

Lenovo Flex System x240 M5 (E5-2600 v3) Product Guide (withdrawn product)

The Lenovo Flex System™ x240 M5 Compute Node is a high-performance server that offers enhanced security, efficiency, and reliability features to handle business-critical workloads. The blade server is based on the Intel Xeon E5-2600 v3 processors. It features up to 18 cores and uses new TruDDR4 Memory, which runs at speeds up to 2133 MHz.

Suggested uses: Database, virtualization, enterprise applications, collaboration and email, streaming media, web, HPC, and cloud applications.

Figure 1 shows the Flex System x240 M5 Compute Node.



Figure 1. Flex System x240 M5 Compute Node

Did you know?

The x240 M5 Compute Node uses TruDDR4 Memory DIMM technology, which offers higher clock speeds, faster data transfer rates, and runs at a lower voltage (1.2V). With DDR4 technology, memory DIMMs can now operate at speeds up to 2133 MHz, which provides lower latency times and enhanced computing power. The TruDDR4 Memory portfolio includes RDIMMs with advanced error correction for reliability, performance, and maximum memory capacity. In addition, TruDDR4 Memory supports memory performance that exceeds industry standards.

The x240 M5 Compute Node integrates leadership security and reliability. System x Trusted Platform Assurance, an exclusive set of System x features and practices, establishes a foolproof security foundation for your workloads. Enterprise-class data protection is provided with optional self-encrypting drives and simple, centralized key management through Security Key Lifecycle Management. Diagnostic tools facilitate reduced downtime and costs.

Key features

The Flex System x240 M5 Compute Node is a high-availability, scalable compute node that is optimized to support the next-generation microprocessor technology. It is ideally suited for medium and large businesses. This section describes the key features of the server.

Scalability and performance

The x240 M5 offers the following features to boost performance, improve scalability, and reduce costs:

- Improves productivity by offering superior system performance with up to 18-core processors, up to 45 MB of L3 cache, and up to 9.6 GT/s QPI interconnect links.
- Supports up to two processors, 36 cores, and 72 threads, which maximizes the concurrent execution of multi-threaded applications.
- Intelligent and adaptive system performance with energy efficient Intel Turbo Boost Technology allows CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor thermal design power (TDP).
- Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.
- Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better use the hardware for virtualization workloads.
- Intel Advanced Vector Extensions 2.0 (AVX 2.0) enable acceleration of enterprise-class workloads, such as databases and enterprise resource planning.
- Up to 2133 MHz memory speeds with two DIMMs per channel that are running at 2133 MHz to help maximize system performance.
- Up to 1.5 TB of memory capacity with 64 GB load-reduced DIMMs (LRDIMMs)
- Optional support for high-performance PCIe-attached NVMe Flash Storage solid-state drives (SSDs) can significantly improve I/O performance.
- Supports the Storage Expansion Node, which provides another 12 hot-swap, 2.5-inch drive bays for local storage.
- Up to 32 virtual I/O ports per compute node with available 10 Gb Virtual Fabric Adapters, which offers the choice of Ethernet, iSCSI, or Fibre Channel over Ethernet (FCoE) connectivity.
- The x240 M5 offers PCI Express 3.0 I/O expansion capabilities that improve the theoretical maximum bandwidth by 60% (8 GT/s per link), compared with the previous generation of PCI Express 2.0.
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E5 family. This integration helps to dramatically reduce I/O latency and increase overall system performance.
- Support for high-bandwidth I/O adapters, up to two in each x240 M5 Compute Node.
- Support for 40 Gb Ethernet, 16 Gb Fibre Channel, and FDR InfiniBand.
- Supports the PCIe Expansion Node for support for up to six more I/O adapters.
- High-speed USB 3.0 port for connectivity to external devices.

Availability and serviceability

The x240 M5 provides the following features to simplify serviceability and increase system up-time:

- Chipkill, memory mirroring, and memory rank sparing for redundancy if there is a non-correctable memory failure.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as CPU, memory, and adapter cards.
- Hot-swap drives support integrated RAID 1 redundancy for data protection and greater system up-time.
- A light path diagnostics panel and individual light path LEDs to quickly lead the technician to failed (or failing) components. This feature simplifies servicing, speeds up problem resolution, and helps improve

system availability.

- Proactive Platform Alerts (including PFA and SMART alerts): Processors, voltage regulators, memory, internal storage (SAS/SATA HDDs and SSDs, NVMe SSDs, flash storage adapters), fans, power supplies, RAID controllers, and server ambient and sub-component temperatures. Alerts can be surfaced through the system IMM to managers such as Lenovo XClarity Administrator, VMware vCenter, and Microsoft System Center. These proactive alerts let you take appropriate actions in advance of possible failure, thereby increasing server uptime and application availability.
- Solid-state drives (SSDs), which offer significantly better reliability than traditional mechanical HDDs for greater uptime.
- Built-in Integrated Management Module II (IMM2) continuously monitors system parameters, triggers alerts, and performs recovering actions if there is a failure to minimize downtime.
- Built-in diagnostics that uses Dynamic Systems Analysis (DSA) Preboot speeds up troubleshooting tasks to reduce service time.
- Three-year customer replaceable unit and on-site limited warranty; next business day 9x5. Optional service upgrades are available.

Manageability and security

The following powerful systems management features simplify the local and remote management of the x240 M5:

- Support for Lenovo XClarity Administrator, providing auto-discovery, inventory tracking, monitoring, policy-based firmware updates, address pool management, configuration patterns and operating system installation.
- Includes an IMM2 to monitor server availability and perform remote management.
- Integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.
- Integrated Trusted Platform Module (TPM) 1.2 and 2.0 support (TPM 2.0 requires UEFI 2.21 or later) enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Supports Secure Boot to ensure only a digitally signed operating system can be used. Supported with HDDs and SSDs as well as SD Cards in the SD Media Adapter.
- System x Trusted Platform Assurance, an exclusive set of System x security features and practices, establishes a foolproof security foundation for workloads by delivering firmware that is securely built, tested, digitally signed, and verified before execution.
- The server offers enterprise-class data protection with optional self-encrypting drives and simple, centralized key management through Security Key Lifecycle Management.
- Industry-standard AES NI support for faster, stronger encryption.
- Intel Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.
- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, which allows an application to run in its own isolated space that is protected from all other software that is running on a system.

Energy efficiency

The x240 M5 offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- Component-sharing design of the Flex System chassis provides ultimate power and cooling savings.
- The server is Energy Star 2.0 compliant
- The Intel Xeon processor E5-2600 v3 product family offers significantly better performance over the E5-2600 v2 family while fitting into the same thermal design power (TDP) limits.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed, which reduces power draw.

- Low-voltage Intel Xeon processors draw less energy to satisfy demands of power and thermally constrained data centers and telecommunication environments.
- Low-voltage 1.2 V DDR4 memory DIMMs use up to 20% less energy compared to 1.35 V DDR3 DIMMs.
- Solid state drives (SSDs) use as much as 80% less power than traditional spinning 2.5-inch HDDs.
- The x240 M5 uses hexagonal ventilation holes, which are a part of Calibrated Vectors Cooling™ technology. Hexagonal holes can be grouped more densely than round holes, which provides more efficient airflow through the system.

Locations of key components and connectors

Figure 2 shows the front of the server.

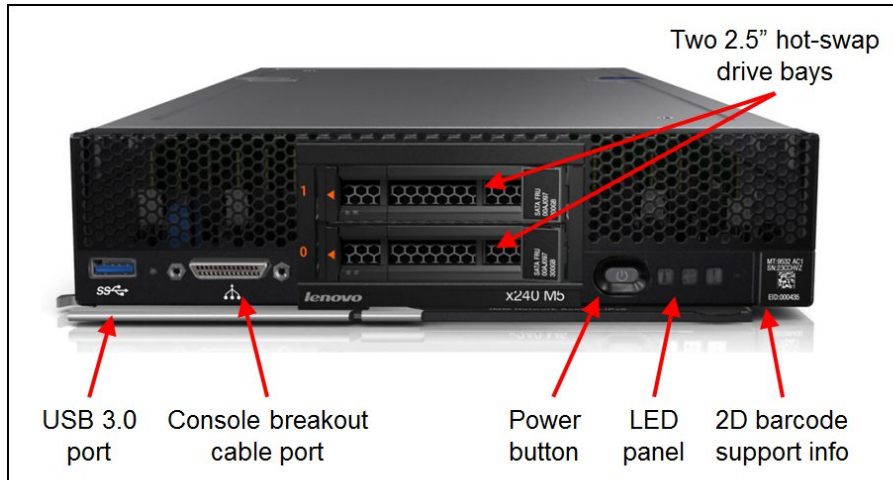


Figure 2. Front view of the Flex System x240 M5 Compute Node

Figure 3 shows the locations of key components inside the server.

