

Lenovo ThinkAgile FX650 V4 Hyperconverged System Product Guide

The Lenovo ThinkAgile FX650 V4 are 2-socket 2U systems that feature the Intel® Xeon® 6 Scalable processors (formerly code named "Granite Rapids"). The latest Lenovo ThinkAgile FX 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 FX V4 Series systems also supports hardware acceleration from Graphics Processing Units (GPUs) for maximum performance. ThinkAgile FX future-proof your investment with seamless HCI software transitions. The ThinkAgile ThinkAgile FX650 V4 provides up to 86 cores and support for the new PCIe 5.0 standard for I/O, the ThinkAgile FX650 V4 offers the ultimate in two-socket performance in a 2U form factor. Lenovo offers ThinkAgile FX with a unique, industry first flexibility for software-defined approach to hyper convergence, leveraging the ability to move between hypervisors of your choice to deliver compute, storage and management in a tightly integrated software stack and future-proof your investment with seamless HCI software transitions between VMware and Nutanix.

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



Figure 1. Lenovo ThinkAgile ThinkAgile FX650 V4 with 2.5-inch drive bays

Did you know?

The ThinkAgile FX650 V4 systems are built on the Lenovo ThinkSystem SR650 V4 server that features enterprise-class reliability, management, and security.

The ThinkAgile FX650 V4 comes paired with Premier Support in supported countries. It offers a single point of support for quick 24/7 problem reporting and resolution.

The ThinkAgile FX650 V4 supports the VMware to Nutanix stack conversion that is handled by professional services.

Key features

ThinkAgile FX650 V4 features

The ThinkAgile FX650 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 and Nutanix.
- Fully tested and validated for vSAN compliance with VMware and includes the latest supported firmware levels integrated at factory.
- Fully validated and integrated hardware and firmware that is certified with Nutanix Cloud Platform (NCP).
- Provide a convenient path to migrate a hyperconverged solution powered by VMware Cloud Foundation (VCF) or VMware vSphere Foundation (VVF) software stacks to Nutanix AHV. Conversion supported with mandatory Lenovo Professional services
- Provide quick and convenient path to implement a hyperconverged solution powered by VMware Cloud Foundation (VCF) or VMware vSphere Foundation (VVF) software stacks with Lenovo Premier Support and Services offering deployment and single point of support services for the solution. Licenses for VCF or VVF can be obtained by contacting a Broadcom Seller directly or a Broadcom authorized software partner.
- Meet various workload demands with performance-optimized all NVMe drives storage configurations.
- 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.

When running VMware software on ThinkAgile FX650 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 vSAN 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.

When running Nutanix software on ThinkAgile FX650 V4 delivers the following key features:

- Mission-critical performance and ultra-reliability of Lenovo's platforms married with the dramatic efficiency and cost savings of the industry-leading Nutanix Enterprise Cloud OS .
- A natively integrated solution for data protection and continuous availability at VM granularity that gives administrators an affordable range of options to meet the recovery point objectives (RPO) and recovery time objectives (RTO) for different applications.
- A fault resistant platform, with no single point of failure and no bottlenecks with shared-nothing architecture, where all data, metadata and services are distributed to all nodes within the cluster, which is built to detect, isolate and recover from failures anywhere in the system.
- An intuitive user-centric management experience to simplify every aspect of the IT infrastructure lifecycle and provide a single pane of glass to monitor and control Nutanix clusters, with simplified workflows and rich automation for common administrative tasks.
- Powerful security features, such as two-factor authentication and data-at-rest encryption, with a security development lifecycle that is integrated into product development to help customers meet the most stringent security requirements.

Hardware features

The ThinkAgile FX650 V4 are based on the ThinkSystem SR650 V4 and have the following hardware features:

Scalability and performance

The ThinkAgile FX650 V4 offer numerous features to boost performance, improve scalability and reduce costs:

- Supports 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. MRDIMMs require Intel Xeon 6700P-series processors.
- Supports up to 4x single-width GPUs or 2x double-wide GPUs, for substantial processing power in a 2U system.
- Supports up to 24x 2.5-inch NVMe front-accessible hot-swap drive 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.

- 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 rear of the server as hot-swap drives.
- Up to 4x PCIe slots (rear accessible), plus two slots dedicated to OCP 3.0 adapters.
- The server has 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.,.

Availability and serviceability

The ThinkAgile FX650 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 is 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 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 ThinkAgile FX650 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 ThinkAgile FX650 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 FX650 V4 are based on the ThinkSystem SR650 V4 server.

The following figure shows the front of the ThinkAgile FX650 V4 with 2.5-inch drives.

