Lenovo ThinkAgile VX650 V4 Hyperconverged System
Product Guide

The Lenovo ThinkAgile VX650 V4 are 2-socket 2U systems that feature the Intel® Xeon® 6 Scalable processors (formerly code named "Granite Rapids"). The latest Lenovo ThinkAgile VX V4 Series systems are backed by the power of Intel® Xeon® 6 processors to deliver more cores, higher memory bandwidth, and enhanced AI acceleration in every core. These systems are designed to make AI accessible with new servers that are purpose-built and optimized to maximize performance and efficiency for wide range of targeted workloads, from compute-intensive AI to general-purpose data services while flexibly matching the specific workloads needs of any business. ThinkAgile VX V4 Series systems also support hardware accelerators like Graphics Processing Units (GPUs) and Data Processing Unit (DPU) cards for maximum performance and increased zero trust security capabilities. The ThinkAgile VX650 V4 provides up to 86 cores and support for the new PCIe 5.0 standard for I/O, the VX650 V4 offers the ultimate in two-socket performance in a 2U form factor. Lenovo offers a unique, software-defined approach to hyperconvergence, leveraging the hypervisor to deliver compute, storage and management in a tightly integrated solution stack based on VMware software.

Suggested uses: AI Inference, virtualization, VDI, Databases, ERP

Figure 1. Lenovo ThinkAgile VX650 V4 with 2.5-inch drive bays

Did you know?

The ThinkAgile VX650 V4 systems are built on the Lenovo ThinkSystem SR650 V4 server that features enterprise-class reliability, management, and security.

The ThinkAgile VX650 V4 provides 4x higher performance through optimized storage compression techniques with vSAN ESA.

The VX650 V4 comes paired with Premier Support in supported countries. It offers a single point of support for quick 24/7 problem reporting and resolution.

Key features

ThinkAgile VX features

The ThinkAgile VX650 V4 offer the following key features:

- Factory-integrated, pre-validated ready-to-go integrated systems built on proven and reliable Lenovo ThinkSystem servers that provide compute power for a variety of workloads and applications and powered by industry-leading hyperconverged infrastructure software from VMware.
- Fully tested and validated for vSAN compliance with VMware and includes the latest supported firmware levels integrated at factory.
- Provide quick and convenient path to implement a implement a private or hybrid cloud environment powered by VMware Cloud Foundation (VCF) or VMware vSphere Foundation (VVF) software stacks. Purchasing the software licenses through Lenovo provides a "one stop shop" and a single point of contact from Lenovo for purchasing, deploying, and supporting the solution.
- Meet various workload demands with performance-optimized all NVMe storage configurations.
- They also come with deployment delivered by Lenovo Professional Services and VMware software licenses.*
- Three and Five-year hardware warranty, bundled with Premier Support in supported countries that provides a 24x7 Single Point of Support, problem reporting and resolution.

The VMware software running on ThinkAgile VX650 V4 delivers the following key features:

- Distributed architecture that allows "pay-as-you-grow", non-disruptive scaling by adding new nodes to the cluster (scale-out) to increase capacity and performance.
- Advanced capacity management, including deduplication, compression, and erasure coding (RAID 5/6), which helps deliver greater storage utilization with dramatically lower storage capacity and costs.
- Provides 4x higher performance through optimized storage compression techniques with ESA.
- Automation of VM storage provisioning and control of storage service levels (capacity, performance, availability) with VM-centric policies to load balance storage resources.
- Native HCI security solution with two-factor authentication (SecurID and CAC) and data-at-rest encryption that does not require self-encrypting drives (SEDs).
- Stretched cluster with local and site failure protection between two geographically dispersed sites for higher level of availability with near zero downtime.
- Centralized management with provisioning, administering, and monitoring virtual resources across multiple hosts and clusters from a centralized interface.
- Rapid workload provisioning, simplified data center operations, increased business efficiency, and decreased CAPEX and OPEX costs.
- VM and data protection with agent-less, image-level virtual machine backups and application-aware protection for business-critical Microsoft applications (Exchange, SQL Server, SharePoint) along with WAN-efficient, encrypted backup data replication.
- Reduced unplanned downtime and virtually eliminated planned downtime for server and storage maintenance with live workload migration, high availability, and fault tolerance.
- Enhanced application performance and availability with resource management, load balancing, and access prioritization.
- Intelligent operations management and automation to proactively monitor and manage compute, storage, and networking resources, identify performance bottlenecks, and re-balance workloads by leveraging predictive analytics.
- Capacity planning and optimization guidance to address future needs with performance trends, projections and extended forecasts.

- Managing remote offices and branch offices with rapid provisioning of servers through virtualization, minimization of host configuration drift, and enhanced visibility into regulatory compliance, across multiple sites.

*Customers have the ability to opt out of these features. Please check sections on Software and Deployment Services for more information.

Hardware features

The ThinkAgile VX650 V4 are based on the ThinkSystem SR650 V4 and have the following hardware features:

Scalability and performance

The VX650 V4 offer numerous features to boost performance, improve scalability and reduce costs:

- Supports one or two Intel Xeon 6700-series or 6500-series processors with Performance-cores (P-cores)
  - Up to 86 cores and 172 threads
  - Core speeds of up to 4 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 6400 MHz
  - Supports 2 DIMMs per channel operating at 5200 MHz
  - Supports 1 MRDIMM per channel operating at 8000 MHz
  - Using 256GB 3D RDIMMs, the server supports up to 8TB of system memory
- Support for MRDIMMs for increased memory bandwidth with memory bus speeds of up to 8000 MHz.
- Supports up to 10x single-width GPUs or 2x double-wide GPUs, for substantial processing power in a 2U system.
- Supports up to 40x 2.5-inch hot-swap drive bays, by using combinations of front-accessible (up to 24 bays), mid bays (8 bays) and rear-accessible (8 bays).
- Supports 24x 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.
- Support for up to 24x E3.S NVMe drives, a new form factor drive for high-density and high-performance storage.
- Supports high-speed controllers from Broadcom providing 12 Gb SAS connectivity to the drive backplanes. A variety of PCIe 3.0 and PCIe 4.0 RAID adapters are available.
- Supports M.2 drives for convenient operating system boot functions or data storage. M.2 drives in a RAID-1 configuration can be internally mounted or can be mounted at the front or rear of the server as hot-swap drives.
- Support NVIDIA Bluefield-3 Data Processing Unit (DPU) with dual ports of 200GbE
- Up to 10x PCIe slots (rear accessible), plus two slots dedicated to OCP 3.0 adapters.
- The server has up to two dedicated industry-standard OCP 3.0 slots 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.

Availability and serviceability

The VX650 V4 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, supporting RAID redundancy for data protection and greater system uptime.
- Available M.2 boot adapters support RAID-1 which can enable two M.2 drives to be configured as a redundant pair.
- 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.
- Supports a new dedicated Firmware and Root of Trust Security Module that stores all system firmware settings, making it easier to transfer customer settings in the event of a system board replacement, while still maintaining data security.
- 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 (SSDs, NVMe SSDs, M.2 storage, flash storage adapters), fans, power supplies, RAID controllers, server ambient and subcomponent temperatures. Alerts can be surfaced through the XClarity Controller to managers such as Lenovo XClarity Administrator, and integrated into VMware vCenter. 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 3 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 3 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 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 VX650 V4:

- The server includes XClarity Controller 3 (XCC3) to monitor server availability. XCC3 Premier is included to provide remote control (keyboard video mouse) functions, support for the mounting of remote media files (ISO and IMG image files), boot capture and power capping. XCC3 Premier also offers additional features such as Neighbor Groups, System Guard, a CNSA-compliant security mode, a FIPS 140-3-compliant mode, and enhanced NIST 800-193 support.
- Dedicated Ethernet port at the rear of the server for remote management (BMC management).
- 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, RAID Setup wizard, 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 SSDs, as well as 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 VX650 V4 offer the following energy-efficiency features to save energy, reduce operational costs, and increase energy availability:

- The server supports advanced Lenovo Neptune Core direct-water cooling (DWC) capabilities, where heat from key components is removed from the rack and the data center using an open loop and coolant distribution units, resulting in lower energy costs:
    - Processor Neptune Core Module uses liquid cooling to remove heat from the processors
- 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.
- Support for 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.
- 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.

Components and connectors

The ThinkAgile VX650 V4 are based on the ThinkSystem SR650 V4 server.

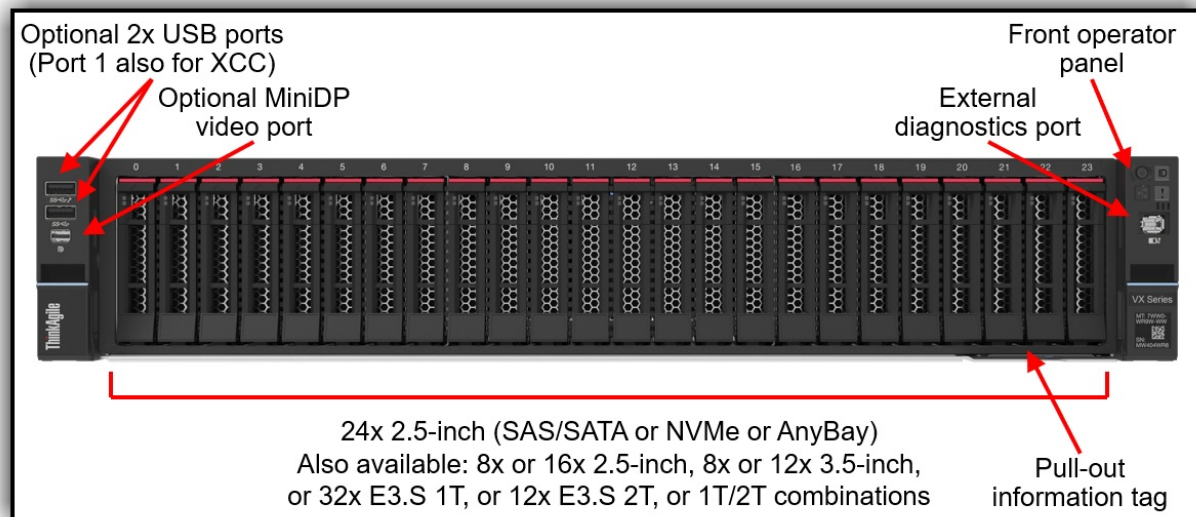The following figure shows the front of the ThinkAgile VX650 V4 with 2.5-inch drives.

