

Lenovo ThinkAgile VX5520 Appliance (Xeon SP Gen 1) Product Guide (withdrawn product)

Lenovo ThinkAgile VX Series appliances combine industry-leading hyperconverged infrastructure software from VMware with Lenovo enterprise platforms that feature the first generation of the Intel Xeon Processor Scalable family (Xeon SP Gen 1). 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 VX5520 is a 2U rack-mount appliance that supports up to two processors, up to 1.5 TB of 2666 MHz TruDDR4 memory, up to 14x SAS/SATA LFF hot-swap drive bays with an extensive choice of SAS/SATA SSDs and NL SAS HDDs, and flexible network connectivity options with 1/10 GbE RJ-45, 10 GbE SFP+, and 10/25 GbE SFP28 ports.

Several common uses for the ThinkAgile VX Series appliances that are optimized for storage-heavy workloads include file servers, on-cluster backups, and big data.

The ThinkAgile VX5520 is shown in the following figure.



Figure 1. Lenovo ThinkAgile VX5520 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 view of the VX5520 appliance.

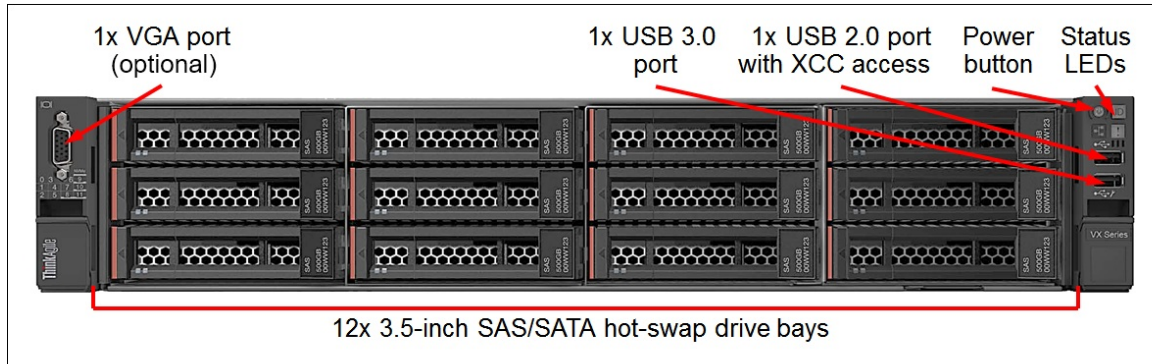


Figure 2. VX5520 front view

The front of the VX5520 appliance includes the following components:

- 12x LFF hot-swap drive bays
- One VGA port (optional)
- One USB 2.0 port with XClarity Controller access
- One USB 3.0 port
- A Power button
- Status LEDs that display the status of the system

The following figure shows the rear view of the VX5520 appliance without rear drive bays.

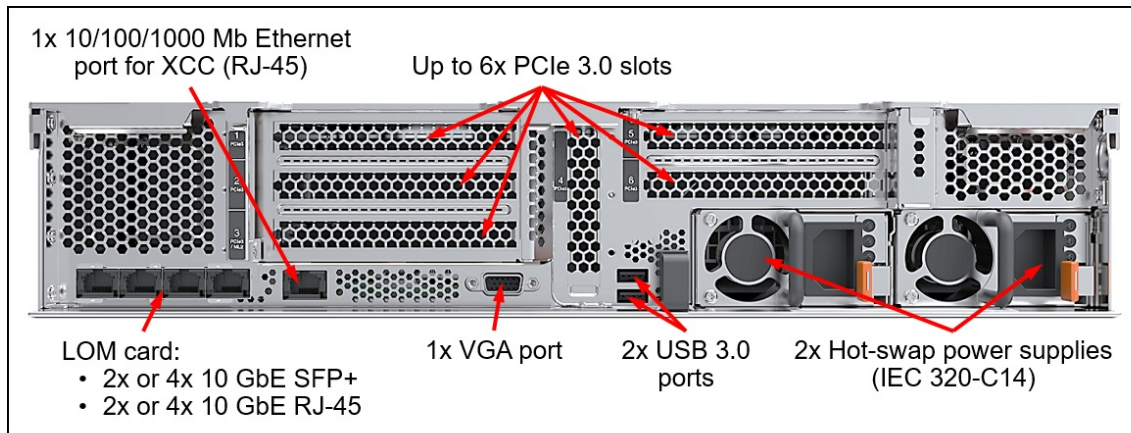


Figure 3. VX5520 rear view without rear drive bays

The following figure shows the rear view of the VX5520 appliance with rear drive bays.

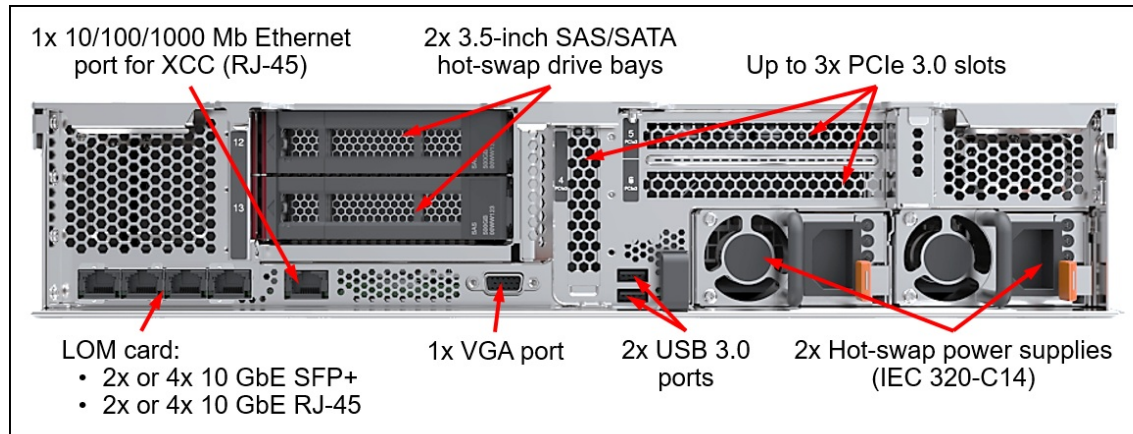


Figure 4. VX5520 rear view with rear drive bays

The rear of the VX5520 appliance includes the following components:

- Up to six PCIe expansion slots, or up to three PCIe expansion slots and 2x LFF hot-swap drive bays
- One LOM card slot
- One 1 GbE port for XClarity Controller
- One VGA port
- Two USB 3.0 ports
- Up to two hot-swap power supplies

System specifications

The following table lists the system specifications of the ThinkAgile VX5520 appliance.

Table 1. VX5520 system specifications

Attribute	Specification
Form factor	2U Rack-mount.
Processor	One or two Intel Xeon Bronze, Silver, Gold, or Platinum Gen 1 processors.
Chipset	Intel C624.
Memory	Up to 24 DIMMs. Support for 8 GB, 16 GB, and 32 GB TruDDR4 2666 MHz RDIMMs or 64 GB TruDDR4 2666 MHz LRDIMMs.
Memory capacity	Up to 1536 GB with 24x 64 GB LRDIMMs.
Memory protection	Error correction code (ECC), Single Device Data Correction (SDDC; for x4-based memory DIMMs), Adaptive Double Device Data Correction (ADDDC; for x4-based memory DIMMs, requires Intel Xeon Gold or Platinum processors), patrol scrubbing, and demand scrubbing.
Drive bays	12x or 14x 3.5-inch SAS/SATA hot-swap.
Internal storage	<ul style="list-style-type: none"> • 1 drive group: 1 cache drive + from 2 to 7 capacity drives. • 2 drive groups: 1 cache drive + from 2 to 6 capacity drives in each group. • 3 drive groups: 1 cache drive + from 2 to 3 capacity drives in each group. • 4 drive groups: 1 cache drive + 2 capacity drives in each group. <p>Note: The quantity of the capacity drives in each drive group must be the same.</p>