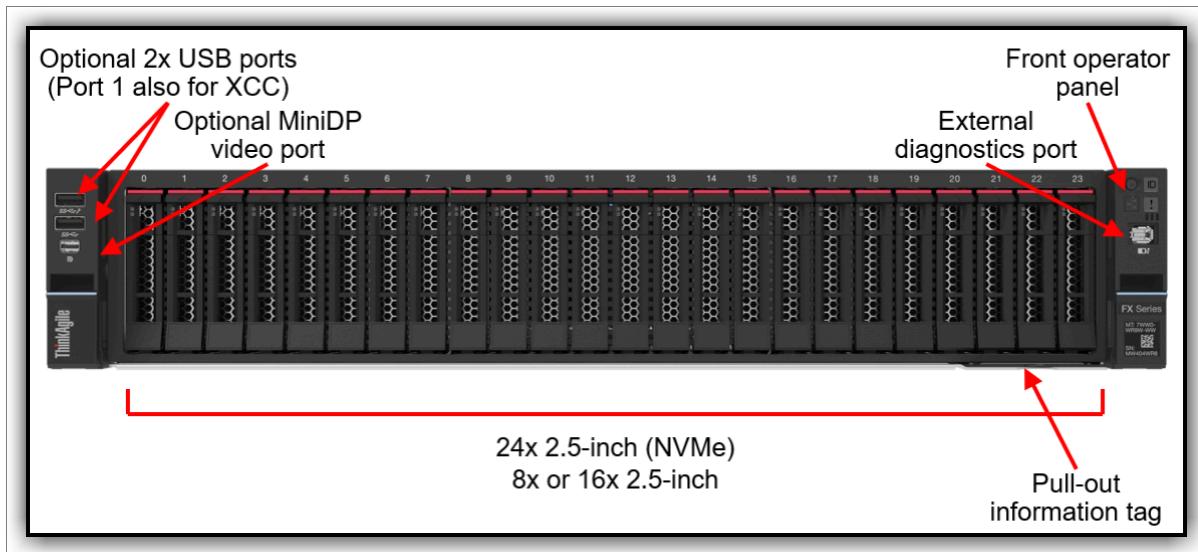


Figure 2. Front view of the ThinkAgile FX650 V4 with 2.5-inch drives

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.

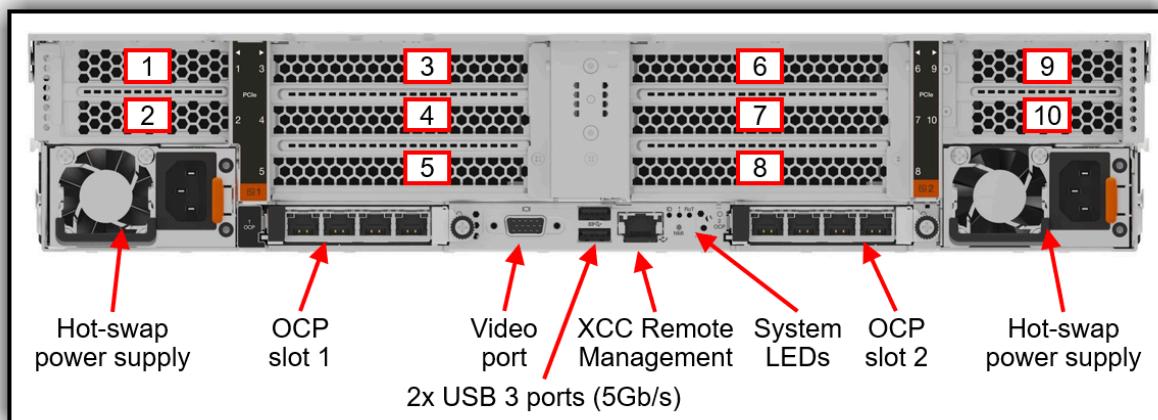


Figure 3. Rear view of the ThinkAgile FX650 V4 systems (configuration with ten PCIe slots)