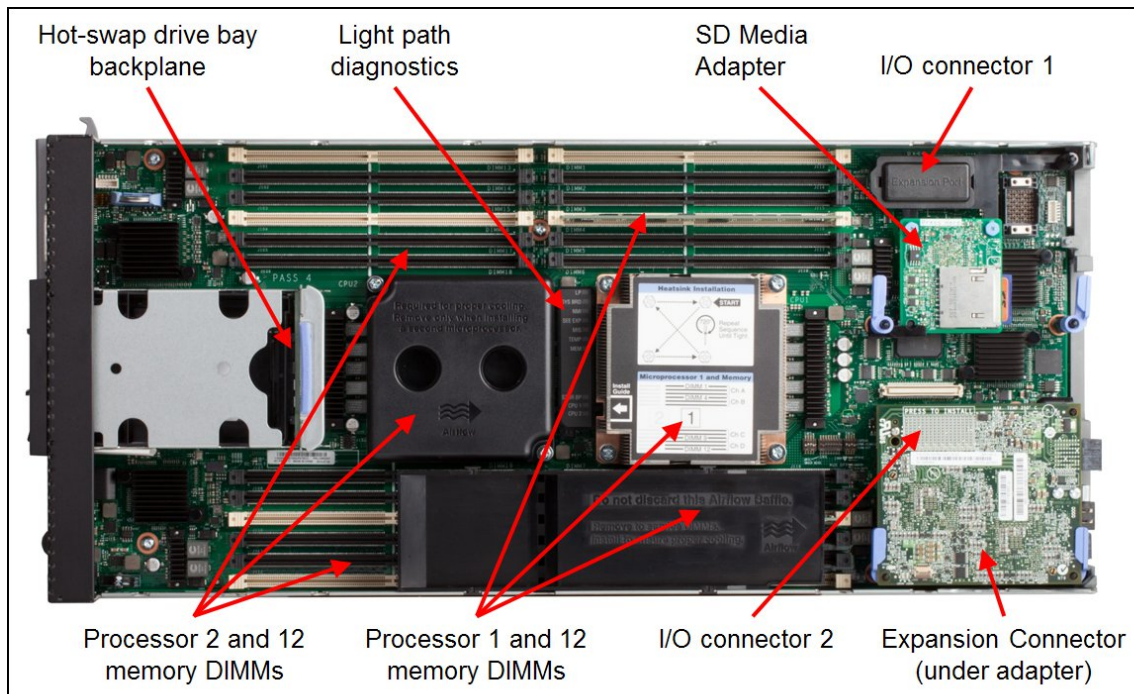


Figure 3. Inside view of the Flex System x240 M5 Compute Node

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Models	9532-x2x, 9532-x4x, 9532-x6x
Firmware	Lenovo-signed firmware
Form factor	Standard-width compute node.
Chassis support	Flex System Enterprise Chassis.
Processor	Up to two Intel Xeon processor E5-2600 v3 product family CPUs with 18 cores (2.3 GHz), 16 cores (2.3 GHz), 14 cores (up to 2.6 GHz), 12 cores (up to 2.6 GHz) or 10 cores (up to 2.6 GHz), 8 cores (up to 3.2 GHz), 6 cores (up to 3.4 GHz), or up to 4 cores (up to 3.5 GHz). Two QPI links up to 9.6 GTps each. Up to 2133 MHz memory speed. Up to 45 MB L3 cache.
Chipset	Intel C612
Memory	Up to 24 DIMM sockets (12 DIMMs per processor). RDIMMs and LRDIMMs are supported. Memory types cannot be intermixed. Memory speed up to 2133 MHz. Four memory channels per processor (3 DIMMs per channel).
Memory maximums	With LRDIMMs: Up to 1.5 TB with 24x 64 GB LRDIMMs and two processors With RDIMMs: Up to 768 GB with 24x 32 GB RDIMMs and two processors
Memory protection	ECC, optional memory mirroring and memory rank sparing.
Disk drive bays	Two 2.5-inch hot-swap SAS/SATA drive bays that support SAS, SATA, and SSDs. Optional support for 2.5-inch NVMe Enterprise PCIe SSDs. Optional support for up to four 1.8-inch SSDs in place of the two 2.5-inch bays. Up to 12 more 2.5-inch drive bays with the optional Storage Expansion Node.
Maximum internal storage	<ul style="list-style-type: none"> With two 2.5-inch hot-swap drives: Up to 15.4 TB using 2x 7.68 TB 2.5-inch SATA SSDs or up to 4 TB using 2x 2 TB NL SAS HDDs. With two 2.5-inch NVMe SSDs: Up to 4 TB using 2x 2 TB NVMe 2.5-inch G3HS Enterprise Value PCIe SSDs. With four 1.8-inch SSDs: Up to 960 GB using 4x 240 GB 1.8-inch SSDs. <p>More storage is available with an attached Flex System Storage Expansion Node.</p>
RAID support	RAID-0, RAID-1 and RAID-1E with integrated ServeRAID M1210e controller (LSI SAS3004-based) or optional ServeRAID M5215. Optional RAID-5 support with ServeRAID M1200 RAID-5 Enablement Kit and 1.8-inch SSDs
Network interfaces	x2x models: None standard; optional 1 Gb or 10 GbE adapters. x4x models: Two 10 GbE ports with EN4172 2-port 10Gb Ethernet Adapter. x6x models: Two 10 GbE ports with CN4052 2-port 10Gb Virtual Fabric Adapter.
PCI Expansion slots	Two I/O connectors for adapters. PCI Express 3.0 x16 interface. Includes an Expansion Connector (PCIe 3.0 x16) to connect an expansion node, such as the PCIe Expansion Node. PCIe Expansion Node supports two full-height PCIe adapters, two low-profile PCIe adapters, and two Flex System I/O adapters.
Ports	Front: One USB 3.0 port and one console breakout cable port that provides local KVM and serial ports (cable standard with chassis; more cables optional). Internal: Optional SD Media Adapter provides two SD Media slots for VMware vSphere hypervisor support (RAID 1 pair).
Systems management	UEFI, Integrated Management Module 2 (IMM2) with Renesas SH7758 controller, Predictive Failure Analysis, light path diagnostics panel, automatic server restart, remote presence. Support for Lenovo XClarity Administrator, IBM Flex System Manager™, IBM Systems Director, Active Energy Manager, and Lenovo ToolsCenter.

Components	Specification
Security features	Power-on password, administrator's password, Trusted Platform Module (TPM) 1.2 and 2.0 (TPM 2.0 requires UEFI 2.21 or later).
Video	Matrox G200eR2 video core with 16 MB video memory integrated into the IMM2. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.
Limited warranty	Three-year customer-replaceable unit and on-site limited warranty with 9x5/NBD.
Operating systems supported	Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, VMware ESXi. See the Operating system support section for specifics.
Service and support	Optional service upgrades are available through Lenovo warranty services: 4-hour or 2-hour response time, 8-hour fix time, 1-year or 2-year warranty extension, remote technical support for Lenovo hardware and selected Lenovo and original equipment manufacturer (OEM) software.
Dimensions	Width: 215 mm (8.5 inches), height 51 mm (2.0 inches), depth 493 mm (19.4 inches).
Weight	Maximum configuration: 7.1 kg (15.6 lb).

The x240 M5 servers are shipped with the following items:

- Statement of Limited Warranty
- Important Notices
- Documentation flyer that contains the *Installation and User's Guide*

Standard models

Table 2 lists the standard models.

Withdrawn from marketing: All standard models are now withdrawn from marketing. The replacements are models of the [x240 M5 with E5 v4 processors](#).

Table 2. Standard models

Model	Intel Xeon Processor (2 maximum)*	Memory	Disk adapter	Disk bays† (used/max)	Disks	10 GbE	I/O slots (used / max)
Models with no Ethernet adapter standard							
9532-A2x	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 16 GB (1600 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-B2x	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-C2x	1x E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-D2x	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-F2x	1x E5-2650L v3 12C 1.8GHz 30MB 2133MHz 65W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-G2x	1x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-H2x	1x E5-2660 v3 10C 2.6GHz 25MB 2133MHz 105W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2

Model	Intel Xeon Processor (2 maximum)*	Memory	Disk adapter	Disk bays† (used/max)	Disks	10 GbE	I/O slots (used / max)
9532-J2x	1x E5-2670 v3 12C 2.3GHz 30MB 2133MHz 120W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-L2x	1x E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-M2x	1x E5-2690 v3 12C 2.6GHz 30MB 2133MHz 135W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-N2x	1x E5-2697 v3 14C 2.6GHz 35MB 2133MHz 145W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-Q2x	1x E5-2698 v3 16C 2.3GHz 40MB 2133MHz 135W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
Models with EN4172 2-port 10Gb Ethernet Adapter standard							
9532-B4x	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
9532-D4x	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
9532-H4x	1x E5-2660 v3 10C 2.6GHz 25MB 2133MHz 105W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
9532-J4x	1x E5-2670 v3 12C 2.3GHz 30MB 2133MHz 120W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
9532-L4x	1x E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
Models with CN4052 2-port 10Gb Virtual Fabric Adapter standard							
9532-B6x	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
9532-D6x	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
9532-H6x	1x E5-2660 v3 10C 2.6GHz 25MB 2133MHz 105W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
9532-J6x	1x E5-2670 v3 12C 2.3GHz 30MB 2133MHz 120W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2
9532-L6x	1x E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	2x 10 Gb	1 / 2

* Processor detail: Processor quantity, model, cores, core speed, L3 cache, memory speed, power TDP rating.