Attribute	Specification
Drive capacities	<ul style="list-style-type: none"> ● Cache drives: <ul style="list-style-type: none"> ○ 12 Gbps SAS SSDs up to 3.2 TB (2.5" SSD in a 3.5" tray). ○ 6 Gbps SATA SSDs up to 3.84 TB (2.5" SSD in a 3.5" tray). ● Capacity drives: 12 Gbps NL SAS HDDs up to 16 TB. <p>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 type and capacity.</p>
Storage capacity	Up to 192 TB (12x 16 TB HDDs).
Storage controller	1x 430-16i HBA (12 Gbps SAS/6 Gbps SATA).
Network interfaces	<ul style="list-style-type: none"> ● 1 GbE RJ-45 ports: 4 - 8 (Up to 2 network adapters). ● 1/10 GbE RJ-45 ports: 2 - 8 (LOM + Up to 2 network adapters). ● 10 GbE SFP+ ports: 2 - 8 (LOM + Up to 2 network adapters). ● 25 GbE SFP28 ports: 1 - 4 (Up to 2 network adapters). <p>Note: The withdrawn VX5520 (7Y14) does not support 10/25 GbE ports.</p>
Boot drive	2x M.2 non-hot-swap SSDs up to 480 GB (RAID-1). Note: The withdrawn VX5520 (7Y14) does not support 240 GB or 480 GB M.2 SSDs.
I/O expansion slots	<p>6x PCIe 3.0 slots (configurations with up to 12 drives installed):</p> <ul style="list-style-type: none"> ● Slot 1: PCIe 3.0 x16 (not used). ● Slot 3: PCIe 3.0 x8 (for the second PCIe network adapter - 1 CPU installed). ● Slot 4: PCIe 3.0 x8 (for the first PCIe network adapter). ● Slot 5: PCIe 3.0 x16 (not used). ● Slot 6: PCIe 3.0 x16 (for the second PCIe network adapter - 2 CPUs installed). ● Slot 7: PCIe 3.0 x8 (for an internal storage controller). <p>4x PCIe 3.0 slots (configurations with more than 12 drives installed):</p> <ul style="list-style-type: none"> ● Slot 4: PCIe 3.0 x8 (for the first PCIe network adapter). ● Slot 5: PCIe 3.0 x16 (not used). ● Slot 6: PCIe 3.0 x16 (for the second PCIe network adapter; the second CPU required). ● Slot 7: PCIe 3.0 x8 (for an internal storage controller).
Ports	<ul style="list-style-type: none"> ● Front: 1x USB 2.0 port with XClarity Controller access, 1x USB 3.0 port, 1x VGA port (optional) ● Rear: 2x USB 3.0 ports, 1x VGA port, 1x RJ-45 10/100/1000 Mb Ethernet port for systems management.
Cooling	Five (one processor) or six (two processors) hot-swap system fans with N+1 redundancy.
Power supply	One or two redundant hot-swap 1100 W (100 - 240 V) or 1600 W (200 - 240 V) High Efficiency Platinum 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	SSDs, HDDs, power supplies, and fans.
Systems management	Lenovo XClarity Controller (XCC) Enterprise (Pilot 4 chip), proactive platform alerts, light path diagnostics, 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.

Attribute	Specification
Software	<p>Software licenses that must be purchased from Lenovo:</p> <ul style="list-style-type: none"> 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. <p>Software licenses that can be purchased from Lenovo or provided by the customer:</p> <ul style="list-style-type: none"> VMware vSphere: Standard, Enterprise Plus, or ROBO. VMware Horizon: Standard (optional). VMware vCenter Server: Foundation or Standard.
Hypervisors	<ul style="list-style-type: none"> 7Y14: VMware ESXi 6.5 U1 (factory preload). 7Y94: VMware ESXi 6.5 U2, 6.5 U3, 6.7, 6.7 U1, 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	One- (PRC only), three-, or five-year software support and subscription (matches the duration of the selected warranty period).
Dimensions	Height: 87 mm (3.4 in.), width: 445 mm (17.5 in.), depth: 720 mm (28.3 in.).
Weight	Maximum configuration: 32 kg (70.5 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 VX5520 appliances.

Product availability: The VX5520 (7Y14) appliances are no longer available for ordering. They are shown for reference purposes only.

Table 2. CTO base models

Description	Machine Type/Model
ThinkAgile VX5520	7Y14CTO1WW
ThinkAgile VX5520 Appliance	7Y94CTO1WW

The following table lists the base chassis for the VX5520 appliance.

Table 3. Base chassis

Description	Feature code
ThinkAgile VX 2U 3.5" 8/12 Bay Chassis	B1DG

The VX5520 appliances ship with the following items:

- *Electronic Publications Flyer*
- Tool-less Slide Rail Kit (with or without 2U CMA depending on the rack installation option selected)
- One or two customer-selected power cables (depending on the quantity of the power supplies)

Processors

The ThinkAgile VX5520 appliances can be configured with one or two processors. The following table lists the processor options that are available for selection.

Table 4. Processor options

Description	Part number	Feature code*	Quantity (min / max)
Intel Xeon Bronze processors			
Intel Xeon Bronze 3104 6C 85W 1.7GHz Processor	7XG7A05572	AWEJ	1 / 2
Intel Xeon Bronze 3106 8C 85W 1.7GHz Processor	7XG7A05570	AWEH	1 / 2
Intel Xeon Silver processors			
Intel Xeon Silver 4108 8C 85W 1.8GHz Processor	7XG7A05571	AWEG	1 / 2
Intel Xeon Silver 4109T 8C 70W 2.0GHz Processor	7XG7A05574	AWET	1 / 2
Intel Xeon Silver 4110 8C 85W 2.1GHz Processor	7XG7A05575	AWEE	1 / 2
Intel Xeon Silver 4112 4C 85W 2.6GHz Processor	7XG7A05577	AWEF	1 / 2
Intel Xeon Silver 4114 10C 85W 2.2GHz Processor	7XG7A05578	AWEC	1 / 2
Intel Xeon Silver 4114T 10C 85W 2.2GHz Processor	7XG7A05579	AWES	1 / 2
Intel Xeon Silver 4116 12C 85W 2.1GHz Processor	7XG7A05576	AWER	1 / 2
Intel Xeon Silver 4116T 12C 85W 2.1GHz Processor	7XG7A05573	AWEA	1 / 2
Intel Xeon Gold processors			
Intel Xeon Gold 5115 10C 85W 2.4GHz Processor	7XG7A05596	AWDU	1 / 2
Intel Xeon Gold 5117 14C 105W 2.0GHz Processor	4XG7A09082	B137	1 / 2
Intel Xeon Gold 5118 12C 105W 2.3GHz Processor	7XG7A05580	AWEP	1 / 2
Intel Xeon Gold 5119T 14C 85W 1.9GHz Processor	7XG7A05581	AWEQ	1 / 2
Intel Xeon Gold 5120 14C 105W 2.2GHz Processor	7XG7A05583	AWE6	1 / 2
Intel Xeon Gold 5120T 14C 105W 2.2GHz Processor	7XG7A05582	AWE8	1 / 2
Intel Xeon Gold 5122 4C 105W 3.6GHz Processor	7XG7A05591	AWED	1 / 2
Intel Xeon Gold 6126 12C 125W 2.6GHz Processor	7XG7A05590	AWEL	1 / 2
Intel Xeon Gold 6128 6C 115W 3.4GHz Processor	7XG7A05588	AWEB	1 / 2
Intel Xeon Gold 6130 16C 125W 2.1GHz Processor	7XG7A05587	AWEN	1 / 2
Intel Xeon Gold 6130T 16C 125W 2.1GHz Processor	7XG7A05586	AWE4	1 / 2
Intel Xeon Gold 6132 14C 140W 2.6GHz Processor	7XG7A05606	AWDY	1 / 2
Intel Xeon Gold 6134 8C 130W 3.2GHz Processor	7XG7A05605	AWE9	1 / 2
Intel Xeon Gold 6134M 8C 130W 3.2GHz Processor	4XG7A09067	B0X4	1 / 2
Intel Xeon Gold 6136 12C 150W 3.0GHz Processor	7XG7A05604	AWE3	1 / 2
Intel Xeon Gold 6138 20C 125W 2.0GHz Processor	7XG7A05585	AWDZ	1 / 2
Intel Xeon Gold 6138T 20C 125W 2.0GHz Processor	7XG7A05584	AWEM	1 / 2
Intel Xeon Gold 6140 18C 140W 2.3GHz Processor	7XG7A05603	AWE1	1 / 2
Intel Xeon Gold 6140M 18C 140W 2.3GHz Processor	7XG7A05602	AWE2	1 / 2
Intel Xeon Gold 6142 16C 150W 2.6GHz Processor	7XG7A05601	AWDW	1 / 2
Intel Xeon Gold 6142M 16C 150W 2.6GHz Processor	4XG7A09066	B0X3	1 / 2
Intel Xeon Gold 6148 20C 150W 2.4GHz Processor	7XG7A05598	AWDX	1 / 2
Intel Xeon Gold 6150 18C 165W 2.7GHz Processor	7XG7A05597	AWDT	1 / 2
Intel Xeon Gold 6152 22C 140W 2.1GHz Processor	7XG7A05595	AWDV	1 / 2