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

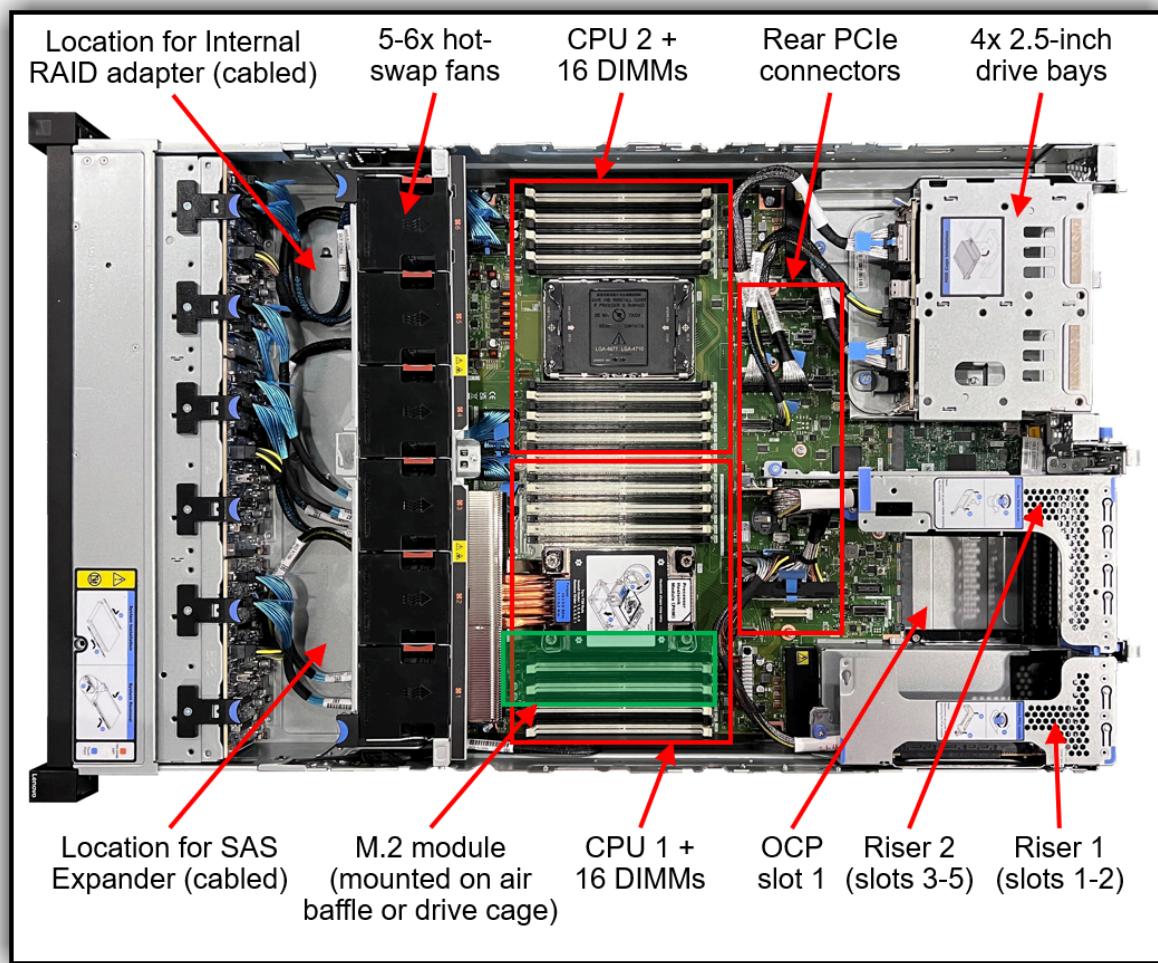


Figure 4. Internal view of the ThinkAgile FX650 V4 systems

Standard specifications

The ThinkAgile FX650 V4 are based on the ThinkSystem SR650 V4 server.

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

Table 1. List of features

	ThinkAgile FX650 V4
Target workloads	Cloud, AI/ML, Database, VDI
Base MTM	7DPMCTO1WW
Form Factor	2U
Base platform	ThinkSystem SR650 V4
Max Cluster Size	64 Hosts
CPU	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 Up to 8TB of system memory
Drive Bays	2x rear hot-swap M.2 with RAID 1 Up to 24x 2.5" drive bays, Front: up to 24x2.5" NVMe hot-swap 2x Internal M.2 with optional RAID 1 PCIe 4.0 NVMe drive support 24x Onboard NVMe ports
Drive configurations	All Flash
Boot drives	2x M.2 NVMe
OCP networking	2x OCP 3.0 adapter 10Gb, 25Gb, 100Gb
PCIe networking	Up to 4x adapters 10Gb BASE-T, 10Gb, 25Gb, 100Gb
DPU- Smart NIC	None
GPUs	Supports up to 4x 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	7DPM - 3 or 5 year warranty
Form factor	2U rack.
Cluster Size	<p>With Lenovo ThinkAgile FX Series & VMware Cloud Foundation (VCF), you need a minimum of 4 nodes to create a management domain cluster.</p> <p>With Lenovo ThinkAgile FX Series & VMware vSphere Foundation (VVF), you can create a vSAN cluster with a minimum 3 hosts* and a maximum of 64 hosts. Requires 8.0 u3 and later releases.</p> <p>With Lenovo ThinkAgile FX Series & Nutanix Foundation, you need a minimum of 3 nodes to create a management domain cluster.</p> <p>*Supports 2-node vSAN cluster deployment with a vSAN witness appliance deployed as a virtual machine or hardware appliance, typically in remote office/branch offices (ROBO) use cases and requires VMware vSphere Foundation (VVF) software license.</p>
Processor	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.
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	<p>24x 2.5-inch hot-swap drive bays:</p> <ul style="list-style-type: none"> Front bays support 24x 2.5-inch NVMe drives <p>M.2 support for OS boot:</p> <ul style="list-style-type: none"> 2x rear hot-swap M.2 drive bays, or Internal M.2 module supporting up to two M.2 drives
Storage controller	<ul style="list-style-type: none"> 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 100 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.

Components	Specification
PCIe slots	<p>Up to 4x 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.</p> <ul style="list-style-type: none"> • 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) <p>All configurations include at the rear of the server:</p> <ul style="list-style-type: none"> • 2x OCP slots with PCIe 5.0 x16 or x8 connection
GPU support	Support for up to 4x single-wide GPUs or 2x double-wide GPUs
Ports	<p>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.</p> <p>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).</p> <p>Internal: Optional 1x USB 3 (5 Gb/s) connector for operating system or license key purposes</p>
Cooling	6x 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	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	See Software Section :
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).
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 FX Hyperconverged Solution

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 FX650 V4	7DPMCTO1WW

Comparison with the ThinkSystem SR650 V4

The ThinkAgile FX650 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 use cases like data migration
- 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 ThinkSystem SR650 V4 product guide:

<https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server>

To verify what specific hardware components are supported with the ThinkAgile FX650 V4, see the DCSC configurator:

<https://dcsc.lenovo.com>

Processors

The ThinkAgile ThinkAgile FX650 V4 supports processors 6th Gen Intel Xeon Scalable Processor family.

- [6th Gen Intel Xeon Scalable processors](#)

6th Gen Intel Xeon Scalable processors

The ThinkAgile FX650 V4 systems support the following processors. The system supports 2 processors installed.