† The two 2.5-inch drive bays can be replaced with four 1.8-inch SSD bays.

NEBS-compliant models

The following table lists the available models that are NEBS compliant when used with the Lenovo Flex System Carrier-Grade Chassis, 7385-DCx.

Withdrawn from marketing: All NEBS models are now withdrawn from marketing.

Table 3. NEBS-compliant models

Model	Intel Xeon Processor (2 maximum)*	Memory	Disk adapter	Disk bays†	Disks	10 GbE	I/O slots (used/max)
9532-RAx	1x E5-2608L v3 6C 2.0GHz 15MB 1866MHz 52W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-RBx	1x E5-2618L v3 8C 2.3GHz 20MB 1866MHz 75W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-RCx	1x E5-2628L v3 10C 2.0GHz 25MB 1866MHz 75W	1x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-RDx	1x E5-2648L v3 12C 1.8GHz 30MB 2133MHz 75W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2
9532-REx	1x E5-2658 v3 12C 2.2GHz 30MB 2133MHz 105W	1x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	Open	0 / 2

* Processor detail: Processor quantity, model, cores, core speed, L3 cache, memory speed, power TDP rating.

TopSeller models

The following table lists the available TopSeller models.

Withdrawn from marketing: All TopSeller models are now withdrawn from marketing. The replacements are models of the [x240 M5 with E5 v4 processors](#).

Table 4. TopSeller models

Model	Intel Xeon Processor (2 maximum)*	Memory	Disk adapter	Disk bays†	Disks	10 GbE‡	I/O slots
TopSeller models - North America							
9532-E1x	2x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	2x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	CN4022	1 / 2
9532-E2x	2x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	4x 16 GB (1866 MHz)	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	CN4022	1 / 2
9532-E3x	2x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	4x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	CN4022	1 / 2
9532-E4x	2x E5-2670 v3 12C 2.3GHz 30MB 2133MHz 120W	8x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	CN4022	1 / 2
9532-E5x	2x E5-2690 v3 12C 2.6GHz 30MB 2133MHz 135W	8x 16 GB 2133 MHz	ServeRAID M1210e	2.5" hot-swap (0 / 2)	Open	CN4022	1 / 2

* Processor detail: Processor quantity, model, cores, core speed, L3 cache, memory speed, power TDP rating.

† The two 2.5-inch drive bays can be replaced with four 1.8-inch SSD bays.

‡ Models come standard with a CN4022 2-port 10Gb Converged Adapter

Chassis support

The x240 M5 Compute Node is supported in the Flex System chassis as listed in the following table.

Table 5. Chassis support

Chassis models	Description	Supports x240 M5 (9532)
8721-HC1 based: 8721-A1x, LRx, DCx 8721-K1G, E1Y, E2Y	Lenovo Flex System Enterprise Chassis with CMM (68Y7030) standard	Yes
8721-HC2 based: 8721-ALx, DLx 8721-E3Y, E4Y	Lenovo Flex System Enterprise Chassis with CMM2 (00FJ669) standard	Yes
7385-DCx	Lenovo Flex System Carrier-Grade Chassis	Yes

Up to 14 x240 M5 Compute Nodes can be installed in the chassis; however, the actual number that can be installed in a chassis depends on the following factors:

- TDP power rating for the processors that are installed in the x240 M5
- Number of power supplies that are installed in the chassis
- Capacity of the installed power supplies (2100 W or 2500 W)
- Chassis power redundancy policy that is used (N+1 or N+N)

The following table provides guidelines about what number of x240 M5 Compute Nodes can be installed. For more information, use the Power Configurator, which is found at the following website:

<https://support.lenovo.com/documents/LNVO-PWRCONF>

The following color coding was used in the table:

- Green = No restriction on the number of x240 M5 Compute Nodes that can be installed
- Yellow = Some bays must be left empty in the chassis

Table 6. Maximum number of x240 M5 Compute Nodes that can be installed based on installed power supplies and power redundancy policy used

x240 M5 TDP rating	2100 W power supplies installed				2500 W power supplies installed			
	N+1, N=5 6 power supplies	N+1, N=4 5 power supplies	N+1, N=3 5 power supplies	N+N, N=3 6 power supplies	N+1, N=5 6 power supplies	N+1, N=4 5 power supplies	N+1, N=3 4 power supplies	N+N, N=3 6 power supplies
52 W	14	14	11	11	14	14	14	14
55 W	14	14	11	11	14	14	14	14
65 W	14	14	11	11	14	14	14	14
75 W	14	14	11	11	14	14	14	14
85 W	14	14	11	11	14	14	14	14
90 W	14	14	11	11	14	14	14	14
105 W	14	14	11	11	14	14	13	14
120 W	14	14	11	11	14	14	13	14
135 W	14	13	11	11	14	14	12	13
145 W	14	13	11	11	14	14	12	13

Processor options

The x240 M5 supports the processor options that are listed in the following table. The server supports one or two processors. The table also shows which server models have each processor standard, if any.

Table 7. Processor options

Part number	Feature code*	Intel Xeon processor description	Models where used
00JX063	A5T1 / A5SJ	Intel Xeon E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	-
00KJ052	AS35 / AS3F	Intel Xeon E5-2608L v3 6C 2.0GHz 15MB 1866MHz 52W	-
00JX062	A5T2 / A5SK	Intel Xeon E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	A2x
00KJ051	AS34 / AS3E	Intel Xeon E5-2618L v3 8C 2.3GHz 20MB 1866MHz 75W	-
00JX060	A5T3 / A5SL	Intel Xeon E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	B2x, B4x, B6x
00KJ048	AS31 / AS3B	Intel Xeon E5-2623 v3 4C 3.0GHz 10MB 1866MHz 105W	-
00KJ050	AS33 / AS3D	Intel Xeon E5-2628L v3 10C 2.0GHz 25MB 1866MHz 75W	-
00JX059	A5T5 / A5SN	Intel Xeon E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	C2x
00JX061	A5T4 / A5SM	Intel Xeon E5-2630L v3 8C 1.8GHz 20MB 1866MHz 55W	-
00JX066	A5T6 / A5SP	Intel Xeon E5-2637 v3 4C 3.5GHz 15MB 2133MHz 135W	-
00JX058	A5T7 / A5SQ	Intel Xeon E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	D2x, D4x, D6x
00JX065	A5T8 / A5SR	Intel Xeon E5-2643 v3 6C 3.4GHz 20MB 2133MHz 135W	-
00KJ049	AS32 / AS3C	Intel Xeon E5-2648L v3 12C 1.8GHz 30MB 2133MHz 75W	-
00JX056	A5TA / A5ST	Intel Xeon E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	G2x
00JX057	A5T9 / A5SS	Intel Xeon E5-2650L v3 12C 1.8GHz 30MB 2133MHz 65W	F2x
00KJ044	AS2X / AS37	Intel Xeon E5-2658 v3 12C 2.2GHz 30MB 2133MHz 105W	-
00JX055	A5TB / A5SU	Intel Xeon E5-2660 v3 10C 2.6GHz 25MB 2133MHz 105W	H2x, H4x, H6x
00JX064	A5TC / A5SV	Intel Xeon E5-2667 v3 8C 3.2GHz 20MB 2133MHz 135W	-
00JX054	A5TD / A5SW	Intel Xeon E5-2670 v3 12C 2.3GHz 30MB 2133MHz 120W	J2x, J4x, J6x
00JX053	A5TE / A5SX	Intel Xeon E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	L2x, L4x, L6x
00KJ047	AS30 / AS3A	Intel Xeon E5-2683 v3 14C 2.0GHz 35MB 2133MHz 120W	-
00KJ046	AS2Z / AS39	Intel Xeon E5-2685 v3 12C 2.6GHz 30MB 2133MHz 120W	-
00JX052	A5TF / A5SY	Intel Xeon E5-2690 v3 12C 2.6GHz 30MB 2133MHz 135W	M2x
00JX051	A5TG / A5SZ	Intel Xeon E5-2695 v3 14C 2.3GHz 35MB 2133MHz 120W	-
00JX050	A5TH / A5T0	Intel Xeon E5-2697 v3 14C 2.6GHz 35MB 2133MHz 145W	N2x
00KJ045	AS2Y / AS38	Intel Xeon E5-2698 v3 16C 2.3GHz 40MB 2133MHz 135W	Q2x
00KJ043	AS2W / AS36	Intel Xeon E5-2699 v3 18C 2.3GHz 45MB 2133MHz 145W	-

* The first feature code is for processor 1 and second feature code is for processor 2.

