

## Lenovo PX04PMC NVMe Mainstream Flash Adapters Product Guide (withdrawn product)

The Lenovo PX04PMC NVMe Enterprise Mainstream Flash Adapters in capacities of 1.92 TB and 3.84 TB are advanced data center PCIe Flash Storage Adapters optimized for mixed read-write performance, endurance, and strong data protection for System x and ThinkServer systems. They are engineered for greater performance and endurance in a cost-effective design, and to support a broader set of workloads.

Suggested uses: Data warehousing, Web servers, Media streaming, and Video on Demand (VOD).



Figure 1. Lenovo NVMe Enterprise Mainstream Flash Adapters

### Did you know?

NVMe (Non-Volatile Memory Express) is a technology that overcomes SAS/SATA SSD performance limitations by optimizing hardware and software to take full advantage of flash technology. The use of NVMe Flash Storage Adapters means data is transferred more efficiently from the processor to the storage compared to the legacy Advance Host Controller Interface (AHCI) stack, thereby reducing latency and overhead. These Flash Storage Adapters connect directly to the processor via the PCIe bus, further reducing latency and TCO compared to SAS/SATA SSDs.

Lenovo Enterprise Mainstream Flash Adapters are suitable for mixed read-write and general-purpose data center workloads, however their NVMe PCIe interface means the adapters also offer high performance. Overall, these adapters provide outstanding IOPS/watt and cost/IOPS for enterprise solutions.

## Part number information

The following tables list the part numbers to order the adapters.

**Withdrawn:** All adapters are now withdrawn from marketing.

Table 1. Part numbers and feature codes for ThinkSystem

Part number	Feature code	Description
7N47A00097	AUUP	ThinkSystem HHHL PX04PMC 1.92TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter
7N47A00098	AUVY	ThinkSystem HHHL PX04PMC 3.84TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter

Table 2. Part numbers and feature codes for System x

Part number	Feature code	Description
00YK286	AVP3	1.92TB NVMe Enterprise Mainstream Flash Adapter
00YK287	AVP4	3.84TB NVMe Enterprise Mainstream Flash Adapter

Table 3. Part numbers for ThinkServer

Part number	Description
4XB0K12394	ThinkServer 1.92TB NVMe Enterprise Mainstream Flash Adapter
4XB0K12395	ThinkServer 3.84TB NVMe Enterprise Mainstream Flash Adapter

The part numbers include the following items:

- One adapter with full-height (3U) PCIe bracket attached
- Separate low-profile (2U) PCIe bracket
- Warranty flyer and Important Notices document
- Support flyer for solid-state devices (System x options only)

## Features

Non-Volatile Memory Express (NVMe) is new PCIe 3.0 high performance solid-state storage technology that provides high I/O throughput and low latency. NVMe interfaces remove SAS/SATA bottlenecks and unleash all of the capabilities of contemporary NAND flash memory. Each Flash Storage Adapter has direct PCIe 3.0 x4 connection, which provides at least 2x more bandwidth and 2x less latency than SATA/SAS-based SSD solutions. NVMe Flash Storage Adapters are also optimized for heavy multi-threaded workloads by using internal parallelism and many other improvements, such as enlarged I/O queues.

The Lenovo NVMe Enterprise Mainstream Flash Adapters have the following features:

- Half-high half-length PCIe adapter with PCIe 3.0 x4 host interface
- Based on the Toshiba PX04P Add-in Card (AIC), PX04PMCxxx
- 19nm MLC NAND (128 Gb/die)
- 3 drive-write-per-day (DWPD) endurance for mixed read-write workloads
- Full Power-Loss-Protection and End-to-End Data Protection
- Low power consumption (maximum 18.5 W)

Enterprise Mainstream Flash Adapters and Enterprise Performance Flash Adapters have similar read IOPS performance, but the key difference between them is their endurance (or lifetime) (that is, how long they can perform write operations because Flash Adapters (like SSDs) have a finite number of program/erase (P/E) cycles). Enterprise Mainstream Flash Adapters have a better cost/IOPS ratio but lower endurance compared to Enterprise Performance Flash Adapters. Write endurance is typically measured by the number of program/erase (P/E) cycles that the adapter incurs over its lifetime, listed as the total bytes of written data (TBW) in the device specification.

