses, or they can purchase new software licenses from Lenovo or Microsoft. If the licenses are purchased from Lenovo, Windows Server can be factory-installed or shipped in the box with the Certified Node for the installation at the customer site.

The following table lists the Windows Server Datacenter software options that are available for selection from Lenovo for Certified Nodes.

Table 17. Windows Server Datacenter software selection options (Certified Nodes only)

Feature code	Description
Windows Server 2022 Datacenter (Factory installed)	
BPA7	Windows Server Datacenter 2022 for Microsoft Azure Stack HCI - English (factory installed)
Windows Server 2022 Datacenter (Not preinstalled)	
BPA3	Windows Server Datacenter 2022 for Microsoft Azure Stack HCI - Multilanguage (not pre-installed)
BPA4	Windows Server Datacenter 2022 for Microsoft Azure Stack HCI - Simplified Chinese (not pre-installed)
BPA5	Windows Server Datacenter 2022 for Microsoft Azure Stack HCI - Traditional Chinese (not pre-installed)
BPA6	Windows Server Datacenter 2022 for Microsoft Azure Stack HCI - Japanese (not pre-installed)
Windows Server 2019 Datacenter (Factory installed)	
B6P2	Windows Server Datacenter 2019 for Microsoft Azure Stack HCI - English (factory installed)
Windows Server 2019 Datacenter (Not preinstalled)	
B6NY	Windows Server Datacenter 2019 for Microsoft Azure Stack HCI - Multilanguage (not pre-installed)
B6P0	Windows Server Datacenter 2019 for Microsoft Azure Stack HCI - Simplified Chinese (not pre-installed)
B6P1	Windows Server Datacenter 2019 for Microsoft Azure Stack HCI - Traditional Chinese (not pre-installed)
B6NZ	Windows Server Datacenter 2019 for Microsoft Azure Stack HCI - Japanese (not pre-installed)

Configuration notes:

- The selection of Windows Server software licenses is optional.
- The quantity of core-based licenses should be sufficient to cover all processor cores in the system.
- Current supported version of Azure Stack HCI OS is 23H2

Warranty and Support

The ThinkAgile MX Integrated Systems can be configured with a three-, four, or five-year hardware warranty with 24x7 ThinkAgile Premier Single Point of Support (Lenovo appliance hardware and Microsoft software) and various levels of coverage with a defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions. For more information refer to the Lenovo Support Plan - MX Integrated System support plan, available from https://support.lenovo.com/us/en/solutions/HT511522.

The ThinkAgile MX Certified Nodes can be configured with a three-, four-, or five-year hardware warranty and various levels of service coverage with a defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

The ThinkAgile MX650 V3 2U Integrated System and Certified Node have a 3-year base warranty:

- 7D6S- 2U Integrated System - 3 year warranty
- 7D6S- 2U Certified Node - 3 year warranty

The standard warranty terms are customer-replaceable unit (CRU) and onsite (for field-replaceable units FRUs only) with standard call center support during normal business hours and 9x5 Next Business Day Parts Delivered.

Lenovo's additional support services provide a sophisticated, unified support structure for your data center, with an experience consistently ranked number one in customer satisfaction worldwide. Available offerings include:

- **Premier Support**

  Premier Support provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following:

    - Direct technician-to-technician access through a dedicated phone line

    - 24x7x365 remote support

    - Single point of contact service

    - End to end case management

    - Third-party collaborative software support

    - Online case tools and live chat support

    - On-demand remote system analysis

- **Warranty Upgrade (Preconfigured Support)**

  Services are available to meet the on-site response time targets that match the criticality of your systems.

    - 3, 4, or 5 years of service coverage

    - 1-year or 2-year post-warranty extensions

    - **Foundation Service**: 9x5 service coverage with next business day onsite response. YourDrive YourData is an optional extra (see below).

    - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select markets). Bundled with YourDrive YourData.

    - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select markets). Bundled with YourDrive YourData.

- **Managed Services**

  Lenovo Managed Services provides continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of your data center using state-of-the-art tools, systems, and practices by a team of highly skilled and experienced Lenovo services professionals.

