Lenovo ThinkAgile VX1320 Appliance
Product Guide (withdrawn product)

Lenovo ThinkAgile VX Series appliances combine industry-leading hyperconverged infrastructure software from VMware with Lenovo enterprise platforms that feature the Intel Xeon processors. VMware offers a unique, software-defined approach to hyper convergence, leveraging the hypervisor to deliver compute, storage and management in a tightly integrated software stack.

The ThinkAgile VX1320 is a 1U rack-mount appliance that supports one processor, up to 64 GB of TruDDR4 memory with up to 2666 MHz memory speeds, up to 10x 2.5-inch SAS/SATA drive bays with an extensive choice of SATA SSDs and SAS HDDs, and flexible network connectivity options with 1/10 GbE RJ-45, 10 GbE SFP+, and 10/25 GbE SFP28 ports.

The ThinkAgile VX1320 appliance is engineered for light to medium workloads (business applications and VDI) and optimized for remote office and branch office (ROBO) environments.

The ThinkAgile VX1320 appliance is shown in the following figure.

Figure 1. Lenovo ThinkAgile VX1320 Appliance

Did you know?

The ThinkAgile VX Series appliances are built on industry-leading Lenovo ThinkSystem servers that feature enterprise-class reliability, management, and security.

The ThinkAgile VX Series appliances offer ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.

Key features

The ThinkAgile VX Series appliances offer the following key features:

- Factory-integrated, pre-configured ready-to-go appliances 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.
- Provide quick and convenient path to implement a hyperconverged solution powered by VMware vSAN with "one stop shop" and a single point of contact provided by Lenovo for purchasing, deploying, and supporting the solution.
- Meet various workload demands with cost-efficient hybrid or performance-optimized all-flash storage configurations.
- Deliver fully validated and integrated hardware and firmware that is certified with VMware software.
- Include Lenovo ThinkAgile Advantage Single Point of Support for quick 24/7 problem reporting and resolution.
- Offer Lenovo deployment services to get customers up and running quickly.

The VMware software running on ThinkAgile VX Series appliances 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.
- 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.

Components and connectors

The following figure shows the front of the ThinkAgile VX1320 appliance with eight 2.5-inch drive bays.

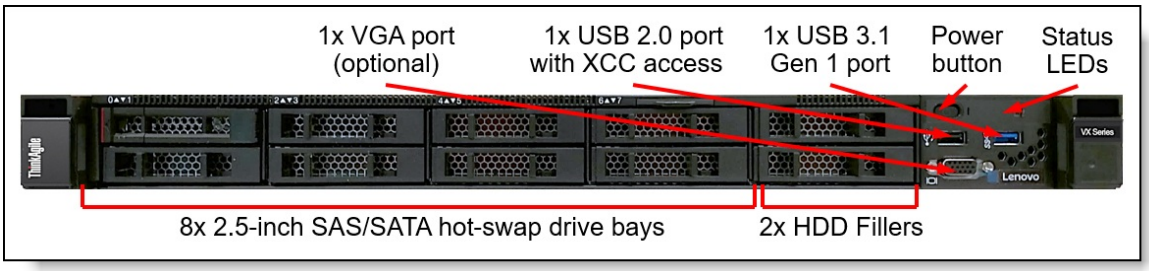

Figure 2. Front view of the ThinkAgile VX1320 appliance: 8x 2.5-inch drive bays

The following figure shows the front of the ThinkAgile VX1320 appliance with ten 2.5-inch drive bays.

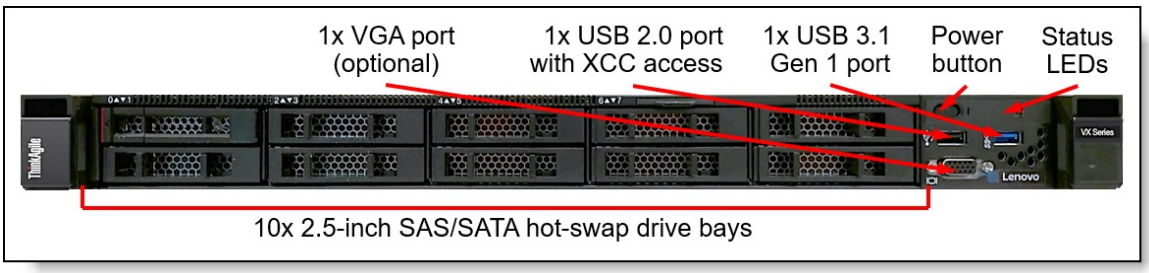

Figure 3. Front view of the ThinkAgile VX1320 appliance: 10x 2.5-inch drive bays

The front of the ThinkAgile VX1320 appliance includes the following components:

- Drive bays:
  - 8x 2.5-inch (Small Form Factor [SFF]) SAS/SATA hot-swap; or
  - 10x 2.5-inch SAS/SATA hot-swap drive bays.
- One VGA port (optional)
- One USB 2.0 port with XClarity Controller access
- One USB 3.1 Gen 1 port
- A Power button
- Status LEDs

The following figure shows the rear of the ThinkAgile VX1320 appliance.

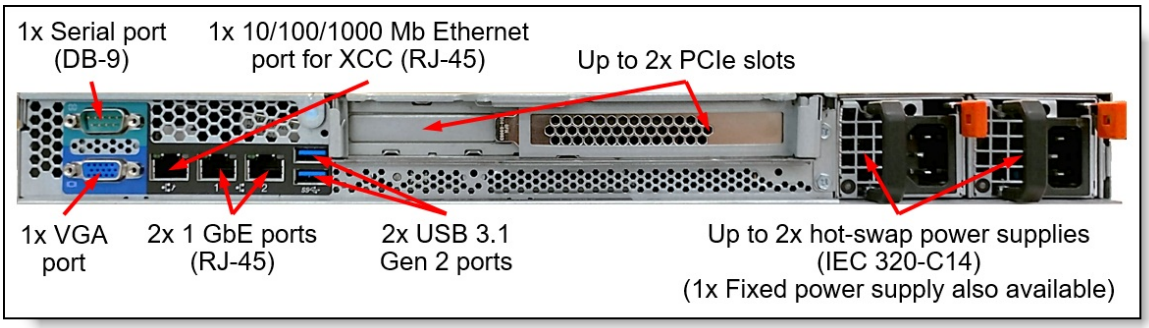

Figure 4. Rear view of the ThinkAgile VX1320 appliance

The rear of the ThinkAgile VX1320 appliance includes the following components:

- Up to two PCIe expansion slots (depending on the riser cards selected).
- One 1 GbE port for XClarity Controller.
- One RS-232 serial port.
- One VGA port.
- Two 1 GbE data network ports.
- Two USB 3.1 Gen 2 ports.
- Power supplies
    - Up to two hot-swap power supplies; or
    - One fixed power supply.

System specifications

The following table lists the system specifications of the ThinkAgile VX2320 appliance.

Table 1. ThinkAgile VX1320 system specifications

Attribute	**Specification**
Form factor	1U Rack-mount.
Processor	One Intel Xeon E processor.
Chipset	Intel C246.
Memory	4 DIMM sockets (two memory channels with two DIMMs per channel). Support for ECC UDIMMs. Memory speed up to 2666 MHz.
Memory capacity	Up to 64 GB (4x 16 GB UDIMMs).
Memory protection	Error correction code (ECC).
Drive bays	• 8 SFF (2.5-inch) SAS/SATA hot-swap drive bays. • 10 SFF (2.5-inch) SAS/SATA hot-swap drive bays.
Internal storage	• 1 drive group: 1 cache drive + from 2 to 7 capacity drives. • 2 drive groups: 1 cache drive + from 2 to 4 capacity drives in each group. • 3 drive groups: 1 cache drive + 2 capacity drives in each group. **Note:** The quantity of the capacity drives in each drive group must be the same.

Drive capacities	• Cache drives: 6 Gbps SATA SSDs up to 1.92 TB.
	• Capacity drives:
	  ◦ 12 Gbps SAS HDDs up to 2.4 TB.
	  ◦ 12 Gbps NL SAS HDDs up to 2 TB.
	  ◦ 6 Gbps SATA SSDs up to 1.92 TB.
	
	Note: All cache drives in the appliance must be of the same model and capacity. All capacity drives in the appliance must be of the same model and capacity.

Storage capacity	• Hybrid: Up to 19.2 TB (8x 2.4 TB HDDs). • All Flash: Up to 15.36 TB (8x 1.92 TB SSDs).

Storage controller	• 12 Gbps SAS/6 Gbps SATA non-RAID:
	  ◦ 430-8i HBA.
	  ◦ 430-16i HBA.

Network interfaces	• 1 GbE RJ-45: 2 - 10 (Onboard + Up to 2 network adapters). • 10 GbE RJ-45 or SFP+: 2 - 8 (Up to 2 network adapters). • 25 GbE SFP28: 1 - 4 (Up to 2 network adapters).
Boot drive	1x M.2 non-hot-swap SSD up to 480 GB.

Attribute	Specification
I/O expansion slots	Up to three slots. Slot 4 is the fixed slot on the system planar, and the remaining slots depend on the riser cards installed. The slots are as follows: • Slot 1: PCIe 3.0 x8; low profile (not present if the Slot 2 is x16). • Slot 2: PCIe 3.0 x8 (x16 physical connector) or x16; full-height, half-length. • Slot 4: PCIe 3.0 x4 (supports an internal storage controller).
Ports	• Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.1 Gen 1 port, 1x VGA port (optional). • Rear: 2x USB 3.1 Gen 2 ports, 1x VGA port, 1x DB-9 serial port, 1x RJ-45 10/100/1000 Mb Ethernet systems management port.
Cooling	Four non-hot-swap system fans.
Power supply	One fixed 300 W Gold, or up to two redundant hot-swap 450 W Platinum AC power supplies.
Video	Matrox G200 with 16 MB memory integrated into the XClarity Controller. Maximum resolution is 1920x1200 at 60 Hz with 32 bits per pixel.
Hot-swap parts	Drives and power supplies (select models).
Systems management	Lenovo XClarity Controller (XCC) Enterprise (Pilot 4 chip), proactive platform alerts, Lenovo XClarity Administrator with Integrator for VMware vCenter, Lenovo XClarity Energy Manager (optional).
Security features	Power-on password, administrator's password, secure firmware updates, Trusted Platform Module (TPM) 1.2 or 2.0 (configurable UEFI setting). Optional lockable front bezel.
Software	Software licenses that must be purchased from Lenovo: • VMware vSAN: Standard, Advanced, Enterprise, or ROBO; or • HCI Kit: Essentials, Standard, Advanced, Enterprise, or ROBO; or • VMware Horizon: Advanced or Enterprise; or • VMware Cloud Foundation (VCF): Basic, Standard, Advanced, Enterprise, or for VDI. Software licenses that can be purchased from Lenovo or provided by the customer: • VMware vSphere: Standard, Enterprise Plus, or ROBO. • VMware Horizon: Standard (optional). • VMware vCenter Server: Foundation or Standard.
Hypervisors	VMware ESXi 6.5 U2, 6.5 U3, 6.7 U2, or 6.7 U3 (factory preload).
Warranty and support	Three- or five-year customer-replaceable unit and onsite limited hardware warranty with ThinkAgile Advantage Support and selectable service levels: 9x5 next business day (NBD) parts delivered, 9x5 NBD onsite response, 24x7 coverage with 2-hour or 4-hour onsite response, or 6-hour or 24-hour committed repair (select areas). Also available are YourDrive YourData, Premier Support, and Enterprise Software Support.
Software maintenance	Three-year or five-year software support and subscription (matches the duration of the selected warranty period).
Dimensions	Height: 43 mm (1.7 in.), width: 434 mm (17.1 in.), depth: 498 mm (19.6 in.).
Weight	Maximum configuration: 12.3 kg (27.1 lb).