The TBW value assigned to a Flash Adapter is the total bytes of written data (based on the number of P/E cycles) that an adapter can be guaranteed to complete (% of remaining P/E cycles = % of remaining TBW). Reaching this limit does not cause the adapter to immediately fail. It simply denotes the maximum number of writes that can be guaranteed. A Flash Adapter will not fail upon reaching the specified TBW. At some point based on manufacturing variance margin, after surpassing the TBW value, the adapter will reach the end-of-life point, at which the adapter will go into a read-only mode.

Because of such behavior by Enterprise Mainstream Flash Adapters, careful planning must be done to use them only in mixed read-write environments to ensure that the TBW of the adapter will not be exceeded before the required life expectancy.

For example, the 1.92TB NVMe Enterprise Mainstream Flash Adapter has an endurance of 10,412 TB of total bytes written (TBW). This means that for full operation over five years, write workload must be limited to no more than 5,705 GB of writes per day, which is equivalent to 3.0 full "drive" writes per day (DWPD). For the device to last three years, the write workload must be limited to no more than 9,509 GB of writes per day, which is equivalent to 5.0 full drive writes per day.

## Technical specifications

The following tables present technical specifications for the NVMe Enterprise Mainstream Flash Adapters.

Table 4. Technical specifications

Feature	1.92 TB adapter	3.84 TB adapter
Interface	PCIe 3.0 x4	PCIe 3.0 x4
Capacity	1.92 TB	3.84 TB
Endurance (total bytes written)	10,512 TB	21,024 TB
Endurance (drive writes per day for 5 years)	3.0 DWPD	3.0 DWPD
Data reliability (UBER)	< 1 in 10 <sup>17</sup> bits read	< 1 in 10 <sup>17</sup> bits read
MTBF	2,000,000 hours	2,000,000 hours
IOPS reads (4 KB blocks)	660,000	660,000
IOPS writes (4 KB blocks)	105,000	105,000
Sequential read rate (128 KB blocks)	3100 MBps	3100 MBps
Sequential write rate (128 KB blocks)	2350 MBps	2350 MBps
Latency (random read)	100 μs	100 μs
Latency (random write)	30 μs	30 μs
Maximum power	18.5 W	18.5 W

## Server support - ThinkSystem

The following table lists the ThinkSystem servers that are compatible.

Table 5. ThinkSystem server support

Part number	Description	2S Rack & Tower						4S Rack		Dense/ Blade			
		ST550 (7X09/7X10)	SR530 (7X07/7X08)	SR550 (7X03/7X04)	SR570 (7Y02/7Y03)	SR590 (7X98/7X99)	SR630 (7X01/7X02)	SR650 (7X05/7X06)	SR850 (7X18/7X19)	SR860 (7X69/7X70)	SR950 (7X11/12/13)	SD530 (7X21)	SN550 (7X16)
7N47A00097	ThinkSystem HHHL PX04PMC 1.92TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter	N	N	N	N	N	Y	Y	Y	Y	Y	N	N
7N47A00098	ThinkSystem HHHL PX04PMC 3.84TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter	N	N	N	N	N	Y	Y	Y	Y	Y	N	N

## Server support - System x

The following tables list the System x servers that are compatible.

### Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Table 6. Support for System x and dense servers with Xeon E5/E7 v4 and E3 v5 processors

Part number	Description	x3250 M6 (3943)	x3250 M6 (3633)	x3550 M5 (8869)	x3650 M5 (8871)	x3850 X6/x3950 X6 (6241, E7 v4)	ix360 M5 (5465, E5-2600 v4)	sd350 (5493)
00YK286	1.92TB NVMe Enterprise Mainstream Flash Adapter	N	N	Y	Y	Y	N	N
00YK287	3.84TB NVMe Enterprise Mainstream Flash Adapter	N	N	Y	Y	Y	N	N

## Support for System x and dense servers with Intel Xeon v3 processors

Table 7. Support for servers with Intel Xeon v3 processors

Part number	Description	x3100 M5 (5457)	x3250 M5 (5458)	x3500 M5 (5464)	x3550 M5 (5463)	x3650 M5 (5462)	x3850 X6/x3950 X6 (6241, E7 v3)	nx360 M5 (5465)
00YK286	1.92TB NVMe Enterprise Mainstream Flash Adapter	N	N	N	N	N	N	N
00YK287	3.84TB NVMe Enterprise Mainstream Flash Adapter	N	N	N	N	N	N	N

## Server support - ThinkServer

The following tables list the ThinkServer systems that are compatible.