  Quarterly reviews check error logs, verify firmware & OS device driver levels, and software as needed. We'll also maintain records of latest patches, critical updates, and firmware levels, to ensure you systems are providing business value through optimized performance.

- **Technical Account Management (TAM)**

  A Lenovo Technical Account Manager helps you optimize the operation of your data center based on a deep understanding of your business. You gain direct access to your Lenovo TAM, who serves as your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. In addition, your TAM will help proactively make service recommendations and manage your service relationship with Lenovo to make certain your needs are met.

- **Enterprise Server Software Support**

  Enterprise Software Support is an additional support service providing customers with software support on Microsoft, Red Hat, SUSE, and VMware applications and systems. Around the clock availability for critical problems plus unlimited calls and incidents helps customers address challenges fast, without incremental costs. Support staff can answer troubleshooting and diagnostic questions, address product comparability and interoperability issues, isolate causes of problems, report defects to software vendors, and more.

- **YourDrive YourData**

  Lenovo's YourDrive YourData is a multi-drive retention offering that ensures your data is always under your control, regardless of the number of drives that are installed in your Lenovo server. In the unlikely event of a drive failure, you retain possession of your drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The YourDrive YourData service can be purchased in convenient bundles and is optional with Foundation Service. It is bundled with Essential Service and Advanced Service.

- **Health Check**

  Having a trusted partner who can perform regular and detailed health checks is central to maintaining efficiency and ensuring that your systems and business are always running at their best. Health Check supports Lenovo-branded server, storage, and networking devices, as well as select Lenovo-supported products from other vendors that are sold by Lenovo or a Lenovo-Authorized Reseller.

Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

If warranty terms and conditions include onsite labor for repair or replacement of parts, Lenovo will dispatch a service technician to the customer site to perform the replacement. Onsite labor under base warranty is limited to labor for replacement of parts that have been determined to be field-replaceable units (FRUs). Parts that are determined to be customer-replaceable units (CRUs) do not include onsite labor under base warranty.

If warranty terms include parts-only base warranty, Lenovo is responsible for delivering only replacement parts that are under base warranty (including FRUs) that will be sent to a requested location for self-service. Parts-only service does not include a service technician being dispatched onsite. Parts must be changed at customer's own cost and labor and defective parts must be returned following the instructions supplied with the spare parts.

Lenovo Service offerings are region-specific. Not all preconfigured support and upgrade options are available in every region. For information about Lenovo service upgrade offerings that are available in your region, refer to the following resources:

- Service part numbers in Lenovo Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com/#/services
- Lenovo Services Availability Locator
  http://lenovolocator.com/

For service definitions, region-specific details, and service limitations, please refer to the following documents:

- Lenovo Statement of Limited Warranty for Infrastructure Solutions Group (ISG) Servers and System Storage
  http://pcsupport.lenovo.com/us/en/solutions/ht503310
- Lenovo Data Center Services Agreement
  http://support.lenovo.com/us/en/solutions/ht116628

Deployment services

The MX systems can optionally include Lenovo deployment services to get customers up and running quickly.

The following Lenovo custom installation services are optional for both MX Premier Solutions and MX Certified Nodes:

- Unpacking and inspecting the systems
- Mounting the systems (rack cabinet, desktop, stack, bookshelf, wall or ceiling, or rack installation)
- Connecting the systems to electrical power and network
- Checking and updating firmware to the latest levels
- Verifying operations
- Disposal of the packaging materials (within the customer site)

The following Lenovo deployment services are optional for both MX Premier Solutions and MX Certified Nodes:

- Conducting remote preparation and planning
- Verifying firmware versions and performing firmware updates, if needed
- Configuring XCC management settings
- Configuring Storage Spaces Direct
- Configuring Microsoft System Center and discovering hosts and storage (if System Center is used)
- Configuring Lenovo XClarity network settings and performing discovery and inventory (if XClarity is selected)
- Transferring knowledge
- Developing post-installation documentation

The following table lists ThinkAgile Health Check & Deployment offerings are available for ThinkAgile MX customers. These offerings are performed by Lenovo Professional Services.