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

Table 4. Granite Rapids Processor choices

Part number	Feature	Description	Mainstream	Maximum supported
				FX650 V4
None	C5QQ	Intel Xeon 6505P 12C 150W 2.2GHz Processor	Mainstream	2
None	C5R6	Intel Xeon 6507P 8C 150W 3.5GHz Processor	Mainstream	2
None	C5RD	Intel Xeon 6515P 16C 150W 2.3GHz Processor	Mainstream	2
None	C5QV	Intel Xeon 6517P 16C 190W 3.2GHz Processor	Mainstream	2
None	C5QR	Intel Xeon 6520P 24C 210W 2.4GHz Processor	Mainstream	2
None	C659	Intel Xeon 6527P 24C 255W 3.0GHz Processor	Mainstream	2
None	C5QT	Intel Xeon 6530P 32C 225W 2.3GHz Processor	Mainstream	2
None	C5R7	Intel Xeon 6714P 8C 165W 4.0GHz Processor	Extended	2
None	C5R5	Intel Xeon 6724P 16C 210W 3.6GHz Processor	Mainstream	2
None	C5R4	Intel Xeon 6730P 32C 250W 2.5GHz Processor	Extended	2
None	CARB	Intel Xeon 6732P 32C 350W 3.8GHz Processor	Extended	2
None	C5R0	Intel Xeon 6736P 36C 205W 2.0GHz Processor	Extended	2
None	C5QX	Intel Xeon 6737P 32C 270W 2.9GHz Processor	Mainstream	2
None	C5R3	Intel Xeon 6740P 48C 270W 2.1GHz Processor	Mainstream	2
None	CARA	Intel Xeon 6745P 32C 300W 3.1GHz Processor	Extended	2
None	C5R8	Intel Xeon 6747P 48C 330W 2.7GHz Processor	Mainstream	2
None	C5R1	Intel Xeon 6760P 64C 330W 2.2GHz Processor	Extended	2
None	C5QY	Intel Xeon 6767P 64C 350W 2.4GHz Processor	Mainstream	2
None	C5QM	Intel Xeon 6787P 86C 350W 2.0GHz Processor	Mainstream	2

Memory

6th Generation Memory options

The ThinkAgile FX650 V4 systems support the following 6th generation memory options. The ThinkAgile FX650 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.

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

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

Table 5. Granite Rapids Memory options

Part number	Feature	Description	Mainstream	Maximum supported
x4 RDIMMs				
4X77A90964	C0U9	ThinkSystem 32GB TruDDR5 6400MHz (1Rx4) RDIMM	Mainstream	32
4X77A90966	C0TQ	ThinkSystem 64GB TruDDR5 6400MHz (2Rx4) RDIMM	Mainstream	32
4X77A90997	BZ7D	ThinkSystem 96GB TruDDR5 6400MHz (2Rx4) RDIMM	Mainstream	32
4X77A90993	C0U1	ThinkSystem 128GB TruDDR5 6400MHz (2Rx4) RDIMM	Mainstream	32
x8 RDIMMs				
4X77A90963	C0U2	ThinkSystem 16GB TruDDR5 6400MHz (1Rx8) RDIMM	Mainstream	32
4X77A90965	BYTJ	ThinkSystem 32GB TruDDR5 6400MHz (2Rx8) RDIMM	Mainstream	32
3DS RDIMMs				
4X77A90994	C0U0	ThinkSystem 256GB TruDDR5 6400MHz (4Rx4) 3DS RDIMM	Mainstream	32
MRDIMMs (operate at 8000 MHz in the ThinkAgile FX650 V4) (Note: Not all processors support MRDIMMs - see Processor features)				
4X77A90999	C0TX	ThinkSystem 64GB TruDDR5 8800MHz (2Rx4) MRDIMM	Mainstream	32
4X77A90998	C0TY	ThinkSystem 32GB TruDDR5 8800MHz (2Rx8) MRDIMM	Mainstream	32

Internal storage

The ThinkAgile FX650 V4 supports:..

The drive bay zone is as follows:

- Front:
 - Up to 24x 2.5-inch NVMe

All drives are hot-swap and are accessible from the front.

The server also supports two M.2 drives:

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

For details about NVMe drives see the the ThinkSystem SR650 V4 product guide:

<https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#nvme-drive-support>

For details about these options, including configuration rules, see the ThinkSystem SR650 V4 product guide:

<https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#internal-storage>

Table 6. Drive backplanes

Part number	Feature	Description	Maximum supported
Front 2.5-inch drive backplanes			
None	C46P	ThinkSystem 2U V4 8x2.5" NVMe Backplane	3

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 ThinkSystem SR650 V4 product guide:
<https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server#internal-storage>

Table 7. Boot Drive Enablement

Part number	Feature	Description	Maximum supported
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 FX650 V4 with VMware](#)
- [Internal drives for FX650 V4 with Nutanix](#)

VMware Configuration Notes:

- Express Storage Architecture (ESA) supports a minimum of 1 drive 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.

Nutanix Configuration Note:

- For Flash with all NVMe config: Per node storage capacity over 307TB is only supported for NUS use cases.

Boot drives

The ThinkAgile FX650 V4 systems support the following drive for boot functions.

Table 8. Boot drives

Part number	Feature	Description	Maximum supported
			FX650 V4
M.2 PCIe 4.0 NVMe Drives			
4XB7A82636	BS2P	ThinkSystem M.2 7450 PRO 480GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD	2
4XB7A13999	BKSR	ThinkSystem M.2 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD	2

Internal drives for FX650 V4 with VMware

The following table lists the drives support in the Internal Drives for ThinkAgile FX650 V4 - VMware.

Table 9. Drives supported in the Internal Drives for ThinkAgile FX650 V4 - VMware

Part number	Feature	Description	All Flash
			ESA
2.5-inch hot-swap PCIe 4.0 NVMe SSDs			
4XB7A95050	C2BR	ThinkSystem 2.5" U.3 7500 PRO 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95051	C2BS	ThinkSystem 2.5" U.3 7500 PRO 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95052	C2BT	ThinkSystem 2.5" U.3 7500 PRO 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95053	C2BU	ThinkSystem 2.5" U.3 7500 PRO 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95055	C2BV	ThinkSystem 2.5" U.3 7500 MAX 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95056	C2BW	ThinkSystem 2.5" U.3 7500 MAX 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24

Part number	Feature	Description	All Flash
			ESA
4XB7A95057	C2BF	ThinkSystem 2.5" U.3 7500 MAX 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24

Internal drives for FX650 V4 with Nutanix

The following table lists the drives support in the Internal Drives for ThinkAgile FX650 V4 - Nutanix.