Memory options

TruDDR4 Memory uses the highest quality components that are sourced from Tier 1 DRAM suppliers and only memory that meets the strict requirements of Lenovo is selected. It is compatibility tested and tuned on every System x server to maximize performance and reliability. TruDDR4 Memory has a unique signature that is programmed into the DIMM that enables System x servers to verify whether the memory that is installed is qualified or supported by Lenovo. Because TruDDR4 Memory is authenticated, certain extended memory performance features can be enabled to extend performance over industry standards. From a service and support standpoint, Lenovo memory automatically assumes the Lenovo system warranty and Lenovo provides service and support worldwide.

The following table lists the supported memory options.

Table 8. Memory options for the x240 M5

Part number	Feature code	Description	Models where used
Registered DIMMs (RDIMMs)			
46W0784	A5B6	4GB TruDDR4 Memory (1Rx8, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	-
46W0788	A5B5	8GB TruDDR4 Memory (1Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	-
46W0792	A5B8	8GB TruDDR4 Memory (2Rx8, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	-
95Y4821	ASD9	16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	All models
95Y4808	A5UJ	32GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	-
Load-reduced DIMMs (LRDIMMs)			
46W0800*	A5B9	32GB TruDDR4 Memory (4Rx4, 1.2V) PC4-17000 CL15 2133MHz LP LRDIMM	-
95Y4812	A5UK	64GB TruDDR4 Memory (4Rx4, 1.2V) PC4-17000 CL15 2133MHz LP LRDIMM	-

* Withdrawn from marketing

The server supports up to 12 TruDDR Memory DIMMs when one processor is installed and up to 24 DIMMs when two processors are installed. Each processor has four memory channels, and there are three DIMMs per memory channel (3 DPC). RDIMMs and LRDIMMs are supported, but the mixing of these different types is not supported. UDIMMs are not supported. DIMMs can be installed individually; however, install them in sets of four (one for each of the four memory channels) for performance reasons.

The following rules apply when the memory configuration is selected:

- Mixing of different types of DIMMs (RDIMM and LRDIMM) in the same server is not supported.
- The maximum number of supported ranks per channel is eight.
- The maximum quantity of DIMMs that can be installed in the server depends on the number of CPUs, DIMM rank and operating voltage, as shown in the "Maximum quantity" row in the following table.
- All DIMMs in all CPU memory channels operate at the same speed, which is determined as the lowest value of the following factors:
 - Memory speed that is supported by the specific CPU.
 - Lowest maximum operating speed for the selected memory configuration that depends on rated speed, as shown in the "Maximum operating speed" section in the following table.

The following table shows the maximum memory speeds that are achievable based on the installed DIMMs and the number of DIMMs per channel. The table also shows the maximum memory capacity at any speed that is supported by the DIMM and maximum memory capacity at rated DIMM speed. In the table, cells that are highlighted in gray indicate when the specific combination of DIMM voltage and number of DIMMs per channel still allows the DIMMs to operate at the rated speed.

Table 9. Maximum memory speeds

Specification	RDIMMs		LRDIMMs
Rank	Single rank	Dual rank	Quad rank
Part numbers	46W0784 (4 GB) 46W0788 (8 GB)	46W0792 (8 GB) 95Y4821 (16 GB) 95Y4808 (32 GB)	46W0800 (32 GB) 95Y4812 (64 GB)
Rated speed	2133 MHz	2133 MHz	2133 MHz
Rated voltage	1.2 V	1.2 V	1.2 V
Operating voltage	1.2 V	1.2 V	1.2 V
Maximum quantity*	24	24	24
Largest DIMM	8 GB	32 GB	64 GB
Max memory capacity	192 GB	768 GB	1.5 TB
Max memory at rated speed	128 GB	512 GB	1.0 TB
Maximum operating speed (MHz)			
One DIMM per channel	2133 MHz	2133 MHz	2133 MHz
Two DIMMs per channel	2133 MHz	2133 MHz†	2133 MHz†
Three DIMMs per channel	1600 MHz	1600 MHz	1866 MHz†

* The maximum quantity that is supported is shown for two processors that are installed. When one processor is installed, the maximum quantity that is supported is half of that shown.

† This speed is achieved only when Lenovo TruDDR4 memory is used

The following memory protection technologies are supported:

- ECC
- Memory mirroring
- Memory sparing

If memory mirroring is used, DIMMs must be installed in pairs (minimum of one pair per CPU), and both DIMMs in a pair must be identical in type and size.

If memory rank sparing is used, a minimum of one quad-rank DIMM or two single-rank or dual-rank DIMMs must be installed per populated channel (the DIMMs do not need to be identical). In rank sparing mode, one rank of a DIMM in each populated channel is reserved as spare memory. The size of a rank varies depending on the DIMMs that are installed.

Internal storage

The x240 M5 server has two 2.5-inch hot-swap drive bays that are accessible from the front of the blade server (see [Figure 2](#)). These bays connect to the integrated ServeRAID M1210e 12 Gbps SAS/SATA controller.

The integrated ServeRAID M1210e controller has the following features:

- Based on the LSI SAS3004 RAID-on-Chip (ROC)
- 12 Gbps controller with four ports
- PCIe x4 Gen 2 host interface
- Two SAS ports routed internally to the two hot-swap drive bays
- Supports RAID-0, RAID-1 and RAID-1E
- Optional support for SED drives
- Optional support for RAID-5 and 4x 1.8-inch drive bays

The onboard M1210e controller optionally supports self-encrypting drives (SEDs) with the addition of Features on Demand license upgrade, ServeRAID M1200 Series Zero Cache/RAID 5 Upgrade, 00AE930. This license upgrade enables the LSI MegaRAID SafeStore service which offers instant secure erase and local key management for SEDs.

The two 2.5-inch front-accessible drive bays can be replaced with four 1.8-inch drive bays by using the ServeRAID M1200 RAID 5 Enablement Kit (00JX141). This kit contains a replacement backplane to connect the four 1.8-inch SSDs, however, to enable RAID 5 you will also need the ServeRAID M1200 Series Zero Cache/RAID 5 Features on Demand upgrade (00AE930).

The two standard 2.5-inch SAS/SATA drive bays can also be replaced with new PCIe NVMe (Non-Volatile Memory Express) drives that are directly connected to the PCIe bus of the second processor. Such connectivity, when combined with SSD drives, ensures the lowest possible latency while still using a standard drive form factor.

2nd processor required: Support for NVMe drives requires a replacement drive backplane for the two 2.5-inch drives plus the second processor must also be installed in the server. The kit containing the backplane, NVMe Enterprise PCIe SSD Enablement Kit for Flex System x240 M5, is listed in the following table.

Table 10. Internal storage upgrades

Part number	Feature code	Name and description	Maximum supported
00AE930	A5H5	ServeRAID M1200 Series Zero Cache/RAID 5 Upgrade for Systems-FoD	1
00JX141	A5SF	ServeRAID M1200 RAID 5 Enablement Kit for Flex System x240 M5	1
00JX177	A5SH	NVMe Enterprise PCIe SSD Enablement Kit for Flex System x240 M5	1
00JX142	A5SE	ServeRAID M5215 with 2GB Flash Enablement - Flex System x240 M5	1

Supported drives are listed in the "Internal drive options" section. The ServeRAID M5215 is described in the next section.

ServeRAID M5215 SAS/SATA controller

The ServeRAID M5215 SAS/SATA controller is an advanced RAID controller based on the LSI SAS 3108 chipset. The M5215 replaces the onboard SAS controller in the compute node and supports high-performance RAID-0 and RAID-1 to the two internal 2.5-inch drive bays. The M5215 is installed at the front of the server over the top of the drive bays, as shown in the following figure.

Note: The use of the ServeRAID M5215 requires that the second processor be installed.