- **Onsite Deployment**: Install, configure, and validate solution on-site, and conduct knowledge transfer.
- **Remote Deployment**: Install, configure, and validate solution remotely, and conduct knowledge transfer.
- **Remote Health Check**: Report & remediation of hardware and cluster health issues, including firmware and software updates.

Table 18. ThinkAgile Health Check & Deployment offerings

Part number	Description
Onsite deployment services	
5MS7B09464	ThinkAgile MX Onsite Deployment (up to 2 nodes)
5MS7B09465	ThinkAgile MX Onsite Deployment (additional node)
Remote deployment services	
5MS7B09466	ThinkAgile MX Remote Deployment (up to 2 nodes)
5MS7B09467	ThinkAgile MX Remote Deployment (additional node)
Remote Health Check	
5MS7B00049	ThinkAgile MX 1X Remote Health Check (per 2-4 node cluster)
5MS7B00050	ThinkAgile MX 1X Remote Health Check (additional node)
5MS7B00051	ThinkAgile MX 1X Remote Health Check & Update (per 2-4 node cluster)
5MS7B00052	ThinkAgile MX 1X Remote Health Check & Update (additional node)

For more information, refer to the Data Center Implementation Services web page:
https://www.lenovo.com/us/en/data-center/services/implementation-services/

Lenovo Financial Services

Lenovo Financial Services reinforces Lenovo's commitment to deliver pioneering products and services that are recognized for their quality, excellence, and trustworthiness. Lenovo Financial Services offers financing solutions and services that complement your technology solution anywhere in the world.

We are dedicated to delivering a positive finance experience for customers like you who want to maximize your purchase power by obtaining the technology you need today, protect against technology obsolescence, and preserve your capital for other uses.

We work with businesses, non-profit organizations, governments and educational institutions to finance their entire technology solution. We focus on making it easy to do business with us. Our highly experienced team of finance professionals operates in a work culture that emphasizes the importance of providing outstanding customer service. Our systems, processes and flexible policies support our goal of providing customers with a positive experience.

We finance your entire solution. Unlike others, we allow you to bundle everything you need from hardware and software to service contracts, installation costs, training fees, and sales tax. If you decide weeks or months later to add to your solution, we can consolidate everything into a single invoice.

Our Premier Client services provide large accounts with special handling services to ensure these complex transactions are serviced properly. As a premier client, you have a dedicated finance specialist who manages your account through its life, from first invoice through asset return or purchase. This specialist develops an in-depth understanding of your invoice and payment requirements. For you, this dedication provides a high-quality, easy, and positive financing experience.

For your region-specific offers, please ask your Lenovo sales representative or your technology provider about the use of Lenovo Financial Services. For more information, see the following Lenovo website:

https://www.lenovo.com/us/en/landingpage/lenovo-financial-services/

Seller training courses

The following sales training courses are offered for employees and partners (login required). Courses are listed in date order.

1. **Lenovo Data Center Product Portfolio**
   2024-04-22 | 20 minutes | Employees and Partners

   This course introduces the Lenovo data center portfolio, and covers servers, storage, storage networking, and software-defined infrastructure products. After completing this course about Lenovo data center products, you will be able to identify product types within each data center family, describe Lenovo innovations that this product family or category uses, and recognize when a specific product should be selected.

   Published: 2024-04-22
   Length: 20 minutes
   Employee link: Grow@Lenovo
   Partner link: Lenovo Partner Learning
   Course code: SXXW1110r7

2. **VTT Cloud and Edge Architecture: Principal Consultant Overview**
   2024-04-10 | 50 minutes | Employees Only

   Join Ruth Miller, Lenovo Principal Consultant, SSG Services for a data-led discussions to examine in detail customer IT environments, highlighting pain points, performance issues, edge and hybrid cloud strategy and carbon reduction capability.
   Examples of workshop deliverables and outcomes will be discussed to illustrate the value of early engagement and discovery.

   Published: 2024-04-10
   Length: 50 minutes
   Employee link: Grow@Lenovo
   Course code: DVCLD211

3. **VTT Data Management How to sell storage - April 2024**
   2024-04-10 | 60 minutes | Employees Only

   In this course, you will know:

   - Why do we sell storage?
   - What are the basics you need to get an opportunity rolling?
   - Why Lenovo for Storage?
   - What is happening in the market today?
   - How to determine traction?