Factory-integrated models

Factory-integrated models of the ThinkAgile VX Series appliances are configured by using the Lenovo Data Center Solution Configurator (DCSC):
http://dcsc.lenovo.com

During the configuration process, you are selecting one of the Configure-to-Order (CTO) base models first, and then you are adding components (processors, memory, drives, and network adapters) to the selected model.

Note: You are required to engage a Lenovo representative in the project that includes the ThinkAgile VX Series appliances.

The following table lists the CTO base models of the ThinkAgile VX1320 appliances.

Table 2. CTO base models

Description	Machine Type/Model
ThinkAgile VX1320 Appliance	7Z58CTO1WW

The following table lists the base chassis for the ThinkAgile VX1320 appliance.

Table 3. Base chassis

Description	Feature code
ThinkAgile VX 1SE 2.5" Chassis	B5N4

The ThinkAgile VX1320 appliances ship with the following items:

- *Electronic Publications Flyer*
- Tool-less Rail Kit (if selected)
- One or two customer-configured power cables (if selected)

Processors

The ThinkAgile VX1320 appliance supports one Intel Xeon E Processor. The following table lists the processors that are available for selection.

Table 4. Intel Xeon E Processor feature codes

Description	Feature code
Intel Xeon E-2126G 6C 80W 3.3GHz Processor	B351
Intel Xeon E-2136 6C 80W 3.3GHz Processor	B34Z
Intel Xeon E-2146G 6C 80W 3.5GHz Processor	B34X
Intel Xeon E-2176G 6C 80W 3.7GHz Processor	B34V
Intel Xeon E-2186G 6C 95W 3.8GHz Processor	B34U

The following table lists the specifications of the processors for the appliance.

Table 5. Processor specifications (HT = Hyper-Threading, TB = Turbo Boost, VT = Virtualization Technology)

CPU model	Core frequency (Base / TB Max)	Number of cores / threads	Cache	Max DDR4 frequency	Max memory capacity	Bus speed	TDP	ECC	HT	TB	VT-x	VT-d	SGX
E-2126G	3.30 / 4.50 GHz	6 / 6	12 MB	2666 MHz	64 GB	8 GT/s	80 W	Yes	No	Yes	Yes	Yes	No
E-2136	3.30 / 4.50 GHz	6 / 12	12 MB	2666 MHz	64 GB	8 GT/s	80 W	Yes	Yes	Yes	Yes	Yes	No
E-2146G	3.50 / 4.50 GHz	6 / 12	12 MB	2666 MHz	64 GB	8 GT/s	80 W	Yes	Yes	Yes	Yes	Yes	No
E-2176G	3.70 / 4.70 GHz	6 / 12	12 MB	2666 MHz	64 GB	8 GT/s	80 W	Yes	Yes	Yes	Yes	Yes	Yes
E-2186G	3.80 / 4.70 GHz	6 / 12	12 MB	2666 MHz	64 GB	8 GT/s	95 W	Yes	Yes	Yes	Yes	Yes	Yes

Memory

The ThinkAgile VX1320 appliance supports up to four TruDDR4 memory UDIMMs with ECC protection. The processor has two memory channels with two DIMMs per channel.

Lenovo TruDDR4 memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets strict requirements is selected. It is compatibility tested and tuned to maximize performance and reliability.

The following rules apply when selecting the memory configuration:

- The appliance supports memory configurations with 2, 3, or 4 UDIMMs.
- All DIMMs in the appliance operate at the same speed of up to 2666 MHz.
  Note: Maximum memory speed can be achieved when Max performance mode is enabled in UEFI.
- The appliance supports up to 64 GB of memory.

The following table lists the memory options that are available for selection for the ThinkAgile VX1320 appliance.

Table 6. Memory options

Description	Part number	Feature code	Quantity
ThinkSystem 16GB TruDDR4 2666MHz (2Rx8, 1.2V) ECC UDIMM	4ZC7A08699	B35K	2, 3, 4

Internal storage

The ThinkAgile VX1320 appliance supports the following internal drive bay configurations to provide storage capacity:

1. 8x 2.5-inch SFF SAS/SATA hot-swap drive bays.
2. 10x 2.5-inch SFF SAS/SATA hot-swap drive bays.

The following table lists the internal drive backplanes that are available for selection for the VX 1SE Certified Node.

Table 7. Internal drive backplanes

Description	Feature code	Quantity
ThinkSystem SR250 2.5" HS SATA/SAS 8-Bay Backplane	B413	1
ThinkSystem SR250 2.5" HS AnyBay 10-Bay Backplane	B414	1

Configuration note: One drive backplane is required for selection.

The following table lists M.2 drive selection options for the hypervisor boot volume.

Table 8. Drive options for hypervisor boot volume

Description	Feature code	Quantity
ThinkSystem M.2 128GB SATA 6Gbps Non-Hot-Swap SSD	AUUV	1
ThinkSystem M.2 5100 240GB SATA 6Gbps Non-Hot Swap SSD	B5S4	1
ThinkSystem M.2 5300 240GB SATA 6Gbps Non-Hot Swap SSD	B8HS	1
ThinkSystem M.2 5100 480GB SATA 6Gbps Non-Hot-Swap SSD	B11V	1
ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	B919	1

Configuration note: One M.2 SATA SSD is required for selection.

The following table lists the storage controllers for internal storage of the VX1320 appliance.

Table 9. Controllers for internal storage

Description	Feature code	Quantity	I/O slots supported
ThinkSystem 430-8i SAS/SATA 12Gb HBA (non-RAID)	AUNL	1	2, 4
ThinkSystem 430-16i SAS/SATA 12Gb HBA (non-RAID)	AUNM	1	2, 4

Configuration notes:

- One SAS HBA for internal storage is required for selection.
- SAS HBAs are supported in the following PCIe slots:
  - PCIe slot 2 on the PCIe x8/x8 Riser Card (feature code B418):
    - No additional PCIe adapters are installed.
    - One additional PCIe adapter is installed in the PCIe slot 1.
  - PCIe slot 4 on the system board:
    - Two additional PCIe adapters are installed in the PCIe slots 1 and 2.
    - The PCIe x16 Riser Card (feature code B417) is installed.

The following table lists supported internal storage configurations with the SAS/SATA and AnyBay backplanes.

Table 10. Internal storage configurations

	Backplane and cable type and quantity			
Drive bay configuration	8x 2.5" HS BP (B413)	10x 2.5" HS BP (B414)	3.5"/2.5" HS x4 Cable HW (B415)	Storage controller quantity and type*
8x 2.5-in. SAS/SATA hot-swap	1	0	2	1x 430-8i/16i HBA (8)
10x 2.5-in. SAS/SATA hot-swap	0	1	3	1x 430-16i HBA (10)

* The number in brackets (x) specifies the quantity of drive bays connected to each of the controllers.

Drives for internal storage

The following tables list the drive selection options for the ThinkAgile VX1320 appliance.

Table 11. Drive selection options: Hybrid storage

Description	Part number	Feature code	Quantity per drive group (min / max)
Hybrid cache - 5200 Mainstream SATA 6Gb SSDs			
ThinkSystem 2.5" 5200 240GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10237	B488	1 / 1
ThinkSystem 2.5" 5200 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10238	B489	1 / 1
ThinkSystem 2.5" 5200 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10239	B48A	1 / 1

Description	Part number	Feature code	Quantity per drive group (min / max)
Hybrid cache - 5300 Mainstream SATA 6Gb SSDs			
ThinkSystem 2.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17088	B8HY	1 / 1
ThinkSystem 2.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17089	B8J6	1 / 1
ThinkSystem 2.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17090	B8JE	1 / 1
Hybrid cache - S4610 Mainstream SATA 6Gb SSDs			
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	1 / 1
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	1 / 1
Hybrid cache - 5300 Entry SATA 6Gb SSDs			
ThinkSystem 2.5" 5300 960GB Entry SATA 6Gb Hot Swap SSD	4XB7A17077	B8HP	1 / 1
ThinkSystem 2.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A17078	B8J5	1 / 1
Hybrid cache - S4510 Entry SATA 6Gb SSDs			
ThinkSystem 2.5" Intel S4510 960GB Entry SATA 6Gb Hot Swap SSD	4XB7A10249	B49A	1 / 1
Hybrid capacity - SAS 12Gb HDDs			
ThinkSystem 2.5" 900GB 10K SAS 12Gb Hot Swap 512n HDD	7XB7A00026	AUM0	2 / 7
ThinkSystem 2.5" 900GB 15K SAS 12Gb Hot Swap 512e HDD	7XB7A00023	AULX	2 / 7
ThinkSystem 2.5" 1.2TB 10K SAS 12Gb Hot Swap 512n HDD	7XB7A00027	AUM1	2 / 7
ThinkSystem 2.5" 1.8TB 10K SAS 12Gb Hot Swap 512e HDD	7XB7A00028	AUM2	2 / 7
ThinkSystem 2.5" 2.4TB 10K SAS 12Gb Hot Swap 512e HDD	7XB7A00069	B0YS	2 / 7
Hybrid capacity - NL SAS 12Gb HDDs			
ThinkSystem 2.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD	7XB7A00034	AUM6	2 / 7
ThinkSystem 2.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD	7XB7A00035	AUM7	2 / 7

Table 12. Drive selection options: All Flash storage

Description	Part number	Feature code	Quantity per drive group (min / max)
All Flash cache - 5200 Mainstream SATA 6Gb SSDs			
ThinkSystem 2.5" 5200 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10238	B489	1 / 1
ThinkSystem 2.5" 5200 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10239	B48A	1 / 1
All Flash cache - 5300 Mainstream SATA 6Gb SSDs			
ThinkSystem 2.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17088	B8HY	1 / 1
ThinkSystem 2.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17089	B8J6	1 / 1
ThinkSystem 2.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17090	B8JE	1 / 1
All Flash cache - S4610 Mainstream SATA 6Gb SSDs			
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	1 / 1
All Flash cache - 5300 Entry SATA 6Gb SSDs			
ThinkSystem 2.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A17078	B8J5	1 / 1
All Flash capacity - 5200 Mainstream 6 Gbps SATA			
ThinkSystem 2.5" 5200 240GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10237	B488	2 / 7
ThinkSystem 2.5" 5200 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10238	B489	2 / 7