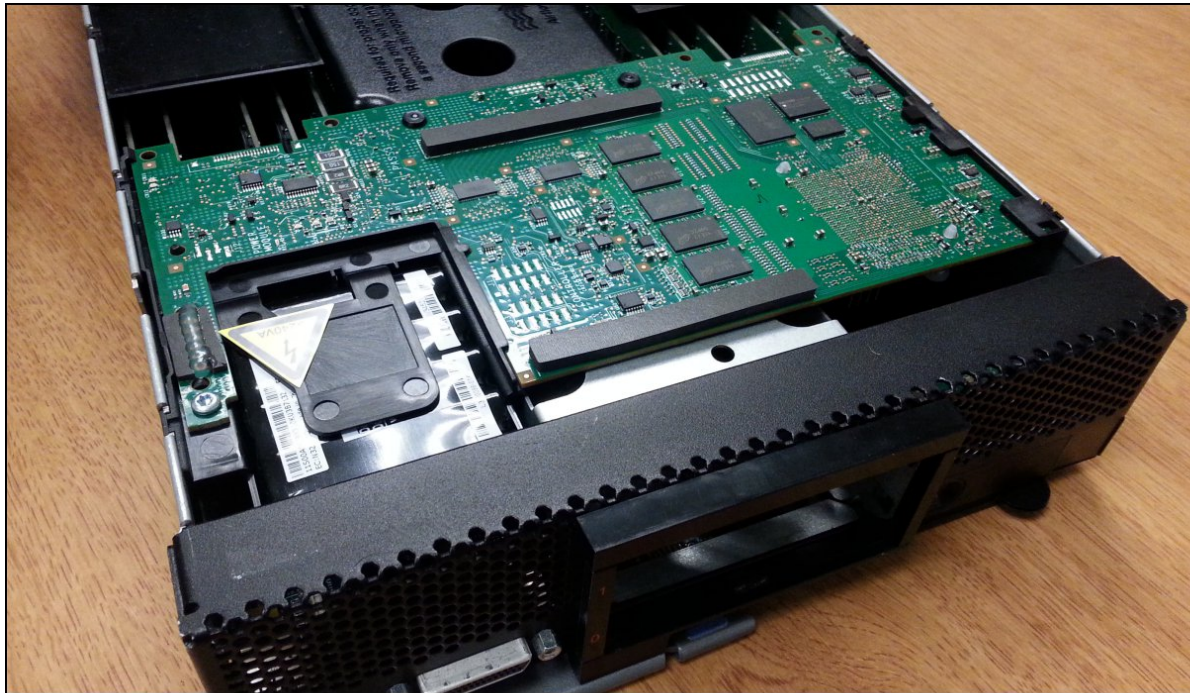


Figure 4. ServeRAID M5215 SAS/SATA controller installed in the Flex System x240 M5

The part numbers to order the ServeRAID M5215 controller and feature upgrade are listed in the following table.

Table 11. ServeRAID M5215 SAS/SATA controller

Part number	Feature code	Name and description	Maximum supported
Adapter			
00JX142	A5SE	ServeRAID M5215 with 2GB Flash Enablement	1
Feature on Demand upgrades			
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator for FoD (MegaRAID FastPath)	1

The ServeRAID M5215 option includes the following components:

- RAID controller
- Flash power module
- Replacement 2-drive backplane

The following figure shows the adapter, flash power module and backplane that are included in the option. The included backplane replaces the standard backplane that came with the server. The backplane also serves as the conduit to route the PCIe signals from the second processor to the RAID controller.

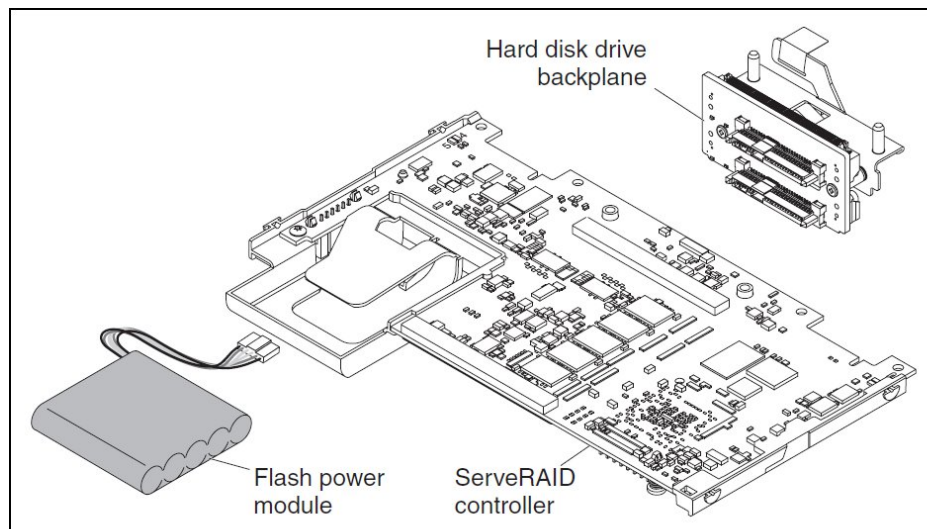


Figure 5. ServeRAID M5215 SAS/SATA controller

Note: The ServeRAID M5215 installed in the x240 M5 only supports two 2.5-inch drives using the supplied backplane. 1.8-inch drives are not supported.

The ServeRAID M5215 SAS/SATA controller has the following features:

- Eight internal 12 Gbps SAS/SATA ports (also supports 6 Gbps)
- PCI Express 3.0 x8 host interface
- 12 Gbps throughput per port
- LSI SAS3108 12 Gbps RAID on Chip (ROC) controller
- Onboard 2 GB data cache (DDR3 running at 1866 MHz)
- Support for RAID levels 0 and 1
- Standard flash power module (supercapacitor-based) provides the power capacity needed to off-load the cache to flash in the event of a power failure
- Support SAS and SATA HDDs and SSDs
- Support for intermixing SAS and SATA HDDs and SSDs; mixing different types of drives in the same array (drive group) is not recommended
- Support for self-encrypting drives, SEDs (LSI MegaRAID SafeStore)
- Optional support for SSD performance acceleration with MegaRAID FastPath
- Support for up to 64 virtual disks, up to 128 arrays, and up to 16 virtual disks per array
- Support for logical unit number (LUN) sizes up to 64 TB
- Configurable stripe size up to 1 MB
- Compliant with Disk Data Format (DDF) configuration on disk (COD)
- S.M.A.R.T. support
- MegaRAID Storage Manager management software

The Performance Accelerator upgrade (47C8710), implemented using the LSI MegaRAID FastPath software, provides high-performance I/O acceleration for SSD-based virtual drives by using an extremely low-latency I/O path to increase the maximum I/O per second (IOPS) capability of the controller. This feature boosts the performance of applications with a highly random data storage access pattern, such as transactional databases. Part number 47C8710 is a Feature on Demand license.

Internal drive options

The x240 M5 supports the following 2.5-inch and 1.8-inch drives internally to the server:

- Table 12: [2.5-inch hot-swap 12 Gb SAS HDDs](#)
- Table 13: [2.5-inch hot-swap 6 Gb SAS/SATA HDDs](#)
- Table 14: [2.5-inch hot-swap 12 Gb SAS SSDs](#)
- Table 15: [2.5-inch hot-swap 6 Gb SAS/SATA SSDs](#)
- Table 16: [2.5-inch NVMe SSDs](#)
- Table 17: [1.8-inch SSDs](#)

Table 12. 2.5-inch hot-swap 12 Gb SAS HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 12 Gb SAS 10K			
00WG685	AT89	300GB 10K 12Gbps SAS 2.5" G3HS HDD	2
00WG690	AT8A	600GB 10K 12Gbps SAS 2.5" G3HS HDD	2
00WG695	AT8B	900GB 10K 12Gbps SAS 2.5" G3HS HDD	2
00WG700	AT8C	1.2TB 10K 12Gbps SAS 2.5" G3HS HDD	2
00NA271	ASBM	1.8TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	2
2.5-inch hot-swap HDDs - 12 Gb SAS 15K			
00WG660	AT84	300GB 15K 12Gbps SAS 2.5" G3HS HDD	2
00WG665	AT85	600GB 15K 12Gbps SAS 2.5" G3HS HDD	2
2.5-inch hot-swap HDDs - 12 Gb NL SAS			
00NA491	AT7Z	1TB 7.2K 12Gbps NL SAS 2.5" G3HS HDD	2
00NA496	AT80	2TB 7.2K 12Gbps NL SAS 2.5" G3HS 512e HDD	2
2.5-inch hot-swap SED HDDs - 12 Gb SAS 10K			
00WG705	AT8D	300GB 10K 12Gbps SAS 2.5" G3HS SED	2
00WG710	AT8E	600GB 10K 12Gbps SAS 2.5" G3HS SED	2
00WG715	AT8F	900GB 10K 12Gbps SAS 2.5" G3HS SED	2
00WG720	AT8G	1.2TB 10K 12Gbps SAS 2.5" G3HS SED	2