   Published: 2024-04-10
   Length: 60 minutes
   Employee link: Grow@Lenovo
   Course code: DVDAT209

4. **Partner Technical Webinar - Latest on Azure Stack HCI and ThinkAgile MX**
   2024-03-26 | 60 minutes | Employees and Partners

   In this PDF, Phil Searles, Solution Architect, and Amit Kulkarni, Sr. Product Manager of Cloud and HCI reviewed the latest info regarding Thinkagile MX and Microsoft Azure Stack HCI.

   Published: 2024-03-26
   Length: 60 minutes
   Employee link: Grow@Lenovo
   Partner link: Lenovo Partner Learning
   Course code: 032224

5. **Data management Overview**
   2024-03-14 | 25 minutes | Employees and Partners

   After completing this course you will be able to:
   1. Know more about the data management trends and challenges
   2. Understand the data management portfolio
   3. Find out how data drives business value

   Published: 2024-03-14
   Length: 25 minutes
   Employee link: Grow@Lenovo
   Partner link: Lenovo Partner Learning
   Course code: DSTOO201

6. **VTT Cloud Architecture: ThinkAgile MX – Latest Premier Solutions, AI, from Cloud to Edge, and AVD**
   2024-03-12 | 75 minutes | Employees Only

   Join Amit Kulkarni, Adam Mandelbloom (Lenovo), and distinguished Microsoft speakers for an exclusive VTT call centered around the Lenovo ThinkAgile MX. Amidst the evolving landscape of technology, Artificial Intelligence stands as a pivotal discussion point, often finding its application at the edge. Explore firsthand how Lenovo and Microsoft navigate these challenges with their compelling edge-to-cloud solutions. Journey into the realm of AVD (Azure Virtual Desktop) and its pivotal role in reshaping the paradigms of remote work.
   Introducing Microsoft Premier Solutions, witness firsthand how it stands apart in its approach, offering unparalleled support and expertise to empower an organization's digital journey. Furthermore, gain invaluable insights into the nuances between Azure Stack HCI 22H2 and 23H2. Our experts will dissect the differences and elucidate the implications for your infrastructure strategy. Join us for an enlightening session where industry leaders converge to explore the forefront of innovation and chart a course for digital transformation. Don't miss out on this opportunity to gain a competitive edge in today's rapidly evolving landscape.

   Published: 2024-03-12
   Length: 75 minutes
   Employee link: Grow@Lenovo
   Course code: DVCLD210

7. **Technical Overview: ThinkAgile HCI and Cloud Platforms**
   2024-03-07 | 35 minutes | Employees and Partners

   This course is designed to give Lenovo sales and partner representatives a technical overview of Lenovo's ThinkAgile hyperconverged infrastructure and cloud platforms. Turnkey cloud platforms along with their architectural makeup, and container and data protection solutions are also covered.

   Learning Objectives:

   • Describe Lenovo's ThinkAgile hyperconverged infrastructure and cloud platforms
   • Explain do-it-yourself and turnkey cloud platforms along with their architectural makeup
   • Describe container and data protection solutions

   Published: 2024-03-07
   Length: 35 minutes
   Employee link: Grow@Lenovo
   Partner link: Lenovo Partner Learning
   Course code: DCLDT2001r3

8. **ThinkAgile MX Overview**
   2024-02-20 | 17 minutes | Employees and Partners

   The Lenovo ThinkAgile MX Certified Node is designed for those customers who want to build their own infrastructure and are embracing hyperconverged. The Lenovo MX Certified Node program brings to the customer validated, performance tested components and configurations supported by both Lenovo and Microsoft. Watch this video to learn features and benefits of the Lenovo MX Certified Node program, options and flexibility of configurations, and who is the customer. Last updated: January 2024

   Published: 2024-02-20
   Length: 17 minutes
   Employee link: Grow@Lenovo
   Partner link: Lenovo Partner Learning
   Course code: DMSO1004

9. **Family Portfolio: ThinkAgile MX**
   2024-01-29 | 15 minutes | Employees and Partners

   This course is designed to give Lenovo sales and partner representatives an overview of ThinkAgile MX integrated systems (appliances) and validated nodes (certified nodes). It explains each offering, the differences between them, and when to choose specific products.