Description	Part number	Feature code	Quantity per drive group (min / max)
ThinkSystem 2.5" 5200 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A10239	B48A	2 / 7
All Flash capacity - 5300 Mainstream SATA 6Gb SSDs			
ThinkSystem 2.5" 5300 240GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17087	B8J1	2 / 7
ThinkSystem 2.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17088	B8HY	2 / 7
ThinkSystem 2.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17089	B8J6	2 / 7
ThinkSystem 2.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17090	B8JE	2 / 7
All Flash capacity - S4610 Mainstream SATA 6Gb SSDs			
ThinkSystem 2.5" Intel S4610 240GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13633	B49L	2 / 7
ThinkSystem 2.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13634	B49M	2 / 7
ThinkSystem 2.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13635	B49N	2 / 7
All Flash capacity - 5200 Entry SATA 6Gb SSDs			
ThinkSystem 2.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD	4XB7A10153	B2X2	2 / 7
ThinkSystem 2.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD	4XB7A10154	B2X3	2 / 7
All Flash capacity - 5300 Entry SATA 6Gb SSDs			
ThinkSystem 2.5" 5300 240GB Entry SATA 6Gb Hot Swap SSD	4XB7A17075	B8HV	2 / 7
ThinkSystem 2.5" 5300 480GB Entry SATA 6Gb Hot Swap SSD	4XB7A17076	B8JM	2 / 7
ThinkSystem 2.5" 5300 960GB Entry SATA 6Gb Hot Swap SSD	4XB7A17077	B8HP	2 / 7
ThinkSystem 2.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A17078	B8J5	2 / 7
All Flash capacity - S4510 Entry SATA 6Gb SSDs			
ThinkSystem 2.5" Intel S4510 240GB Entry SATA 6Gb Hot Swap SSD	4XB7A10247	B498	2 / 7
ThinkSystem 2.5" Intel S4510 480GB Entry SATA 6Gb Hot Swap SSD	4XB7A10248	B499	2 / 7
ThinkSystem 2.5" Intel S4510 960GB Entry SATA 6Gb Hot Swap SSD	4XB7A10249	B49A	2 / 7

Configuration notes:

- The ThinkAgile VX1320 appliance supports up to 3 drive groups. Each drive group contains 1 cache drive and up to 7 capacity drives depending on the quantity of the drive groups:
  - 1 drive group: From 2 to 7 capacity drives.
  - 2 drive groups: From 2 to 4 capacity drives in each group.
  - 3 drive groups: 2 capacity drives in each group.
- The quantity of the capacity drives in each drive group must be the same.
- All cache drives in the appliance must be of the same model and capacity. All capacity drives in the appliance must be of the same model and capacity.

I/O expansion

The ThinkAgile VX1320 appliance supports up to three PCIe slots: one slot on the system planar that supports an internal storage controller and up to two PCIe slots on a riser card.

The slot form factors are as follows:

- Slot 1: PCIe 3.0 x8; low profile (not present if the Slot 2 is x16)
- Slot 2: PCIe 3.0 x8 (x16 physical connector) or x16; full-height, half-length
- Slot 4: PCIe 3.0 x4 (x8 physical connector; supports an internal storage controller)

The following table lists available PCIe riser card options.

Table 13. PCIe riser cards

Description	Part number	Feature code	Maximum quantity
ThinkSystem SR250/SR150 x8/x8 PCIe Riser	4C57A12111	B418	1
ThinkSystem SR250 x16 PCIe Riser	4C57A12110	B417	1

Configuration notes:

- A riser card is required for selection.
- The PCIe x8 riser card supplies slots 1 and 2, and the PCIe x16 riser card supplies slot 2.

Network connectivity

The ThinkAgile VX1320 appliances provide two onboard Gigabit Ethernet network ports that are based on the Broadcom BCM5720 network interface controller (NIC) chip. Two, four, six, or eight additional 1 GbE RJ-45, 1/10 GbE RJ-45, or 10 GbE SFP+ ports, or two of four additional 10/25 GbE SFP28 ports can be selected, if required.

The following table lists the network adapter options that are available for selection.

Table 14. Network adapters

Description	Part number	Feature code	Maximum quantity	I/O slots supported
PCIe Low Profile adapters - 1 Gb Ethernet				
Broadcom 5720 1GbE RJ45 2-Port PCIe Ethernet Adapter	7ZT7A00482	AUZX	2	1, 2
Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter	7ZT7A00484^	AUZV^	2	1, 2
ThinkSystem I350-T2 PCIe 1Gb 2-Port RJ45 Ethernet Adapter	7ZT7A00534	AUZY	2	1, 2
ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	7ZT7A00535	AUZW	2	1, 2
PCIe Low Profile adapters - 10 Gb Ethernet				
Broadcom 57416 10GBASE-T 2-Port PCIe Ethernet Adapter	7ZT7A00496	AUKP	2	1, 2
Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter	00AG570	AT7S	2*	1, 2
Intel X550-T1 Single Port 10GBase-T Adapter	00MM850	ATRY	2	1, 2
Intel X550-T2 Dual Port 10GBase-T Adapter	00MM860	ATPX	2	1, 2
Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	7ZT7A00537	AUKX	2*	1, 2
Intel X710-T4 PCIe 10Gb 4-Port Base-T Adapter	7XC7A05927	B0X1	2	1, 2
QLogic QL41134 PCIe 10Gb 4-Port Base-T Ethernet Adapter	4XC7A08225	B31G	2	1, 2
PCIe Full Height adapters - 10 Gb Ethernet				
Emulex OCe14104B-NX PCIe 10Gb 4-Port SFP+ Ethernet Adapter	7ZT7A00493	AUKN	1*	2
Intel X710-DA4 PCIe 10Gb 4-Port SFP+ Ethernet Adapter	7XC7A05525	B0YL	1*	2

Description	Part number	Feature code	Maximum quantity	I/O slots supported
PCIe Low Profile adapters - 25 Gb Ethernet				
Broadcom 57412 10/25GbE SFP28 1-Port PCIe Ethernet Adapter	7ZT7A00505	AUKS	2*	1, 2
Intel XXV710-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	7XC7A05523	B0WY	2*	1, 2
Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-Port PCIe Eth. Adapter	01GR250	AUAJ	2*	1, 2
QLogic QL41262 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	4XC7A08228	B21R	2*	1, 2

^ Field upgrade option only; no factory installation.
* The adapter comes without transceivers or cables; for ordering information, see the configuration notes below the table.

Configuration notes:

- PCIe full-height network adapters are supported in the full-height PCIe slot 2 supplied by the PCIe x8 or x16 riser card.
- PCIe Low Profile network adapters are supported in the full-height and low profile slots supplied by the PCIe x8 or x16 riser card.
- Supported transceivers or DAC cables should be purchased for the SFP+ and SFP28 ports, and UTP Category 6 or Category 5e cables should be purchased for the 10 GbE (Cat6) or 1 GbE (Cat5e or Cat6) RJ-45 ports. The maximum number of transceivers or cables that are supported per adapter equals the quantity of the adapter ports, and all adapter ports must have the same type of the transceiver or cable selected.
  The following transceiver and cables can be purchased:
  - UTP cables for 10 GbE and 1 GbE RJ-45 ports
  - Transceivers and cables for 10 GbE SFP+ ports
  - Transceivers and cables for 25 GbE SFP28 ports

The following table lists cables for the 10 GbE and 1 GbE RJ-45 ports.

Table 15. Cables for 10 GbE and 1 GbE RJ-45 ports

Description	Part number	Feature code
UTP Category 6 cables (Green) for 10 GbE and 1 GbE RJ-45 ports		
0.75m Cat6 Green Cable	00WE123	AVFW
1.0m Cat6 Green Cable	00WE127	AVFX
1.25m Cat6 Green Cable	00WE131	AVFY
1.5m Cat6 Green Cable	00WE135	AVFZ
3m Cat6 Green Cable	00WE139	AVG0
10m Cat6 Green Cable	90Y3718	A1MT
25m Cat6 Green Cable	90Y3727	A1MW
UTP Category 5e cables (Blue) for 1 GbE RJ-45 ports		
0.75m Blue Cat5e Cable	00WE111	AVFT
1.0m Blue Cat5e Cable	00WE115	AVFU
1.25m Blue Cat5e Cable	00WE119	AVFV
1.5m Blue Cat5e Cable	40K8785	3802
3m Blue Cat5e Cable	40K5581	3803
10m Blue Cat5e Cable	40K8927	3804
25m Blue Cat5e Cable	40K8930	3805
UTP Category 5e cables (Green) for 1 GbE RJ-45 ports		
0.75m Green Cat5e Cable	00WE099	AVFQ
1.0m Green Cat5e Cable	00WE103	AVFR

Description	Part number	Feature code
1.25m Green Cat5e Cable	00WE107	AVFS
1.5m Green Cat5e Cable	40K5643	3797
3m Green Cat5e Cable	40K5793	3798
10m Green Cat5e Cable	40K5794	3799
25m Green Cat5e Cable	40K8869	3800

The following table lists transceivers and cables for the 10 GbE SFP+ ports.

Table 16. Transceivers and cables for 10 GbE SFP+ ports

Description	Part number	Feature code
10 GbE transceivers for SFP+ ports		
Lenovo 10GBASE-SR SFP+ Transceiver	46C3447	5053
Lenovo 10GBASE-LR SFP+ Transceiver	00FE331*	B0RJ*
Optical cables for 10 GbE SFP+ SR transceivers		
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB
Lenovo 30m LC-LC OM3 MMF Cable	00MN520	ASRC
Passive SFP+ DAC cables for 10 GbE SFP+ ports		
Lenovo 0.5m Passive SFP+ DAC Cable	00D6288	A3RG
Lenovo 1m Passive SFP+ DAC Cable	90Y9427	A1PH
Lenovo 1.5m Passive SFP+ DAC Cable	00AY764	A51N
Lenovo 2m Passive SFP+ DAC Cable	00AY765	A51P
Lenovo 3m Passive SFP+ DAC Cable	90Y9430	A1PJ
Lenovo 5m Passive SFP+ DAC Cable	90Y9433	A1PK
Lenovo 7m Passive SFP+ DAC Cable	00D6151	A3RH
Active SFP+ DAC cables for 10 GbE SFP+ ports**		
Lenovo 1m Active DAC SFP+ Cable	00VX111	AT2R
Lenovo 3m Active DAC SFP+ Cable	00VX114	AT2S
Lenovo 5m Active DAC SFP+ Cable	00VX117	AT2T
SFP+ active optical cables for 10 GbE SFP+ ports		
Lenovo 1m SFP+ to SFP+ Active Optical Cable	00YL634	ATYX
Lenovo 3m SFP+ to SFP+ Active Optical Cable	00YL637	ATYY
Lenovo 5m SFP+ to SFP+ Active Optical Cable	00YL640	ATYZ
Lenovo 7m SFP+ to SFP+ Active Optical Cable	00YL643	ATZ0
Lenovo 15m SFP+ to SFP+ Active Optical Cable	00YL646	ATZ1
Lenovo 20m SFP+ to SFP+ Active Optical Cable	00YL649	ATZ2

* Not supported with the Intel X710-DA4 network adapter (7XC7A05525).
** The Emulex VFA5.2 PCIe network adapter (00AG570) does not support active SFP+ DAC cables.

The following table lists transceivers and cables for the 25 GbE SFP28 ports.