Description	Part number	Feature code*	Quantity (min / max)
Intel Xeon Platinum processors			
Intel Xeon Platinum 8153 16C 125W 2.0GHz Processor	7XG7A05593	AWDR	1 / 2
Intel Xeon Platinum 8156 4C 105W 3.6GHz Processor	7XG7A05592	AWDL	1 / 2
Intel Xeon Platinum 8158 12C 150W 3.0GHz Processor	7XG7A05617	AWDS	1 / 2
Intel Xeon Platinum 8160 24C 150W 2.1GHz Processor	7XG7A05616	AWDP	1 / 2
Intel Xeon Platinum 8160M 24C 150W 2.1GHz Processor	7XG7A05615	AWDQ	1 / 2
Intel Xeon Platinum 8164 26C 150W 2.0GHz Processor	7XG7A05613	AWDM	1 / 2
Intel Xeon Platinum 8170 26C 165W 2.1GHz Processor	7XG7A05611	AWDK	1 / 2
Intel Xeon Platinum 8170M 26C 165W 2.1GHz Processor	4XG7A09065	B0X2	1 / 2
Intel Xeon Platinum 8176 28C 165W 2.1GHz Processor	7XG7A05610	AWDH	1 / 2
Intel Xeon Platinum 8176M 28C 165W 2.1GHz Processor	7XG7A05609	AWDG	1 / 2

* For CTO configurations, the feature code represents a processor, and fans and heatsinks are derived by the configuration tool. For field upgrades, the part number includes a processor, a heatsink, and an additional system fan.

** Factory-installed only.

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

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 per socket	UPI speed	TDP	HT	TB	VT-x	VT-d
Intel Xeon Bronze processors											
3104	1.7 / 1.7 GHz	6 / 6	8.25 MB	2133 MHz	768 GB	9.6 GT/s	85 W	No	No	Yes	Yes
3106	1.7 / 1.7 GHz	8 / 8	11 MB	2133 MHz	768 GB	9.6 GT/s	85 W	No	No	Yes	Yes
Intel Xeon Silver processors											
4108	1.8 / 3.0 GHz	8 / 16	11 MB	2400 MHz	768 GB	9.6 GT/s	85 W	Yes	Yes	Yes	Yes
4109T	2.0 / 3.0 GHz	8 / 16	11 MB	2400 MHz	768 GB	9.6 GT/s	70 W	Yes	Yes	Yes	Yes
4110	2.1 / 3.0 GHz	8 / 16	11 MB	2400 MHz	768 GB	9.6 GT/s	85 W	Yes	Yes	Yes	Yes
4112	2.6 / 3.0 GHz	4 / 8	8.25 MB	2400 MHz	768 GB	9.6 GT/s	85 W	Yes	Yes	Yes	Yes
4114	2.2 / 3.0 GHz	10 / 20	13.75 MB	2400 MHz	768 GB	9.6 GT/s	85 W	Yes	Yes	Yes	Yes
4114T	2.2 / 3.0 GHz	10 / 20	13.75 MB	2400 MHz	768 GB	9.6 GT/s	85 W	Yes	Yes	Yes	Yes
4116	2.1 / 3.0 GHz	12 / 24	16.5 MB	2400 MHz	768 GB	9.6 GT/s	85 W	Yes	Yes	Yes	Yes
4116T	2.1 / 3.0 GHz	12 / 24	16.5 MB	2400 MHz	768 GB	9.6 GT/s	85 W	Yes	Yes	Yes	Yes
Intel Xeon Gold processors											
5115	2.4 / 3.2 GHz	10 / 20	13.75 MB	2400 MHz	768 GB	10.4 GT/s	85 W	Yes	Yes	Yes	Yes
5117	2.0 / 2.8 GHz	14 / 28	19.25 MB	2400 MHz	768 GB	10.4 GT/s	105W	Yes	Yes	Yes	Yes
5118	2.3 / 3.2 GHz	12 / 24	16.5 MB	2400 MHz	768 GB	10.4 GT/s	105 W	Yes	Yes	Yes	Yes
5119T	1.9 / 3.2 GHz	14 / 28	19.25 MB	2400 MHz	768 GB	10.4 GT/s	85 W	Yes	Yes	Yes	Yes
5120	2.2 / 3.2 GHz	14 / 28	19.25 MB	2400 MHz	768 GB	10.4 GT/s	105 W	Yes	Yes	Yes	Yes
5120T	2.2 / 3.2 GHz	14 / 28	19.25 MB	2400 MHz	768 GB	10.4 GT/s	105 W	Yes	Yes	Yes	Yes
5122	3.6 / 3.7 GHz	4 / 8	16.5 MB	2666 MHz	768 GB	10.4 GT/s	105 W	Yes	Yes	Yes	Yes
6126	2.6 / 3.7 GHz	12 / 24	19.25 MB	2666 MHz	768 GB	10.4 GT/s	125 W	Yes	Yes	Yes	Yes
6128	3.4 / 3.7 GHz	6 / 12	19.25 MB	2666 MHz	768 GB	10.4 GT/s	115 W	Yes	Yes	Yes	Yes
6130	2.1 / 3.7 GHz	16 / 32	22 MB	2666 MHz	768 GB	10.4 GT/s	125 W	Yes	Yes	Yes	Yes
6130T	2.1 / 3.7 GHz	16 / 32	22 MB	2666 MHz	768 GB	10.4 GT/s	125 W	Yes	Yes	Yes	Yes
6132	2.6 / 3.7 GHz	14 / 28	19.25 MB	2666 MHz	768 GB	10.4 GT/s	140 W	Yes	Yes	Yes	Yes
6134	3.2 / 3.7 GHz	8 / 16	24.75 MB	2666 MHz	768 GB	10.4 GT/s	130 W	Yes	Yes	Yes	Yes