   Published: 2024-01-29
   Length: 15 minutes
   Employee link: Grow@Lenovo
   Partner link: Lenovo Partner Learning
   Course code: SXSW2108r4

10. **Family Introduction: Converged and Hyperconverged**
    2024-01-25 | 15 minutes | Employees and Partners

    This course is designed to give Lenovo sales a foundation on the characteristics of the Converged and Hyperconverged family. As an introduction to each family, this course also includes positioning, when to use a family and product, and keywords a client may use when discussing a converged or hyperconverged product.
    Objectives:
    • Family characteristics
    • Priority positioning
    • Product usage
    • Key words and phrases

    Published: 2024-01-25
    Length: 15 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: SXSW1101r2

11. **FY24Q3 Hybrid Cloud Update**
    2023-12-11 | 15 minutes | Employees and Partners

    This update is designed to help you discuss the features and customer benefits of Lenovo ThinkAgile systems that use the 5th Gen Intel® Xeon® processors. Lenovo has also introduced a new service, Lenovo TruScale Hybrid Cloud for Edge, which provides agile and reliable infrastructure as a service where you need it, when you need it. New Professional Services for AI with NVIDIA provides customers with expert guidance for designing and implementing tailored AI solutions. Reasons to call your customer and talk about refreshing their infrastructure are also included as a guideline.

    Published: 2023-12-11
    Length: 15 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: SXXW2523a

12. **VTT Cloud Architecture: What new with ThinkAgile MX and SXM roadshow review and AKS?**
    2023-11-22 | 65 minutes | Employees Only

    Join us as our speakers discuss the latest from Microsoft Ignite conference and ThinkAgile SXM and MX with Intel EagleStream and the differences from previous generations. Our speakers will cover the top use cases and workloads as well as an in-depth discussion on AKS Hybrid Architecture on MX Azure Stack HCI, deployment, and maintaining a Kubernetes cluster on-premises, making it quicker to get started hosting Linux and Windows containers in your customer's datacenter.

    Published: 2023-11-22
    Length: 65 minutes
    Employee link: Grow@Lenovo
    Course code: DVCLD207

13. **Lenovo Azure Stack Solutions Overview**
    2023-11-02 | 15 minutes | Employees and Partners

    In this course, Eric Mills presents the new Microsoft Azure Stack family and Lenovo ThinkAgile MX server, offering detailed information on Hub and Edge.

    Upon completion of this training, you will be able to:
    • List the solutions of the Microsoft Azure Stack family
    • Name the Lenovo hardware for Microsoft Azure Stack family

    Published: 2023-11-02
    Length: 15 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DMXF100

14. **Lenovo Azure Stack HCI Solution Overview**
    2023-11-02 | 27 minutes | Employees and Partners

    In this course, watch Phillip Moss define the Microsoft Azure HCI solution. He walks your though the technologies the HCI solution is built on and the business value it can bring to your customers.

    Upon completion of this training, you will be able to:
    • Identify the core features of Azure Stack HCI
    • Identify the key benefits of an Azure Stack HCI solution
    • Describe Storage Spaces Direct and it's key features

    Published: 2023-11-02
    Length: 27 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DMXF101

15. **Azure Stack HCI Solution Selling Tips**
    2023-11-01 | 8 minutes | Employees and Partners

    In this course Eric Mills provides useful selling tips for the ThinkAgile MX solution with Azure Stack HCI.

    Published: 2023-11-01
    Length: 8 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DMXF107

16. **Azure Stack HCI Licensing**
    2023-10-30 | 8 minutes | Employees and Partners

    In this course, Phillip Moss and Eric Mills discuss the licensing for the Azure Stack HCI solution.

    Published: 2023-10-30
    Length: 8 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DMXF105

17. **Azure Stack HCI Core Components and Features**
    2023-10-30 | 15 minutes | Employees and Partners

    In this course, Phillip Moss, with an assist from Cosmos Darwin discuss the core components and features of the Azure Stack HCI solution. The course further details each of the components, features and the role it plays in the HCI.

