

ThinkSystem 5200 Entry 6Gb SATA SSDs Product Guide (withdrawn product)

The 5200 Entry SATA solid-state drives (SSDs) are new SSDs for ThinkSystem servers. The drives use Micron 64-layer 3D NAND flash memory technology with a SATA 6Gbps interface and provide an affordable solution for read-intensive applications such as boot, web servers, lower data rate operational databases and analytics.

The 5200 Entry SATA SSD is shown in the following figure.



Figure 1. Lenovo ThinkSystem 5200 Entry SATA SSD

Did you know?

The 5200 Series of SATA SSDs are the follow-on to the 5100 line of SSDs. The two series share the same controller, firmware, interface and features. The key difference is that the 5200 Series uses a new 64-layer 3D NAND storage medium. The new NAND technology results in similar or improved performance, and improved endurance.

Lenovo also offers high-performance self-encrypting drives (SEDs) in the 5200 Series. These SSDs adhere to the Trusted Computing Group Enterprise Security Subsystem Class cryptographic standard (TCG Enterprise SSC). Read about them in the [ThinkSystem 5200 Entry SATA 6Gb SED SSD product guide](#) .

Part number information

The following table lists the ThinkSystem part numbers.

Withdrawn: All 5200 Entry SSDs are now withdrawn from marketing.

Table 1. ThinkSystem ordering information

Part number	Feature	Description
2.5-inch hot-swap drives		
4XB7A10153	B2X2	ThinkSystem 2.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD
4XB7A10154	B2X3	ThinkSystem 2.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD
4XB7A10155	B2X4	ThinkSystem 2.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD
4XB7A10156	B2X5	ThinkSystem 2.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD
4XB7A10157	B2X6	ThinkSystem 2.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD
3.5-inch hot-swap drives		
4XB7A10158	B2X7	ThinkSystem 3.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD
4XB7A10159	B2X8	ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD
4XB7A10160	B2X9	ThinkSystem 3.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD
4XB7A10161	B2XA	ThinkSystem 3.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD
4XB7A10162	B2XB	ThinkSystem 3.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD
3.5-inch simple-swap drives		
4XB7A08515	B5Y3	ThinkSystem 3.5" 5200 480GB Entry SATA 6Gb Simple Swap SSD
4XB7A10151	B5Y4	ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Simple Swap SSD
3.5-inch non-hot-swap drives for ST50		
4XB7A14050	B63R	ThinkSystem ST50 3.5" 5200 480GB Entry SATA 6Gb Non Hot Swap SSD
4XB7A14051	B63S	ThinkSystem ST50 3.5" 5200 960GB Entry SATA 6Gb Non Hot Swap SSD

Features

The 5200 Enterprise Entry SATA SSDs have the following features:

- Industry standard 2.5-inch or 3.5-inch form factors
- 64-layer 3D TLC NAND flash memory
- Suitable for read-intensive workloads with an endurance of between 0.6 and 1.1 drive writes per day (DWPD) for 5 years
- 6 Gbps SATA host interface
- High reliability and enhanced ruggedness
- Absence of moving parts to reduce potential failure points in the server
- S.M.A.R.T. support
- Advanced Encrypting Standard (AES) 256-bit encryption

SSDs have a huge but finite number of program/erase (P/E) cycles, which affect how long they can perform write operations and thus their life expectancy. Enterprise Entry SSDs typically have a better cost per read IOPS ratio but lower endurance and performance compared to Enterprise Performance SSDs. SSD write endurance is typically measured by the number of program/erase cycles that the drive can incur over its lifetime, which is listed as total bytes written (TBW) in the device specification.

The TBW value that is assigned to a solid-state device is the total bytes of written data that a drive can be guaranteed to complete. Reaching this limit does not cause the drive to immediately fail; the TBW simply denotes the maximum number of writes that can be guaranteed. A solid-state device does *not* fail upon reaching the specified TBW. However, at some point after surpassing the TBW value (and based on manufacturing variance margins), the drive reaches the end-of-life point, at which time the drive goes into read-only mode. Because of such behavior, careful planning must be done to use SSDs in the application environments to ensure that the TBW of the drive is not exceeded before the required life expectancy.