Figure 2. Front view of the ThinkAgile VX650 V4 with 2.5-inch drives

The following figure shows the components visible from the rear of the system. The figure shows one configuration, with ten PCIe slots, however there are additional rear configurations which 2.5-inch drive bays.
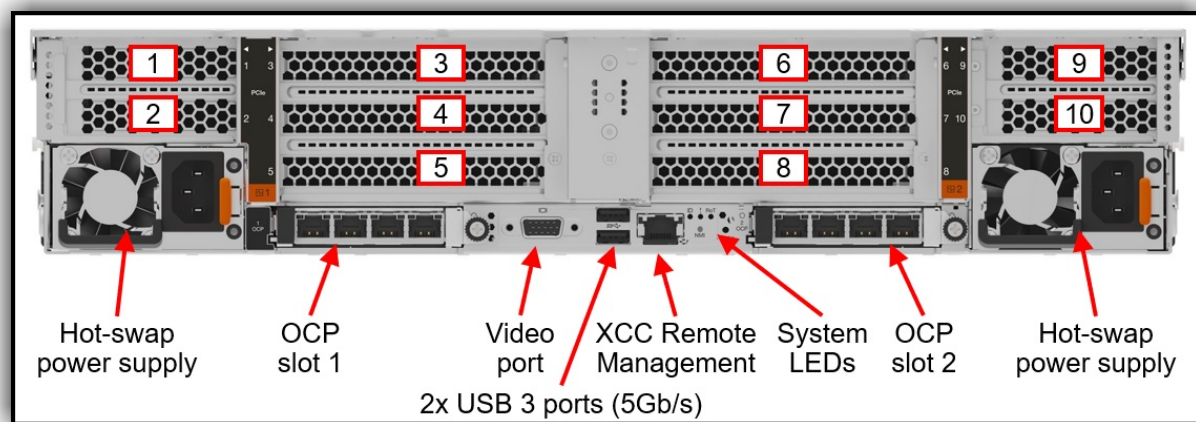

Figure 3. Rear view of the ThinkAgile VX650 V4 systems (configuration with ten PCIe slots)

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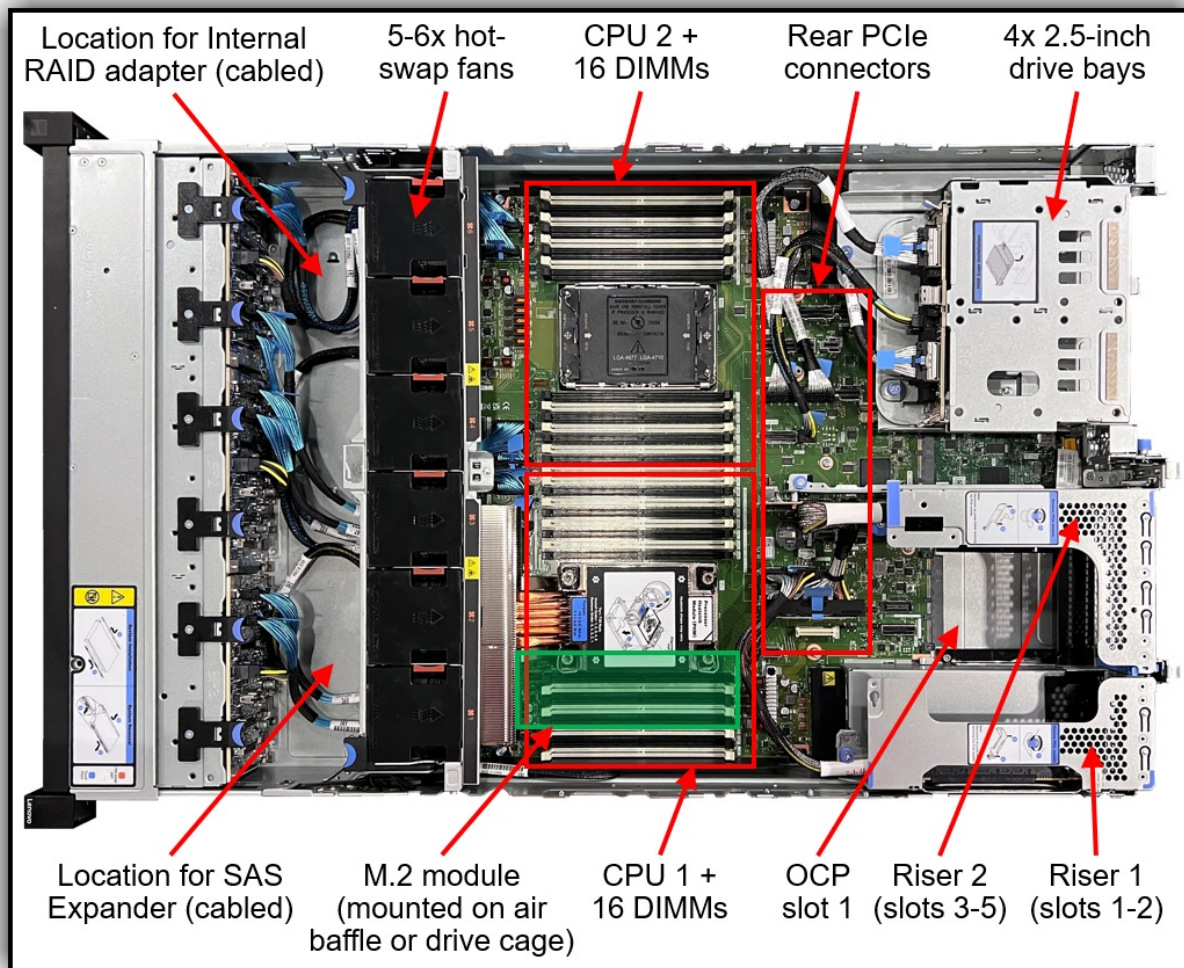

Figure 4. Internal view of the ThinkAgile VX650 V4 systems

Standard specifications

The ThinkAgile VX650 V4 are based on the ThinkSystem SR650 V4 server.

The following table provides an overview of the ThinkAgile VX 650 V4 systems.

Table 1. List of features

	ThinkAgile VX650 V4
VX offering type	Flexible
Target workloads	Cloud, AI/ML, Database, VDI
Base MTM	7DG6CTO1WW
Form Factor	2U
Base platform	SR650 V4
Max Cluster Size	64 Hosts
CPU	1x or 2x Intel® Xeon® 6 (Granite Rapids-SP)
Memory	• DDR5 memory operating up to 8000 MHz • 8 channels per CPU • 32 DIMMs (16 per processor), 2 DIMMs per channel • Supports RDIMMs, 3DS RDIMMs, and MRDIMMs • Supports CXL 2.0 memory in E3.S 2T form factor • Up to 8TB of system memory
Drive Bays	• Up to 24x 2.5" drive bays, 16x E3.S • Front: up to 24x2.5"/ 32x E3.S, hot-swap • 2x Internal M.2 with optional RAID 1 • 2x front or rear hot-swap M.2 with RAID 1 • PCIe 5.0 NVMe drive support • 36x Onboard NVMe ports
Drive configurations	All Flash
Boot drives	2x M.2 SATA
OCP networking	2x OCP 3.0 adapter 1Gb, 10Gb, 25Gb, 100Gb
PCIe networking	Up to 10x adapters 1Gb, 10Gb BASE-T, 10Gb, 25Gb, 100Gb, 200Gb
DPU- Smart NIC	None
GPUs	• Supports up to 10x single-wide GPUs • Supports up to 2x double-wide GPUs
Hypervisor	ESXi 8.0u3 (Factory Installed) ESXi 9.0 (Factory Installed)

The following table lists the standard specifications.

Table 2. Standard specifications

Components	Specification
Machine types	7DG6 - 3 or 5 year warranty
Form factor	2U rack.

Components	Specification
Cluster Size	With Lenovo ThinkAgile VX Series & VMware Cloud Foundation (VCF), you need a minimum of 4 nodes to create a management domain cluster. With Lenovo ThinkAgile VX Series & VMware vSphere Foundation (VVF), you can create a vSAN cluster with a minimum 3 hosts and a maximum of 64 hosts. Requires vSAN 7.0, 8.0 P05 and later releases.
Processor	One or two Intel Xeon 6700P-series or 6500P-series processors (formerly codenamed "Granite Rapids-SP"). Supports processors up to 86 cores and 172 threads, core speeds of up to 4.0 GHz, and TDP ratings of up to 350 W.
Chipset	None. Integrated into the processor
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 are supported. DIMMs operate at up to 6400 MHz at 1 DPC and up to 5200 MHz at 2 DPC. Xeon 6500P and 6700P-series processors also support MRDIMMs up to 8000 MHz at 1 DPC. Xeon 6500P and 6700P-series processors also support up to 8x CXL 2.0 memory DIMMs (4 per processor) installed in E3.S 2T drive bays.
Memory maximum	Up to 8TB by using 32x 256GB 3DS RDIMMs
Memory protection	ECC, SDDC (for x4-based memory DIMMs), ADDDC (for x4-based memory DIMMs), and memory mirroring.
Disk drive bays	24x 2.5-inch or 16x E3.S hot-swap drive bays: • Front bays can be 2.5-inch (8, 16 or 24 bays), or E3.S (16 bays) • Combinations of NVMe, or AnyBay (supporting NVMe) are available M.2 support for OS boot: • 2x front or rear hot-swap M.2 drive bays, or • Internal M.2 module supporting up to two M.2 drives
Storage controller	• Up to 24x Onboard NVMe ports
Network interfaces	Two dedicated OCP 3.0 SFF slots with a PCIe 5.0 host interface, either x8 or x16. Support a variety of 2-port and 4-port adapters with up to 400 GbE network connectivity. One port of each installed OCP adapter can optionally be shared with the XClarity Controller 3 (XCC3) management processor for Wake-on-LAN and NC-SI support.
PCIe slots	Up to 10x slots, all at the rear, plus 2x OCP slots. All slots are PCIe 5.0. The use of Riser 3 and 4 requires 2 processors. • Riser 1: 2x low-profile slots, x8 or x16 (CPU 1) • Riser 2: 3x full-height slots, two x16 and one x8 (CPU 1) • Riser 3: 3x full-height slots, two x16 and one x8 (CPU 2) • Riser 4: 2x low-profile slots, x8 or x16 (CPU 2) The server also supports rear 2.5" or 3.5" drive bays, and rear hot-swap M.2 drives, instead of some slots. If the server has 8x 2.5-inch rear drive bays, then Riser 1 slots are full-height. All configurations include at the rear of the server: • 2x OCP slots with PCIe 5.0 x16 or x8 connection For 2.5-inch front drive configurations, the server supports the installation of a CFF RAID adapter in a dedicated area that does not consume any of the rear PCIe slots.
GPU support	Support for up to 10x single-wide GPUs or 2x double-wide GPUs