Table 10. Drives supported in the Internal Drives for ThinkAgile FX650 V4 - Nutanix

Part number	Feature	Description	Maximum supported
			FX650 V4
2.5-inch hot-swap PCIe 4.0 NVMe SSDs			
4XB7A95050	C2BR	ThinkSystem 2.5" U.3 7500 PRO 1.92TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95051	C2BS	ThinkSystem 2.5" U.3 7500 PRO 3.84TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95052	C2BT	ThinkSystem 2.5" U.3 7500 PRO 7.68TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95053	C2BU	ThinkSystem 2.5" U.3 7500 PRO 15.36TB Read Intensive NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95055	C2BV	ThinkSystem 2.5" U.3 7500 MAX 1.6TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95056	C2BW	ThinkSystem 2.5" U.3 7500 MAX 3.2TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24
4XB7A95057	C2BF	ThinkSystem 2.5" U.3 7500 MAX 6.4TB Mixed Use NVMe PCIe 4.0 x4 HS SSD	24

Network adapters

The ThinkAgile FX650 V4 system supports the following networking options.

For details about these options, including configuration rules, see the ThinkSystem 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
			FX650 V4
10 Gb Ethernet - 10GBASE-T			
4XC7A08236	B5ST	ThinkSystem Broadcom 57416 10GBASE-T 2-port OCP Ethernet Adapter	2
4XC7A95696	C4GB	ThinkSystem Broadcom 57412 10GBase-T 4-Port OCP Ethernet Adapter	2
25 Gb Ethernet			
4XC7A08237	BN2T	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-Port OCP Ethernet Adapter	2
4XC7A62582	BE4T	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-port OCP Ethernet Adapter	2
4XC7A80567	BPPW	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-Port OCP Ethernet Adapter	2

Table 12. PCIe network adapters

Part number	Feature	Description	Maximum supported
			FX650 V4
10 Gb Ethernet - 10GBASE-T			
7ZT7A00496	AUKP	ThinkSystem Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	4
25 Gb Ethernet			
4XC7A62580	BE4U	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-port PCIe Ethernet Adapter	4
4XC7A08238	BK1H	ThinkSystem Broadcom 57414 10/25GbE SFP28 2-port PCIe Ethernet Adapter	4
4XC7A80566	BNWM	ThinkSystem Broadcom 57504 10/25GbE SFP28 4-port PCIe Ethernet Adapter	4
100 Gb Ethernet			
4XC7A08248	B8PP	ThinkSystem Mellanox ConnectX-6 Dx 100GbE QSFP56 2-port PCIe Ethernet Adapter	4

GPU adapters

The ThinkAgile FX650 V4 systems support the following GPU options.

For details about these options, including configuration rules, see the ThinkSystem 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 FX Systems

Table 13. GPU adapters

Part number	Feature	Description	Maximum supported
Single-wide GPUs			
4X67A84824	BS2C	ThinkSystem NVIDIA L4 24GB PCIe Gen4 Passive GPU	4
Double-wide GPUs			
4X67A90669	BYFH	ThinkSystem NVIDIA L40S 48GB PCIe Gen4 Passive GPU	2

Operating system support

The ThinkAgile FX650 V4 supports the following operating systems:

- Vmware ESXi 8.0u3 (Factory Installed)
- Vmware ESXi 9.0 (Factory Installed)
- Nutanix AHV (Field Installed)

Configuration Note:

For further details, including any restrictions, see the OS Interoperability Guide:

<https://lenovopress.lenovo.com/osig#term=vx&support=all>

Software

ThinkAgile FX650 V4 with VMware

When using VMware hypervisor, ThinkAgile FX Series offers support for VMware Cloud Foundation (VCF) and VMware vSphere Foundation (VVF) primary software stack options. Subscription Licenses can be purchased by contacting Broadcom Seller directly or a Broadcom authorized software partner. It is recommended that the VMware subscription license should match the length of the Lenovo hardware warranty, 3-year or 5-year durations. In addition to the primary stack options, advanced service options are available for features like vSAN additional capacity, Live Recovery, Firewall with Advanced Threat Prevention and Avi Load Balancer. Private AI Foundation is no longer a standalone add-on but part of the VCF license. The following VMware subscription software license are available for purchase by contacting a Broadcom Seller directly or a Broadcom authorized software partner.:

- Primary Software
 1. VMware Cloud Foundation (VCF)
 2. VMware vSphere Foundation (VVF)

For the current list of available add-ons for the VMware primary software, see the Broadcom feature comparison document. <https://www.vmware.com/docs/vmware-cloud-foundation-9-0-feature-comparison-and-upgrade-paths>.

Configuration notes:

- For more information on ThinkAgile FX Series Hardware needed for the respective VMware license quantities, please use the VMware SW license calculator at <https://lets.lenovo.com/vlets-calculator/>.

ThinkAgile FX650 V4 with Nutanix

When using Nutanix, ThinkAgile FX Series offers support for the Nutanix hypervisor listed in the following table. Hypervisors are installed on the 2x M.2 SSDs configured in a RAID-1 drive group.

Table 14. Hypervisors

Feature	Description
B15S	Nutanix SW Stack on Nutanix AHV

Configuration notes:

- The ThinkAgile FX Hyperconverged Solutions support firmware updates from Nutanix with Lifecycle Manager (UEFI, XCC3, drives, and network adapters)

Nutanix licenses: The ThinkAgile FX650 V4 software licenses are optional and are recommended to be purchased from Lenovo for a more seamless experience. Customers can use the existing Nutanix term-based software licenses and active support contracts, or they can purchase term-based software licenses and support contracts from Nutanix.