Table 13. 2.5-inch hot-swap 6 Gb SAS/SATA HDDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gb NL SATA			
00AJ141	A4TX	1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	2
00NA526	AT81	2TB 7.2K 6Gbps NL SATA 2.5" G3HS 512e HDD	2

Table 14. 2.5-inch hot-swap 12 Gb SAS SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise Capacity			
01GR786	AVKV	PM1633a 3.84TB Enterprise Capacity 12Gb SAS G3HS 2.5" SSD	2
01GR771	AUEJ	PM1633a 7.68TB Enterprise Capacity 12Gb SAS G3HS 2.5" SSD	2
2.5-inch hot-swap SSDs - 12 Gb SAS - Enterprise Performance (10+ DWPD)			
01GV711	AVL0	400GB Enterprise Performance 12G SAS G3HS 2.5" SSD	2
01GV716	AVL1	800GB Enterprise Performance 12G SAS G3HS 2.5" SSD	2
01GV721	AVL2	1.6TB Enterprise Performance 12G SAS G3HS 2.5" SSD	2
00FN379	AS7C	200GB 12G SAS 2.5" MLC G3HS Enterprise SSD	2
00FN389	AS7E	400GB 12G SAS 2.5" MLC G3HS Enterprise SSD	2
00FN399	AS7G	800GB 12G SAS 2.5" MLC G3HS Enterprise SSD	2
00FN409	AS7J	1.6TB 12G SAS 2.5" MLC G3HS Enterprise SSD	2

Table 15. 2.5-inch hot-swap 6 Gb SAS/SATA SSDs

Part number	Feature	Description	Maximum supported
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Performance (10+ DWPD)			
00YC330	AT9E	Intel S3710 800GB Enterprise Performance SATA G3HS 2.5" SSD	2
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Mainstream (3-5 DWPD)			
4XB7A08499	B10A	Intel S4600 240GB Enterprise Mainstream SATA G3HS 2.5" SSD	2
7SD7A05713	B10B	Intel S4600 480GB Enterprise Mainstream SATA G3HS 2.5" SSD	2
7SD7A05712	B10C	Intel S4600 960GB Enterprise Mainstream SATA G3HS 2.5" SSD	2
7SD7A05711	B10D	Intel S4600 1.92TB Enterprise Mainstream SATA G3HS 2.5" SSD	2
01GV843	AXFV	5100 240GB Enterprise Mainstream SATA G3HS 2.5" SSD	2
01GV848	AXFW	5100 480GB Enterprise Mainstream SATA G3HS 2.5" SSD	2
01GV853	AXFX	5100 960GB Enterprise Mainstream SATA G3HS 2.5" SSD	2
01GV858	AXFY	5100 1.92TB Enterprise Mainstream SATA G3HS 2.5" SSD	2
01GV863	AXFZ	5100 3.84TB Enterprise Mainstream SATA G3HS 2.5" SSD	2
2.5-inch hot-swap SSDs - 6 Gb SATA - Enterprise Entry (<3 DWPD)			
7SD7A05732	B0Z8	Intel S4500 240GB Enterprise Entry SATA G3HS 2.5" SSD	2
7SD7A05731	B0Z9	Intel S4500 480GB Enterprise Entry SATA G3HS 2.5" SSD	2
7SD7A05730	B0ZA	Intel S4500 960GB Enterprise Entry SATA G3HS 2.5" SSD	2
4XB7A08493	B0ZB	Intel S4500 1.92TB Enterprise Entry SATA G3HS 2.5" SSD	2
4XB7A08494	B0ZC	Intel S4500 3.84TB Enterprise Entry SATA G3HS 2.5" SSD	2
01KR496	AXGL	5100 480GB Enterprise Entry SATA G3HS 2.5" SSD	2
01KR501	AXGM	5100 960GB Enterprise Entry SATA G3HS 2.5" SSD	2
01KR506	AXGN	5100 1.92TB Enterprise Entry SATA G3HS 2.5" SSD	2
01KR511	AXGP	5100 3.84TB Enterprise Entry SATA G3HS 2.5" SSD	2
01GR726	AUEM	Intel S3520 240GB Enterprise Entry SATA G3HS 2.5" SSD	2
01GR731	AUEP	Intel S3520 480GB Enterprise Entry SATA G3HS 2.5" SSD	2
01GR736	AUER	Intel S3520 960GB Enterprise Entry SATA G3HS 2.5" SSD	2
01GR836	AVHP	PM863a 240GB Enterprise Entry SATA G3HS 2.5" SSD	2
01GR841	AVHQ	PM863a 480GB Enterprise Entry SATA G3HS 2.5" SSD	2
01GR846	AVHR	PM863a 960GB Enterprise Entry SATA G3HS 2.5" SSD	2
01GR711	AUE7	1.92TB Enterprise Entry SATA G3HS 2.5" SSD	2
00YC385	AT8R	120GB Enterprise Entry SATA G3HS 2.5" SSD	2
00YC400	AT8U	960GB Enterprise Entry SATA G3HS 2.5" SSD	2

Table 16. 2.5-inch NVMe SSDs

Part number	Feature	Description	Maximum supported
2.5-inch SSDs - NVMe - Enterprise Performance (10+ DWPD)			
00YA818	AT7V	Intel P3700 400GB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	2
00YA821	AT7W	Intel P3700 800GB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	2
00YA827	AT7Y	Intel P3700 2.0TB NVMe 2.5" G3HS Enterprise Performance PCIe SSD	2
2.5-inch SSDs - NVMe - Enterprise Mainstream (3-5 DWPD)			
90Y3227	A5RW	Intel P3600 400GB NVMe 2.5" G3HS Enterprise Value PCIe SSD	2
90Y3233	A5RY	Intel P3600 1.6TB NVMe 2.5" G3HS Enterprise Value PCIe SSD	2
00YK285†	AVP2	1.92TB NVMe 2.5" Enterprise Mainstream PCIe SSD	2
00YK284†	AVP1	960GB NVMe 2.5" Enterprise Mainstream PCIe SSD	2

Flex System Storage Expansion Node

The x240 M5 supports the attachment of the Flex System Storage Expansion Node.

Withdrawn: The Storage Expansion Node is now withdrawn from marketing.

The Flex System Storage Expansion Node provides the ability to attach another 12 hot-swap 2.5-inch HDDs or SSDs locally to the attached compute node. The Storage Expansion Node provides storage capacity for Network Attach Storage (NAS) workloads, which provides flexible storage to match capacity, performance, and reliability needs.

The following figure shows the Flex System Storage Expansion Node attached to a compute node.



Figure 6. Flex System Storage Expansion Node (right) attached to the x240 M5 (left)

The ordering information for the Storage Expansion Node is shown in the following table.

Table 17. Ordering part number and feature code

Part number	Feature code	Description	Maximum supported
68Y8588*	A3JF	Flex System Storage Expansion Node	1

* Withdrawn from marketing

The Storage Expansion Node has the following features:

- Connects directly to supported compute nodes via a PCIe 3.0 interface to the compute node's expansion connector (see the internal view in the [Locations of key components and connectors](#) section).
- Supports 12 hot-swap 2.5-inch drives, accessible via a sliding tray.
- Supports 6 Gbps SAS and SATA drives, both HDDs and SSDs.
- Based on an LSI SAS2208 6 Gbps RAID on Chip (ROC) controller.
- Supports RAID-0, 1, and 10 as standard. JBOD also supported. Optional RAID-5 and 50 with cache upgrade.
- Optional 512 MB or 1 GB cache with cache-to-flash super capacitor offload and RAID 5/50 support.

Notes:

- The use of the Storage Expansion Node requires that the x240 M5 Compute Node have both processors installed.
- The Storage Expansion Node uses a different hot-swap drive tray (G2HS) to the x240 M5 (G3HS). As a result, the SEN drives and x240 M5 drives not interchangeable.

For more information, including the supported drive options, see the Lenovo Press Product Guide: <http://lenovopress.com/tips0914>

Internal tape drives

The server does not support an internal tape drive. However, it can be attached to external tape drives by using Fibre Channel connectivity.

Optical drives

The server does not support an internal optical drive option, however, you can connect an external USB optical drive. See <http://support.lenovo.com/en/documents/pd011281> for information about available external optical drives from Lenovo. Alternatively, use the remote media feature of the IMMv2 and the Chassis Management Module.

Note: The USB port on the compute nodes supplies up to 0.5 A at 5 V. For devices that require more power, another power source is required.

EN4172 2-port 10Gb Ethernet Adapter

Some models of the x240 M5 (those with a model of the form 9532-x4x) include the Flex System EN4172 2-port 10Gb Ethernet Adapter installed in slot 1. Table 2 lists the models with this adapter standard. These models require that a compatible Ethernet switch be installed in I/O module bays 1 and 2 of the chassis.