Components	Specification
Ports	Front: External diagnostics port, optional 2x USB 3 (5 Gb/s) port, one supports XCC local management, optional Mini DisplayPort (miniDP) v1.1a video port. Rear: 2x USB 3 (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 a slot). Support for an optional second RJ-45 1GbE systems management port for XCC remote management (installs in OCP adapter slot). Support for an optional adapter to share an incoming remote management network connection across 4 servers (installs in an OCP slot). Internal: Optional 1x USB 3 (5 Gb/s) connector for operating system or license key purposes
Cooling	6x (with two processors installed) or 5x (with one processor installed) single-rotor or 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. For customers with water infrastructure in their data center, the server also supports open-loop water cooling for efficient heat removal.
Power supply	Up to two hot-swap redundant AC power supplies, 80 PLUS Platinum or 80 PLUS Titanium certification. 800W, 1300W, 2000W, 2700W and 3200W AC options. All AC power supplies support 230V power; some also support 115V input supply. In China only, all power supply options support 240 V DC. Support for HVDC and -48V DC power supply options.
Video	Embedded graphics with 16 MB memory with 2D hardware accelerator, integrated into the XClarity Controller 3 management controller. Two video ports (rear VGA and optional front Mini DisplayPort); both can be used simultaneously if desired. 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. Clarity Controller 3 (XCC3) embedded management based on the ASPEED AST2600 baseboard management controller (BMC), XClarity Administrator centralized infrastructure delivery, XClarity Integrator plugins, and XClarity Energy Manager centralized server power management. Optional XCC3 Premier to enable remote control functions and other features
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	All ThinkAgile VX Series products will support the following Primary Software Stack (3-year & 5-year terms) and Add-Ons. Primary Software 1. VMware Cloud Foundation (VCF) 2. VMware vSphere Foundation (VVF) Add-On Options (requires purchase of a Primary Software version) 1. VMware vSAN (for capacity over TiB allocation from primary SKU) 2. VMware Live Recovery 3. VMware Firewall (requires VCF) 4. VMware Firewall with Advanced Threat Prevention (requires VCF) 5. VMware Avi Load Balancer 6. VMware Private AI Foundation (requires VCF)
Hypervisors	VMware ESXi. See Operating system support section for details.
Limited warranty	Three or Five-year (model dependent) customer-replaceable unit and onsite limited warranty with 9x5 next business day (NBD).

Components	Specification
Service and support	Optional service upgrades are available through Lenovo Services: 4-hour or 2-hour response time, 6-hour fix time, 1-year or 2-year warranty extension, software support for Lenovo hardware and some third-party applications.
Dimensions	Width: 445 mm (17.5 in.), height: 87 mm (3.4 in.), depth: 796 mm (31.3 in.)
Weight	Maximum weight: 38.8 kg (85.5 lb)

Models

Factory-integrated models 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.

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

The following table lists the base CTO models.

Table 3. CTO base models

Server model	Standard Open models
	These CTO models are available in all markets.
ThinkAgile VX650 V4	7DG6CTO1WW

Comparison with the ThinkSystem SR650 V4

The ThinkAgile VX650 V4 are based on the ThinkSystem SR650 V4 server, however there are key differences:

- No HBA support
- No vROC support
- RAID adapter supported for boot only
- Encryption not supported on SED drives
- Fibre Channel support for data migration only
- No InfiniBand support
- ESA configurations only consist of a storage tier, no cache drives or disk groups required

For details about the ThinkSystem SR650 V4, see the SR650 V4 product guide: https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server

To verify what specific hardware components are supported with the VX650 V4, see the DCSC configurator: https://dcsc.lenovo.com

Processors

The ThinkAgile VX650 V4 supports processors 6th Gen Intel Xeon Scalable Processor family.

- 6th Gen Intel Xeon Scalable processors
- Lenovo Processor Neptune Core Module - Open-loop liquid cooling

6th Gen Intel Xeon Scalable processors

The VX650 V4 systems support the following processors. The systems support 1 or 2 processors installed.

For details about these options, including configuration rules, see the SR650 V4 product guide: https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#processors

Table 4. Granite Rapids Processor choices

Part number	Feature	Description	Maximum supported VX650 V4
None	C5QQ	Intel Xeon 6505P 12C 150W 2.2GHz Processor*	2
None	C5R6	Intel Xeon 6507P 8C 150W 3.5GHz Processor*	2
None	C5RD	Intel Xeon 6515P 16C 150W 2.3GHz Processor	2
None	C5QV	Intel Xeon 6517P 16C 190W 3.2GHz Processor	2
None	C5QR	Intel Xeon 6520P 24C 210W 2.4GHz Processor	2
None	C5QT	Intel Xeon 6530P 32C 225W 2.3GHz Processor	2
None	C5R7	Intel Xeon 6714P 8C 165W 4.0GHz Processor*	2
None	C5R5	Intel Xeon 6724P 16C 210W 3.6GHz Processor	2
None	C5R4	Intel Xeon 6730P 32C 250W 2.5GHz Processor	2
None	C5R0	Intel Xeon 6736P 36C 205W 2.0GHz Processor	2
None	C5QX	Intel Xeon 6737P 32C 270W 2.9GHz Processor	2
None	C5R3	Intel Xeon 6740P 48C 270W 2.1GHz Processor	2
None	C5R8	Intel Xeon 6747P 48C 330W 2.7GHz Processor	2
None	C5R1	Intel Xeon 6760P 64C 330W 2.2GHz Processor	2
None	C5QY	Intel Xeon 6767P 64C 350W 2.4GHz Processor	2
None	C5QM	Intel Xeon 6787P 86C 350W 2.0GHz Processor	2

*Minimum of 16 cores is required for ESA configurations.

Lenovo Processor Neptune Core Module - Open-loop liquid cooling

The VX650 V4 also supports advanced direct-water cooling (DWC) capability with the Lenovo Processor Neptune Core Module. This module implements a liquid cooling solution where heat from the processors is removed from the rack and the data center using an open loop and coolant distribution units.

With the Processor Neptune Core Module, all heat generated by the processors is removed from the server using water. This means that the server fans and data center air conditioning units only need to remove the heat generated by the other components. This results in lower air conditioning costs and it enables the use of slower fans which results in lower overall power consumption.

Internal testing has shows a 63% fan power saving per node and 24.7% rack-level power saving with the use of open-loop liquid cooling. Power savings are configuration dependent.

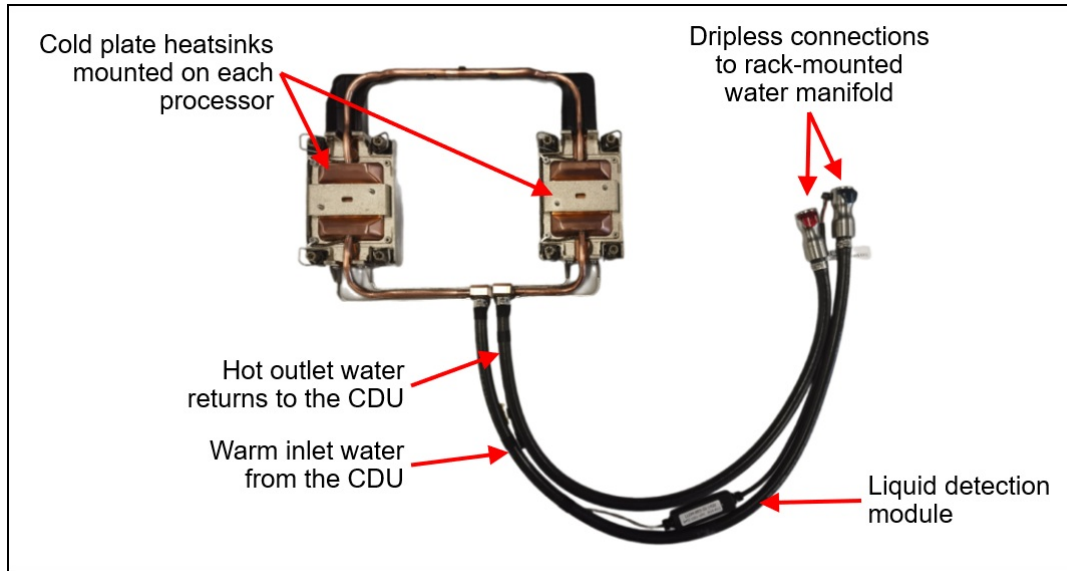The following figure shows the Lenovo Processor Neptune Core Module.

Figure 5. Lenovo Processor Neptune Core Module

The Processor Neptune Core Module also includes a leak detection module which can detect a leakage of more than 0.5ml (about 10 drops) along the length of the tube and then issue an event to the XClarity Controller. XCC will then post an error to the System Event Log and enable further actions. Once the liquid evaporates, a further event is issue to XCC.

The Processor Neptune Core Module is only available in CTO orders, not as a field upgrade. Ordering information is listed in the following table.

Table 5. Lenovo Processor Neptune Core Module

Part number	Feature code	Description
CTO only	C1XH*	ThinkSystem V4 1U/2U Processor Neptune Core Module

* In DCSC, this feature code is listed in the Processor tab

Configuration notes:

- The Processor Neptune Core Module requires water infrastructure be available in the rack cabinet and data center, as described in the Water infrastructure section.
- All processor SKUs are supported
- Either one or two CPUs are supported
- All front drive bay configurations are supported
- Slot 8 is not available for adapters - the water loop is routed through the space otherwise occupied by slot 8
- Rear drive bays are supported
- M.2 adapters are supported based on the configurations in the Storage configurations section
- Standard fans can be configured in most configurations
- The use of a cable management arm (CMA) is not supported

For more information, see the Thermal Rules page:
https://pubs.lenovo.com/sr650-v4/thermal_rules

Memory

6th Generation Memory options

The VX650 V4 systems support the following 6th generation memory options. The VX650 V4 uses Lenovo TruDDR5 memory operating at up to 8800 MHz. The server supports up to 32 DIMMs with 2 processors. The processors have 8 memory channels and support 2 DIMMs per channel (DPC). The server supports up to 8TB of memory using 32x 256GB RDIMMs and two processors. The server also supports up to 12x CXL memory DIMMs (6 per CPU) which are installed in E3.S 2T drive bays.