Table 17. Transceivers and cables for 25 GbE SFP28 ports

Description	Part number	Feature code
25 GbE transceivers for SFP28 ports		
Lenovo 25GBase-SR SFP28 Transceiver	7G17A03537	AV1B
Optical cables for 25 GbE SFP28 SR transceivers		
Lenovo 0.5m LC-LC OM3 MMF Cable	00MN499	ASR5
Lenovo 1m LC-LC OM3 MMF Cable	00MN502	ASR6
Lenovo 3m LC-LC OM3 MMF Cable	00MN505	ASR7
Lenovo 5m LC-LC OM3 MMF Cable	00MN508	ASR8
Lenovo 10m LC-LC OM3 MMF Cable	00MN511	ASR9
Lenovo 15m LC-LC OM3 MMF Cable	00MN514	ASRA
Lenovo 25m LC-LC OM3 MMF Cable	00MN517	ASRB
Lenovo 30m LC-LC OM3 MMF Cable	00MN520*	ASRC*
Passive copper cables for 25 GbE SFP28 ports		
Lenovo 1m Passive 25G SFP28 DAC Cable	7Z57A03557*	AV1W*
Lenovo 3m Passive 25G SFP28 DAC Cable	7Z57A03558	AV1X
Lenovo 5m Passive 25G SFP28 DAC Cable	7Z57A03559	AV1Y
Active optical cables for 25 GbE SFP28 ports*		
Lenovo 3m 25G SFP28 Active Optical Cable	7Z57A03541	AV1F
Lenovo 5m 25G SFP28 Active Optical Cable	7Z57A03542	AV1G
Lenovo 10m 25G SFP28 Active Optical Cable	7Z57A03543	AV1H
Lenovo 15m 25G SFP28 Active Optical Cable	7Z57A03544	AV1J
Lenovo 20m 25G SFP28 Active Optical Cable	7Z57A03545	AV1K

* Not supported with the Intel XXV710-DA2 PCIe 25Gb 2-Port SFP28 Ethernet Adapter (7XC7A05523).

For more information, see the list of Product Guides in the Ethernet Adapters category:
http://lenovopress.com/servers/options/ethernet#rt=product-guide

Power supplies and cables

The VX1320 appliances can be configured with one fixed power supply or up to two redundant hot-swap power supplies. With two power supplies, the appliance is capable of N+N redundancy depending on the configuration. A second power supply can be added to the models that come with one hot-swap power supply.

The following table lists the power supply options that are available for selection.

Table 18. Power supplies

Description	Part number	Feature code	Maximum quantity
ThinkSystem SR250/SR150 Fixed 300W Power Supply	None*	B40Q	1
ThinkSystem 450W (230V/115V) Platinum Hot-Swap Power Supply	4P57A12649	B40R	2

* Factory-installed only.

Configuration note: To ensure that the properly sized power supply is chosen for optimal performance, it is highly recommended to validate system configuration for specific power requirements by using the latest version of the Lenovo Capacity Planner:
http://datacentersupport.lenovo.com/us/en/solutions/lnvo-lcp

The VX1320 appliance ships without a power cord, or with one or two customer-configured power cords. A hot-swap power supply option ships without a power cord.

The following table lists the line cords and rack power cables that can be ordered for the VX1320 appliance. One or two power cables can be ordered, depending on the quantity of power supplies in the appliance.

Table 19. Power cables

Description	Part number	Feature code
Rack power cables		
1.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	00Y3043	A4VP
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
2.0m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08365	B0N4
2.0m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08369	6570
2.8m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08366	6311
2.8m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08370	6400
2.8m, 10A/100-250V, C13 to IEC 320-C20 Rack Power Cable	39Y7938	6204
4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7932	6263
4.3m, 13A/125V-10A/250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08371	6583
Line cords		
Argentina 2.8m, 10A/250V, C13 to IRAM 2073 Line Cord	39Y7930	6222
Argentina 4.3m, 10A/250V, C13 to IRAM 2073 Line Cord	81Y2384	6492
Australia/New Zealand 2.8m, 10A/250V, C13 to AS/NZS 3112 Line Cord	39Y7924	6211
Australia/New Zealand 4.3m, 10A/250V, C13 to AS/NZS 3112 Line Cord	81Y2383	6574
Brazil 2.8m, 10A/250V, C13 to NBR 14136 Line Cord	69Y1988	6532
Brazil 4.3m, 10A/250V, C13 to NBR14136 Line Cord	81Y2387	6404
China 2.8m, 10A/250V, C13 to GB 2099.1 Line Cord	39Y7928	6210
China 4.3m, 10A/250V, C13 to GB 2099.1 Line Cord	81Y2378	6580
Denmark 2.8m, 10A/250V, C13 to DK2-5a Line Cord	39Y7918	6213
Denmark 4.3m, 10A/250V, C13 to DK2-5a Line Cord	81Y2382	6575

Description	Part number	Feature code
Europe 2.8m, 10A/250V, C13 to CEE7-VII Line Cord	39Y7917	6212
Europe 4.3m, 10A/250V, C13 to CEE7-VII Line Cord	81Y2376	6572
Israel 2.8m, 10A/250V, C13 to SI 32 Line Cord	39Y7920	6218
Israel 4.3m, 10A/250V, C13 to SI 32 Line Cord	81Y2381	6579
Italy 2.8m, 10A/250V, C13 to CEI 23-16 Line Cord	39Y7921	6217
Italy 4.3m, 10A/250V, C13 to CEI 23-16 Line Cord	81Y2380	6493
Japan 2.8m, 12A/125V, C13 to JIS C-8303 Line cord	46M2593	A1RE
Japan 2.8m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08357	6533
Japan 4.3m, 12A/125V, C13 to JIS C-8303 Line Cord	39Y7926	6335
Japan 4.3m, 12A/250V, C13 to JIS C-8303 Line Cord	4L67A08362	6495
Korea 2.8m, 12A/250V, C13 to KS C8305 Line Cord	39Y7925	6219
Korea 4.3m, 12A/250V, C13 to KS C8305 Line Cord	81Y2385	6494
South Africa 2.8m, 10A/250V, C13 to SABS 164 Line Cord	39Y7922	6214
South Africa 4.3m, 10A/250V, C13 to SABS 164 Line Cord	81Y2379	6576
Switzerland 2.8m, 10A/250V, C13 to SEV 1011-S24507 Line Cord	39Y7919	6216
Switzerland 4.3m, 10A/250V, C13 to SEV 1011-S24507 Line Cord	81Y2390	6578
Taiwan 2.8m, 10A/125V, C13 to CNS 10917-3 Line Cord	23R7158	6386
Taiwan 2.8m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2375	6317
Taiwan 4.3m, 10A/125V, C13 to CNS 10917-3 Line Cord	4L67A08363	AX8B
Taiwan 4.3m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2389	6531
United Kingdom 2.8m, 10A/250V, C13 to BS 1363/A Line Cord	39Y7923	6215
United Kingdom 4.3m, 10A/250V, C13 to BS 1363/A Line Cord	81Y2377	6577
United States 2.8m, 10A/125V, C13 to NEMA 5-15P Line Cord	90Y3016	6313
United States 2.8m, 10A/250V, C13 to NEMA 6-15P Line Cord	46M2592	A1RF
United States 4.3m, 10A/125V, C13 to NEMA 5-15P Line Cord	4L67A08359	6370
United States 4.3m, 10A/250V, C13 to NEMA 6-15P Line Cord	4L67A08361	6373

Rack installation

The VX Series appliances ship with or without a rail kit, depending on the rack installation option selected. The following table lists the rack installation options that are available for the VX1320 appliances.

Table 20. Rack installation options

Description	Part number	Feature code	Maximum quantity
4-post rail kit			
ThinkSystem Tool-less Friction Rail v2	4M17A13564	B42B	1
Front VGA port			
ThinkSystem SR250/SR150 Front VGA Connector Kit	4Z57A12653	B419	1
Lockable front bezel			
ThinkSystem 1U Security Bezel	7Z17A02581	AUWR	1

The following table summarizes the rail kit features and specifications.

Table 21. Rail kit features and specifications summary

Feature	4-Post Tool-less Rail Kit
Part number	4M17A13564
CMA	None
Rail length	751.2 mm (29.6 in.)
Rail type	Half-out slide (friction)
Tool-less installation	Yes
In-rack server maintenance	No
1U PDU support	Yes
0U PDU support	Limited*
Rack type	IBM or Lenovo 4-post, EIA standard-compliant
Mounting holes	Square or round
Mounting flange thickness	2 mm (0.08 in.) – 3.3 mm (0.13 in.)
Distance between front and rear mounting flanges^	609.6 mm (24 in.) – 863.6 mm (34 in.)

* If a 0U PDU used, the rack cabinet must be at least 1000 mm (39.37 in.) deep.
^ Measured when mounted on the rack cabinet, from the front surface of the front mounting flange to the rear most point of the rail.

Software

The ThinkAgile VX Series appliances support the following VMware HCI components:

- VMware vSphere ESXi hypervisor
- VMware vSAN distributed enterprise storage
- VMware vCenter Server centralized management

The VMware ESXi hypervisor is factory-preinstalled on the M.2 SSD.

The following table lists the VMware ESXi hypervisor versions that are available for selection.

Table 22. VMware ESXi hypervisor selection options

Description	Feature code
VMware ESXi 6.5 U2 (Factory Installed)	B3VW
VMware ESXi 6.5 U3 (Factory installed)	B6U0
VMware ESXi 6.7 U2 (Factory Installed)	B6U1
VMware ESXi 6.7 U3 (Factory installed)	B88T

VMware vSAN, vSphere, and vCenter Server software licenses and support are required for ThinkAgile VX Series appliances. Customers are required to purchase VMware vSAN licenses for VX Series appliances from Lenovo. For VMware vSphere and vCenter Server, customers can use the existing VMware software licenses and active support contracts, or they can purchase software licenses and support from Lenovo or VMware.

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

- VMware vSAN License and Subscription
- VMware vSphere License and Subscription
- VMware HCI Kit License and Subscription
- VMware Horizon License and Subscription
- VMware Cloud Foundation License and Subscription
- VMware vCenter Server License and Subscription

Configuration notes:

- The selection of vSAN licenses is required: Standalone licenses, HCI bundle licenses, VDI solution licenses, or VCF licenses.
  Important: The Horizon 7 Standard license does not include vSAN; standalone vSAN license options must be selected with the Horizon 7 Standard.
- VMware software licenses are available with 3-year or 5-year software support (matches the duration of the selected hardware warranty period).
- The quantity of VM-based licenses is specified based on the VM requirements.
- The quantity of CCU-based licenses is specified based on the concurrent user requirements.

VMware vSAN License and Subscription

Lenovo offers the following VMware vSAN License and Subscription options that can be purchased for ThinkAgile VX Series appliances:

- *VMware Virtual SAN 6 Standard* provides support for hybrid and all-flash storage configurations.
- *VMware Virtual SAN 6 Advanced* provides support for hybrid and all-flash storage configurations with space efficiency features (compression, deduplication, and erasure coding).
- *VMware Virtual SAN 6 Enterprise* provides support for hybrid and all-flash storage configurations with space efficiency features (compression, deduplication, and erasure coding), stringent security (data-at-rest encryption), and advanced failure protection (stretched cluster).
- *VMware Virtual SAN 6 for Remote Office Branch Office (ROBO)* provides support for hybrid and all-flash storage configurations for up to 25 virtual machines at remote locations.

VMware vSAN selection options for the ThinkAgile VX Series appliances are listed in the following table.

Table 23. VMware vSAN selection options

Description	Feature code
VMware Virtual SAN 6 Standard	B2Q7
VMware Virtual SAN 6 Advanced	B2Q8
VMware Virtual SAN 6 Enterprise	B2Q9
VMware Virtual SAN 6 for Remote Office Branch Office (25 VM Pack)	B2QA

The following table lists the VMware vSAN License and Subscription options that are derived by the configurator based on the selected software edition and warranty period.