For example, the 5200 Entry 3.8 4TB drive has an endurance of 7,700 TB of total bytes written (TBW). This means that for full operation over five years, write workload must be limited to no more than 4,219 GB of writes per day, which is equivalent to 1.1 full drive writes per day (DWPD). For the device to last three years, the drive write workload must be limited to no more than 7,032 GB of writes per day, which is equivalent to 1.8 full drive writes per day.

Technical specifications

The following table presents technical specifications for the 5200 Enterprise Entry SATA SSDs.

Tip: Drives listed in this product guide are the Lenovo versions of the Micron 5200 ECO family of SSDs.

Table 2. Technical specifications

Feature	480 GB drive	960 GB drive	1.92 TB drive	3.84 TB drive	7.68 TB drive
Interface	6 Gbps SATA	6 Gbps SATA	6 Gbps SATA	6 Gbps SATA	6 Gbps SATA
Capacity	480 GB	960 GB	1.92 TB	3.84 TB	7.68 TB
Endurance (drive writes per day)	0.7 DWPD	1.0 DWPD	1.0 DWPD	1.1 DWPD	0.6 DWPD
Endurance (total bytes written)	610 TB	1750 TB	3500 TB	7700 TB	8400 TB
Data reliability	< 1 in 10 ¹⁷ bits read	< 1 in 10 ¹⁷ bits read	< 1 in 10 ¹⁷ bits read	< 1 in 10 ¹⁷ bits read	< 1 in 10 ¹⁷ bits read
MTBF	2,000,000 hours	2,000,000 hours	2,000,000 hours	2,000,000 hours	2,000,000 hours
IOPS reads (4 KB blocks)	81,000	95,000	95,000	95,000	95,000
IOPS writes (4 KB blocks)	31,000	28,000	22,000	17,000	9,500
Sequential read rate (128 KB blocks)	540 MBps	540 MBps	540 MBps	540 MBps	540 MBps
Sequential write rate (128 KB blocks)	385 MBps	520 MBps	520 MBps	520 MBps	520 MBps
Read latency (seq)	200 µs	200 µs	200 µs	200 µs	200 µs
Write latency (seq)	300 µs	300 µs	300 µs	500 µs	900 µs
Shock, non-operating	1,500 G (Max) at 0.5 ms	1,500 G (Max) at 0.5 ms	1,500 G (Max) at 0.5 ms	1,500 G (Max) at 0.5 ms	1,500 G (Max) at 0.5 ms
Vibration, non-operating	3.13 G _{RMS} (5-800 Hz)	3.13 G _{RMS} (5-800 Hz)	3.13 G _{RMS} (5-800 Hz)	3.13 G _{RMS} (5-800 Hz)	3.13 G _{RMS} (5-800 Hz)
Typical power	6.0 W	6.0 W	6.0 W	6.0 W	6.0 W

Server support

The following tables list the ThinkSystem servers that are compatible.

Table 3. Server support (Part 1 of 3)

Part Number	Description	Edge		1S Intel V2			AMD V3				Intel V3			Dense V3					
		SE350 (7Z46 / 7D1X)	SE450 (7D8T)	ST50 V2 (7D8K / 7D8J)	ST250 V2 (7D8G / 7D8F)	SR250 V2 (7D7R / 7D7Q)	SR635 V3 (7D9H / 7D9G)	SR655 V3 (7D9F / 7D9E)	SR645 V3 (7D9D / 7D9C)	SR665 V3 (7D9B / 7D9A)	SR675 V3 (7D9Q / 7D9R)	SR630 V3 (7D72 / 7D73)	SR650 V3 (7D75 / 7D76)	SR850 V3 (7D97 / 7D96)	SR860 V3 (7D94 / 7D93)	SD665 V3 (7D9P)	SD665-N V3 (7DAZ)	SD650 V3 (7D7M)	SD650-I V3 (7D7L)
2.5-inch hot-swap drives																			
4XB7A10153	ThinkSystem 2.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10154	ThinkSystem 2.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10155	ThinkSystem 2.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10156	ThinkSystem 2.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10157	ThinkSystem 2.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.5-inch hot-swap drives																			
4XB7A10158	ThinkSystem 3.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10159	ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10160	ThinkSystem 3.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10161	ThinkSystem 3.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10162	ThinkSystem 3.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.5-inch simple-swap drives																			
4XB7A08515	ThinkSystem 3.5" 5200 480GB Entry SATA 6Gb Simple Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10151	ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Simple Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.5-inch non-hot-swap drives for ST50																			
4XB7A14050	ThinkSystem ST50 3.5" 5200 480GB Entry SATA 6Gb Non Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A14051	ThinkSystem ST50 3.5" 5200 960GB Entry SATA 6Gb Non Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 4. Server support (Part 2 of 3)