    Published: 2023-10-30
    Length: 15 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DMXF103

18. **Azure Stack HCI Management**
    2023-10-30 | 16 minutes | Employees and Partners

    In this course, Phillip Moss, Eric Mills and Cosmo Darwin take turns discussing the number of available options to manage the Microsoft Azure HCI solution. The course briefly discusses each of the management platforms and how each is used to manage the HCI solution and its integration with Lenovo's XClarity hardware management.

    Published: 2023-10-30
    Length: 16 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DMXF102

19. **Azure Stack HCI Applications, Workloads and Hybrid Integration**
    2023-10-30 | 28 minutes | Employees and Partners

    In this course, Cosmos Darwin and Phillip Moss discuss the primary applications and workloads for the Azure Stack HCI solution. Phillip continues to further discusses the Hybrid Integration Services available to your customers.

    Course Objectives:
    • Identify the 5 primary applications for Azure Stack HCI
    • Describe the Azure Stack HCI co-existence with existing infrastructure, VDI, and scale capacity
    • Discuss the Azure Stack HCI integration with the public cloud and Azure Services

    Published: 2023-10-30
    Length: 28 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DMXF104

20. **ThinkAgile Accelerating Cloud Agility: MX Series Technical Presentation**
    2023-07-28 | 45 minutes | Employees and Partners

    Amalu Santhosh, Lenovo Technical Product Manager, reviews the ThinkAgile MX product portfolio and SXM. She will walk you through a technical deep dive into MX and SXM workloads and discuss technical details and performance of the latest ThinkAgile MX and SXM solutions.

    Published: 2023-07-28
    Length: 45 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DMXT201

21. **Lenovo Data Center Product Portfolio**
    2023-07-21 | 15 minutes | Employees and Partners

    This course introduces the Lenovo data center portfolio, and covers servers, storage, storage networking, and software-defined infrastructure products. After completing this course about Lenovo data center products, you will be able to identify product types within each data center family, describe Lenovo innovations that this product family or category uses, and recognize when a specific product should be selected.

    Published: 2023-07-21
    Length: 15 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: SXXW1110r6

22. **Cloud and HCI or Somewhere in Between**
2023-07-11 | 40 minutes | Employees and Partners

Provides a brief overview of Lenovo Portfolio for HCI and Cloud including ThinkAgile HX, VX, MX Certified Nodes and Appliances, Azure, and Engineered Cloud Solutions. Review Scenarios and complete questions "choose your own adventure" to identify and qualify an opportunity as HCI or Cloud and which portfolio solution would be the best option.

Course objectives:
• Where in the Sales Cycle we are
• What is Cloud
• What is Hyperconverged Infrastructure (HCI)
• Review Lenovo Offerings in Cloud and HCI
• Scenarios

Published: 2023-07-11
Length: 40 minutes
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning
Course code: DCLDS104r2

23. **Partner Technical Webinar - HX vs VX vs MX Panelist Discussion**
2023-04-11 | 60 minutes | Employees and Partners

In this 60-minute replay, Joe Murphy moderated a panelist discussion on ThinkAgile SHI. Baker Hull, VMware represented VX; Mike Tilt, Lenovo Technical Sales Manager presented HX; Phil Searles, Lenovo Solution Architect represented MX; and Brandon Saxton Lenovo NA Product Manager for ThinkAgile made up the panelist. The focus was less on the differences but how to elevate the conversation to get to the best solution. No slides were presented.

Published: 2023-04-11
Length: 60 minutes
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning
Course code: 033123

24. **ThinkAgile MX & SXM Seller Presentation**
2023-02-17 | 25 minutes | Employees Only

This training is designed for Lenovo internal sales team to help them understand MX & SXM, its sales tactics and transaction processes. By the end of this training, you should be able to articulate the benefits of selling ThinkAgile MX, identify the sales elevator pitch, and describe the processes to transact both hardware and software and customer consumption's models.

Published: 2023-02-17
Length: 25 minutes
Employee link: Grow@Lenovo
Course code: DMXSP101

25. **Partner Technical Webinar - ThinkAgile V3 Overview and SMB Express**
2023-02-13 | 60 minutes | Employees and Partners

In this 60-minute replay, Joe Murphy and Dave Brown, Lenovo Solution Architects reviewed the new ThinkAgile V3 solutions. In addition, Dave did a lengthy demo and explanation of the new SMB Express feature of DCSC.