Table 24. VMware vSAN License and Subscription options

Description	Part number	Feature code
vSAN 6 Standard		
VMware vSAN 6 Standard for 1 Processor w/3Yr Support	7S06004TWW	B2C6
VMware vSAN 6 Standard for 1 Processor w/5Yr Support	7S060083WW	B2FG
vSAN 6 Advanced		
VMware vSAN 6 Advanced for 1 Processor w/3Yr Support	7S06004XWW	B2CA
VMware vSAN 6 Advanced for 1 Processor w/5Yr Support	7S060087WW	B2FL
vSAN 6 Enterprise		
VMware vSAN 6 Enterprise for 1 Processor w/3Yr Support	7S060051WW	B2CE
VMware vSAN 6 Enterprise for 1 Processor w/5Yr Support	7S06008BWW	B2FQ
vSAN 6 Standard for Remote Office Branch Office (ROBO)		
VMware vSAN 6 Standard for Rmt Off Brnch Off 25VM Pk w/3Yr Support	7S06004WWW	B2C9
VMware vSAN 6 Standard for Rmt Off Brnch Off 25VM Pk w/5Yr Support	7S060086WW	B2FK

The following table compares features of the VMware vSAN software editions.

Table 25. VMware vSAN software editions feature comparison

Feature	VMware vSAN software edition		
	Standard	**Advanced**	**Enterprise**
Licensing for data center	Processor-based (per 1 processor)		
Licensing for ROBO	VM-based (per 25 VMs)*		
Cluster size	2 - 64	2 - 64	2 - 64
Storage-Policy Based Management	Yes	Yes	Yes
Flash Read/Write Caching	Yes	Yes	Yes
Distributed RAID	Yes	Yes	Yes
Virtual Distributed Switch	Yes	Yes	Yes
Rack Awareness	Yes	Yes	Yes
vSphere Replication	Yes	Yes	Yes
Software Checksum	Yes	Yes	Yes
All-Flash Hardware	Yes	Yes	Yes
iSCSI Target Service	Yes	Yes	Yes
IOPS Limit	Yes	Yes	Yes
Deduplication and Compression	No	Yes**	Yes**
RAID-5/6 Erasure Coding	No	Yes**	Yes**
Data-at-Rest Encryption	No	No	Yes
Stretched Cluster with Local Failure Protection	No	No	Yes

* A maximum of 25 VMs is supported at any single location under the ROBO license. Two or more nodes can be used in a cluster under the ROBO license, however, the maximum number of VMs at the location must not exceed 25.
** Requires All-Flash configurations; hybrid configurations not supported.

VMware vSphere License and Subscription

Lenovo offers the following VMware vSphere License and Subscription options that can be purchased for ThinkAgile VX Series appliances:

- *VMware vSphere 6 Standard* provides an entry-level solution for basic server consolidation and business continuity.
- *VMware vSphere 6 Enterprise Plus* offers resource management with enhanced application availability and performance for server virtualization and cloud solutions.
- *VMware vSphere 6 Remote Office Branch Office (ROBO) Standard* provides remote site server virtualization with business continuity and backup features.
- *VMware vSphere 6 Remote Office Branch Office Advanced* provides remote site server virtualization that offers business continuity and backup with advanced features such as standardization of host configurations.

VMware vSphere selection options for the ThinkAgile VX Series appliances are listed in the following table.

Table 26. VMware vSphere selection options

Description	Feature code
VMware vSphere 6 Standard	B2Q0
VMware vSphere 6 Enterprise Plus	B2Q1
VMware vSphere 6 Remote Office Branch Office Standard	B2Q3
VMware vSphere 6 Remote Office Branch Office Advanced	B2Q4

The following table lists the VMware vSphere License and Subscription options that are derived by the configurator based on the selected software edition and warranty period.

Table 27. VMware vSphere License and Subscription options

Description	Part number	Feature code
vSphere 6 Standard		
VMware vSphere 6 Standard for 1 Processor w/3Yr Support	7S06003DWW	B2AS
VMware vSphere 6 Standard for 1 Processor w/5Yr Support	7S06006PWW	B2E2
vSphere 6 Enterprise Plus		
VMware vSphere 6 Enterprise Plus for 1 Processor w/3Yr Support	7S06003EWW	B2AT
VMware vSphere 6 Enterprise Plus for 1 Processor w/5Yr Support	7S06006QWW	B2E3
vSphere 6 Remote Office Branch Office Standard		
VMware vSphere 6 Remote Office Branch Office Standard (25 VM Pack) w/3Yr S&S	7S06003KWW	B2AY
VMware vSphere 6 Remote Office Branch Office Standard (25 VM Pack) w/5Yr S&S	7S06006VWW	B2E8
vSphere 6 Remote Office Branch Office Advanced		
VMware vSphere 6 Remote Office Branch Office Advanced (25 VM Pack) w/3Yr S&S	7S06003LWW	B2AZ
VMware vSphere 6 Remote Office Branch Office Advanced (25 VM Pack) w/5Yr S&S	7S06006WWW	B2E9

The following table compares features of the VMware vSphere software editions.

Table 28. VMware vSphere software editions feature comparison

Feature	VMware vSphere software edition			
	Standard	Enterprise Plus	ROBO Standard	ROBO Advanced
Licensing	Processor-based (per 1 processor)		VM-based (per 25 VMs)	
Hypervisor	Yes	Yes	Yes	Yes
vMotion	Yes	Yes	Yes	Yes
Storage vMotion	Yes	Yes	Yes	Yes
Cross-Switch vMotion	Yes	Yes	No	No
Fault Tolerance	2 vCPU	8 vCPU	2 vCPU	4 vCPU
Data Protection and Replication	Yes	Yes	Yes	Yes
Virtual Volumes	Yes	Yes	Yes	Yes
Storage-Policy Based Management	Yes	Yes	Yes	Yes
APIs for Storage Awareness	Yes	Yes	No	No
APIs for Array Integration, Multipathing	Yes	Yes	No	No

Feature	VMware vSphere software edition			
	Standard	**Enterprise Plus**	**ROBO Standard**	**ROBO Advanced**
Content Library	Yes	Yes	No	No
vCenter High Availability	Yes*	Yes*	No	No
vCenter Backup and Restore	Yes*	Yes*	No	No
vCenter Server Appliance Migration Tool	Yes*	Yes*	No	No
Virtual Machine Encryption	No	Yes	No	No
Proactive High Availability	No	Yes	No	No
vSphere Integrated Containers	No	Yes	No	Yes
Distributed Resource Scheduler (DRS)	No	Yes	No	No
Distributed Power Management	No	Yes	No	No
Big Data Extensions	No	Yes	No	No
Distributed Switch	No	Yes	No	Yes
Storage DRS	No	Yes	No	No
I/O Controls (Network and Storage) and SR-IOV	No	Yes	No	No
Host Profiles and Auto Deploy	No	Yes	No	Yes
Flash Read Cache	No	Yes	No	No
Cross-vCenter and Long Distance vMotion	No	Yes	No	No
vGPU	No	Yes	No	No

* Requires vCenter Server Standard.

VMware HCI Kit License and Subscription

Lenovo offers the following VMware HCI license bundles for ThinkAgile VX Series appliances that include both vSphere and vSAN License and Subscription options:

- VMware HCI Kit Essentials (For 3 nodes):
  - vSphere Essentials Plus
  - vSAN Standard
- VMware HCI Kit Standard (Per CPU):
  - vSphere Standard
  - vSAN Standard
- VMware HCI Kit Advanced (Per CPU):
  - vSphere Enterprise Plus
  - vSAN Advanced
- VMware HCI Kit Enterprise (Per CPU):
  - vSphere Enterprise Plus
  - vSAN Enterprise

Note: *VMware vSphere Essentials Plus* provides server virtualization and consolidation with centralized management and business continuity for up to three nodes, and it includes the following features: vSphere Hypervisor, vMotion, Cross-Switch vMotion, High Availability, Data Protection and Replication, and vCenter Server Essentials.

VMware HCI Kit selection options for the ThinkAgile VX Series appliances are listed in the following table.

Table 29. VMware HCI Kit selection options

Description	Feature code
VMware 6 HCI Kit Essentials for 3 Nodes (each node with up to two processors)	BAKF
VMware 6 HCI Kit Standard	BAKE
VMware 6 HCI Kit Advanced	B2PY
VMware 6 HCI Kit Enterprise	B2PZ

The following table lists the VMware HCI Kit License and Subscription options that are derived by the configurator based on the selected software edition and warranty period.

Table 30. VMware HCI Kit License and Subscription options

Description	Part number	Feature code
HCI Kit Essentials		
VMware HCI Kit Essentials for 3 Nodes w/3Yr Support	7S0600A9WW	S04F
VMware HCI Kit Essentials for 3 Nodes w/5Yr Support	7S0600ACWW	S04J
HCI Kit Standard		
VMware HCI Kit Standard (Per CPU) w/3Yr Support	7S060057WW	B2CL
VMware HCI Kit Standard (Per CPU) w/5Yr Support	7S06008HWW	B2FW
HCI Kit Advanced		
VMware HCI Kit Advanced (Per CPU) w/3Yr Support	7S060058WW	B2CM
VMware HCI Kit Advanced (Per CPU) w/5Yr Support	7S06008JWW	B2FX
HCI Kit Enterprise		
VMware HCI Kit Enterprise (Per CPU) w/3Yr Support	7S060059WW	B2CN
VMware HCI Kit Enterprise (Per CPU) w/5Yr Support	7S06008KWW	B2FY

VMware Horizon 7 License and Subscription

Lenovo offers the following VMware Horizon 7 License and Subscription options for Virtual Desktop Infrastructure (VDI) deployments that can be purchased for the ThinkAgile VX Series appliances:

- *VMware Horizon 7 Standard* delivers simple, powerful VDI with great user experience, and it includes VMware vSphere Desktop (delivers the full range of vSphere 6 Enterprise Plus features for desktop workloads) and vCenter Server for Desktop.
- *VMware Horizon 7 Advanced* delivers desktops and applications for physical and virtual machines through a unified workspace, and it includes VMware vSphere Desktop, vCenter Server for Desktop, and vSAN Advanced for Desktop with All-Flash.
- *VMware Horizon 7 Enterprise* delivers desktops and applications with closed-loop management and automation, and it includes VMware vSphere Desktop, vCenter Server for Desktop, and vSAN Advanced for Desktop with All-Flash.

The Standard license is available in 10-user or 100-user packs for concurrent users, and the Advanced and Enterprise licenses are available in 10-user or 100-user packs for concurrent or named users.

VMware Horizon 7 selection options for the ThinkAgile VX Series appliances are listed in the following table.

Table 31. VMware Horizon 7 selection options

Description	Feature code
VMware vSphere 7 Horizon Standard (concurrent users)	B2Z3
VMware vSphere 7 Horizon Advanced (concurrent users)	B2Z4
VMware vSphere 7 Horizon Advanced (named users)	B2Z5
VMware vSphere 7 Horizon Enterprise (concurrent users)	B2Z6
VMware vSphere 7 Horizon Enterprise (named users)	B2Z7

The following table lists the VMware Horizon License and Subscription options that are derived by the configurator based on the selected number of users, software edition, and warranty period.