### Support for ThinkServer Gen 5 servers with E5 v4 or E3 v5 processors

**Support for sd350:** The adapters supported with the sd350 are listed in [Table 4](#).

Table 8. Support for ThinkServer Generation 5 servers with E5 v4 or E3 v5 processors

Part number	Description	TS150 (E3 v5)	TS450 (E3 v5)	RS160 (E3 v5)	TD350 (E5 v4)	RD350 (E5 v4)	RD450 (E5 v4)	RD550 (E5 v4)	RD650 (E5 v4)
4XB0K12394	ThinkServer 1.92TB NVMe Enterprise Mainstream Flash Adapter	N	N	N	N	N	N	Y	Y
4XB0K12395	ThinkServer 3.84TB NVMe Enterprise Mainstream Flash Adapter	N	N	N	N	N	N	Y	Y

### Support for ThinkServer Gen 5 servers with E5 v3 processors

Table 9. Support for ThinkServer Generation 5 servers with E5 v3 processors

Part number	Description	TS140	TS440	RS140	TD350 (E5 v3)	RD350 (E5 v3)	RD450 (E5 v3)	RD550 (E5 v3)	RD650 (E5 v3)	RQ750 (E5 v3)
4XB0K12394	ThinkServer 1.92TB NVMe Enterprise Mainstream Flash Adapter	N	N	N	N	N	N	N	N	N
4XB0K12395	ThinkServer 3.84TB NVMe Enterprise Mainstream Flash Adapter	N	N	N	N	N	N	N	N	N

## Operating system support

The following tables list the supported operating systems

- [ThinkSystem HHHH PX04PMC 1.92TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter, 7N47A00097](#)
- [ThinkSystem HHHH PX04PMC 3.84TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter, 7N47A00098](#)

**Tip:** These tables are automatically generated based on data from [Lenovo ServerProven](#).

Table 10. Operating system support for ThinkSystem HHHH PX04PMC 1.92TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter, 7N47A00097

Operating systems	SD530 (Gen 2)	SR630 (Gen 2)	SR650 (Gen 2)	SR850 (Gen 2)	SR860 (Gen 2)	SR950 (Gen 2)	SD530 (Gen 1)	SR630 (Gen 1)	SR650 (Gen 1)	SR850 (Gen 1)	SR860 (Gen 1)	SR950 (Gen 1)
Microsoft Windows Server 2012 R2	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Microsoft Windows Server 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Microsoft Windows Server 2019	Y	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Microsoft Windows Server 2022	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Microsoft Windows Server version 1709	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Microsoft Windows Server version 1803	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 6.10	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 6.9	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.3	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
Red Hat Enterprise Linux 7.4	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.5	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.9	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 11 SP4	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 11 SP4 with Xen	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP2	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
SUSE Linux Enterprise Server 12 SP2 with Xen	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
SUSE Linux Enterprise Server 12 SP3	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP3 with Xen	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

	SD530 (Gen 2)	SR630 (Gen 2)	SR650 (Gen 2)	SR850 (Gen 2)	SR860 (Gen 2)	SR950 (Gen 2)	SD530 (Gen 1)	SR630 (Gen 1)	SR650 (Gen 1)	SR850 (Gen 1)	SR860 (Gen 1)	SR950 (Gen 1)
<b>Operating systems</b>												
SUSE Linux Enterprise Server 12 SP5 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP1 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP2 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP3 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.0 U3	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
VMware vSphere Hypervisor (ESXi) 6.5 U1	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5 U2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7 U2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0 U1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0 U2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 11. Operating system support for ThinkSystem HHHH PX04PMC 3.84TB Mainstream NVMe PCIe 3.0 x4 Flash Adapter, 7N47A00098

	SD530 (Gen 2)	SR630 (Gen 2)	SR650 (Gen 2)	SR850 (Gen 2)	SR860 (Gen 2)	SR950 (Gen 2)	SD530 (Gen 1)	SR630 (Gen 1)	SR650 (Gen 1)	SR850 (Gen 1)	SR860 (Gen 1)	SR950 (Gen 1)
<b>Operating systems</b>												
Microsoft Windows Server 2012 R2	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Microsoft Windows Server 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Microsoft Windows Server 2019	Y	Y	Y	Y	Y	Y	N	Y	N	N	N	Y
Microsoft Windows Server 2022	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Microsoft Windows Server version 1709	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Microsoft Windows Server version 1803	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 6.10	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 6.9	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.3	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
Red Hat Enterprise Linux 7.4	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.5	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