For the information on ThinkAgile FX Hyperconverged Solution firmware levels, hypervisor versions, and software versions that have been tested for interoperability, refer to the Lenovo ThinkAgile FX Series Best Recipes:

<http://datacentersupport.lenovo.com/us/en/solutions/ht505413>

Nutanix Portfolio 2.0 (PnP) Licensing Model

Nutanix provides an enterprise-ready unified cloud platform with our HCI solution as the foundation. The new, simplified product portfolio includes: Nutanix Cloud Platform (NCP), Nutanix Cloud Infrastructure (NCI) and Nutanix Cloud Manager (NCM), NCI-Data with 3 license tiers for each software edition. There are additional packages, Nutanix Unified Storage, Nutanix Database Service (NDB), and Nutanix Desktop Services (NDS), Virtual Desktop Infrastructure (VDI) & Nutanix Frame that are available.

The Nutanix software is available for all base CTO models.

The editions have the following characteristics:

Table 15. Software Editions

License Tier	Nutanix Cloud Platform (NCP)	Nutanix Cloud Infrastructure (NCI)	Nutanix Cloud Manager (NCM)	NCI-Data
Ultimate	<ul style="list-style-type: none">• NCI Ultimate• NCM Ultimate	<ul style="list-style-type: none">• Advanced DR: Sync, Near-Sync,• Runbook Security: Micro-segmentation, Encryption• Cloud Native: Kubernetes Services	<ul style="list-style-type: none">• Application Automation• Security General	<ul style="list-style-type: none">• No Mseg• No Karbon
Pro	<ul style="list-style-type: none">• NCI Ultimate• NCM Pro	<ul style="list-style-type: none">• Multisite Async DR• Overlay Networking	<ul style="list-style-type: none">• Self Service Cost Governance	<ul style="list-style-type: none">• No Flow Networking
Starter	<ul style="list-style-type: none">• NCI Pro• NCM Pro	<ul style="list-style-type: none">• AOS Storage + Compression + Deduplication	<ul style="list-style-type: none">• AI Operations	<ul style="list-style-type: none">• No AHV Support

Nutanix Cloud Platform (NCP)

Nutanix Cloud Platform is the complete software edition package that includes both Nutanix Cloud Infrastructure (NCI) and Nutanix Cloud Manager (NCM). It is available in several editions to meet your infrastructure needs with the right set of capabilities.

Nutanix Cloud Infrastructure (NCI)

Nutanix Cloud Infrastructure (NCI) is a complete software stack to unify your hybrid cloud infrastructure including compute, storage and network, hypervisors and containers, in public or enterprise clouds; all with built-in resilience, self-healing, disaster recovery capabilities, and security. It includes enterprise data services and consolidated storage, data protection and disaster recovery, native virtualization and container management, networking and security.

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#nci>

Nutanix Cloud Manager (NCM)

Nutanix Cloud Manager (NCM) offers our customers simplicity and ease of use to build and grow their cloud deployments faster and realize rapid ROI, by providing intelligent operations, self-service and orchestration, visibility and governance of spend, security and teams, all through a unified Multi-cloud management solution.

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#ncm>

Nutanix Unified Storage

Nutanix Unified Storage provides software-defined, scale-out storage solutions for enterprise NAS and object workloads for unstructured data, block storage for structured data, and backup storage. Nutanix Unified Storage replaces traditional independent storage services and brings NAS, object, and block

workloads into a consolidated unified storage platform with all its benefits, including a unified control plane.

Nutanix Data Lens delivers cloud-based data governance for unstructured data stored in the Nutanix Unified Storage platform, including data lifecycle management, data security, ransomware protection, and audit compliance.

Nutanix Unified Storage and Data Lens are purchased and licensed on a per TiB usable basis.

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#nus>

Nutanix Database Service

Nutanix Database Service (NDB) is a Hybrid Multicloud DBaaS that enables small, nimble teams of DBAs to easily manage large fleets of databases using a single console and API, while enabling developers to self-service their database requests. NDB is purchased and licensed on a per core basis and is available either as a standalone or as an add-on to NCI. In the standalone version, NDB includes NCI Ultimate functionality in addition to database-specific capabilities and is licensed on a per-core basis.

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#database>

Nutanix Virtual Desktop Infrastructure (VDI) & Nutanix Frame

The Nutanix VDI per user model offers hybrid cloud infrastructure capabilities appropriate for on-prem virtual desktop infrastructure (VDI) and Desktop as a Service (DaaS) use cases with pricing based on a Maximum Concurrent User basis (maximum number of provisioned end user VMs). VDI per user is an alternative to the core-based NCI licensing option and is designed to provide simple, transparent licensing for all VDI users, regardless of the underlying hardware, hypervisor, or cloud.

- Agnostic: Works with any EUC management platform including Citrix Virtual Apps & Desktops and VMware Horizon
- Term license: 1-year through 5-year options
 - Term license must run on a dedicated software licensed VDI cluster with no core-based licensing. Mixing of non-VDI workloads is not supported.
- Unified Storage: Built-in and available as a per TiB base add-on
- No additional license cost for DR site
- Portable across on-premises and public cloud, public cloud use requires Ultimate edition
- Available in Starter, Pro, and Ultimate editions
- Cloud Native and Database Service Add-ons not available with NCI VDI. Advanced Replication and Security Add-on features require NCI Ultimate edition

For details on software editions see <https://www.nutanix.com/products/cloud-platform/software-options#vdi>

License Options

ThinkAgile HX can be configured with one of the latest Nutanix software editions that are listed in the following table.