Table 32. VMware Horizon License and Subscription options

Description	Part number	Feature code
Horizon 7 Standard		
VMware Horizon 7 Standard 10 Concurrent User Pack w/3Yr Support	7S06003VWW	B2B8
VMware Horizon 7 Standard 10 Concurrent User Pack w/5Yr Support	7S060075WW	B2EJ
VMware Horizon 7 Standard 100 Concurrent User Pack w/3Yr Support	7S06003WWW	B2B9
VMware Horizon 7 Standard 100 Concurrent User Pack w/5Yr Support	7S060076WW	B2EK
Horizon 7 Advanced		
VMware Horizon 7 Advanced 10 Concurrent User Pack w/3Yr Support	7S06003ZWW	B2BC
VMware Horizon 7 Advanced 10 Concurrent User Pack w/5Yr Support	7S060079WW	B2EN
VMware Horizon 7 Advanced 10 Named User Pack w/3Yr Support	7S060041WW	B2BE
VMware Horizon 7 Advanced 10 Named User Pack w/5Yr Support	7S06007BWW	B2EQ
VMware Horizon 7 Advanced 100 Concurrent User Pack w/3Yr Support	7S060040WW	B2BD
VMware Horizon 7 Advanced 100 Concurrent User Pack w/5Yr Support	7S06007AWW	B2EP
VMware Horizon 7 Advanced 100 Named User Pack w/3Yr Support	7S060042WW	B2BF
VMware Horizon 7 Advanced 100 Named User Pack w/5Yr Support	7S06007CWW	B2ER
Horizon 7 Enterprise		
VMware Horizon 7 Enterprise 10 Concurrent User Pack w/3Yr Support	7S060047WW	B2BL
VMware Horizon 7 Enterprise 10 Concurrent User Pack w/5Yr Support	7S06007HWW	B2EW
VMware Horizon 7 Enterprise 10 Named User Pack w/3Yr Support	7S060049WW	B2BN
VMware Horizon 7 Enterprise 10 Named User Pack w/5Yr Support	7S06007KWW	B2EY
VMware Horizon 7 Enterprise 100 Concurrent User Pack w/3Yr Support	7S060048WW	B2BM
VMware Horizon 7 Enterprise 100 Concurrent User Pack w/5Yr Support	7S06007JWW	B2EX
VMware Horizon 7 Enterprise 100 Named User Pack w/3Yr Support	7S06004AWW	B2BP
VMware Horizon 7 Enterprise 100 Named User Pack w/5Yr Support	7S06007LWW	B2EZ

The following table compares key features of the VMware Horizon software editions.

Table 33. VMware Horizon software editions feature comparison

Feature	VMware Horizon software edition		
	Standard	**Advanced**	**Enterprise**
Licensing	User-based (per 10 or 100 users)		
Concurrent Users	Yes	Yes	Yes
Named Users	No	Yes	Yes
Windows Virtual Desktops	Yes	Yes	Yes
Linux Virtual Desktops	No	No	Yes
Packaged Applications	Yes	Yes	Yes
Hosted Applications	No	Yes	Yes
Session-based Desktops	No	Yes	Yes
Single Sign-On for Application and Desktop Access	No	Yes	Yes
Image Management for Physical Desktop	No	Yes	Yes
Virtualization Pack for Skype for Business	No	Yes	Yes
Session Collaboration	No	No	Yes
Real-time Application Delivery	No	No	Yes
Just-in-Time Delivery with Instant Clone Technology	No	No	Yes
User, Profile, and Policy Management	No	No	Yes
Health Monitoring and Performance Analytics	No	No	Yes
Capacity Management: Planning and Optimization	No	No	Yes
Help Desk Tool	No	No	Yes

VMware Cloud Foundation

Lenovo offers VMware Cloud Foundation for hybrid cloud deployments of the ThinkAgile VX Series appliances. VMware Cloud Foundation is an integrated software platform that automates the deployment and lifecycle management of a complete software-defined data center (SDDC) in hyperconverged environments.

The following Cloud Foundation License and Subscription options are offered:

- *Cloud Foundation Basic* includes vSphere Enterprise Plus, vSAN Advanced, NSX Data Center Professional, and SDDC Manager.
- *Cloud Foundation Standard* includes vSphere Enterprise plus, vSAN Advanced, NSX Data Center Advanced, vRealize Suite Standard, vRealize Network Insight Advanced, and SDDC Manager.
- *Cloud Foundation Advanced* includes vSphere Enterprise plus, vSAN Advanced, NSX Data Center Advanced, vRealize Suite Enterprise, vRealize Network Insight Advanced, and SDDC Manager.
- *Cloud Foundation Enterprise* includes vSphere Enterprise plus, vSAN Enterprise, NSX Data Center Enterprise plus, vRealize Suite Enterprise, vRealize Network Insight Enterprise, and SDDC Manager.
- *Cloud Foundation for VDI* includes SDDC Manager for Desktop and NSX Data Center Advanced or Enterprise plus for Desktop, and it comes with or without Horizon Enterprise.

Configuration note: vCenter Server that is required for Cloud Foundation is licensed separately; only one vCenter Server license is required for all vCenter Servers deployed in a Cloud Foundation system.

VMware VCF selection options for the ThinkAgile VX Series appliances are listed in the following table.

Table 34. VMware VCF selection options

Description	Feature code
VMware Cloud Foundation Basic (1 CPU)	BAAM
VMware Cloud Foundation Standard (1 CPU)	BAAN
VMware Cloud Foundation Advanced (1 CPU)	BAAP
VMware Cloud Foundation Enterprise (1 CPU)	BAAQ
VCF for VDI: SDDC Manager, NSX DC ADV, and Horizon ENT (concurrent users)	BAAR
VCF for VDI: SDDC Manager and NSX DC ADV w/o Horizon ENT (concurrent users)	BAAS
VCF for VDI: SDDC Manager and NSX DC ENT+ w/o Horizon ENT (concurrent users)	BAAT

The following table lists the VMware Cloud Foundation License and Subscription options that are derived by the configurator based on the selected number of users (for concurrent user [CCU]-based licenses), software edition, and warranty period.

Table 35. VMware Cloud Foundation License and Subscription options

Description	Part number	Feature code
VMware Cloud Foundation Basic		
VMware Cloud Foundation Basic (Per CPU) w/3Yr Subscription and Support	7S0600D1WW	S1RR
VMware Cloud Foundation Basic (Per CPU) w/5Yr Subscription and Support	7S0600D2WW	S1RS
VMware Cloud Foundation Standard		
VMware Cloud Foundation Standard (Per CPU) w/3Y Subscription and Support	7S0600DNWW	S1SC
VMware Cloud Foundation Standard (Per CPU) w/5Y Subscription and Support	7S0600DPWW	S1SD
VMware Cloud Foundation Advanced		
VMware Cloud Foundation Advanced (Per CPU) w/3Y Subscription and Support	7S0600DRWW	S1SF
VMware Cloud Foundation Advanced (Per CPU) w/5Y Subscription and Support	7S0600DSWW	S1SG
VMware Cloud Foundation Enterprise		
VMware Cloud Foundation Enterprise (Per CPU) w/3Y Subscription and Support	7S0600DUWW	S1SJ
VMware Cloud Foundation Enterprise (Per CPU) w/5Y Subscription and Support	7S0600DVWW	S1SK
VMware Cloud Foundation for VDI with NSX Data Center Advanced and Horizon Enterprise		
VCF for VDI: SDDC Mgr, NSX DC ADV, and Horizon ENT 10 pack (Per CCU) w/3Y S&S	7S0600D7WW	S1RX
VCF for VDI: SDDC Mgr, NSX DC ADV, and Horizon ENT 10 pack (Per CCU) w/5Y S&S	7S0600D8WW	S1RY
VCF for VDI: SDDC Mgr, NSX DC ADV, and Horizon ENT 100 pack (Per CCU) w/3Y S&S	7S0600D4WW	S1RU
VCF for VDI: SDDC Mgr, NSX DC ADV, and Horizon ENT 100 pack (Per CCU) w/5Y S&S	7S0600D5WW	S1RV
VMware Cloud Foundation for VDI with NSX Data Center Advanced (no Horizon included)		
VCF for VDI: SDDC Mgr and NSX DC ADV w/o Horizon ENT 10 pack (per CCU) w/3Y S&S	7S0600DDWW	S1S3
VCF for VDI: SDDC Mgr and NSX DC ADV w/o Horizon ENT 10 pack (per CCU) w/5Y S&S	7S0600DEWW	S1S4
VCF for VDI: SDDC Mgr and NSX DC ADV w/o Horizon ENT 100 pack (per CCU) w/3Y S&S	7S0600DAWW	S1Z7
VCF for VDI: SDDC Mgr and NSX DC ADV w/o Horizon ENT 100 pack (per CCU) w/5Y S&S	7S0600DBWW	S1Z8
VMware Cloud Foundation for VDI with NSX Data Center Enterprise plus (no Horizon included)		
VCF for VDI: SDDC Mgr and NSX DC ENT+ w/o Horizon ENT 10 pack (Per CCU) w/3Y S&S	7S0600DKWW	S1S9
VCF for VDI: SDDC Mgr and NSX DC ENT+ w/o Horizon ENT 10 pack (Per CCU) w/5Y S&S	7S0600DLWW	S1SA

Description	Part number	Feature code
VCF for VDI: SDDC Mgr and NSX DC ENT+ w/o Horizon ENT 100 pack (Per CCU) w/3Y S&S	7S0600DGWW	S1S6
VCF for VDI: SDDC Mgr and NSX DC ENT+ w/o Horizon ENT 100 pack (Per CCU) w/5Y S&S	7S0600DHWW	S1S7

VMware vCenter Server License and Subscription

VMware vCenter Server provides centralized management of vSphere environments to simplify day-to-day operations and reduce the complexity of managing virtual infrastructure.

vCenter Server is required for managing ThinkAgile VX Series appliances. The nodes can be added to an existing installation of vCenter Server, or the software license for the vCenter Server instance can be purchased from Lenovo by selecting one the following License and Subscription options:

- VMware vCenter Server 6 Foundation for vSphere 6 (Per Instance) (manages up to 4 hosts)
- VMware vCenter Server 6 Standard for vSphere 6 (Per Instance) (unlimited hosts)

The vCenter Server license purchased from Lenovo includes three or five years of support and subscription (matches the duration of the selected hardware warranty period).

VMware vCenter Server selection options for the ThinkAgile VX Series appliances are listed in the following table.

Table 36. VMware vCenter Server selection options

Description	Feature code
VMware vCenter Server 6 Foundation	B2Q6
VMware vCenter Server 6 Standard	B2Q5

The following table lists the VMware vCenter License and Subscription options that are derived by the configurator based on the selected software edition and warranty period.

Table 37. VMware vCenter Server License and Subscription options

Description	Part number	Feature code
vCenter Server Foundation		
VMware vCenter Srv 6 Fdn for vSph 6 (Per Instance) w/3Yr Support	7S06003PWW	B2B2
VMware vCenter Srv 6 Fdn for vSph 6 (Per Instance) w/5Yr Support	7S06006ZWW	B2EC
vCenter Server Standard		
VMware vCenter Srv 6 Std for vSph 6 (Per Instance) w/3Yr Support	7S06003NWW	B2B1
VMware vCenter Srv 6 Std for vSph 6 (Per Instance) w/5Yr Support	7S06006YWW	B2EB

VMware vCenter Server offers the following key features:

- Centralized management of virtualized hosts and virtual machines from a single console.
- Centralized inventory of virtual machines, hosts, datastores and networks.
- Alerts and notifications can trigger automated workflows to remedy and preempt problems.
- Host profiles standardize and simplify configuration and management of VMware ESXi hosts.
- Resource management for virtual machines allows to control allocation of processor, memory, disk and network resources.
- Continuously monitors utilization across resource pools and intelligently allocates available resources among virtual machines according to predefined rules
- Automatically restarts virtual machines that have failed without manual intervention with VMware vSphere HA.
- Maintains records of significant configuration changes and exports reports for event tracking.
- Patch management enforces compliance to patch standards through automated scanning and patching of online ESXi hosts and select Microsoft and Linux virtual machines.