Published: 2023-02-13
Length: 60 minutes
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning
Course code: 021023

26. **Lenovo Solutions Supporting Microsoft Business Continuity Services**
2023-02-01 | 30 minutes | Employees and Partners

This training aims to build familiarity with Lenovo Microsoft solutions for BCDR (Business Continuity and Disaster Recovery) and the relevance of Lenovo Cloud Marketplace, Azure Backup and Azure Site Recovery.

Completing this course will enable the sellers to:
• Describe Lenovo Solutions supporting Microsoft Business Continuity Services
• Identify customers who would benefit from Azure Backup and Azure Site Recovery
• Start the Business Continuity conversation
• Start the customer conversation.

Published: 2023-02-01
Length: 30 minutes
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning
Course code: DMSO200

27. **ThinkAgile MX & SXM Customer Presentation**
2022-11-01 | 25 minutes | Employees Only

This training was designed to guide customers facing teams who's pitching ThinkAgile Microsoft solutions to the customers. By the end of this training, you should be able to describe the Customer Environments & Application Requirements, articulate the benefits of choosing Lenovo ThinkAgile MX, and identify Hybrid Cloud Use Cases with ThinkAgile MX.

Published: 2022-11-01
Length: 25 minutes
Employee link: Grow@Lenovo
Course code: DMXCP101

28. **ThinkAgile Advantage Services**
    2022-07-20 | 15 minutes | Employees and Partners

    The goal of this training is to go through the details of ThinkAgile Advantage, and to provide everything you need to have customer conversations and to order ThinkAgile Advantage and recommended services.
    Course objectives:
    1. Learn about the customer challenges and benefits of ThinkAgile Advantage
    2. Discover what it includes
    3. Understand how to make the most of ThinkAgile products and solutions with the elevator pitch for customer conversations.

    Published: 2022-07-20
    Length: 15 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DSVC121r2

29. **Start the Conversation - Lenovo Cloud Strategy**
    2021-10-25 | 25 minutes | Employees and Partners

    The purpose of this course is to help sellers use the Lenovo cloud strategy as a foundation to start the customer cloud conversation. Topics include:
    • Why customers choose the cloud
    • The Lenovo Cloud Strategy
    • Starting the customer cloud conversation

    Published: 2021-10-25
    Length: 25 minutes
    Employee link: Grow@Lenovo
    Partner link: Lenovo Partner Learning
    Course code: DCLDS103r2

Related publications and links

For more information, see these resources:

- Lenovo ThinkAgile MX Series product page
  https://www.lenovo.com/us/en/data-center/software-defined-infrastructure/ThinkAgile-MX-Certified-Node/p/WMD00000377
- Microsoft Azure Stack HCI documentation
  https://docs.microsoft.com/en-us/azure-stack/hci/overview
- Lenovo Data Center Solution Configurator (DCSC):
  https://dcsc.lenovo.com
- Lenovo ThinkAgile MX for Microsoft Azure Stack HCI Best Recipes
  https://datacentersupport.lenovo.com/us/en/solutions/ht507406

Related product families

Product families related to this document are the following:

- 2-Socket Rack Servers
- Hyperconverged Infrastructure
- Hyperconverged Infrastructure
- ThinkAgile MX Series for Microsoft Azure Stack HCI

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document, LP1675, was created or updated on April 30, 2024.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
  https://lenovopress.lenovo.com/LP1675

- Send your comments in an e-mail to:
  comments@lenovopress.com

This document is available online at https://lenovopress.lenovo.com/LP1675.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at https://www.lenovo.com/us/en/legal/copytrade/.

The following terms are trademarks of Lenovo in the United States, other countries, or both:
Lenovo®
AnyBay®
Lenovo Services
ThinkAgile®
ThinkSystem®
XClarity®

The following terms are trademarks of other companies:

Intel® and Xeon® are trademarks of Intel Corporation or its subsidiaries.

Microsoft®, Azure®, Hyper-V®, Windows Server®, and Windows® are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.