Table 16. Nutanix license options

Feature code	Description	Quantity Required
BVKU	Nutanix Cloud Platform Starter Edition	1 per node
BVKW	Nutanix Cloud Platform Pro Edition	1 per node
BVKY	Nutanix Cloud Platform Ultimate Edition	1 per node
BSPJ	Nutanix Cloud Infrastructure Starter Edition	1 per node
BSPG	Nutanix Cloud Infrastructure Pro Edition	1 per node
BSPL	Nutanix Cloud Infrastructure Ultimate Edition	1 per node

Feature code	Description	Quantity Required
BSQ0	Nutanix Cloud Manager Starter Edition	1 per node
BSPY	Nutanix Cloud Manager Pro Edition	1 per node
BSQ2	Nutanix Cloud Manager Ultimate Edition	1 per node
BSPQ	NCI-Data Starter Edition	1 per node
BSPN	NCI-Data Pro Edition	1 per node
BSPS	NCI-Data Ultimate Edition	1 per node
BSQH	Nutanix Database Service (NDB) Platform	1 per node
BSQ7	End User Computing (EUC) Starter	1 for every 200 concurrent users
BSQ5	End User Computing (EUC) Pro	1 for every 200 concurrent users
BSQ9	End User Computing (EUC) Ultimate	1 for every 200 concurrent users
BSQD	Nutanix Unified Storage (NUS) Starter	1 per Tib
BSQB	Nutanix Unified Storage (NUS) Pro	1 per Tib

Warranty and Support

The ThinkAgile FX650 V4 has a 3 or 5-year warranty based on the machine type:

- 7DPM - 3 or 5 year warranty

The ThinkAgile FX Series can be configured with a three- or five-year hardware warranty with 24x7 ThinkAgile Advantage Single Point of Support 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 Premier determination and resolution for hardware-related issues and escalate to VMware by Broadcom or Nutanix, on behalf of the customer, for software-related problem determination. VMware or Nutanix depending on current hypervisor installed 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.
- **Premier Enhanced Storage Support 24x7 4-Hour Response** – Best choice for storage systems where maximum uptime is critical.

For more information, consult the brochure [Lenovo Operational Support Services for Data Centers Services](#).

Services

Lenovo Data Center Services empower you at every stage of your IT lifecycle. From expert advisory and strategic planning to seamless deployment and ongoing support, we ensure your infrastructure is built for success. Our comprehensive services accelerate time to value, minimize downtime, and free your IT staff to focus on driving innovation and business growth.

Note: Some service options may not be available in all markets or regions. For more information, go to <https://lenovolocator.com/>. For information about Lenovo service upgrade offerings that are available in your region, contact your local Lenovo sales representative or business partner.

In this section:

- [Lenovo Advisory Services](#)
- [Lenovo Plan & Design Services](#)
- [Lenovo Deployment, Migration, and Configuration Services](#)
- [Lenovo Support Services](#)
- [Lenovo Managed Services](#)
- [Lenovo Sustainability Services](#)

Lenovo Advisory Services

Lenovo Advisory Services simplify the planning process, enabling customers to build future-proofed strategies in as little as six weeks. Consultants provide guidance on projects including virtual machine migration, storage, backup and recovery, and cost management to accelerate time to value, improve cost efficiency, and build a flexibly scalable foundation.

- **Assessment Services**

An Assessment helps solve your IT challenges through an onsite, multi-day session with a Lenovo technology expert. We perform a tools-based assessment which provides a comprehensive and thorough review of a company's environment and technology systems. In addition to the technology based functional requirements, the consultant also discusses and records the non-functional business requirements, challenges, and constraints. Assessments help organizations like yours, no matter how large or small, get a better return on your IT investment and overcome challenges in the ever-changing technology landscape.

- **Design Services**

Professional Services consultants perform infrastructure design and implementation planning to support your strategy. The high-level architectures provided by the assessment service are turned into low level designs and wiring diagrams, which are reviewed and approved prior to implementation. The implementation plan will demonstrate an outcome-based proposal to provide business capabilities through infrastructure with a risk-mitigated project plan.

Lenovo Plan & Design Services

Unlock faster time to market with our tailored, strategic design workshops to align solution approaches with your business goals and technical requirements. Leverage our deep solution expertise and end-to-end delivery partnership to meet your goals efficiently and effectively.

Lenovo Deployment, Migration, and Configuration Services

Optimize your IT operations by shifting labor-intensive functions to Lenovo's skilled technicians for seamless on-site or remote deployment, configuration, and migration. Enjoy peace of mind, faster time to value, and

comprehensive knowledge sharing with your IT staff, backed by our best-practice methodology.

- **Deployment Services for Storage and ThinkAgile**

A comprehensive range of remote and onsite options tailored specifically for your business needs to ensure your storage and ThinkAgile hardware are fully operational from the start.

- **Hardware Installation Services**

A full-range, comprehensive setup for your hardware, including unpacking, inspecting, and positioning components to ensure your equipment is operational and error-free for the most seamless and efficient installation experience, so you can quickly benefit from your investments.

- **DM/DG File Migration Services**

Take the burden of file migration from your IT's shoulders. Our experts will align your requirements and business objectives to the migration plans while coordinating with your team to plan and safely execute the data migration to your storage platforms.

- **DM/DG/DE Health Check Services**

Our experts perform proactive checks of your Firmware and system health to ensure your machines are operating at peak and optimal efficiency to maximize up-time, avoid system failures, ensure the security of IT solutions and simplify maintenance.

- **Factory Integrated Services**

A suite of value-added offerings provided during the manufacturing phase of a server or storage system that reduces time to value. These services aim at improving your hardware deployment experience and enhance the quality of a standard configuration before it arrives at your facility.

Lenovo Support Services

In addition to response time options for hardware parts, repairs, and labor, Lenovo offers a wide array of additional support services to ensure your business is positioned for success and longevity. Our goal is to reduce your capital outlays, mitigate your IT risks, and accelerate your time to productivity.