DIMMs operate at the following speeds, up to the memory bus speed of the processor selected. See the Processor features section for specifics.

- RDIMMs and 3DS RDIMMs:
    - 1 DIMM per channel: Up to 6400 MHz
    - 2 DIMMs per channel using RDIMMs: Up to 5200 MHz
- MRDIMMs (support for MRDIMMs is processor-model dependent)
    - 1 DIMM per channel: 8000 MHz
- CXL 2.0 DIMMs - installs in E3.S 2T front drive bays
    - Up to 12 DIMMs per server (6 per CPU)

For details about these options, including configuration rules, see the SR650 V4 product guide: https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#memory

Table 6. Granite Rapids Memory options

Part number	Feature	Description	Maximum supported VX650 V4
x4 RDIMMs			
4X77A90964	C0U9	ThinkSystem 32GB TruDDR5 6400MHz (1Rx4) RDIMM	32
4X77A90966	C0TQ	ThinkSystem 64GB TruDDR5 6400MHz (2Rx4) RDIMM	32
4X77A90997	BZ7D	ThinkSystem 96GB TruDDR5 6400MHz (2Rx4) RDIMM	32
4X77A90993	C0U1	ThinkSystem 128GB TruDDR5 6400MHz (2Rx4) RDIMM	32
x8 RDIMMs			
4X77A90963	C0U2	ThinkSystem 16GB TruDDR5 6400MHz (1Rx8) RDIMM	32
4X77A90965	BYTJ	ThinkSystem 32GB TruDDR5 6400MHz (2Rx8) RDIMM	32
4X77A90996	BZ7C	ThinkSystem 48GB TruDDR5 6400MHz (2Rx8) RDIMM	32
3DS RDIMMs			
4X77A90994	C0U0	ThinkSystem 256GB TruDDR5 6400MHz (4Rx4) 3DS RDIMM	32
MRDIMMs (operate at 8000 MHz in the VX650 V4) (Note: Not all processors support MRDIMMs - see Processor features)			
4X77A90998	C0TY	ThinkSystem 32GB TruDDR5 8800MHz (2Rx8) MRDIMM	32
4X77A90999	C0TX	ThinkSystem 64GB TruDDR5 8800MHz (2Rx4) MRDIMM	32
CXL DIMMs			
4X77A91000	C0TW	ThinkSystem 96GB E3.S 2T CXL DIMM	16
4X77A91001	C0TV	ThinkSystem 128GB E3.S 2T CXL DIMM	16

Internal storage

The VX650 V4 has three drive bay zones and supports up to 16x 3.5-inch or 40x 2.5-inch hot-swap drive bays or a combination of drive bays, depending on the selected chassis and backplane configuration. The server also supports configurations with E3.S 1T and E3.S 2T drive bays including support for CXL memory in the E3.S 2T form factor. The server supports configurations without any drive bays if desired.

The drive bay zone is as follows:

- Front:
  - Up to 24x 2.5-inch hot-swap bays, or
  - Up to 16x E3.S 1T or 12x E3.S 2T hot-swap drive bays (or a mix of 1T/2T drive bays)

All drives are hot-swap and are accessible from the front, from the rear, or from drive bays that are located in the middle of the server (accessible when you remove the top cover of the server).

The server also supports one or two M.2 drives, in three possible locations, configuration dependent:

- Installed in an M.2 adapter internal to the server (non-hot-swap)

- Hot-swap in the rear of the server

- Hot-swap in the front of the server

For details about NVMe drives see the the SR650 V4 product guide: https://lenovopress.lenovo.com/lp1601-thinksystem-sr650-v3-server#nvme-drive-support

For details about these options, including configuration rules, see the SR650 V4 product guide: https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#internal-storage

Table 7. Drive backplanes

Part number	Feature	Description	Maximum supported VX650 V4
Front 2.5-inch drive backplanes			
None	C46P	ThinkSystem 2U V4 8x2.5" NVMe Backplane	3
Front E3.S drive backplanes			
None	C221	ThinkSystem V4 EDSFF E3.S 4x1T NVMe Gen5 Backplane	8
None	C222	ThinkSystem V4 EDSFF E3.S 2x2T NVMe Gen5 Backplane	6

For OS boot functions, the systems also support one M.2 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 boot drives.

For details about these options, including configuration rules, see the SR650 V4 product guide: https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#internal-storage

Table 8. Boot Drive Enablement

Part number	Feature	Description	Maximum supported VX650 V4
Front M.2 enablement kits			
4XH7B03857	C217	ThinkSystem M.2 RAID B540d-2HS SATA/NVMe Hot-Swap Controller Board	1
4Y37A93014	C0TT	ThinkSystem M.2 RAID B540d-2HS SATA/NVMe Adapter	1
Rear M.2 enablement kits			
4Y37A90064	C0JJ	ThinkSystem M.2 RAID B540p-2HS SATA/NVMe Adapter	1
Internal M.2 (non-hot-swap)			
4Y37A93746	C26V	ThinkSystem M.2 RAID B545i-2i SATA/NVMe Adapter	1

Internal drive options

This section lists the supported drives:

- Boot drives
- Internal drives for VX650 V4

Configuration Note:

- Express Storage Architecture (ESA) supports a minimum of 1 drives and a maximum of 24 drives. Please reference the vSAN ESA ReadyNode Hardware Guidance for additional requirements.

- VMware vSAN certification for Generic NVMe drives: The drives are listed in the Broadcom Compatibility Guide (BCG) under the drive vendor company name instead of Lenovo. To check a drive for vSAN certification, search the VCG using the Supplier part number. Part numbers can be found using the Product Guide for the corresponding Drive Family on Lenovo Press https://lenovopress.lenovo.com/servers/options/drives#sort=last_update.

Boot drives

The VX650 V4 systems support the following drive for boot functions.

Table 9. Boot drives

Part number	Feature	Description	Maximum supported VX650 V4
M.2 6 Gb SATA SSDs			
4XB7A82286	BQ1Z	ThinkSystem M.2 5400 PRO 240GB Read Intensive SATA 6Gb NHS SSD	2
4XB7A82288	BQ20	ThinkSystem M.2 5400 PRO 960GB Read Intensive SATA 6Gb NHS SSD	2
4XB7A82287	BQ1Y	ThinkSystem M.2 5400 PRO 480GB Read Intensive SATA 6Gb NHS SSD	2
4XB7A89422	BYF7	ThinkSystem M.2 ER3 240GB Read Intensive SATA 6Gb NHS SSD	2
4XB7A90049	BYF8	ThinkSystem M.2 ER3 480GB Read Intensive SATA 6Gb NHS SSD	2
4XB7A90230	BYF9	ThinkSystem M.2 ER3 960GB Read Intensive SATA 6Gb NHS SSD	2

Internal drives for VX650 V4

The following table lists the drives support in the VX650 V4.

Table 10. Drives supported in the VX650 V4

Part number	Feature	Description	All Flash ESA	All Flash Cache	All Flash Capacity
2.5-inch hot-swap PCIe 4.0 NVMe SSDs					
4XB7A95054	C2BG	ThinkSystem 2.5" U.3 7500 MAX 800GB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	No
4XB7A95055	C2BV	ThinkSystem 2.5" U.3 7500 MAX 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	No
4XB7A95056	C2BW	ThinkSystem 2.5" U.3 7500 MAX 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	No
4XB7A95057	C2BF	ThinkSystem 2.5" U.3 7500 MAX 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	No

Part number	Feature	Description	All Flash ESA	All Flash Cache	All Flash Capacity
4XB7A95058	C2BX	ThinkSystem 2.5" U.3 7500 MAX 12.8TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24	No	No
4XB7A95049	C2BY	ThinkSystem 2.5" U.3 7500 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24	No	No
4XB7A95050	C2BR	ThinkSystem 2.5" U.3 7500 PRO 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24	No	No
4XB7A95051	C2BS	ThinkSystem 2.5" U.3 7500 PRO 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24	No	No
4XB7A95052	C2BT	ThinkSystem 2.5" U.3 7500 PRO 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24	No	No
4XB7A95053	C2BU	ThinkSystem 2.5" U.3 7500 PRO 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24	No	No
2.5-inch hot-swap PCIe 5.0 NVMe SSDs					
4XB7A93066	C0GK	ThinkSystem 2.5" U.2 PM9D3a 960GB Read Intensive NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93067	C0GL	ThinkSystem 2.5" U.2 PM9D3a 1.92TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93068	C0GN	ThinkSystem 2.5" U.2 PM9D3a 3.84TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93069	C0GP	ThinkSystem 2.5" U.2 PM9D3a 7.68TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93095	C1WL	ThinkSystem 2.5" U.2 PM9D3a 15.36TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93097	C1WM	ThinkSystem 2.5" U.2 PM9D5a 800GB Mixed Use NVMe NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93098	C1WN	ThinkSystem 2.5" U.2 PM9D5a 1.6TB Mixed Use NVMe NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93099	C1WP	ThinkSystem 2.5" U.2 PM9D5a 3.2TB Mixed Use NVMe NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93100	C1WR	ThinkSystem 2.5" U.2 PM9D5a 6.4TB Mixed Use NVMe NVMe PCIe 5.0 x4 HS SSD	24	No	No
4XB7A93101	C1WQ	ThinkSystem 2.5" U.2 PM9D5a 12.8TB Mixed Use NVMe NVMe PCIe 5.0 x4 HS SSD	24	No	No
E3.S hot-swap SSDs - PCIe 5.0 NVMe					
4XB7A95510	C3P7	ThinkSystem E3.S CD8P 1.6TB Mixed Use NVMe PCIe 5.0 x4 HS SSD	16	No	No
4XB7A93810	C0R2	ThinkSystem E3.S CD8P 1.92TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	16	No	No
4XB7A95513	C3PA	ThinkSystem E3.S CD8P 12.8TB Mixed Use NVMe PCIe 5.0 x4 HS SSD	16	No	No
4XB7A93813	C0R5	ThinkSystem E3.S CD8P 15.36TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	16	No	No
4XB7A95511	C3P8	ThinkSystem E3.S CD8P 3.2TB Mixed Use NVMe PCIe 5.0 x4 HS SSD	16	No	No
4XB7A93811	C0R3	ThinkSystem E3.S CD8P 3.84TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	16	No	No

Part number	Feature	Description	All Flash ESA	All Flash Cache	All Flash Capacity
4XB7A95512	C3P9	ThinkSystem E3.S CD8P 6.4TB Mixed Use NVMe PCIe 5.0 x4 HS SSD	16	No	No
4XB7A93812	C0R4	ThinkSystem E3.S CD8P 7.68TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	16	No	No

Network adapters

The VX650 V4 systems support the following networking options.