CPU model	Core frequency (Base / TB Max)	Number of cores / threads	Cache	Max DDR4 frequency	Max memory per socket	UPI speed	TDP	HT	TB	VT-x	VT-d
6134M	3.2 / 3.7 GHz	8 / 16	24.75 MB	2666 MHz	1.5 TB	10.4 GT/s	130 W	Yes	Yes	Yes	Yes
6136	3.0 / 3.7 GHz	12 / 24	24.75 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
6138	2.0 / 3.7 GHz	20 / 40	27.5 MB	2666 MHz	768 GB	10.4 GT/s	125 W	Yes	Yes	Yes	Yes
6138T	2.0 / 3.7 GHz	20 / 40	27.5 MB	2666 MHz	768 GB	10.4 GT/s	125 W	Yes	Yes	Yes	Yes
6140	2.3 / 3.7 GHz	18 / 36	24.75 MB	2666 MHz	768 GB	10.4 GT/s	140 W	Yes	Yes	Yes	Yes
6140M	2.3 / 3.7 GHz	18 / 36	24.75 MB	2666 MHz	1.5 TB	10.4 GT/s	140 W	Yes	Yes	Yes	Yes
6142	2.6 / 3.7 GHz	16 / 32	22 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
6142M	2.6 / 3.7 GHz	16 / 32	22 MB	2666 MHz	1.5 TB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
6148	2.4 / 3.7 GHz	20 / 40	27.5 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
6150	2.7 / 3.7 GHz	18 / 36	24.75 MB	2666 MHz	768 GB	10.4 GT/s	165 W	Yes	Yes	Yes	Yes
6152	2.1 / 3.7 GHz	22 / 44	30.25 MB	2666 MHz	768 GB	10.4 GT/s	140 W	Yes	Yes	Yes	Yes
Intel Xeon Platinum processors											
8153	2.0 / 2.8 GHz	16 / 32	22 MB	2666 MHz	768 GB	10.4 GT/s	125 W	Yes	Yes	Yes	Yes
8156	3.6 / 3.7 GHz	4 / 8	16.5 MB	2666 MHz	768 GB	10.4 GT/s	105 W	Yes	Yes	Yes	Yes
8158	3.0 / 3.7 GHz	12 / 24	24.75 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
8160	2.1 / 3.7 GHz	24 / 48	33 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
8160M	2.1 / 3.7 GHz	24 / 48	33 MB	2666 MHz	1.5 TB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
8164	2.0 / 3.7 GHz	26 / 52	35.75 MB	2666 MHz	768 GB	10.4 GT/s	150 W	Yes	Yes	Yes	Yes
8170	2.1 / 3.7 GHz	26 / 52	35.75 MB	2666 MHz	768 GB	10.4 GT/s	165 W	Yes	Yes	Yes	Yes
8170M	2.1 / 3.7 GHz	26 / 52	35.75 MB	2666 MHz	1.5 TB	10.4 GT/s	165 W	Yes	Yes	Yes	Yes
8176	2.1 / 3.8 GHz	28 / 56	38.5 MB	2666 MHz	768 GB	10.4 GT/s	165 W	Yes	Yes	Yes	Yes
8176M	2.1 / 3.8 GHz	28 / 56	38.5 MB	2666 MHz	1.5 TB	10.4 GT/s	165 W	Yes	Yes	Yes	Yes

Memory

The ThinkAgile VX5520 appliances support Lenovo TruDDR4 memory. 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 VX5520 supports up to 24 DIMMs. The following rules apply when selecting the memory configuration:

- The appliances support RDIMMs or LRDIMMs; mixing RDIMMs and LRDIMMs is not supported.
- All DIMMs in the appliance must be of the same type and capacity.
- All DIMMs in the appliance operate at the same speed up to 2666 MHz, which is determined by the maximum memory speed supported by the specific processor.
Note: Maximum memory speed can be achieved when Max performance mode is enabled in UEFI.

The following memory protection technologies are supported:

- ECC
- SDDC (for x4-based memory DIMMs)
- ADDDC (for x4-based memory DIMMs; Gold and Platinum processors only)
- Patrol scrubbing
- Demand scrubbing

Single Device Data Correction (SDDC) works only in the independent channel mode (the default operational mode) and supports only x4-based memory DIMMs.

Adaptive Double Device Data Correction (ADDDC) works with x4-based memory DIMMs and requires two DIMM ranks per channel, Intel Xeon Gold or Platinum processors, and the Closed Page memory access mode.

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

Table 6. Memory options

Description	Part number	Feature code	Quantity*
RDIMMs			
ThinkSystem 8GB TruDDR4 2666 MHz (1Rx8 1.2V) RDIMM	7X77A01301	AUU1	4, 6, 8, 12 / 4, 6, 8, 12, 16, 24
ThinkSystem 16GB TruDDR4 2666 MHz (1Rx4 1.2V) RDIMM	7X77A01302	AUNB	4, 6, 8, 12 / 4, 6, 8, 12, 16, 24
ThinkSystem 16GB TruDDR4 2666 MHz (2Rx8 1.2V) RDIMM	7X77A01303	AUNC	4, 6, 8, 12 / 4, 6, 8, 12, 16, 24
ThinkSystem 32GB TruDDR4 2666 MHz (2Rx4 1.2V) RDIMM	7X77A01304	AUND	4, 6, 8, 12 / 4, 6, 8, 12, 16, 24
LRDIMMs			
ThinkSystem 64GB TruDDR4 2666 MHz (4Rx4 1.2V) LRDIMM	7X77A01305	AUNE	4, 6, 8, 12 / 4, 6, 8, 12, 16, 24

* The quantity shown is with one processor / two processors.

Internal storage

The ThinkAgile VX5520 appliance provides up to 14 LFF SAS/SATA hot-swap drive bays for configurable storage capacity, and it contains two internal M.2 SATA non-hot-swap SSDs for a hypervisor boot volume.

The following table lists the internal storage options for the VX5520 appliance.

Table 7. Internal storage options

Description	Part number	Feature code	Quantity
Backplanes			
ThinkSystem SR550/SR650 3.5" SATA/SAS 12-Bay Backplane	None*	AUR9	1
ThinkSystem SR590/SR650 3.5" Rear HDD Kit	7XH7A06253	AURZ	1
M.2 enablement kit			
ThinkSystem M.2 with Mirroring Enablement Kit	7Y37A01093	AUMV	1

* Factory-installed.

Configuration notes:

- The Rear HDD Kit (7XH7A06253) is required if more than 12 drives are selected. The rear drive bays are optional if 12 or fewer drives are selected.
- The M.2 with Mirroring Enablement Kit (7Y37A01093) is connected to the Intel PCH via the PCIe link, and the kit supports two M.2 SATA SSDs configured in a RAID-1 drive group for a hypervisor boot volume.

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

Table 8. Drive options for hypervisor boot volume

Description	Part number	Feature code	Quantity
ThinkSystem M.2 128GB SATA 6Gbps Non-Hot-Swap SSD	7N47A00130	AUUV	2
ThinkSystem M.2 5100 240GB SATA 6Gbps Non-Hot Swap SSD	4XB7A14049	B5S4	2
ThinkSystem M.2 5300 240GB SATA 6Gbps Non-Hot Swap SSD	4XB7A17071	B8HS	2
ThinkSystem M.2 5100 480GB SATA 6Gbps Non-Hot-Swap SSD	7SD7A05703	B11V	2
ThinkSystem M.2 5300 480GB SATA 6Gbps Non-Hot Swap SSD	4XB7A17073	B919	2

Configuration note: Two M.2 SATA SSDs are required for selection, and they must be of the same model and capacity. The withdrawn VX5520 (7Y14) appliance does not support M.2 5100 or 5300 SATA SSDs.

The following table lists the storage controllers for internal storage of the VX5520 appliance.

Table 9. Controllers for internal storage

Description	Part number	Feature code	Quantity
ThinkSystem 430-16i SAS/SATA 12Gb HBA	7Y37A01089	AUNM	1

Configuration note: A low profile SAS HBA for internal storage occupies the dedicated PCIe x8 slot 7 on the system board.

Drives for internal storage

The following tables list the drive selection options.