Systems management

The ThinkAgile VX1320 appliances support the following systems management tools:

- Lenovo XClarity Controller
- Lenovo XClarity Administrator and XClarity Pro
- Lenovo XClarity Integrator for VMware vCenter
- Lenovo XClarity Energy Manager

Lenovo XClarity Controller

The ThinkAgile VX1320 appliances contain Lenovo XClarity Controller (XCC) Enterprise, which provides advanced service-processor control, monitoring, and alerting functions.

XClarity Controller Enterprise offers the following capabilities for the ThinkAgile VX Series appliances:

- Gathering and viewing system information and inventory
- Monitoring system status and health
- Alerting and notifications
- Event logging
- Syslog alerting
- Configuring security
- Updating system firmware
- Real-time power usage monitoring
- Displaying graphics for real-time and historical power usage data and temperature
- Capping power usage
- Remotely controlling power (Power on, Power off, Restart)

The XClarity Controller provides remote server management through the following interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Data Center Manageability Interface (DCMI) Version 1.5
- Redfish REpresentational State Transfer (REST) API
- Web browser with HTML5 support
- Command-line interface
- Virtual Operator Panel with XClarity Mobile App via the front USB port with XClarity Controller access

Virtual Operator Panel provides quick access to system status, firmware, network, health, and alerts information. With proper authentication, it also allows to configure systems management and network settings and to control system power (Power on, Power off, Restart). The Virtual Operator Panel can be accessed from the XClarity Mobile App running on the Android or iOS mobile device that is connected to the front USB port with XClarity Controller access (See Components and connectors).

Lenovo XClarity Administrator and XClarity Pro

Lenovo XClarity Administrator is a centralized systems management solution that helps administrators deliver infrastructure faster. This solution integrates easily with Lenovo x86 servers, appliances, certified nodes, Top-of-Rack Ethernet switches, and storage systems, providing automated agent-less discovery, inventory, monitoring, and alerts across multiple systems. In addition, some managed endpoints support firmware updates and configuration management.

Lenovo XClarity Administrator is used for managing ThinkAgile VX Series appliances, and it comes with the Lenovo XClarity Pro subscription license that provides software support for XClarity Administrator and XClarity Integrator for VMware for the duration of the selected warranty period.

Lenovo XClarity Administrator offers the following features:

- Auto-discovery and monitoring of the ThinkAgile VX Series appliances
- Firmware updates and compliance enforcement
- External alerts and notifications via SNMP traps, syslog remote logging, and e-mail
- Secure connections to managed endpoints
- NIST 800-131A or FIPS 140-2 compliant cryptographic standards between the management solution and managed endpoints
- Integration into existing higher-level management systems such as cloud automation and orchestration tools through REST APIs, providing extensive external visibility and control over hardware resources
- An intuitive, easy-to-use GUI
- Scripting support with Windows PowerShell, providing command-line visibility and control over hardware resources

For more information, refer to the Lenovo XClarity Administrator Product Guide:
http://lenovopress.com/tips1200

Lenovo XClarity Integrator for VMware vCenter

Lenovo XClarity Integrator for VMware vCenter is a software plug-in module for Lenovo XClarity Administrator that allows administrators to manage physical infrastructure from leading external virtualization management software tool from VMware.

Lenovo XClarity Integrator for VMware vCenter offers the following features:

- Ability to discover, manage, and monitor Lenovo appliance hardware from the virtualization management tool
- Deployment of firmware updates to VX Series appliances from the virtualization management tool
- Non-disruptive server maintenance in clustered environments that reduces workload downtime by dynamically migrating workloads from affected hosts during rolling server updates or reboots
- Greater service level uptime and assurance in clustered environments during unplanned hardware events by dynamically triggering workload migration from impacted hosts when impending hardware failures are predicted

For more information, refer to the Lenovo XClarity Integrator for VMware vCenter web page:
https://support.lenovo.com/us/en/solutions/lnvo-vmware

Lenovo XClarity Energy Manager

Lenovo XClarity Energy Manager provides a stand-alone, web-based agent-less power management console that provides real time data and enables you to observe, plan and manage power and cooling for Lenovo servers, appliances, and certified nodes. Using built-in intelligence, XClarity Energy Manager identifies server power consumption trends and ideal power settings, and it performs cooling analysis so that customers can define and optimize their power-saving policies.

Lenovo XClarity Energy Manager offers the following capabilities:

- Monitors room, row, rack, and device levels in the data center
- Reports vital system information, such as power, temperature and resource utilization
- Monitors inlet temperature to locate hot spots, reducing the risk of data or device damage
- Provides finely-grained controls to limit platform power in compliance with IT policy
- Generates alerts when a user-defined threshold is reached

Lenovo XClarity Energy Manager license is included in the XClarity Controller Enterprise upgrade.

For more information, refer to the Lenovo XClarity Energy Manager web page:
http://datacentersupport.lenovo.com/us/en/solutions/lnvo-lxem

Physical specifications

The ThinkAgile VX1320 appliances have the following dimensions and weight (approximate):

- Height: 43 mm (1.7 in)
- Width: 434 mm (17.1 in)
- Depth: 498 mm (19.6 in)
- Weight (maximum): 12.3 kg (27.1 lb)

Operating environment

The ThinkAgile VX1320 appliance complies with ASHRAE class A2 specifications. The appliance performance might be impacted when the operating temperature is outside the ASHRAE A2 specifications or in case of a system fan failure. Depending on the hardware configuration, some appliance configurations comply with ASHRAE class A3 specifications. To comply with ASHRAE class A3 specifications, the ThinkAgile VX1320 appliances must be configured with 8x 2.5-inch hot-swap drive bays and a processor of up to 80 W TDP.

The ThinkAgile VX1320 appliance is supported in the following environment:

- Air temperature:
  - Operating:
    - ASHRAE Class A3: 5 °C - 40 °C (41 °F - 104 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 175-m (574-ft) increase in altitude
    - ASHRAE Class A2: 10 °C - 35 °C (50 °F - 95 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 300-m (984-ft) increase in altitude
  - Non-operating: 5 °C - 45 °C (41 °F - 113 °F)
  - Storage: -40 °C - +60 °C (-40 °F - 140 °F)
- Maximum altitude: 3050 m (10,000 ft)
- Humidity:
  - Operating:
    - ASHRAE Class A3: 8% - 85% (non-condensing); maximum dew point: 24 °C (75 °F)
    - ASHRAE Class A2: 8% - 80% (non-condensing); maximum dew point: 21 °C (70 °F)
  - Storage: 8% - 90% (non-condensing)
- Electrical:
  - 100 - 127 (nominal) V AC; 50 Hz / 60 Hz
  - 200 - 240 (nominal) V AC; 50 Hz / 60 Hz
- Acoustics:
  - Minimum configuration:
    - Operating: 5.3 bels
    - Idle: 4.9 bels
  - Maximum configuration:
    - Operating: 5.7 bels
    - Idle: 5.4 bels
- Vibration:
  - Operating: 0.21 G rms at 5 Hz to 500 Hz for 15 minutes across 3 axes
  - Non-operating: 1.04 G rms at 2 Hz to 200 Hz for 15 minutes across 6 surfaces
- Shock:
  - Operating: 15 G for 3 milliseconds in each direction (positive and negative X, Y, and Z axes)
  - Non-operating: 50 G for 152 in./sec velocity change across 6 surfaces

The following table lists the maximum system power load, rated inlet current, and system heat output based on the power supply and source voltage.

Table 38. Rated system power, inlet current, and system heat output

Power supply	Source voltage	Maximum power load per system	Rated current per inlet	System heat output
300 W Gold (One power supply)	100 - 127 V AC	334 W	4 A	1139 BTU/hour
	200 - 240 V AC	326 W	2 A	1111 BTU/hour
450 W Platinum (Two power supplies)	100 - 127 V AC	503 W	5.8 A	1717 BTU/hour
	200 - 240 V AC	484 W	2.9 A	1650 BTU/hour

Regulatory compliance

The ThinkAgile VX1320 appliances conform to the following regulations:

- United States FCC Title 47 CFR Part 15 Subpart B
- Canada ICES-003/NMB-03, Class A
- UL62368-1
- Mexico NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 32, Class A
- China CCC GB4943.1, GB9254 Class A, GB17625.1, CECP, CELP
- Taiwan BSMI CNS13438, Class A; CNS14336-1; CNS15663
- Korea KN32, Class A; KN35
- Russia, Belorussia, and Kazakhstan TR CU 020/2011 and TR CU 004/2011
- IEC 60950-1, IEC 62368-1 (CB Certificate and CB Test Report)
- Europe CE Mark (EN55032 Class A, EN60950-1, EN55024, EN50581, EN61000-3-2, EN61000-3-3, EN62368-1)
- CISPR 32, Class A
- Germany TUV-GS (EK1-ITB2000, EN62368-1)
- Reduction of Hazardous Substances (ROHS)

Warranty and support

The ThinkAgile VX Series appliances can be configured with a three- or five-year hardware warranty with 24x7 ThinkAgile Advantage 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.

The base warranty provides 9x5 Next Business Day response with parts delivered. Lenovo’s additional support services provide a sophisticated, unified support structure for a customer's data center, with an experience consistently ranked number one in customer satisfaction worldwide.

The following Lenovo support services are available for selection:

- **Premier Support** provides a Lenovo-owned customer experience and delivers direct access to technicians skilled in hardware, software, and advanced troubleshooting, in addition to the following capabilities:
    - Direct technician-to-technician access through a dedicated phone line.
    - 24x7x365 remote support.
    - Single point of contact service.
    - End to end case management.
    - 3rd Party collaborative software support.
    - Online case tools and live chat support.
    - On-demand remote system analysis.
- **Warranty service level upgrades (Preconfigured Support)** are available to meet the on-site response time targets that match the criticality of customer's systems:
    - 3 or 5 years of service coverage.
    - **Foundation Service:** 9x5 service coverage with next business day onsite response, with optional YourDrive YourData.
    - **Essential Service:** 24x7 service coverage with 4-hour onsite response or 24-hour committed repair (available only in select regions), bundled with YourDrive YourData.
    - **Advanced Service:** 24x7 service coverage with 2-hour onsite response or 6-hour committed repair (available only in select regions), bundled with YourDrive YourData.

- **Managed Services**
  Lenovo Managed Services provide continuous 24x7 remote monitoring (plus 24x7 call center availability) and proactive management of a customer's 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 and operating system device driver levels, and software as needed. Lenovo will also maintain records of latest patches, critical updates, and firmware levels, to ensure customer's systems are providing business value through optimized performance.

- **Technical Account Management (TAM)**
  A Lenovo Technical Account Manager helps customers optimize operations of their data centers based on a deep understanding of customer's business. Customers gain direct access to a Lenovo TAM, who serves as their single point of contact to expedite service requests, provide status updates, and furnish reports to track incidents over time. Also, a TAM helps proactively make service recommendations and manage service relationship with Lenovo to make certain that customer's needs are met.

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

- **YourDrive YourData**
  Lenovo’s YourDrive YourData service is a multi-drive retention offering that ensures that customer's data is always under their control, regardless of the number of drives that are installed in their Lenovo server. In the unlikely event of a drive failure, customers retain possession of their drive while Lenovo replaces the failed drive part. Customer's data stays safely on customer premises, in their hands. The YourDrive YourData service can be purchased in convenient bundles with Foundation, Essential, or Advanced services.