For details about these options, including configuration rules, see the SR650 V4 product guide:
https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#i-o-expansion
https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#network-adapters

Table 11. OCP network adapters

Part number	Feature	Description	Maximum supported VX650 V4
Gigabit Ethernet			
4XC7A08235	B5T1	ThinkSystem Broadcom 5719 1GbE RJ45 4-port OCP Ethernet Adapter	2
10 Gb Ethernet - 10GBASE-T			
4XC7A95696	C4GB	ThinkSystem Broadcom 57412 10GBase-T 4-Port OCP Ethernet Adapter	2
4XC7A08236	B5ST	ThinkSystem Broadcom 57416 10GBASE-T 2-port OCP Ethernet Adapter	2
4XC7A96732	C4HS	ThinkSystem Intel E610-T2 10GBase-T 2-Port OCP Ethernet Adapter(Generic FW)	2
25 Gb Ethernet			
4XC7A08237	BN2T	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-Port OCP Ethernet Adapter	2
4XC7A80567	BPPW	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-Port OCP Ethernet Adapter	2
4XC7A62582	BE4T	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-port OCP Ethernet Adapter	2
100 Gb Ethernet			
4XC7A08243	BPPX	ThinkSystem Broadcom 57508 100GbE QSFP56 2-Port OCP Ethernet Adapter	2
400 Gb Ethernet			
4XC7A95695	C4CQ	ThinkSystem Broadcom 57608 2x200/1x400GbE QSFP112 OCP Ethernet Adapter(Generic FW))	2

Table 12. PCIe network adapters

Part number	Feature	Description	Maximum supported VX650 V4
Gigabit Ethernet			
7ZT7A00484	AUZV	ThinkSystem Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter	10
10 Gb Ethernet - 10GBASE-T			
4XC7A95697	C4GC	ThinkSystem Broadcom 57412 10GBase-T 4-Port PCIe Ethernet Adapter	10
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	10
4XC7A96733	C4HT	ThinkSystem Intel E610-T4 10GBase-T 4-Port PCIe Ethernet Adapter(Generic FW)	8
25 Gb Ethernet			
4XC7A08238	BK1H	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter	10
4XC7A80566	BNWM	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-port PCIe Ethernet Adapter	6
4XC7A62580	BE4U	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-port PCIe Ethernet Adapter	10
100 Gb Ethernet			
4XC7A08297	BK1J	ThinkSystem Broadcom 57508 100GbE QSFP56 2-Port PCIe 4 Ethernet Adapter	6
200 Gb Ethernet			
4XC7A81883	BQBN	ThinkSystem NVIDIA ConnectX-7 NDR200/200GbE QSFP112 2-port PCIe Gen5 x16 Adapter	6

GPU adapters

The ThinkAgile VX650 V4 systems support the following GPU options.

For details about these options, including configuration rules, see the SR650 V4 product guide: https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#gpu-adapters

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.

Note: It is highly recommended to engage a Lenovo representative early in a project that includes the ThinkAgile VX Systems

Table 13. GPU adapters

Part number	Feature	Description	Maximum supported VX650 V4
Single-wide GPUs			
4X67A84824	BS2C	ThinkSystem NVIDIA L4 24GB PCIe Gen4 Passive GPU	10
4X67A97287	C4S1	ThinkSystem NVIDIA RTX 4000 Ada 20GB PCIe Active GPU	4
Double-wide GPUs			
4X67A89325	BXAK	ThinkSystem NVIDIA H100 NVL 94GB PCIe Gen5 Passive GPU	2
4X67A90669	BYFH	ThinkSystem NVIDIA L40S 48GB PCIe Gen4 Passive GPU	2
4X67A96491	C4RX	ThinkSystem NVIDIA RTX 4500 Ada 24GB PCIe Active GPU	2
4X67A89324	C2DP	ThinkSystem NVIDIA RTX 6000 Ada 48GB PCIe Active GPU	2

Fibre Channel host bus adapters

Table 14. Fibre Channel host bus adapters

Part number	Feature	Description	Maximum supported VX650 V4
64 Gb Fibre Channel HBAs			
4XC7A96744	C4L3	ThinkSystem QLogic QLE2872 64Gb 2-Port PCIe Fibre Channel Adapter(Generic FW)	10
4XC7A96458	C5FD	ThinkSystem Emulex LPe38102 64Gb 2-Port PCIe Fibre Channel Adapter	10
32 Gb Fibre Channel HBAs			
4XC7A08276	BA1F	ThinkSystem QLogic QLE2772 32Gb 2-Port PCIe Fibre Channel Adapter	10
4XC7A96457	C5FC	ThinkSystem Emulex LPe37102 32Gb 2-Port PCIe Fibre Channel Adapter	10

Operating system support

The ThinkAgile VX650 V4 supports the following operating systems:

- ESXi 9.0 (Factory Installed)
- ESXi 8.0u3 (Factory Installed)

Configuration Note:

On the ThinkAgile VX650 V4, the ESXi version to be installed is selected on the ThinkAgile VX Deployer.** The system ships out of the factory with the Feature Code (FC) BLA3 which includes the Lenovo custom image with the VX Deployer SW installed as a VM. The customer can then use the VX Deployer tool to select the ESXi version of their choice and follow the step-by-step installation process to deploy/install/activate/configure vSphere, vSAN, vCenter, LXCi (HSM), etc. Once the deployer completes its activity, the customer follows the regular management flow using vCenter.

VMware vSAN certification for Generic NVMe drives: The drives are listed in the Broadcom Compatibility Guide (BCG) under the drive vendor company name instead of Lenovo. To check a drive for vSAN certification, search the BCG using the Supplier part number. Part numbers can be found using the Product Guide for the corresponding Drive Family on Lenovo Press https://lenovopress.lenovo.com/servers/options/drives#sort=last_update.

For further details, including any restrictions, see the OS Interoperability Guide: https://lenovopress.lenovo.com/osig#term=vx&support=all

**Phase 1 of VX650 V4 will not be shipped with the VX Deployer (FC: BLA3) and customer will have the ability to select the preferred version of ESXi to be factory installed. Phase 2 delivery will ship with this factory installed feature.

Software

ThinkAgile VX Series offerings are available with the VMware Cloud Foundation (VCF) and VMware vSphere Foundation (VVF) primary software stack options. Licenses can be purchased through flexible term subscription-based models with 3-year or 5-year durations. In addition to the primary stack options, advanced service add-on options are available for features like vSAN additional capacity, Live Recovery, Firewall with Advanced Threat Prevention, Avi Load Balancer and Private AI Foundation.

Customers who have purchased VMware Licenses directly from Broadcom or an approved distributor have the flexibility to choose "Customer has VMware by Broadcom Software License" in their DCSC configuration.

Lenovo offers the following VMware software license and support options for ThinkAgile VX Series systems:

- Primary Software

    1. VMware Cloud Foundation (VCF)
    2. VMware vSphere Foundation (VVF)

- Add-On Options (requires purchase of a Primary Software version)

    1. VMware vSAN (for capacity over TiB allocation from primary SKU)
    2. VMware Live Recovery
    3. VMware vDefend Firewall Bundle (requires VCF)
    4. VMware vDefend Firewall with Advanced Threat Prevention Bundle (requires VCF)
    5. VMware Avi Load Balancer
    6. VMware Private AI Foundation (requires VCF)

For details and ordering information, see the VMware Software Solution Product Guide: https://lenovopress.com/lp1265-vmware-software-solution-product-guide

Configuration notes:

- VMware software licenses that are available for selection include 3-year, or 5-year software support (matches the duration of the selected solution-level warranty period).
- The quantity of processor core count-based licenses is derived by the configuration tool based on the number of processors selected.
- The quantity of VM-based licenses is specified based on VM requirements.

ThinkAgile VX Deployer Tool

The ThinkAgile VX Deployer tool is a web-based UI tool used to simplify and automate the deployment of Lenovo ThinkAgile VX systems within your VMware environment. The ThinkAgile VX Deployer tool can install and configure the following software:

VMware ESXi

VMware ESXi is a bare-metal hypervisor that the ThinkAgile VX Deployer tool installs on the hardware of each host in the cluster. ESXi translates requests between the physical and virtual resources, making virtualization possible.

VMware vCenter Server

VMware vCenter Server is a management console that provides a centralized platform for controlling VMware vSphere environments. One service that runs in VMware vCenter Server is VMware vLCM, which provides centralized and simplified management to install software, maintain that software through updates and upgrades, and decommission it.

Lenovo® XClarity Integrator

Lenovo XClarity Integrator is the hardware support manager (HSM) used by vCenter for firmware upgrades. Lenovo XClarity Integrator fully integrates with VMware vLCM to give the VMware vCenter Server software visibility into Lenovo hardware. The interface for the ThinkAgile VX Deployer tool is a straightforward web-based installation wizard with three top-level options:

- Install a new cluster (using the wizard).
- Add nodes to an existing cluster (using the wizard).
- Use a configuration file to install a new cluster or add nodes to an existing cluster.