Table 10. Drive selection options

Description	Part number	Feature code	Quantity per drive group (min / max)
SSD selection (Cache tier): SAS 12Gb SSDs - SS300 Performance			
ThinkSystem 3.5" HUSMM32 400GB Performance SAS 12Gb Hot Swap SSD	7N47A00997	B16Z	1 / 1
ThinkSystem 3.5" HUSMM32 800GB Performance SAS 12Gb Hot Swap SSD	7N47A00998	B170	1 / 1
ThinkSystem 3.5" HUSMM32 1.6TB Performance SAS 12Gb Hot Swap SSD	7N47A00999	B171	1 / 1
SSD selection (Cache tier): SAS 12Gb SSDs - SS530 Performance			
ThinkSystem 3.5" SS530 800GB Performance SAS 12Gb Hot Swap SSD	4XB7A10234	B4Y8	1 / 1
ThinkSystem 3.5" SS530 1.6TB Performance SAS 12Gb Hot Swap SSD	4XB7A10235	B4Y9	1 / 1
ThinkSystem 3.5" SS530 3.2TB Performance SAS 12Gb Hot Swap SSD	4XB7A10236	B4YA	1 / 1
SSD selection (Cache tier): SAS 12Gb SSDs - PM1645 Mainstream			
ThinkSystem 3.5" PM1645 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13657	B4A3	1 / 1
ThinkSystem 3.5" PM1645 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13658	B4A4	1 / 1
ThinkSystem 3.5" PM1645 3.2TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A13659	B4A5	1 / 1
SSD selection (Cache tier): SAS 12Gb SSDs - PM1645a Mainstream			
ThinkSystem 3.5" PM1645a 800GB Mainstream SAS 12Gb Hot Swap SSD	4XB7A17066	B8HT	1 / 1
ThinkSystem 3.5" PM1645a 1.6TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A17043	B8JN	1 / 1

Description	Part number	Feature code	Quantity per drive group (min / max)
ThinkSystem 3.5" PM1645a 3.2TB Mainstream SAS 12Gb Hot Swap SSD	4XB7A17067	B8JK	1 / 1
SSD selection (Cache tier): SAS 12Gb SSDs - PM1643 Capacity			
ThinkSystem 3.5" PM1643 3.84TB Capacity SAS 12Gb Hot Swap SSD	4XB7A13649	B4A8	1 / 1
SSD selection (Cache tier): SAS 12Gb SSDs - PM1643a Entry			
ThinkSystem 3.5" PM1643a 3.84TB Entry SAS 12Gb Hot Swap SSD	4XB7A17058	B91E	1 / 1
SSD selection (Cache tier): SATA 6Gb SSDs - 5300 Mainstream			
ThinkSystem 3.5" 5300 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17097	B8JF	1 / 1
ThinkSystem 3.5" 5300 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17098	B8J0	1 / 1
ThinkSystem 3.5" 5300 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17099	B8HR	1 / 1
ThinkSystem 3.5" 5300 3.84TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A17100	B8HX	1 / 1
SSD selection (Cache tier): SATA 6Gb SSDs - S4600 Mainstream			
ThinkSystem 3.5" Intel S4600 1.92TB Mainstream SATA 6Gb Hot Swap SSD	7SD7A05715	B109	1 / 1
SSD selection (Cache tier): SATA 6Gb SSDs - S4610 Mainstream			
ThinkSystem 3.5" Intel S4610 480GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13640	B49S	1 / 1
ThinkSystem 3.5" Intel S4610 960GB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13641	B49T	1 / 1
ThinkSystem 3.5" Intel S4610 1.92TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13642	B49U	1 / 1
ThinkSystem 3.5" Intel S4610 3.84TB Mainstream SATA 6Gb Hot Swap SSD	4XB7A13643	B49V	1 / 1
SSD selection (Cache tier): SATA 6Gb SSDs - 5300 Entry			
ThinkSystem 3.5" 5300 960GB Entry SATA 6Gb Hot Swap SSD	4XB7A17083	B8JC	1 / 1
ThinkSystem 3.5" 5300 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A17084	B8HZ	1 / 1
ThinkSystem 3.5" 5300 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A17085	B8HQ	1 / 1
SSD selection (Cache tier): SATA 6Gb SSDs - S4510 Entry			
ThinkSystem 3.5" Intel S4510 960GB Entry SATA 6Gb Hot Swap SSD	4XB7A13627	B49F	1 / 1
ThinkSystem 3.5" Intel S4510 1.92TB Entry SATA 6Gb Hot Swap SSD	4XB7A13628	B49G	1 / 1
ThinkSystem 3.5" Intel S4510 3.84TB Entry SATA 6Gb Hot Swap SSD	4XB7A13629	B49H	1 / 1
HDD selection (Capacity tier): NL SAS 12Gb HDDs			
ThinkSystem 3.5" 1TB 7.2K SAS 12Gb Hot Swap 512n HDD	7XB7A00041	AUU4	2 / 7
ThinkSystem 3.5" 2TB 7.2K SAS 12Gb Hot Swap 512n HDD	7XB7A00042	AUU5	2 / 7
ThinkSystem 3.5" 4TB 7.2K SAS 12Gb Hot Swap 512n HDD	7XB7A00043	AUU6	2 / 7
ThinkSystem 3.5" 6TB 7.2K SAS 12Gb Hot Swap 512e HDD	7XB7A00044	AUU7	2 / 7
ThinkSystem 3.5" 8TB 7.2K SAS 12Gb Hot Swap 512e HDD	7XB7A00045	B0YR	2 / 7
ThinkSystem 3.5" 10TB 7.2K SAS 12Gb Hot Swap 512e HDD	7XB7A00046	AUUG	2 / 7
ThinkSystem 3.5" 12TB 7.2K SAS 12Gb Hot Swap 512e HDD	7XB7A00067	B117	2 / 7
ThinkSystem 3.5" 14TB 7.2K SAS 12Gb Hot Swap 512e HDD	4XB7A13906	B496	2 / 7
ThinkSystem 3.5" 16TB 7.2K SAS 12Gb Hot Swap 512e HDD	4XB7A13911	B7EZ	2 / 7

Configuration notes:

- The VX5520 appliance supports up to 4 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 6 capacity drives in each group.
 - 3 drive groups: From 2 to 3 capacity drives in each group.
 - 4 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 type and capacity.
- The withdrawn VX5520 (7Y14) appliance also supports 2 TB, 4 TB, and 6 TB NL SAS HDDs.

I/O expansion

The VX5520 appliance supports one LOM card slot and up to seven PCIe slots: one slot on the system planar that is dedicated to an internal storage controller, one regular PCIe slot on the system planar, and up to five PCIe slots with different riser cards installed into two riser sockets on the system planar (one riser socket supports installation of one riser card).

The slot form factors are as follows:

- LOM card slot
- Slot 1: PCIe 3.0 x16 or PCIe 3.0 x8; full-height, half-length (PCIe x16 slot is double-wide)
- Slot 2: PCIe 3.0 x8; full-height, half-length (not present if the slot 1 is PCIe x16 or slot 3 is ML2 x16)
- Slot 3: PCIe 3.0 x8, or ML2 x8, or ML2 x16; full-height, half-length
- Slot 4: PCIe 3.0 x8; low profile (vertical slot on system planar)
- Slot 5: PCIe 3.0 x16; full-height, half-length
- Slot 6: PCIe 3.0 x16; full-height, half-length
- Slot 7: PCIe 3.0 x8 (dedicated to an internal storage controller)

Configuration notes:

- Slots 5 and 6 require the second processor to be installed.
- Slots 1 - 3 are not present if the Rear HDD Kit is installed.

Riser Card 1 supplies Slots 1, 2, and 3, and Riser 2 supplies Slots 5 and 6. The slots that are available for use depend on the number of riser cards that are installed and whether the second processor is installed, as shown in the following table.

Table 11. Slots available for use

Riser Card 1	Riser Card 2	Slots available for use	
		Processor 1	Processor 2
None	None	LOM, 4, 7	-
None	PCIe x16/x16	LOM, 4, 7	5, 6
PCIe x8/x8/x8 or PCIe x8/x8/x8ML2	None	LOM, 1, 2, 3, 4, 7	-
PCIe x8/x8/x8 or PCIe x8/x8/x8ML2	PCIe x16/x16	LOM, 1, 2, 3, 4, 7	5, 6
PCIe x16/x8 or PCIe x8/x16ML2	None	LOM, 1, 3, 4, 7	-
PCIe x16/x8 or PCIe x8/x16ML2	PCIe x16/x16	LOM, 1, 3, 4, 7	5, 6

The locations of the PCIe slots are shown in the following figure.