The EN4172 2-port 10Gb Ethernet Adapter includes the following features:

- Two-port 10 Gb Ethernet adapter
- Single ASIC controller that uses the QLogic BCM57840 ASIC
- PCI Express 3.0 x8 host interface
- B and 10 Gb auto-negotiation)
- Full line-rate performance
- Supports vNIC - Switch Independent Mode

For more information about this adapter, see the Lenovo Press Product Guide, available from: <http://lenovopress.com/tips1087>

CN4052 2-port 10Gb Virtual Fabric Adapter

Some models of the x240 M5 (those with a model of the form 9532-x6x) include the Flex System CN4052 2-port 10Gb Virtual Fabric Adapter installed in slot 1. Table 2 lists the models with this adapter standard. These models require that a compatible Ethernet switch be installed in I/O module bays 1 and 2 of the chassis.

The CN4052 2-port 10Gb Virtual Fabric Adapter includes the following features:

- Two-port 10 Gb Ethernet adapter.
- Optional support for FCoE and iSCSI via an Features on Demand license upgrade.
- Single ASIC controller that uses the Emulex XE104 design.
- PCIe Express 3.0 x8 host interface (8 GT/s).
- Connection to 1 Gb or 10 Gb data center infrastructure (1 Gb and 10 Gb auto-negotiation) .
- Full line-rate performance.
- Supports NIC virtualization (vNIC) up to four virtual ports per physical port. Supports Virtual Fabric Mode, Switch Independent Mode, and Unified Fabric Port Mode.

For more information about this adapter, see the Lenovo Press Product Guide, available from: <http://lenovopress.com/tips1164>

I/O expansion options

The x240 M5 has two I/O expansion connectors for attaching I/O adapter cards. There is a third expansion connector that is designed to connect an expansion node, such as the Storage Expansion Node. The I/O expansion connectors are a high-density, 216-pin PCIe connector. Installing I/O adapter cards allows the server to connect with switch modules in the Flex System Enterprise Chassis. Each slot has a PCI Express 3.0 x16 host interface and both slots support the same form-factor adapters.

The following figure shows the location of the I/O expansion connectors.

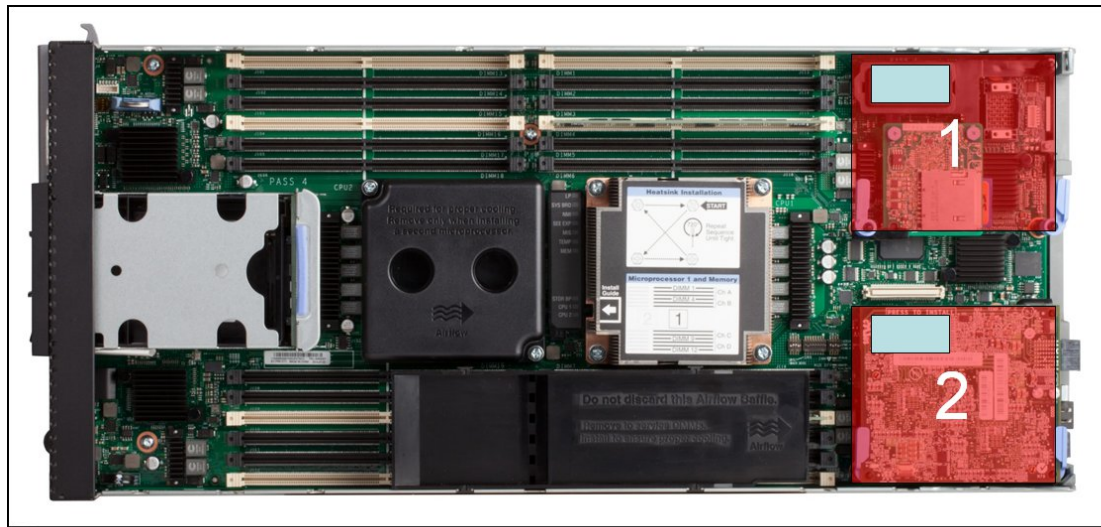


Figure 7. Location of the I/O adapter slots in the Flex System x240 M5 Compute Node

All I/O adapters are the same shape and can be used in any available slot.. A compatible switch or pass-through module must be installed in the corresponding I/O bays in the chassis, as indicated in the following table. Installing two switches means that all ports of the adapter are enabled, which improves performance and network availability.

Table 18. Adapter to I/O bay correspondence

I/O adapter slot in the server	Port on the adapter	Corresponding I/O module bay in the chassis
Slot 1	Port 1	Module bay 1
	Port 2	Module bay 2
	Port 3 (for 4-port cards)	Module bay 1
	Port 4 (for 4-port cards)	Module bay 2
Slot 2	Port 1	Module bay 3
	Port 2	Module bay 4
	Port 3 (for 4-port cards)	Module bay 3
	Port 4 (for 4-port cards)	Module bay 4

The following figure shows the location of the switch bays in the Flex System Enterprise Chassis.

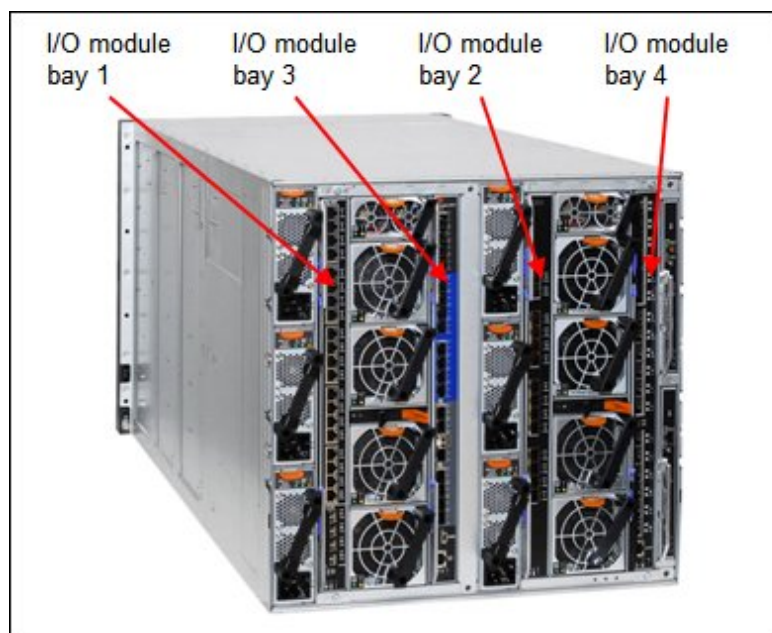


Figure 8. Location of the switch bays in the Flex System Enterprise Chassis

The following figure shows how two-port adapters are connected to switches that are installed in the chassis.

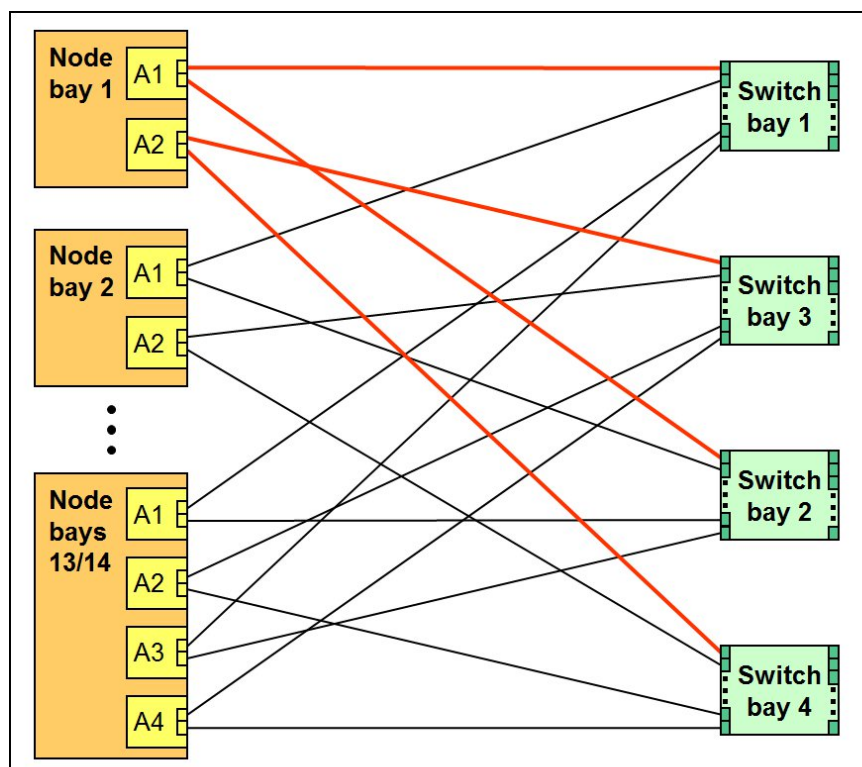


Figure 9. Logical layout of the interconnects between I/O adapters and I/O modules

Flex System PCIe Expansion Node

The x240 M5 supports the attachment of the Flex System PCIe Expansion Node. By using the Flex System PCIe Expansion Node, more PCI Express cards can be attached, such as High IOPS SSD adapters, fabric mezzanine cards, and next-generation graphics processing units (GPU) to supported Flex System compute nodes. This capability is ideal for many applications that require high performance I/O, special telecommunications network interfaces, or hardware acceleration that uses a PCI Express card. The PCIe Expansion Node supports up to four PCIe 2.0 adapters and two more Flex System expansion adapters.