Prowess testing included all three of these options, plus some key lifecycle-management features in VMware vCenter Server. To view the results of our testing please use the link https://prowessconsulting.com/wp-content/uploads/2023/07/lenovo-thinkagile-vx-hci-easy-deployment-operation-vmware-1.pdf

Warranty and Support

The VX650 V4 has a 3 or 5-year warranty based on the machine type:

- 7DG6 - 3 or 5 year warranty

The ThinkAgile VX System can be configured with a three- or five-year hardware warranty with 24x7. In available countries, ThinkAgile Premier Single Point of Support (Lenovo server hardware and VMware software; requires an active software support contract purchased either from VMware or Lenovo) and various levels of coverage with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

The Lenovo local support centers perform problem determination and resolution for hardware-related issues and escalate to VMware, on behalf of the customer, for software-related problem determination. VMware will contact the customer and will own the software-related problem resolution until closure.

Our global network of regional support centers offers consistent, local-language support enabling you to vary response times and level of service to match the criticality of your support needs:

- **Standard Next Business Day** – Best choice for non-essential systems requiring simple maintenance.
- **Premier Next Business Day** – Best choice for essential systems requiring technical expertise from senior-level Lenovo engineers.
- **Premier 24x7 4-Hour Response** – Best choice for systems where maximum uptime is critical.

For more information, consult the brochure Lenovo Operational Support Services for Data Centers Services.

Software maintenance

The ThinkAgile VX Solutions can include three-, or five-year software subscription (matches the duration of the selected warranty period) that entitles customers to submit service requests to troubleshoot VMware software issues and receive code updates, including fixes, patches, and new software releases.

The Lenovo local support centers perform problem determination and resolution for hardware-related issues and escalate to VMware, on behalf of the customer, for software-related problem determination. Lenovo will contact the customer and will own the software-related problem resolution until closure.

For the VMware software and subscription licenses provided by the customer, software support that is provided by VMware is based on the support level included with these licenses. VMware by Broadcom will contact the customer and will own the software-related problem resolution until closure.

Deployment services

The following optional Lenovo basic installation services are available for the ThinkAgile VX Solutions:

- Unpacking and inspecting the systems
- Mounting the systems in a rack cabinet
- 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)

ThinkAgile VX Solutions include deployment services delivered by Lenovo Professional Services for the ultimate customer experience. However, "Channel Partner Provided" option is also available on DCSC. By choosing this option, Lenovo Customer or Lenovo Business Partner assumes the full responsibility to perform the deployment services for the quoted system. It is strongly recommended that Lenovo Professional Services or approved business partners are used to perform the deployment services.

The following additional Lenovo deployment services are available for the ThinkAgile VX Series with VMware vSphere Foundation solution to get customers up and running quickly. You can use the table below to add these services:

- Conducting remote preparation and planning
- Verifying firmware versions and performing firmware updates, if needed
- Configuring XCC management settings
- Configuring hypervisor settings
- Configuring vSAN
- Configuring VMware vCenter Server and discovering hosts and storage
- Configuring Lenovo XClarity network settings and performing discovery and inventory
- Transferring knowledge
- Developing post-installation documentation

The following Lenovo deployment services are provided with the ThinkAgile VX Series with VMware Cloud Foundation co-engineered solution to get customers up and running quickly:

- Planning and Design
  - Collect technical details for hardware and VMware environment
  - Plan the architecture based on Customer's business and tech requirements
  - Fill the VCF Plan, Prepare Workbook

- Implementation
  - Configure hardware (XCC IP, UEFI), upgrade firmware via OneCLI or BoMC
  - Deploy & Configure ESXi, Cloud Builder & import VCF Workbook, Lenovo xClarity software components
  - Check compliance with VX Best Recipes

- Handover
  - BAU updates based on VCF releases and VX Best Recipes
  - VMware Async Patch Tool (if required)

- Readiness Handover
  - Create handover document and knowledge transfer
  - Includes details for each deployed component

The following table lists ThinkAgile Health Check & Deployment offerings are available for ThinkAgile VX 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 15. ThinkAgile Deployment offerings

Part number	Description
Onsite deployment services	
5MS7B00082	ThinkAgile VX Onsite Deployment (up to 4 nodes)
5MS7B00083	ThinkAgile VX Onsite Deployment (additional node)
Remote deployment services	
5MS7A87711	ThinkAgile VX Remote Deployment (up to 4 nodes)
5MS7A87712	ThinkAgile VX Remote Deployment (additional node)
Remote Health Check	
5MS7B00178	ThinkAgile VX 1X Remote Health Check (up to 4 node cluster)
5MS7B00179	ThinkAgile VX 1X Remote Health Check (additional node)
5MS7B00059	ThinkAgile VX 1X Remote Health Check & Update (up to 4 node cluster)
5MS7B00060	ThinkAgile VX 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 TruScale

Lenovo TruScale IaaS is your set of flexible IT services that makes everything easier. Streamline IT procurement, simplify infrastructure and device management, and pay only for what you use – so your business is free to grow and go anywhere.

Lenovo TruScale is the unified solution that gives you simplified access to:

- The industry's broadest portfolio – from pocket to cloud – all delivered as a service
- A single-contract framework for full visibility and accountability
- The global scale to rapidly and securely build teams from anywhere
- Flexible fixed and metered pay-as-you-go models with minimal upfront cost
- The growth-driving combination of hardware, software, infrastructure, and solutions – all from one single provider with one point of accountability.

For information about Lenovo TruScale offerings that are available in your region, contact your local Lenovo sales representative or business partner.

Regulatory compliance

The server conforms to the following standards:

- CE, UKCA Mark (EN55032 Class A, EN62368-1, EN55035, EN61000-3-11, EN61000-3-12, (EU) 2019/424, and EN IEC 63000 (RoHS))
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 7, Class A
- CISPR 32, Class A, CISPR 35
- Korea KS C 9832 Class A, KS C 9835
- Japan VCCI, Class A
- Taiwan BSMI CNS15936, Class A; CNS15598-1; Section 5 of CNS15663
- Australia/New Zealand AS/NZS CISPR 32, Class A; AS/NZS 62368.1
- UL Green Guard, UL2819
- Energy Star 4.0
- EPEAT (NSF/ ANSI 426) Bronze
- Japanese Energy-Saving Act
- EU2019/424 Energy Related Product (ErP Lot9)
- TCO Certified
- China CCC certificate, GB17625.1; GB4943.1; GB/T9254
- China CECP certificate, CQC3135
- China CELP certificate, HJ 2507-2011

Lenovo Financial Services

Why wait to obtain the technology you need now? No payments for 90 days and predictable, low monthly payments make it easy to budget for your Lenovo solution.

- **Flexible**

  Our in-depth knowledge of the products, services and various market segments allows us to offer greater flexibility in structures, documentation and end of lease options.

- **100% Solution Financing**

  Financing your entire solution including hardware, software, and services, ensures more predictability in your project planning with fixed, manageable payments and low monthly payments.

- **Device as a Service (DaaS)**

  Leverage latest technology to advance your business. Customized solutions aligned to your needs. Flexibility to add equipment to support growth. Protect your technology with Lenovo's Premier Support service.

- **24/7 Asset management**

  Manage your financed solutions with electronic access to your lease documents, payment histories, invoices and asset information.

- **Fair Market Value (FMV) and $1 Purchase Option Leases**

  Maximize your purchasing power with our lowest cost option. An FMV lease offers lower monthly payments than loans or lease-to-own financing. Think of an FMV lease as a rental. You have the flexibility at the end of the lease term to return the equipment, continue leasing it, or purchase it for the fair market value. In a $1 Out Purchase Option lease, you own the equipment. It is a good option when you are confident you will use the equipment for an extended period beyond the finance term. Both lease types have merits depending on your needs. We can help you determine which option will best meet your technological and budgetary goals.

Ask your Lenovo Financial Services representative about this promotion and how to submit a credit application. For the majority of credit applicants, we have enough information to deliver an instant decision and send a notification within minutes.

Seller training courses

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

1. **Think AI Weekly: Simplifying AI Deployments with ThinkAgile**
   2025-04-11 | 54 minutes | Employees Only

   Please view this session to hear Adam Mandelbloom, Technical Marketing Manager for ISG explain these topics:

   -Overall value proposition of ThinkAgile in AI solutions
   -Use cases for ThinkAgile HX
   -Use cases for ThinkAgile VX and MX

   Tags: Artificial Intelligence (AI), ThinkAgile

   Published: 2025-04-11
   Length: 54 minutes

   > **Start the training:**
   > Employee link: Grow@Lenovo

   Course code: DTAIW137

2. **Family Portfolio: ThinkAgile Systems**
   2025-02-06 | 45 minutes | Employees and Partners

   This course covers the foundational components of the ThinkAgile family, including server configurations, key system differences, and the unique features of the HX, MX, and VX product families.

   By the end of this course, you should be able to:
   - List the ThinkSystem and ThinkEdge servers that the ThinkAgile family is based on
   - Explain the difference between Certified Nodes and Integrated Systems
   - List two features each of the HX, MX, and VX families

   Tags: ThinkAgile, ThinkSystem

   Published: 2025-02-06
   Length: 45 minutes

   > **Start the training:**
   > Employee link: Grow@Lenovo
   > Partner link: Lenovo Partner Learning

   Course code: SXSW2150

3. **ThinkAgile VX - How to sell**
2024-12-18 | 15 minutes | Employees and Partners

This module will introduce you to the ThinkAgile VX product line. It also introduces the latest updates to the VMware software packages available with the ThinkAgile VX product line.

Course Objectives:
1. Find out more about the competitive advantage of ThinkAgile VX.
2. Learn about the hardware and software solutions in the ThinkAgile VX line.
3. Understand the business needs and how you can sell more.

Tags: ThinkAgile, VMware

Published: 2024-12-18
Length: 15 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: DVXS100

4. **Selling On Prem Value - Private Cloud and Private AI**
2024-12-13 | 40 minutes | Employees Only

This course provides Lenovo Sellers with a series of five videos that are designed to help you better articulate our joint value in the Private Cloud and Private AI solution opportunity. After completing this course, Lenovo Sellers should be prepared to elevate customer discussions by transitioning from product features to explaining value-driven benefits, enabling a deeper understanding of the strategic impact for their business.

Tags: Artificial Intelligence (AI), Industry solutions, Technology solutions, ThinkAgile, VMware

Published: 2024-12-13
Length: 40 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DVMB101

5. **Partner Technical Webinar - Data Center 101 - Why HCI? Why 3-tier?**
2024-11-14 | 60 minutes | Employees and Partners

October 11, 2024 – In this 60-minute webinar Alex Docherty, Channel Technical Strategist, discussed When to HCI vs 3 Tier.