Part Number	Description	2S Intel V2				AMD V1				Dense V2				4S V2	8S	4S V1			
		ST650 V2 (7Z75 / 7Z74)	SR630 V2 (7Z70 / 7Z71)	SR650 V2 (7Z72 / 7Z73)	SR670 V2 (7Z22 / 7Z23)	SR635 (7Y98 / 7Y99)	SR655 (7Y00 / 7Z01)	SR655 Client OS	SR645 (7D2Y / 7D2X)	SR665 (7D2W / 7D2V)	SD630 V2 (7D1K)	SD650 V2 (7D1M)	SD650-N V2 (7D1N)	SN550 V2 (7Z69)	SR850 V2 (7D31 / 7D32)	SR860 V2 (7Z59 / 7Z60)	SR950 (7X11 / 7X12)	SR850 (7X18 / 7X19)	SR850P (7D2F / 2D2G)
2.5-inch hot-swap drives																			
4XB7A10153	ThinkSystem 2.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	Y	Y	Y
4XB7A10154	ThinkSystem 2.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	Y	Y	Y
4XB7A10155	ThinkSystem 2.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	Y	Y	Y
4XB7A10156	ThinkSystem 2.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	Y	Y	Y
4XB7A10157	ThinkSystem 2.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	Y	Y	Y	Y
3.5-inch hot-swap drives																			
4XB7A10158	ThinkSystem 3.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10159	ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10160	ThinkSystem 3.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10161	ThinkSystem 3.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10162	ThinkSystem 3.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.5-inch simple-swap drives																			
4XB7A08515	ThinkSystem 3.5" 5200 480GB Entry SATA 6Gb Simple Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10151	ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Simple Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
3.5-inch non-hot-swap drives for ST50																			
4XB7A14050	ThinkSystem ST50 3.5" 5200 480GB Entry SATA 6Gb Non Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A14051	ThinkSystem ST50 3.5" 5200 960GB Entry SATA 6Gb Non Hot Swap SSD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Table 5. Server support (Part 3 of 3)

Part Number	Description	1S Intel V1				2S Intel V1								Dense V1			
		ST50 (7Y48 / 7Y50)	ST250 (7Y45 / 7Y46)	SR150 (7Y54)	SR250 (7Y52 / 7Y51)	ST550 (7X09 / 7X10)	SR530 (7X07 / 7X08)	SR550 (7X03 / 7X04)	SR570 (7Y02 / 7Y03)	SR590 (7X98 / 7X99)	SR630 (7X01 / 7X02)	SR650 (7X05 / 7X06)	SR670 (7Y36 / 7Y37)	SD530 (7X21)	SD650 (7X58)	SN550 (7X16)	SN650 (7X15)
2.5-inch hot-swap drives																	
4XB7A10153	ThinkSystem 2.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
4XB7A10154	ThinkSystem 2.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
4XB7A10155	ThinkSystem 2.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y
4XB7A10156	ThinkSystem 2.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y
4XB7A10157	ThinkSystem 2.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	Y
3.5-inch hot-swap drives																	
4XB7A10158	ThinkSystem 3.5" 5200 480GB Entry SATA 6Gb Hot Swap SSD	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A10159	ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Hot Swap SSD	N	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A10160	ThinkSystem 3.5" 5200 1.92TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A10161	ThinkSystem 3.5" 5200 3.84TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
4XB7A10162	ThinkSystem 3.5" 5200 7.68TB Entry SATA 6Gb Hot Swap SSD	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N
3.5-inch simple-swap drives																	
4XB7A08515	ThinkSystem 3.5" 5200 480GB Entry SATA 6Gb Simple Swap SSD	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A10151	ThinkSystem 3.5" 5200 960GB Entry SATA 6Gb Simple Swap SSD	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N
3.5-inch non-hot-swap drives for ST50																	
4XB7A14050	ThinkSystem ST50 3.5" 5200 480GB Entry SATA 6Gb Non Hot Swap SSD	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
4XB7A14051	ThinkSystem ST50 3.5" 5200 960GB Entry SATA 6Gb Non Hot Swap SSD	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N

Operating system support

SATA SSDs operate transparently to users, storage systems, applications, databases, and operating systems.