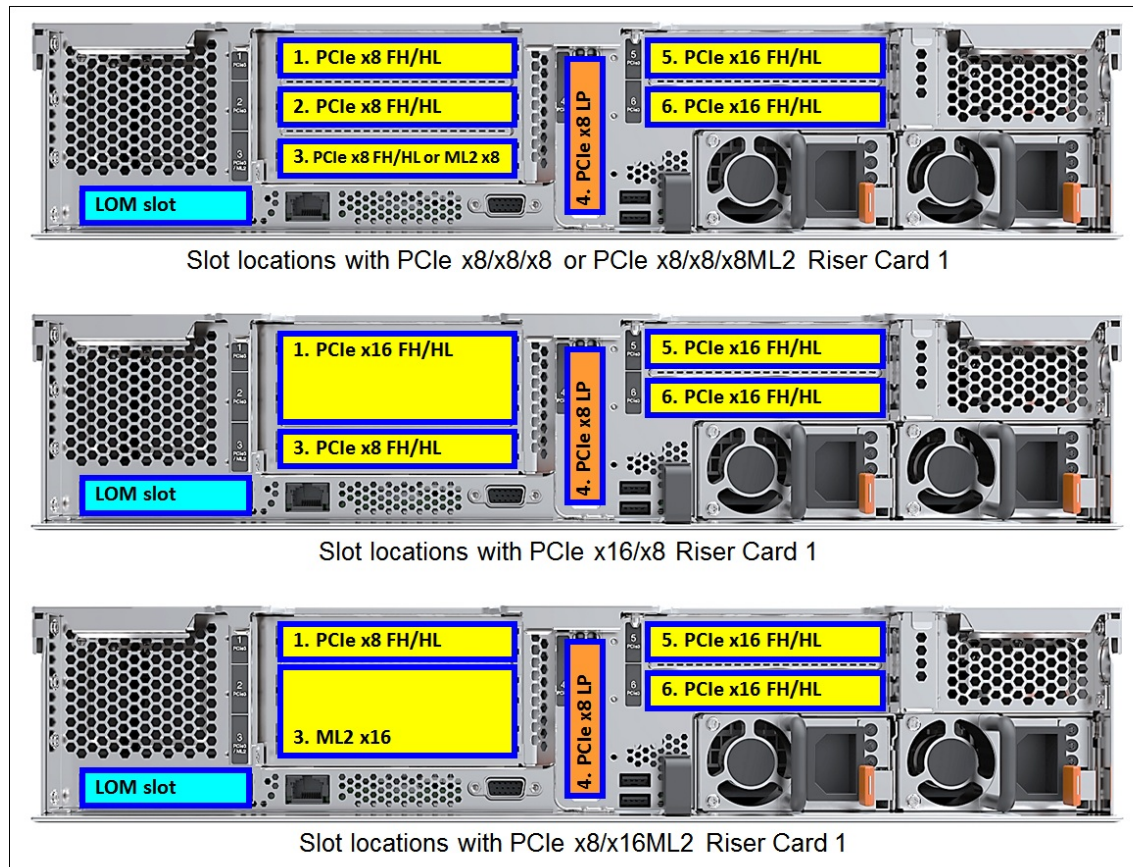


Figure 5. Slot locations

The following table lists available PCIe riser card options.

Table 12. PCIe riser cards and miscellaneous options

Description	Part number	Feature code	Maximum quantity
x8 Riser Card 1 options (Riser Card 1 supplies Slots 1, 2, and 3)			
ThinkSystem SR550/SR590/SR650 x8/x8/x8 PCIe FH Riser 1 Kit	7XH7A02677	AUR4	1
ThinkSystem SR550/SR590/SR650 x8/x8/x8ML2 PCIe FH Riser 1 Kit	7XH7A02680	AUR7	1
x16 Riser Card 1 options (Riser Card 1 supplies Slots 1 and 3)			
ThinkSystem SR550/SR590/SR650 x16/x8 PCIe FH Riser 1 Kit	7XH7A02678	AUR3	1
ThinkSystem SR650 x8/x16ML2 PCIe FH Riser 1 Kit	7XH7A02681	AURB	1
Riser Card 2 option (Riser Card 2 supplies Slots 5 and 6)			
ThinkSystem SR550/SR590/SR650 (x16/x8)/(x16/x16) PCIe FH Riser 2 Kit	7XH7A02679	AURC	1

Network connectivity

The ThinkAgile VX5520 appliances provide two- or four-port 1/10 GbE RJ-45 or 10 GbE SFP+ network connectivity with the onboard Intel X722 NIC and a LOM card installed in the appliance. Two or four additional 1/10 GbE RJ-45, 10 GbE SFP+, or 10/25 GbE SFP28 ports, or four or eight additional 1 GbE RJ-45 ports can be selected, if required.

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

Table 13. Network adapter selection options: VX5520 (7Y94)

Description	Part number	Feature code	Qty*	I/O slots supported
1 GbE RJ-45 adapter ports				
ThinkSystem I350-T4 PCIe 1Gb 4-Port RJ45 Ethernet Adapter	7ZT7A00535	AUZW	0 / 2	4, 2, 6, 3, 5, 1
1/10 GbE RJ-45 LOM ports				
ThinkSystem 10Gb 2-port Base-T LOM (RJ-45)	7ZT7A00548	AUKL	0 / 1	LOM slot
ThinkSystem 10Gb 4-port Base-T LOM (RJ-45)	7ZT7A00549	AUKM	0 / 1	LOM slot
1/10 GbE RJ-45 adapter ports				
Intel X550-T2 Dual Port 10GBase-T Adapter (RJ-45)	00MM860	ATPX	0 / 2	4, 2, 6, 3, 5, 1
10 GbE SFP+ LOM ports				
ThinkSystem 10Gb 2-port SFP+ LOM	7ZT7A00546	AUKJ	0 / 1	LOM slot
ThinkSystem 10Gb 4-port SFP+ LOM	7ZT7A00547	AUKK	0 / 1	LOM slot
10 GbE SFP+ adapter ports				
Emulex VFA5.2 2x10 GbE SFP+ PCIe Adapter	00AG570	AT7S	0 / 2	4, 2, 6, 3, 5, 1
Intel X710-DA2 PCIe 10Gb 2-Port SFP+ Ethernet Adapter	7ZT7A00537	AUKX	0 / 2	4, 2, 6, 3, 5, 1
10/25 GbE SFP28 adapter ports				
Broadcom 57412 10/25GbE SFP28 1-Port PCIe Ethernet Adapter	7ZT7A00505	AUKS	0 / 2	4, 2, 6, 3, 5, 1
Intel XXV710-DA2 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	7XC7A05523	B0WY	0 / 2	4, 2, 6, 3, 5, 1
Mellanox ConnectX-4 Lx 10/25GbE SFP28 2-Port PCIe Ethernet Adapter	01GR250	AUAJ	0 / 2	4, 2, 6, 3, 5, 1

* Quantity: Minimum / Maximum.

Configuration notes:

- PCIe network adapters are supported in the low profile PCIe x8 slot 4 on the system board and full-height PCIe x8 and x16 slots supplied by the Riser Cards 1 and 2.
- One of the network adapter options is required for selection. Additional ports can be selected, if needed.
- If two PCIe adapters are selected, they must be of the same model.
- The withdrawn VX5520 (7Y14) appliance does not support 10/25 GbE SFP28 network adapters.
- Supported transceivers or DAC cables should be purchased for the SFP+ and SFP28 adapters, and UTP Category 6 cables should be purchased for the 1 GbE or 10 GbE RJ-45 adapters. 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 1/10 GbE RJ-45 adapters](#)
- [Transceivers and cables for 10 GbE SFP+ adapters](#)
- [Transceivers and cables for 25 GbE SFP28 adapters](#)

The following table lists cables for the 1/10 GbE RJ-45 adapters.

Table 14. Cables for 1/10 GbE RJ-45 adapters

Description	Part number	Feature code
UTP Category 6 cables (Green) for 1/10 GbE RJ-45 adapters		
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

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

Table 15. Transceivers and cables for 10 GbE SFP+ adapters

Description	Part number	Feature code
10 GbE SFP+ SR transceivers for 10 GbE SFP+ adapters		
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+ adapters		
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+ adapters*		
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

Description	Part number	Feature code
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

* The Emulex VFA5.2 ML2 (00AG560) and PCIe (00AG570) network adapters do not support active SFP+ DAC cables.

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

Table 16. Transceivers and cables for 25 GbE SFP28 adapters

Description	Part number	Feature code
25 GbE SFP28 SR transceivers for 25 GbE SFP28 adapters		
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 network adapters		
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 network adapters*		
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).