Tags: ThinkAgile, ThinkSystem

Published: 2024-11-14
Length: 60 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: 101124

6. **ThinkAgile Solutions for AI - Security and Compliance Considerations**
2024-10-01 | 15 minutes | Employees and Partners

This course, tailored specifically for Lenovo and its partner technical sellers, is designed to equip participants with essential knowledge and skills to effectively assess security measures and address compliance considerations for ThinkAgile Solutions for AI.

Upon completion of this training, you will be able to:
• Describee security features of ThinkAgile for AI data protection.
• Explain how to mitigate risk and address compliance considerations in AI deployments.

Last Updated: September 2024

Tags: Artificial Intelligence (AI), High-Performance Computing (HPC), ThinkAgile

Published: 2024-10-01
Length: 15 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: DCLDAI203

7. **Integration of ThinkAgile and AI**
2024-09-11 | 25 minutes | Employees and Partners

Designed specifically for Lenovo and its partner technical sellers, this course aims to equip you with the knowledge and skills to effectively communicate the integration of ThinkAgile Solutions and AI.

Upon completion of this training, you will be able to:
•Highlight the advantages of using ThinkAgile for AI workloads
•Explore how ThinkAgile platforms are specifically optimized for AI

Last Updated: September 2024

Tags: Artificial Intelligence (AI), ThinkAgile

Published: 2024-09-11
Length: 25 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: DCLDAI204

8. **Key Features of Lenovo ThinkAgile Solutions for AI**
2024-09-10 | 15 minutes | Employees and Partners

Designed specifically for Lenovo and its partner technical sellers, this course aims to equip you with the knowledge and skills to effectively communicate the key features of ThinkAgile Solutions for AI. By completing this course, you'll be better prepared to understand customer needs and present the most suitable AI solutions, ensuring successful engagements and driving value for your clients.

In this course, you will learn how to:
• Present compute capabilities for AI processing
• Articulate optimized storage solutions with ThinkAgile for high-speed AI performance
• Identify essential networking considerations for ThinkAgile AI workloads
• Present ThinkAgile AI Ready solutions

Last Updated: September 2024

Tags: Artificial Intelligence (AI), ThinkAgile

Published: 2024-09-10
Length: 15 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DCLDAI201

9. **ThinkAgile Solutions for AI - Sales Strategies and Messaging**
2024-09-06 | 15 minutes | Employees and Partners

This course is designed exclusively for Lenovo and its partner technical sales teams, with the goal of empowering you with the knowledge and strategies necessary to effectively engage customers in conversations about ThinkAgile Solutions for AI.

In this course, you'll learn how to:
• Identify customer pain points.
• Recommend ThinkAgile Solutions for AI tailored to those needs. And lastly,
• Communicate the benefits of ThinkAgile for AI to key stakeholders.

Last Updated: September 2024

Tags: Artificial Intelligence (AI), ThinkAgile

Published: 2024-09-06
Length: 15 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DCLDAI202

10. **Position Lenovo ThinkAgile Solutions for AI**
2024-08-19 | 10 minutes | Employees and Partners

Designed specifically for Lenovo and partner technical sellers, this course aims to equip you with the knowledge and skills necessary to effectively evaluate and position ThinkAgile Solutions for AI to your customers. By completing this course, you will be better prepared to understand customer needs and present the most suitable AI solutions, ensuring successful engagements and driving value for your clients.

In this course, you will learn how to position ThinkAgile Solutions for AI to your customers by:
•Evaluating the key challenges in the enterprise landscape
•Advocating the value proposition of ThinkAgile Hyper-Converged Infrastructure
•Exploring use cases of ThinkAgile in AI environments
•Implementing ThinkAgile-based AI deployments

Tags: Artificial Intelligence (AI), ThinkAgile

Published: 2024-08-19
Length: 10 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: DCLDAI200

11. **Lenovo VTT Cloud Architecture - Unlock Gen AI with VMware Private AI Foundation with NVIDIA**
2024-07-16 | 60 minutes | Employees Only

In today's rapidly evolving digital landscape, businesses are hungry for the transformative power of Artificial Intelligence (AI). They see AI as the key to streamlining operations and unlocking exciting new opportunities. However, widespread adoption has been hampered by concerns surrounding privacy, the complexity of implementation, and the hefty costs associated with deploying and managing AI solutions at an enterprise level.
Join Chris Gully and Baker Hull, Solutions Architects from VMware by Broadcom, as they discuss how Lenovo, NVIDIA, and VMware By Broadcom are partnering to deliver a private, secure, scalable, and flexible AI infrastructure solution that helps enterprise customers build and deploy AI workloads within their own private cloud infrastructure, ensure the control of sensitive data and compliance with regulatory requirements, ultimately driving faster time to value and achieving their AI objectives.

Tags: Artificial Intelligence (AI), Cloud, Nvidia, ThinkAgile, VMware

Published: 2024-07-16
Length: 60 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DVCLD214

12. **ThinkAgile Roadshow for Account Managers**
    2024-06-21 | 60 minutes | Employees Only

    As customers transition through technology refresh and modernize their IT, learn how to win and position ThinkAgile portfolio. Get an overview of current ThinkAgile momentum and strategy along with best practices in product positioning

    Tags: Artificial Intelligence (AI), Cloud, Microsoft, Nutanix, ThinkAgile, VMware

    Published: 2024-06-21
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo

    Course code: DTAO101

13. **VTT Cloud Architecture - What next with VMware Discussion**
    2024-06-13 | 60 minutes | Employees Only

    Broadcom's acquisition of VMware has stirred significant interest and concern among customers who rely on VMware for their cloud and on-premises infrastructure needs. This acquisition may prompt customers to explore alternative platforms due to potential changes in service quality, pricing, and product roadmaps. Join John Encizo, Lenovo Field CTO & Principal Technical Consultant for an in-depth look at what it takes to migrate customers to different platforms and considerations for whether they should make the move.

    Tags: Cloud, Microsoft, Nutanix, Technical Sales, VMware

    Published: 2024-06-13
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo

    Course code: DVCLD213

14. **SAP Webinar for Lenovo Sellers: Lenovo Portfolio Update for SAP Landscapes**
    2024-06-04 | 60 minutes | Employees Only

    Join Mark Kelly, Advisory IT Architect with the Lenovo Global SAP Center of Competence as he discusses:
    •Challenges in the SAP environment
    •Lenovo On-premise Solutions for SAP
    •Lenovo support resources for SAP solutions

    Tags: SAP, ThinkAgile, ThinkEdge, ThinkSystem

    Published: 2024-06-04
    Length: 60 minutes

    Start the training:
    Employee link: Grow@Lenovo

    Course code: DSAPF101

15. **Lenovo Data Center Product Portfolio**
2024-05-29 | 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.

Tags: Advanced DataCenter, DataCenter Products, ThinkAgile, ThinkEdge, ThinkSystem

Published: 2024-05-29
Length: 20 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: SXXW1110r7

16. **VTT Cloud Architecture: NVIDIA Using Cloud for GPUs and AI**
2024-05-22 | 60 minutes | Employees Only

Join JD Dupont, NVIDIA Head of Americas Sales, Lenovo partnership and Veer Mehta, NVIDIA Solution Architect on an interactive discussion about cloud to edge, designing cloud Solutions with NVIDIA GPUs and minimizing private\hybrid cloud OPEX with GPUs. Discover how you can use what is done at big public cloud providers for your customers. We will also walk through use cases and see a demo you can use to help your customers.

Tags: Artificial Intelligence (AI), Cloud, Nvidia, Software Defined Infrastruture (SDI), Technical Sales

Published: 2024-05-22
Length: 60 minutes

> **Start the training:**
> Employee link: Grow@Lenovo

Course code: DVCLD212

17. **Start the Conversation - Lenovo Cloud Strategy**
2024-05-20 | 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.

Course Objectives:
•Understand why customers choose the cloud
•Describe the Lenovo Cloud Strategy
•Be able to start the customer cloud conversation

Tags: Cloud, Technology solutions

Published: 2024-05-20
Length: 25 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DCLDS103r3

18. **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.

Tags: Cloud, Services, Sustainability, Technology solutions, TruScale Infrastructure as a Service

Published: 2024-04-10
Length: 50 minutes

> **Start the training:**
> Employee link: Grow@Lenovo

Course code: DVCLD211

19. **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?

Tags: Data Management, Storage

Published: 2024-04-10
Length: 60 minutes

> **Start the training:**
> Employee link: Grow@Lenovo

Course code: DVDAT209

20. **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

Tags: Data Management, Storage, ThinkSystem

Published: 2024-03-14
Length: 25 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DSTOO201

21. **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

    Tags: Architecture, Engineering & Construction, Cloud, Technical Sales, ThinkAgile

    Published: 2024-03-07
    Length: 35 minutes

    > **Start the training:**
    > Employee link: Grow@Lenovo
    > Partner link: Lenovo Partner Learning

    Course code: DCLDT2001r3

22. **ThinkAgile VX in 3 minutes**
    2024-02-01 | 5 minutes | Employees and Partners

    Learn about ThinkAgile VX in under 3 minutes. The business challenges it solves and how it can increase the size of your sales opportunities.

    By the end of this training, you should be able to:

    1) Learn how to sell Lenovo ThinkAgile VX
    2) Describe what differentiates ThinkAgile VX from other VMware offerings

    Tags: ThinkAgile

    Published: 2024-02-01
    Length: 5 minutes

    > **Start the training:**
    > Employee link: Grow@Lenovo
    > Partner link: Lenovo Partner Learning

    Course code: DVXS101

23. **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

Tags: Sales, Storage

Published: 2024-01-25
Length: 15 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: SXSW1101r2

24. **Lenovo Solutions for the Cloud**
2024-01-03 | 30 minutes | Employees and Partners

Understanding your customer's needs around cloud solutions is imperative. This course aims to increase Lenovo and Partner Seller's ability to identify various Lenovo Cloud offerings and services to position related Lenovo Cloud Solutions.