	SD530 (Gen 2)	SR630 (Gen 2)	SR650 (Gen 2)	SR850 (Gen 2)	SR860 (Gen 2)	SR950 (Gen 2)	SD530 (Gen 1)	SR630 (Gen 1)	SR650 (Gen 1)	SR850 (Gen 1)	SR860 (Gen 1)	SR950 (Gen 1)
<b>Operating systems</b>												
Red Hat Enterprise Linux 7.7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 7.9	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red Hat Enterprise Linux 8.5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 11 SP4	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 11 SP4 with Xen	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP2	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
SUSE Linux Enterprise Server 12 SP2 with Xen	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
SUSE Linux Enterprise Server 12 SP3	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP3 with Xen	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP4 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 12 SP5 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP1 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP2 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 SP3 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SUSE Linux Enterprise Server 15 with Xen	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.0 U3	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5	N	N	N	N	N	N	Y	Y	Y	Y	N	Y
VMware vSphere Hypervisor (ESXi) 6.5 U1	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.5 U2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 6.7 U2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0 U1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
VMware vSphere Hypervisor (ESXi) 7.0 U2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y



## Warranty

The NVMe Enterprise Mainstream Flash Adapters carry a one-year, customer-replaceable unit (CRU) limited warranty. When the adapters are installed in a supported server, these adapters assume the system's base warranty and any warranty upgrades.

Solid State Memory cells have an intrinsic, finite number of program/erase cycles that each cell can incur. As a result, each solid state device has a maximum amount of program/erase cycles to which it can be subjected. The warranty for Lenovo Flash Storage Adapters is limited to adapters that have not reached the maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the product. An adapter that reaches this limit may fail to operate according to its Specifications.

## Physical specifications

The NVMe Enterprise Mainstream Flash Adapters have the following physical specifications:

Dimensions and weight:

- Height: 69 mm (2.7 in.)
- Length: 168 mm (6.6 in.)
- Depth: 19 mm (0.74 in.)
- Weight: 220 g (7.8 oz)

## Operating environment

The NVMe Enterprise Mainstream Flash Adapters are supported in the following environment:

- Temperature:
  - Operating: 0 to 50 °C (32 to 122 °F)
  - Non-operating: -40 to 70 °C (-40 to 158 °F)
  - Transport: -40 to 70 °C (-40 to 158 °F)
- Relative humidity: 5 to 95% (non-condensing)
- Maximum altitude:
  - Operating: 5,486 m (18,000 ft)
  - Non-operating: 12,192 m (40,000 ft)
- Shock: 400 G (Max) at 2 ms
- Vibration: 2.17 G<sub>RMS</sub> (5-800 Hz)

## Agency approvals

The NVMe Enterprise Mainstream Flash Adapters conform to the following regulations:

- Underwriters Laboratories: UL60950-1
- Canada: CAN/CSA-C22.2 No.60950-1
- TUV: EN 60950-1
- BSMI (Taiwan): CNS 13438 (CISPR Pub. 22 Class B): D33003
- MSIP: KN22, KN24 (CISPR Pub. 22 Class B)
- Australia/New Zealand: AS/NZS CISPR22
- EMC: EN55022 (2010) Class B
- EMC: EN55024 (2010)
- RoHS 2011/65/EU: EN50581 (2012) Category 3

## Related publications and links

For more information, see the following documents:

- Lenovo ThinkSystem storage options product page  
<https://lenovopress.com/lp0761-storage-options-for-thinksystem-servers>
- Lenovo System x storage options product page  
<https://www3.lenovo.com/us/en/data-center/servers/server-options/system-x-options/server-storage/c/system-x-storage>
- Toshiba product page for PC04PMCxxx Flash Storage Adapters  
<https://toshiba.semicon-storage.com/us/product/storage-products/enterprise-ssd/px04pmcxxx.html>
- ServerProven compatibility for Flash Storage Adapters  
<http://www.lenovo.com/us/en/serverproven/xseries/storage/mcmatrix.shtml>
- ThinkServer Option Compatibility Matrix (OCM)  
<http://www.lenovo.com/accessoriesguide>

## Related product families

Product families related to this document are the following:

- [PCIe Flash Adapters](#)

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