- **Premier Support for Data Centers**

Your direct line to the solution that promises the best, most comprehensive level of support to help you fully unlock the potential of your data center.

- **Premier Enhanced Storage Support (PESS)**

Gain all the benefits of Premier Support for Data Centers, adding dedicated storage specialists and resources to elevate your storage support experience to the next level.

- **Committed Service Repair (CSR)**

Our commitment to ensuring the fastest, most seamless resolution times for mission-critical systems that require immediate attention to ensure minimal downtime and risk for your business. This service is only available for machines under the Premier 4-Hour Response SLA.

- **Multivendor Support Services (MVS)**

Your single point of accountability for resolution support across vast range of leading Server, Storage, and Networking OEMs, allowing you to manage all your supported infrastructure devices seamlessly from a single source.

- **Keep Your Drive (KYD)**

Protect sensitive data and maintain compliance with corporate retention and disposal policies to ensure your data is always under your control, regardless of the number of drives that are installed in your Lenovo server.

- **Technical Account Manager (TAM)**

Your single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time, ensuring smooth operations and optimized performance as your business grows.

- **Enterprise Software Support (ESS)**

Gain comprehensive, single-source, and global support for a wide range of server operating systems and Microsoft server applications.

For more information, consult the brochure [Lenovo Operational Support Services for Data Centers](#).

Lenovo Managed Services

Achieve peak efficiency, high security, and minimal disruption with Lenovo's always-on Managed Services. Our real-time monitoring, 24x7 incident response, and problem resolution ensure your infrastructure operates seamlessly. With quarterly health checks for ongoing optimization and innovation, Lenovo's remote active monitoring boosts end-user experience and productivity by keeping your data center's hardware performing at its best.

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 your systems are providing business value through optimized performance.

Lenovo Sustainability Services

- **Asset Recovery Services**

Lenovo Asset Recovery Services (ARS) provides a secure, seamless solution for managing end-of-life IT assets, ensuring data is safely sanitized while contributing to a more circular IT lifecycle. By maximizing the reuse or responsible recycling of devices, ARS helps businesses meet sustainability goals while recovering potential value from their retired equipment. For more information, see the [Asset Recovery Services offering page](#).

- **CO2 Offset Services**

Lenovo's CO2 Offset Services offer a simple and transparent way for businesses to take tangible action on their IT footprint. By integrating CO2 offsets directly into device purchases, customers can easily support verified climate projects and track their contributions, making meaningful progress toward their sustainability goals without added complexity.

- **Lenovo Certified Refurbished**

Lenovo Certified Refurbished offers a cost-effective way to support IT circularity without compromising on quality and performance. Each device undergoes rigorous testing and certification, ensuring reliable performance and extending its lifecycle. With Lenovo's trusted certification, you gain peace of mind while making a more sustainable IT choice.

Software maintenance

The software maintenance from Broadcom or Nutanix should match the three-, or five-year duration of the selected Lenovo hardware warranty period that entitles customers to submit service requests to troubleshoot VMware or Nutanix 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 Broadcom or Nutanix, 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.

Lenovo TruScale

Lenovo TruScale XaaS 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 ThinkSystem SR650 V4 conforms to the following standards:

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. VTT Cloud Architecture: The Lenovo ThinkAgile Demo Toolkit - Maximizing Resources and Driving Customer Confidence

2026-01-22 | 63 minutes | Employees and Partners

Seeing is believing when it comes to showcasing the value of ThinkAgile.

As a technical seller, solution architect or pre-sales engineer you know that a successful demonstration can be the linchpin of the sales cycle. ThinkAgile offers simplicity, scalability, and TCO reduction, but conveying these benefits effectively requires more than just a demo environment—it requires a strategy and a mastery of the resources at your disposal.

Did you know we have various pre-built demos and environments available for use with your customers?

This exclusive, Lenovo focused webinar is your master class on leveraging our existing HCI demo assets. We will dive into what's available, how to use it for maximum impact, and gather your crucial feedback to refine our future technical sales tools.

This session moves beyond product features to focus entirely on execution and resource utilization.

- Catalog of HCI Demo Resources: Get a comprehensive, up-to-date tour of all available assets, including:
 - Pre-recorded Demo Videos for different workloads (VDI, Lifecycle Management).
 - Clickable, Interactive Product Tours for early-stage discovery.
 - Reference Architecture Demos illustrating hybrid cloud and multi-site deployments.

Your Voice, Our Future Demos (Feedback Session): This is your opportunity to directly influence the tools you use every day. We will dedicate time to:

- Reviewing the effectiveness of current demos in competitive scenarios.
- Gathering direct feedback on what critical use cases or feature gaps need to be covered in future demo development.
- Discussing any technical or logistical issues encountered while using the current environments.

Tags: Microsoft, Nutanix, Software Defined Infrastructure (SDI), ThinkAgile, VMware

Published: 2026-01-22

Length: 63 minutes

Start the training:

Employee link: [Grow@Lenovo](#)

Partner link: [Lenovo 360 Learning Center](#)

Course code: DVCLD229

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>
- Lenovo ThinkAgile HX Series Best Recipes
<https://support.lenovo.com/us/en/solutions/HT515725>
- 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

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.

© Copyright Lenovo 2026. All rights reserved.

This document, LP2338, was created or updated on January 13, 2026.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
<https://lenovopress.lenovo.com/LP2338>
- Send your comments in an e-mail to:
comments@lenovopress.com

This document is available online at <https://lenovopress.lenovo.com/LP2338>.

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®
Neptune®
ThinkAgile®
ThinkSystem®
XClarity®

The following terms are trademarks of other companies:

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

Microsoft®, SQL Server®, and SharePoint® 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.