Tags: Cloud, Technology solutions, ThinkAgile, ThinkEdge, ThinkSystem

Published: 2024-01-03
Length: 30 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: DCLDO112r2

25. **VTT Cloud Architecture: Google Cloud Platform with Anthos on ThinkAgile VX - October 2023**
2023-10-11 | 54 minutes | Employees and Partners

Join Chandrakandh Mouleeswaran, Lenovo Senior Software Engineer and Cristian Ghetau, Lenovo Software Engineer for a discussion on Google Cloud Platform (GCP) with Anthos solution based on the Lenovo ThinkAgile VX VMware vSAN certified platform. They will cover a technical overview of Google Kubernetes Engine (GKE) On-prem, which is a containerized workload orchestration software. We will cover the functional aspects of Anthos core components including the Kubernetes, Istio service mesh, Anthos config management, Hybrid and multi-cloud management, and Google cloud marketplace. We will also provide an architecture overview and deployment of Anthos on top of Lenovo ThinkAgile VX hyperconverged infrastructure (HCI) platform. Cristian and Chandrakandh will cover customer use cases for Anthos, including Continuous Integration/Continuous Delivery (CI/CD), Micro-services and Service Mesh, Hybrid Cloud and Multi-cloud management, and Anthos Config Management.

Tags: Cloud, Software Defined Infrastruture (SDI), Technology solutions, ThinkAgile, VMware

Published: 2023-10-11
Length: 54 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DVCLD205

26. **VEEAM Solutions Sales Training**
2023-09-27 | 20 minutes | Employees and Partners

In this course you will learn about Hyper-availability for the Always-On Enterprise.

By the end of this training, you should be able to:

Identify and explain the core products and solutions offered by Veeam.
Explain the key benefits and value propositions of integrating Veeam solutions with Lenovo products.

Tags: Sales

Published: 2023-09-27
Length: 20 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DSTOO100

27. **VTT Cloud Architecture - Application Migration September 2023**
2023-09-12 | 35 minutes | Employees Only

This VTT Cloud Architecture training aims to equip participants with the knowledge necessary to help your customers successfully migrate applications to a cloud infrastructure. With the increasing adoption of cloud computing, organizations are looking to harness the benefits of private and hybrid clouds, such as enhanced security, control, and customization. However, migrating applications to cloud requires careful planning, architectural considerations, and a deep understanding of the migration process.
In this training, we will delve into cloud infrastructure and learn about the key components involved in application migration. We will explore various migration strategies, including lift-and-shift, re-platforming, and re-architecting, and understand the factors that influence the selection of an appropriate migration approach. We will also cover best practices for evaluating application readiness, assessing dependencies, identifying potential challenges and risks, and solution design considerations. We will discuss using migration tools, technologies specific to cloud environments and automation techniques for streamlining the migration process, ensuring minimal disruption to business operations.

Tags: Cloud, Software Defined Infrastruture (SDI), Technical Sales, VMware

Published: 2023-09-12
Length: 35 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DVCLD204

28. **VTT Cloud Architecture - DevOps Cloud Story August 2023**
2023-08-17 | 60 minutes | Employees Only

Understanding how architecture is deployed to support DevOps environment in the cloud. Tanzu/Containers vs VM's. When it best to use each? Modern Application deployment in containers. In the beginning, public cloud IaaS was delivered exclusively via virtual machines. But today, new virtualization methods are taking hold, including containers and serverless computing. As cloud computing principles become more embedded in application development and infrastructure operations, containers and serverless will become increasingly attractive deployment vehicles for code. From requirements to installation.

Tags: Cloud, Infrastructure as a Service (IaaS), ThinkAgile, VMware

Published: 2023-08-17
Length: 60 minutes

Start the training:
Employee link: Grow@Lenovo

Course code: DVCLD203

29. **ThinkAgile Accelerating Cloud Agility: Understanding ThinkAgile VX**
2023-07-28 | 50 minutes | Employees and Partners

Brian Faleiro, Lenovo Technical Product Manager, discusses ThinkAgile VX use cases, where the solution can be positioned. He reviews recent technical improvements and discusses deployment and lifecycle management, 'why ThinkAgile VX', what are the requirements that customers are looking for and how we are solving those requirements.

Tags: ThinkAgile

Published: 2023-07-28
Length: 50 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DVXT201

30. **VTT: SAP HANA Transition and Refresh Opportunity - July 2023**
2023-07-14 | 60 minutes | Employees Only

In this session, we cover:
- What Next for SAP Clients?
- Lenovo Opportunity
- Lenovo Portfolio for SAP Solutions
- RISE with SAP

Tags: Data Management, SAP, ThinkAgile, ThinkEdge, ThinkSystem

Published: 2023-07-14
Length: 60 minutes

> **Start the training:**
> Employee link: Grow@Lenovo

Course code: DVDAT202

31. **ThinkAgile VX Series - Technical Presentation**
2023-07-12 | 60 minutes | Employees and Partners

Join us in this comprehensive course on ThinkAgile VX Series, where you will gain a deep understanding of its technical overview and components. Dive into the world of Data Processing Units (DPUs) and explore their technical aspects, including their role and benefits. Unlock the potential of ThinkAgile VX Series through a detailed exploration of its versatile use cases, ranging from Hybrid Cloud deployment to VDI, Kubernetes, and AI/ML applications. Moreover, you will learn about effective deployment strategies and lifecycle management processes.

By the end of this training, you should be able to:
•Understand the technical overview of ThinkAgile VX Series
•Gain knowledge about DPU (Data Processing Unit) and its technical aspects
•Explore various use cases of ThinkAgile VX Series, including Hybrid Cloud deployment, VDI (Virtual Desktop Infrastructure), Kubernetes, and AI/ML (Artificial Intelligence/Machine Learning)
•Describe deployment strategies and lifecycle management processes for ThinkAgile VX Series

Tags: Cloud, ThinkAgile

Published: 2023-07-12
Length: 60 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DVXSV104

32. **VTT Cloud Architecture - Why Cloud? July 2023**
2023-07-12 | 90 minutes | Employees Only

Theresa Thompson and Luke Huckaba from VMware discuss the VMware and Lenovo Partnership for cloud solutions addresses common IT constraints, such as slow time to value, limited resources and incompatible systems. Cloud is an enabler of digital business. How do we reduce the operational burden of running and maintaining hardware and software for cloud and prepare our customers for workload migrations and which are suitable for a cloud environment. How to align cloud Initiative outcomes with business goals.

Tags: Cloud, Software Defined Infrastruture (SDI), ThinkAgile, VMware

Published: 2023-07-12
Length: 90 minutes

> **Start the training:**
> Employee link: Grow@Lenovo

Course code: DVCLD202

33. **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

Tags: Cloud

Published: 2023-07-11
Length: 40 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: DCLDS104r2

34. **Evolve your Data Center with VMware vSphere Distributed Services Engine on Lenovo**
2023-05-26 | 60 minutes | Employees and Partners

Join us for an insightful course that explores the evolving data center landscape and the role of VMware Distributed Services Engine (DSE) in conjunction with Lenovo's ThinkAgile VX series and NVIDIA DPUs. Discover how DSE enhances data security and enables efficient management of heterogeneous infrastructure. Learn about the increasing adoption of GPUs, DPUs, and FPGAs in data centers and their impact on next-generation workloads. Explore the use cases and industries leveraging the benefits of DPUs, including financials, healthcare, retail edge, and sovereign cloud deployments. By the end of this course, you will have a comprehensive understanding of DSE and its potential applications in transforming data center operations.

By the end of this training, you should be able to:
•Understand the concept of VMware Distributed Services Engine (DSE) and its role in evolving the data center
•Recognize the impact of new infrastructure devices on data center operations
•Explore the use cases and industries leveraging the benefits of DPUs

Tags: Cloud, Nvidia, ThinkAgile, VMware

Published: 2023-05-26
Length: 60 minutes

Start the training:
Employee link: Grow@Lenovo
Partner link: Lenovo Partner Learning

Course code: DVXSV102

35. **Improve Storage Performance with VMware vSAN ESA on Lenovo ThinkAgile VX Series**
2023-05-26 | 10 minutes | Employees and Partners

Explore VMware's vSAN 8 release and Lenovo's ThinkAgile VX series in this comprehensive course. Discover how the Express Storage Architecture (ESA) revolutionizes storage by eliminating caching tiers and leveraging storage pools. Learn about hardware requirements, VMware certifications, and Lenovo's Configurator for successful ESA implementation. Enhance your storage performance and optimize your infrastructure. Enroll now to unlock the potential of vSAN 8 and ESA on ThinkAgile VX.

By the end of this training, you should be able to:
•Understand the benefits of VMware's vSAN 8 release and Express Storage Architecture (ESA)
•Recognize the hardware requirements and prerequisites for implementing ESA
•Explore how Lenovo Think Agile VX series supports the implementation of ESA

Tags: Cloud, ThinkAgile, VMware

Published: 2023-05-26
Length: 10 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DVXSV101

36. **Day 0 Operations with ThinkAgile VX**
2023-05-25 | 10 minutes | Employees and Partners

Discover the power of the ThinkAgile VX Deployer in this comprehensive course. Learn to easily deploy and configure ThinkAgile VX Integrated Systems using step-by-step instructions and practical demonstrations. Explore key features, such as vCenter configuration, integration with Lenovo XClarity Integrator, and efficient software installations. Master the deployment process, streamline operations, and optimize your cluster environment.

By the end of this training, you should be able to:
•Understand the purpose and capabilities of the ThinkAgile VX Deployer
•Recognize the benefits of using the Lenovo XClarity Integrator
•Comprehend the steps involved in deploying a cluster with ThinkAgile VX Deployer

Tags: Cloud, Technical Sales, ThinkAgile, VMware, XClarity

Published: 2023-05-25
Length: 10 minutes

> **Start the training:**
> Employee link: Grow@Lenovo
> Partner link: Lenovo Partner Learning

Course code: DCVD101

Related publications and links

For more information, see these resources:

- Lenovo ThinkAgile VX Series
  https://www.lenovo.com/us/en/data-center/software-defined-infrastructure/ThinkAgile-VX-Series/p/WMD00000340
- ThinkAgile VX - Best Recipes
  http://datacentersupport.lenovo.com/us/en/solutions/HT505302
- VMware documentation
  https://docs.vmware.com/
- ThinkSystem SR650 V4 product guide:
  https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server

Related product families

Product families related to this document are the following:

- 2-Socket Rack Servers
- Hyperconverged Infrastructure
- ThinkAgile VX Series for VMware

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