Operating system support is based on the controller used to connect to the drives. Consult the controller product guide for more information:

- RAID controllers: <https://lenovopress.com/servers/options/raid>
- SAS HBAs: <https://lenovopress.com/servers/options/hba>

Warranty

The 5200 Entry SATA SSDs carry a one-year, customer-replaceable unit (CRU) limited warranty. When the SSDs are installed in a supported server, these drives 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 solid state drives (SSDs) is limited to drives that have not reached the maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the SSD product. A drive that reaches this limit may fail to operate according to its Specifications.

Physical specifications

The drives have the following physical specifications (approximate, without the tray):

- Height: 7 mm (0.3 in.)
- Width: 70 mm (2.8 in.)
- Depth: 100 mm (4.0 in.)
- Weight: 70 g (2.5 oz)

Shipping dimensions and weight - 2.5-inch drives (approximate, including the tray):

- Height: 63 mm (2.5 in.)
- Width: 174 mm (6.9 in.)
- Depth: 133 mm (5.2 in.)
- Weight: 434 g (1.0 lb)

Shipping dimensions and weight - 3.5-inch drives (approximate, including the tray):

- Height: 95 mm (3.7 in.)
- Width: 257 mm (10.1 in.)
- Depth: 193 mm (7.6 in.)
- Weight: 484 g (1.1 lb)

Operating environment

The SSDs are supported in the following environment:

- Operating temperature: 0 to 70°C (32 to 158°F)
- Non-operating temperature: -40 to 85°C (-40 to 185°F)
- Relative humidity: 5 to 95% (non-condensing)

Agency approvals

The 5200 Enterprise Entry SATA SSDs conform to the following regulations:

- Micron Green Standard
- Built with sulfur resistant resistors
- CE (Europe): EN 55032 Class B, RoHS
- FCC: CFR Title 47, Part 15 Class B
- UL: UL-60950-1, 2nd Edition
- BSMI (Taiwan): approval to CNS 13438
- RCM (Australia, New Zealand): AS/NZS CISPR32 Class B
- KCC RRL (Korea): approval to KN 32 Class B, KN 35 Class B
- W.E.E.E.: Compliance with EU WEEE directive 2002/96/EC.
- TUV (Germany): approval to IEC60950/EN60950
- VCCI (Japan): 2015-04 Class B
- IC (Canada): CISPR32 Class B: Canadian ICES-003:2016

Related publications and links

For more information, see the following documents:

- Lenovo ThinkSystem storage options product web page
<https://lenovopress.com/lp0761-storage-options-for-thinksystem-servers>
- ServerProven support
<http://www.lenovo.com/us/en/serverproven>
- Lenovo RAID Introduction
<https://lenovopress.com/lp0578-lenovo-raid-introduction>
- Lenovo RAID Management Tools and Resources
<https://lenovopress.com/lp0579-lenovo-raid-management-tools-and-resources>

Related product families

Product families related to this document are the following:

- [Drives](#)

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service. Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk. Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

© Copyright Lenovo 2023. All rights reserved.

This document, LP0868, was created or updated on October 22, 2021.

Send us your comments in one of the following ways:

- Use the online Contact us review form found at:
<https://lenovopress.lenovo.com/LP0868>
- Send your comments in an e-mail to:
comments@lenovopress.com

This document is available online at <https://lenovopress.lenovo.com/LP0868>.

Trademarks

Lenovo and the Lenovo logo are trademarks or registered trademarks of Lenovo in the United States, other countries, or both. A current list of Lenovo trademarks is available on the Web at <https://www.lenovo.com/us/en/legal/copytrade/>.

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo®

ServerProven®

ThinkSystem®

The following terms are trademarks of other companies:

Intel® is a trademark of Intel Corporation or its subsidiaries.

Other company, product, or service names may be trademarks or service marks of others.