Power supplies and cables

The VX5520 appliance can be configured with one or two power supplies. The following table lists the power supply options that are available for selection.

Table 17. Power supply selection options

Description	Part number	Feature code	Quantity (min / max)
ThinkSystem 1100W (230V/115V) Platinum Hot-Swap Power Supply	7N67A00885	AVWF	1 / 2
ThinkSystem 1600W (230V) Platinum Hot-Swap Power Supply	7N67A00886	AVWG	1 / 2

Configuration notes:

- A minimum of 1 and a maximum of 2 power supplies can be selected per system.
- For N+N power redundancy, the power supplies should provide sufficient power without oversubscription for the selected appliance configuration. To ensure that the right power supply is chosen, you should always validate your appliance configuration using the latest version of the Lenovo Capacity Planner: <http://datacentersupport.lenovo.com/us/en/solutions/Invo-lcp>
- If two power supplies are installed, they must be identical.
- The power supplies support AC (Worldwide) and HVDC (China only) power sources.

The VX5520 appliances ship with one or two customer-configured power cords (A hot-swap power supply option does not contain a power cord). The following table lists the rack power cables and line cords that can be ordered for the VX5520 appliances.

Table 18. Power cables

Description	Part number	Feature code
Rack power cables		
1.0m, 10A/125-250V, C13 to IEC 320-C14 Rack Power Cable	00Y3043	A4VP
1.0m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08367	B0N5
1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable	39Y7937	6201
1.5m, 13A/100-250V, C13 to IEC 320-C14 Rack Power Cable	4L67A08368	B0N6
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

Description	Part number	Feature code
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
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
India 2.8m, 10A/250V, C13 to IS 6538 Line Cord	39Y7927	6269
India 4.3m, 10A/250V, C13 to IS 6538 Line Cord	81Y2386	6567
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/250V, C13 to CNS 10917-3 Line Cord	81Y2375	6317
Taiwan 2.8m, 15A/125V, C13 to CNS 10917-3 Line Cord	81Y2374	6402
Taiwan 4.3m, 10A/250V, C13 to CNS 10917-3 Line Cord	81Y2389	6531
Taiwan 4.3m, 15A/125V, C13 to CNS 10917-3 Line Cord	81Y2388	6530
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/250V, C13 to NEMA 6-15P Line Cord	46M2592	A1RF
United States 2.8m, 13A/125V, C13 to NEMA 5-15P Line Cord	00WH545	6401
United States 4.3m, 10A/250V, C13 to NEMA 6-15P Line Cord	4L67A08361	6373
United States 4.3m, 13A/125V, C13 to NEMA 5-15P Line Cord	4L67A08360	AX8A

Configuration note: If the 1100 W AC power supplies (7N67A00885) in the appliance are connected to a low-voltage power source (100 - 125 V), the only supported power cables are those that are rated above 10 A; cables that are rated at 10 A are not supported.

Rack installation

The VX Series appliances ship with a rail kit with or without CMA depending on the rack installation option selected. The following table lists the rack installation options that are available for the VX5520 appliances.

Table 19. Rack installation options

Description	Part number	Feature code	Quantity (min / max)
4-post rail kits			
ThinkSystem Tool-less Slide Rail	7M27A05702	AXCA	0 / 1
ThinkSystem Tool-less Slide Rail Kit with 2U CMA	7M27A05700	AXCH	0 / 1
Cable management arm (CMA) upgrade			
ThinkSystem 2U CMA Upgrade Kit for Tool-less Slide Rail	7M27A05698	None^	0 / 1*
Front VGA port			
ThinkSystem SR550/SR590/SR650 EIA Latch w/ VGA Upgrade Kit	7Z17A02578	AUS8	0 / 1
Lockable front bezel			
ThinkSystem 2U Security Bezel	7Z17A02580	AURX	0 / 1

^ Field upgrade only.

* The 2U CMA Upgrade Kit for Tool-less Slide Rail is supported with the Tool-less Slide Rail (7M27A05702) only.

Configuration note: One of the rail kits is required for selection.

The following table summarizes the rail kit features and specifications.

Table 20. Rail kit features and specifications summary

Feature	Tool-less Slide Rail	
	Without CMA	With CMA
Part number	7M27A05702	7M27A05700
CMA	7M27A05698	Included
Rail length	730 mm (28.74 in.)	807 mm (31.8 in.)
Rail type	Full-out slide (ball bearing)	
Tool-less installation	Yes	
In-rack server maintenance	Yes	
1U PDU support	Yes	
0U PDU support	Limited*	
Rack type	IBM and Lenovo 4-post, IEC 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 is used, the rack cabinet must be at least 1100 mm (43.31 in.) deep if no CMA is used, or at least 1200 mm (47.24 in.) deep if a CMA is used.

^ Measured when mounted on the rack, 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 two internal M.2 SSDs configured in a RAID-1 drive group.

The following table lists the VMware ESXi hypervisor versions that are available for selection for the withdrawn VX5520 (7Y14).

Table 21. VMware ESXi hypervisor selection options: VX5520 (7Y14)

Description	Feature code
VMware ESXi 6.5 U1 (Factory Installed)	AXFT

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

Table 22. VMware ESXi hypervisor selection options: VX5520 (7Y94)

Description	Feature code
VMware ESXi 6.5 U2 (Factory Installed)	B3VW
VMware ESXi 6.5 U3 (Factory installed)	B6U0
VMware ESXi 6.7 (Factory Installed)	B3VX
VMware ESXi 6.7 U1 (Factory Installed)	B4XA
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](#)
- [VMware License and Subscription with 1-year software support for PRC](#)

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 that are available for selection include 1-year (the selection is available in PRC only), 3-year, or 5-year software support (matches the duration of the selected solution-level warranty period).

- The quantity of processor-based licenses is derived by the configuration tool based on the number of processors selected.
- The quantity of VM-based licenses is specified based on VM requirements.
- 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 quantity of processors, 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 quantity of processors, 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 quantity of processors, 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), quantity of processors (for processor-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.

VMware License and Subscription with 1-year software support for PRC

The following table lists ordering information for the additional VMware License and Subscription options with 1-year software support that are available for selection in PRC only.

Table 38. VMware License and Subscription options with 1-year software support

Description	Part number	Feature code
vSAN 6		
VMware vSAN 6 Standard for 1 Processor w/1Yr Support	7S06001HWW	B28W
VMware vSAN 6 Advanced for 1 Processor w/1Yr Support	7S06001MWW	B290
VMware vSAN 6 Enterprise for 1 Processor w/1Yr Support	7S06001RWW	B294
VMware vSAN 6 Enterprise Plus for 1 Processor w/1Y Support	7S0600FRWW	S226
vSAN 6 for Remote Office Branch Office		
VMware vSAN 6 Standard for Rmt Off Brnch Off 25VM Pk w/1Yr Support	7S06001LWW	B28Z
VMware vSAN 6 Advanced for Rmt Off Brnch Off 25VM Pk w/1Yr Support	7S06001QWW	B293
VMware vSAN 6 Enterprise for Rmt Off Brnch Off 25VM Pk w/1Yr Support	7S06001UWW	B297
vSAN 6 for Desktop		
VMware vSAN 6 Standard for Desktop 10 Conc User Pk w/1Yr Support	7S06001JWW	B28X
VMware vSAN 6 Standard for Desktop 100 Conc User Pk w/1Yr Support	7S06001KWW	B28Y
VMware vSAN 6 Advanced for Desktop 10 Conc User Pk w/1Yr Support	7S06001NWW	B291
VMware vSAN 6 Advanced for Desktop 100 Conc User Pk w/1Yr Support	7S06001PWW	B292
VMware vSAN 6 Enterprise for Desktop 10 Conc User Pk w/1Yr Support	7S06001SWW	B295
VMware vSAN 6 Enterprise for Desktop 100 Conc User Pk w/1Yr Support	7S06001TWW	B296
vSphere 6		
VMware vSphere 6 Standard for 1 Processor w/1Yr Support	7S060003WW	B27G
VMware vSphere 6 Enterprise Plus for 1 Processor w/1Yr Support	7S060004WW	B27H
VMware vSphere 6 Remote Off Branch Off Std (25 VM Pk) w/1Yr Support	7S060009WW	B27N
VMware vSphere 6 Remote Off Branch Off Adv (25 VM Pk) w/1Yr Support	7S06000AWW	B27P
Horizon 7		
VMware Horizon 7 Standard 10 Concurrent User Pack w/1Yr Support	7S06000KWW	B27Y