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

Some regions might have different warranty terms and conditions than the standard warranty. This is due to local business practices or laws in the specific region. Local service teams can assist in explaining region-specific terms when needed. Examples of region-specific warranty terms are second or longer business day parts delivery or parts-only base warranty.

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

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

Lenovo support services are region-specific. Not all support services are available in every region. For information about Lenovo support services that are available in a specific region, refer to the following resources:

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

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

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

Software maintenance

The ThinkAgile VX Series appliances include a three-year or five-year software support and subscription (matches the duration of the selected hardware 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. VMware will contact the customer and will own the software-related problem resolution until closure.

For the VMware vSphere, vSAN, and vCenter Server software and subscription licenses purchased from Lenovo together with the ThinkAgile VX Series appliances, software support that is provided by VMware includes Production-level support with 24x7 phone and web coverage with the following target response times (priorities are defined by VMware based on the impact on productivity):

- Severity 1 (Critical: Substantial loss or disruption of service, significant risk of data loss): 30 minutes
- Severity 2 (Major: Operations are severely constrained, significant impact): 4 business hours
- Severity 3 (Minor: Non-critical loss of functionality, minimal impact): 8 business hours
- Severity 4 (Cosmetic: General questions): 12 business hours

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.

Deployment services

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

- 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)

The following Lenovo deployment services are available for the ThinkAgile VX Series appliances to get customers up and running quickly:

- 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

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

Ethernet LAN switches

The following table lists the Ethernet LAN switches that are offered by Lenovo that can be used with the ThinkAgile VX1320 appliances for network connectivity.

Table 39. Ethernet LAN switches

Description	Part number
1 Gb Ethernet switches (Out-of-band hardware management or 1 GbE host connectivity)	
Lenovo ThinkSystem NE0152T RackSwitch (Rear to Front)	7Y810011WW
Lenovo ThinkSystem NE0152TO RackSwitch (Rear to Front, ONIE)	7Z320O11WW
Lenovo RackSwitch G7028 (Rear to Front)	7159BAX
Lenovo RackSwitch G7052 (Rear to Front)	7159CAX
Lenovo CE0128TB Switch (3-Year Warranty)	7Z340011WW
Lenovo CE0128TB Switch (Limited Lifetime Warranty)	7Z360011WW
Lenovo CE0128PB Switch (3-Year Warranty)	7Z340012WW
Lenovo CE0128PB Switch (Limited Lifetime Warranty)	7Z360012WW
Lenovo CE0152TB Switch (3-Year Warranty)	7Z350021WW
Lenovo CE0152TB Switch (Limited Lifetime Warranty)	7Z370021WW
Lenovo CE0152PB Switch (3-Year Warranty)	7Z350022WW
Lenovo CE0152PB Switch (Limited Lifetime Warranty)	7Z370022WW
10 Gb Ethernet switches (10 GbE host connectivity)	
Lenovo ThinkSystem NE1032 RackSwitch (Rear to Front)	7159A1X
Lenovo ThinkSystem NE1032T RackSwitch (Rear to Front)	7159B1X
Lenovo ThinkSystem NE1064TO RackSwitch (Rear to Front, ONIE)	7Z330O11WW
Lenovo ThinkSystem NE1072T RackSwitch (Rear to Front)	7159C1X
Lenovo RackSwitch G8272 (Rear to Front)	7159CRW
25 Gb Ethernet switches (25 GbE host connectivity)	
Lenovo ThinkSystem NE2572 RackSwitch (Rear to Front)	7159E1X
Lenovo ThinkSystem NE2572O RackSwitch (Rear to Front, ONIE)	7Z210O21WW
Lenovo ThinkSystem NE2580O RackSwitch (Rear to Front, ONIE)	7Z330O21WW
100 Gb Ethernet switches (40 GbE/100 GbE aggregation layer; 10 GbE/25 GbE breakout host connectivity)	
Lenovo ThinkSystem NE10032 RackSwitch (Rear to Front)	7159D1X
Lenovo ThinkSystem NE10032O RackSwitch (Rear to Front, ONIE)	7Z210O11WW

For more information, see the list of Product Guides in the Top-of-rack Switches category:
http://lenovopress.com/servers/options/switches#rt=product-guide

Rack cabinets

The following table lists the rack cabinets that are currently offered by Lenovo that can be used for mounting the ThinkAgile VX1320 appliances and other IT infrastructure building blocks.

Table 40. Rack cabinets

Description	Part number
12U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 1YR Warranty	7D2B0001WW
12U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 3YR Warranty	7D2N0001WW
18U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 1YR Warranty	7D2C0001WW
18U 1200mm Deep Micro Datacenter Rack (no sidewall compartments), 3YR Warranty	7D2P0001WW
25U S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072RX
25U Static S2 Standard Rack (1000 mm deep; 2 sidewall compartments)	93072PX
42U S2 Standard Rack (1000 mm deep; 6 sidewall compartments)	93074RX
42U 1100mm Enterprise V2 Dynamic Rack (6 sidewall compartments)	93634PX
42U 1100mm Enterprise V2 Dynamic Expansion Rack (6 sidewall compartments)	93634EX
42U 1200mm Deep Dynamic Rack (6 sidewall compartments)	93604PX
42U 1200mm Deep Static Rack (6 sidewall compartments)	93614PX
42U Enterprise Rack (1105 mm deep; 4 sidewall compartments)	93084PX
42U Enterprise Expansion Rack (1105 mm deep; 4 sidewall compartments)	93084EX

For more information, see the list of Product Guides in the Rack Cabinets category:
http://lenovopress.com/servers/options/racks#rt=product-guide

Power distribution units

The following table lists the power distribution units (PDUs) that are currently offered by Lenovo that can be used for distributing electrical power to the ThinkAgile VX1320 appliances and other IT infrastructure building blocks mounted in a rack cabinet.

Table 41. Power distribution units

Description	Part number
0U Basic PDUs	
0U 36 C13/6 C19 24A/200-240V 1 Phase PDU with NEMA L6-30P line cord	00YJ776
0U 36 C13/6 C19 32A/200-240V 1 Phase PDU with IEC60309 332P6 line cord	00YJ777
0U 21 C13/12 C19 32A/200-240V/346-415V 3 Phase PDU with IEC60309 532P6 cord	00YJ778
0U 21 C13/12 C19 48A/200-240V 3 Phase PDU with IEC60309 460P9 line cord	00YJ779
Switched and Monitored PDUs	
0U 20 C13/4 C19 Switched and Monitored 24A/200-240V/1Ph PDU w/ NEMA L6-30P cord	00YJ781
0U 20 C13/4 C19 Switched and Monitored 32A/200-240V/1Ph PDU w/ IEC60309 332P6 cord	00YJ780
0U 18 C13/6 C19 Switched and Monitored 32A/200-240/346-415V/3Ph PDU w/ IEC60309 532P6 cord	00YJ782
0U 12 C13/12 C19 Switched and Monitored 48A/200-240V/3Ph PDU w/ IEC60309 460P9 cord	00YJ783
1U 9 C19/3 C13 Switched and Monitored DPI PDU (without line cord)	46M4002
1U 9 C19/3 C13 Switched and Monitored 60A 3Ph PDU with IEC 309 3P+Gnd cord	46M4003
1U 12 C13 Switched and Monitored DPI PDU (without line cord)	46M4004
1U 12 C13 Switched and Monitored 60A 3 Phase PDU with IEC 309 3P+Gnd line cord	46M4005

Description	Part number
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	
Ultra Density Enterprise C19/C13 PDU Module (without line cord)	71762NX
Ultra Density Enterprise C19/C13 PDU 60A/208V/3ph with IEC 309 3P+Gnd line cord	71763NU
C13 Enterprise PDUs (12x IEC 320 C13 outlets)	
DPI C13 Enterprise PDU+ (without line cord)	39M2816
DPI Single Phase C13 Enterprise PDU (without line cord)	39Y8941
C19 Enterprise PDUs (6x IEC 320 C19 outlets)	
DPI Single Phase C19 Enterprise PDU (without line cord)	39Y8948
DPI 60A 3 Phase C19 Enterprise PDU with IEC 309 3P+G (208 V) fixed line cord	39Y8923
Front-end PDUs (3x IEC 320 C19 outlets)	
DPI 30amp/125V Front-end PDU with NEMA L5-30P line cord	39Y8938
DPI 30amp/250V Front-end PDU with NEMA L6-30P line cord	39Y8939
DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8934
DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8940
DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd line cord	39Y8935
Universal PDUs (7x IEC 320 C13 outlets)	
DPI Universal 7 C13 PDU (with 2 m IEC 320-C19 to C20 rack power cord)	00YE443
Line cords for PDUs that ship without a line cord	
DPI 30a Line Cord (NEMA L6-30P)	40K9614
DPI 32a Line Cord (IEC 309 P+N+G)	40K9612
DPI 32a Line Cord (IEC 309 3P+N+G)	40K9611
DPI 60a Cord (IEC 309 2P+G)	40K9615
DPI 63a Cord (IEC 309 P+N+G)	40K9613
DPI Australian/NZ 3112 Line Cord (32A)	40K9617
DPI Korean 8305 Line Cord (30A)	40K9618

For more information, see the list of Product Guides in the Power Distribution Units category:
http://lenovopress.com/servers/options/pdu#rt=product-guide

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are currently offered by Lenovo that can be used for providing electrical power protection to the ThinkAgile VX1320 appliances and other IT infrastructure building blocks.

Table 42. Uninterruptible power supply units

Description	Part number
Worldwide models	
RT1.5kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA 5-15R 12A outlets)	55941AX
RT1.5kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A outlets)	55941KX
RT2.2kVA 2U Rack or Tower UPS (100-125VAC) (8x NEMA 5-20R 16A outlets)	55942AX
RT2.2kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets)	55942KX
RT3kVA 2U Rack or Tower UPS (100-125VAC) (6x NEMA 5-20R 16A, 1x NEMA L5-30R 24A outlets)	55943AX
RT3kVA 2U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 1x IEC 320 C19 16A outlets)	55943KX
RT5kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets)	55945KX
RT6kVA 3U Rack or Tower UPS (200-240VAC) (8x IEC 320 C13 10A, 2x IEC 320 C19 16A outlets)	55946KX
RT8kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets)	55948KX
RT11kVA 6U Rack or Tower UPS (200-240VAC) (4x IEC 320-C19 16A outlets)	55949KX
RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets)	55948PX
RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC) (4x IEC 320-C19 16A outlets)	55949PX
ASEAN, HTK, INDIA, and PRC models	
ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)	55943KT
ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)	55943LT
ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)	55946KT
ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)	5594XKT

For more information, see the list of Product Guides in the Uninterruptible Power Supply Units category: http://lenovopress.com/servers/options/ups#rt=product-guide

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Related publications and links

For more information, see these resources:

- Lenovo ThinkAgile VX Series
  http://www3.lenovo.com/us/en/p/WMD00000340
- Lenovo Data Center Solution Configurator (DCSC):
  http://dcsc.lenovo.com
- ThinkAgile VX - Best Recipes
  http://datacentersupport.lenovo.com/us/en/solutions/HT505302
- VMware documentation
  https://docs.vmware.com/
- Lenovo Data Center Support
  http://datacentersupport.lenovo.com

Related product families

Product families related to this document are the following:

- Hyperconverged Infrastructure
- ThinkAgile VX Series for VMware
- VMware Alliance

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