Description	Part number	Feature code
VMware Horizon 7 Standard 100 Concurrent User Pack w/1Yr Support	7S06000LWW	B27Z
VMware Horizon 7 Advanced 10 Concurrent User Pack w/1Yr Support	7S06000PWW	B282
VMware Horizon 7 Advanced 10 Named User Pack w/1Yr Support	7S06000RWW	B284
VMware Horizon 7 Advanced 100 Concurrent User Pack w/1Yr Support	7S06000QWW	B283
VMware Horizon 7 Advanced 100 Named User Pack w/1Yr Support	7S06000SWW	B285
VMware Horizon 7 Enterprise 10 Concurrent User Pack w/1Yr Support	7S06000XWW	B28A
VMware Horizon 7 Enterprise 10 Named User Pack w/1Yr Support	7S06000ZWW	B28C
VMware Horizon 7 Enterprise 100 Concurrent User Pack w/1Yr Support	7S06000YWW	B28B
VMware Horizon 7 Enterprise 100 Named User Pack w/1Yr Support	7S060010WW	B28D
VMware Cloud Foundation		
VMware Cloud Foundation Basic (Per CPU) w/1Yr Subscription and Support	7S0600D0WW	S1RQ
VMware Cloud Foundation Standard (Per CPU) w/1Y Subscription and Support	7S0600DMWW	S1SB
VMware Cloud Foundation Advanced (Per CPU) w/1Y Subscription and Support	7S0600DQWW	S1SE
VMware Cloud Foundation Enterprise (Per CPU) w/1Y Subscription and Support	7S0600DTWW	S1SH
VMware Cloud Foundation for VDI		
VCF for VDI: SDDC Mgr, NSX DC ADV, and Horizon ENT 10 pack (Per CCU) w/1Y S&S	7S0600D6WW	S1RW
VCF for VDI: SDDC Mgr, NSX DC ADV, and Horizon ENT 100 pack (Per CCU) w/1Y S&S	7S0600D3WW	S1RT
VCF for VDI: SDDC Mgr and NSX DC ADV w/o Horizon ENT 10 pack (per CCU) w/1Y S&S	7S0600DCWW	S1S2
VCF for VDI: SDDC Mgr and NSX DC ADV w/o Horizon ENT 100 pack (per CCU) w/1Y S&S	7S0600D9WW	S1RZ
VCF for VDI: SDDC Mgr and NSX DC ENT+ w/o Horizon ENT 10 pack (Per CCU) w/1Y S&S	7S0600DJWW	S1S8
VCF for VDI: SDDC Mgr and NSX DC ENT+ w/o Horizon ENT 100 pack (Per CCU) w/1Y S&S	7S0600DFWW	S1S5
vCenter Server		
VMware vCenter Srv 6 Fdn for vSph 6 (Per Instance) w/1Yr Support	7S06000DWW	B27S
VMware vCenter Srv 6 Std for vSph 6 (Per Instance) w/1Yr Support	7S06000CWW	B27R

Systems management

The ThinkAgile VX Series appliances support the following systems management tools:

- [Lenovo XClarity Controller](#)
- [Light path diagnostics](#)
- [Lenovo XClarity Administrator and XClarity Pro](#)
- [Lenovo XClarity Integrator for VMware vCenter](#)
- [Lenovo XClarity Energy Manager](#)

Lenovo XClarity Controller

The ThinkAgile VX Series 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](#)).

Light path diagnostics

The ThinkAgile VX5520 appliances include basic light path diagnostics, which provides the system LEDs on the front of the node and the LEDs near the monitored components (for example, the DIMM error LEDs on the system board).

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/lvno-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/lvno-lxem>

Physical specifications

The ThinkAgile VX5520 appliances have the following dimensions and weight (approximate):

- Height: 87 mm (3.4 in.)
- Width: 445 mm (17.5 in.)
- Depth: 720 mm (28.3 in.)
- Weight (maximum): 32 kg (70.5 lb)

Operating environment

The ThinkAgile VX5520 appliances comply with ASHRAE class A2 specifications. The appliance performance might be impacted when the operating temperature is outside the ASHRAE A2 specifications. Some VX5520 appliances comply with ASHRAE class A3 and class A4 specifications. To comply with ASHRAE A3 and A4 specifications, the appliances must meet the following hardware configuration requirements:

- Two power supplies installed.
- Processors with TDP more than or equal to 150 W not installed.
- Intel Xeon 4112, 5122, 6126, 6128, 6132, 6134, 6134M, and 8156 processors not installed.

The ThinkAgile VX5520 appliances are supported in the following environment:

- Air temperature:
 - Operating:
 - ASHRAE Class A4: 5 °C - 45 °C (41 °F - 113 °F); for altitudes above 900 m (2,953 ft), decrease the maximum ambient temperature by 1 °C for every 125-m (410-ft) increase in altitude
 - 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: 3,050 m (10,000 ft)
- Humidity:
 - Operating:
 - ASHRAE Class A4: 8% - 90% (non-condensing); maximum dew point: 24 °C (75 °F)
 - 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 (1100 W power supplies only)
 - 200 - 240 (nominal) V AC; 50 Hz / 60 Hz
 - 180 - 300 V DC (supported in China only)
- Acoustics (maximum configuration, operating): 6.2 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:
 - 12 kg - 22 kg: 50 G for 152 in./sec velocity change across 6 surfaces
 - 23 kg - 31 kg: 35 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 39. Rated system power, inlet current, and system heat output

Power supply	Source voltage	Maximum power load per system (two power supplies)	Rated current per inlet	System heat output
1100 W Platinum	100 - 127 V AC	1382 W	12 A	4715 BTU/hour
	200 - 240 V AC	1408 W	6 A	4804 BTU/hour
	180 - 300 V DC	1408 W	5.1 A	4804 BTU/hour
1600 W Platinum	200 - 240 V AC	2068 W	8.7 A	7056 BTU/hour
	180 - 300 V DC	2024 W	7.3 A	6906 BTU/hour

Regulatory compliance

The ThinkAgile VX Series appliances conform to the following regulations:

- United States FCC Part 15, Class A
- Canada ICES-003/NMB-03, Class A
- UL/CSA 60950-1
- Mexico NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22, Class A
- China CCC GB4943.1, GB9254 Class A, GB17625.1
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- Korea KN22, Class A; KN24
- Russia/GOST ME01; IEC-60950-1; GOST R 51318.22, 51318.24, 51317.3.2, and 51317.3.3
- IEC 60950-1 (CB Certificate and CB Test Report)
- Europe CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- Germany TUV-GS (EN60950-1/IEC60950-1, EK1-ITB2000)
- Reduction of Hazardous Substances (ROHS)
- Energy Star 3.0 (excluding configurations with Bronze 3104, Silver 4112, Gold 5122, or Platinum 8156 processors)

Note: For more information on the Energy Star 3.0 certification, refer to the *Energy Star 3.0 Certifications for ThinkSystem Servers* publication:

<http://lenovopress.com/lp1230>

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://lenovocator.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 one- (PRC only), three-, or five-year software support and subscription (matches the duration of the selected warranty period) that entitles customers to submit service requests to troubleshoot VMware software issues and receive code updates, including fixes, patches, and new software releases.

The Lenovo local support centers perform problem determination and resolution for hardware-related issues and escalate to VMware, on behalf of the customer, for software-related problem determination. 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 VX5520 appliances for network connectivity.

Table 40. 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 VX5520 appliances and other IT infrastructure building blocks.

Table 41. 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 VX5520 appliances and other IT infrastructure building blocks mounted in a rack cabinet.

Table 42. 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
Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)	

Description	Part number
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 VX5520 appliances and other IT infrastructure building blocks.

Table 43. 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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<http://www.lenovofs.com>

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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