The PCIe Expansion Node is attached to a Flex System compute node, as shown in the following figure.

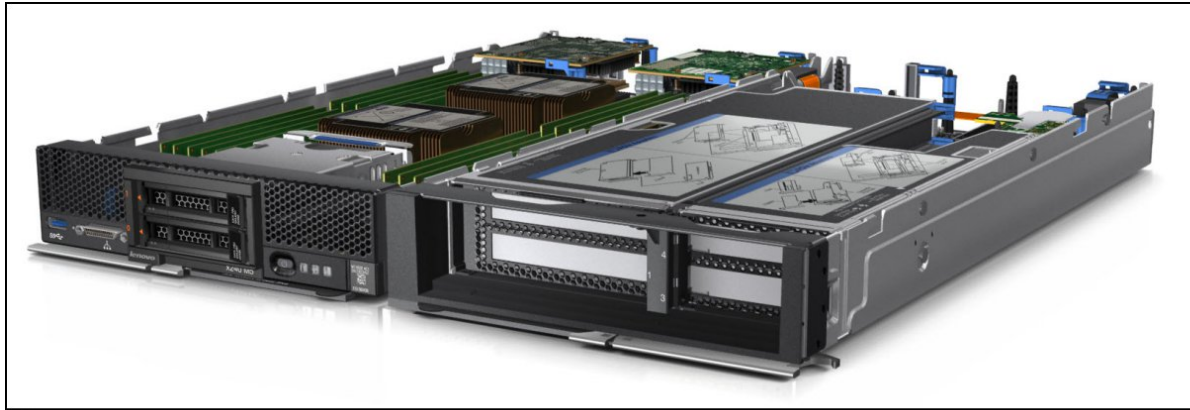


Figure 10. PCIe Expansion Node attached to the x240 M5

The ordering information for the PCIe Expansion Node is shown in the following table.

Table 19. Ordering part number and feature code

Part number	Feature code	Description	Maximum supported
81Y8983	A1BV	Flex System PCIe Expansion Node	1

The PCIe Expansion Node has the following features:

- Support for up to four standard PCIe 2.0 adapters:
 - Two PCIe 2.0 x16 slots that support full-length, full-height adapters
 - Two PCIe 2.0 x8 slots that support half-length, low-profile adapters
- Support for PCIe 3.0 adapters by operating them in PCIe 2.0 mode
- Support for one full-length, full-height double-wide adapter (that uses the space of the two full-length, full-height adapter slots)
- Support for PCIe cards with higher power requirements; a single adapter card (up to 225W) or to two adapters (up to 150W each)
- Two Flex System I/O expansion connectors to further expand the I/O capability of the attached compute node

Note: The use of the PCIe Expansion Node requires that the x240 M5 Compute Node have both processors installed.

For more information, see the Lenovo Press Product Guide: <http://lenovopress.com/tips0906>

Network adapters

The following table lists the supported network adapters and upgrades. Adapters can be installed in either slot. However, compatible switches must be installed in the corresponding bays of the chassis. All adapters can also be installed in the PCIe Expansion Node. The "Maximum supported" column in the table indicates the number of adapter that can be installed in the server and in the PCIe Expansion Node (PEN).

Table 20. Network adapters

Part number	Feature code	Description	Number of ports	Maximum supported (x240 M5** / PEN)
40 Gb Ethernet				
90Y3482	A3HK	Flex System EN6132 2-port 40Gb Ethernet Adapter	2	2 / None
10 Gb Ethernet				
88Y5920	A4K3	Flex System CN4022 2-port 10Gb Converged Adapter	2	2 / 2
01CV780	AU7X	Flex System CN4052S 2-port 10Gb Virtual Fabric Adapter Advanced (with FCoE / iSCSI)	2	2 / 2
00AG540	ATBT	Flex System CN4052S 2-port 10Gb Virtual Fabric Adapter	2	2 / 2
00JY804	A5RV	Flex System CN4052 Virtual Fabric Adapter SW Upgrade (FoD) (License to enable FCoE and iSCSI on 00AG540 or 00JY800)	License	2 / 2
01CV790	AU7Y	Flex System CN4054S 4-port 10Gb Virtual Fabric Adapter Advanced (with FCoE / iSCSI)	4	2 / 2
00AG590	ATBS	Flex System CN4054S 4-port 10Gb Virtual Fabric Adapter	4	2 / 2
00AG594	ATBU	Flex System CN4054S 4-port 10Gb Virtual Fabric Adapter SW Upgrade (License to enable FCoE and iSCSI on 00AG590)	License	2 / 2
00Y3306*	A4K2*	Flex System CN4054R 10Gb Virtual Fabric Adapter	4	2 / 2
90Y3558	A1R0	Flex System CN4054 Virtual Fabric Adapter (SW Upgrade) (License to enable FCoE and iSCSI on 00Y3306)	License	2 / 2
94Y5160	A4R6	Flex System CN4058S 8-port 10Gb Virtual Fabric Adapter	8	2 / 2
94Y5164	A4R9	Flex System CN4058S Virtual Fabric Adapter SW Upgrade (FoD) (License to enable FCoE and iSCSI on 94Y5160)	License	2 / 2
90Y3466	A1QY	Flex System EN4132 2-port 10Gb Ethernet Adapter	2	2 / 2
00AG530	A5RN	Flex System EN4172 2-port 10Gb Ethernet Adapter	2	2 / 2
1 Gb Ethernet				
49Y7900	A10Y	Flex System EN2024 4-port 1 Gb Ethernet Adapter	4	2 / 2
InfiniBand				
90Y3454	A1QZ	Flex System IB6132 2-port FDR InfiniBand Adapter	2	2 / 2

* Withdrawn from marketing

** For x4x and x6x models (where an Ethernet adapter is standard in slot 1), only one extra adapter can be installed in the compute node.

For more information about adapter-to-switch compatibility, see the Flex System Interoperability Guide, which is available at this web page:

<http://lenovopress.com/fsig>

Storage host bus adapters

The following table lists storage HBAs that are supported by the x240 M5 server, both internally in the compute node and in the PCIe Expansion Node.

Table 21. Storage adapters

Part number	Feature code	Description	Number of ports	Maximum supported (x240 M5 / PEN)
Fibre Channel				
95Y2386	A45R	Flex System FC5052 2-port 16Gb FC Adapter	2	1 / 1 (Slot 2)
95Y2391	A45S	Flex System FC5054 4-port 16Gb FC Adapter	4	1 / 1 (Slot 2)
69Y1942	A1BQ	Flex System FC5172 2-port 16Gb FC Adapter	2	1 / 1 (Slot 2)
69Y1938	A1BM	Flex System FC3172 2-port 8Gb FC Adapter	2	1 / 1 (Slot 2)
95Y2375	A2N5	Flex System FC3052 2-port 8Gb FC Adapter	2	1 / 1 (Slot 2)

For more information about adapter-to-switch compatibility, see the Flex System Interoperability Guide, which is available at this web page:

<http://lenovopress.com/fsig>

PCIe Flash Storage adapters

All supported Flash Storage Adapters are now withdrawn from marketing.

GPU adapters

The compute node supports the GPU adapters listed in the following table. These adapters are installed in an attached PCIe Expansion Node.

Table 22. GPU adapters

Part number	Feature code	Description	Maximum supported
47C2137	A5HD	NVIDIA Tesla K40 for Flex System PCIe Expansion Node	1†‡

† The K40 adapter is a double-wide card and occupies the two full-height PCIe slots. If installed, the adjacent slot is unavailable, however adapters can be installed in the two low-profile slots.

‡ NVIDIA GRID Kx and Tesla Kxx GPUs supported only when the x240 M5 has 1 TB or less memory installed.

Power supplies

Server power is derived from the power supplies that are installed in the chassis. There are no server options regarding power supplies.

Integrated virtualization

The x240 M5 supports the VMware vSphere (ESXi) hypervisor on one or two SD cards with the optional SD Media Adapter for System x. This adapter is installed in a dedicated slot beneath I/O Adapter slot 1, as shown in the following figure.

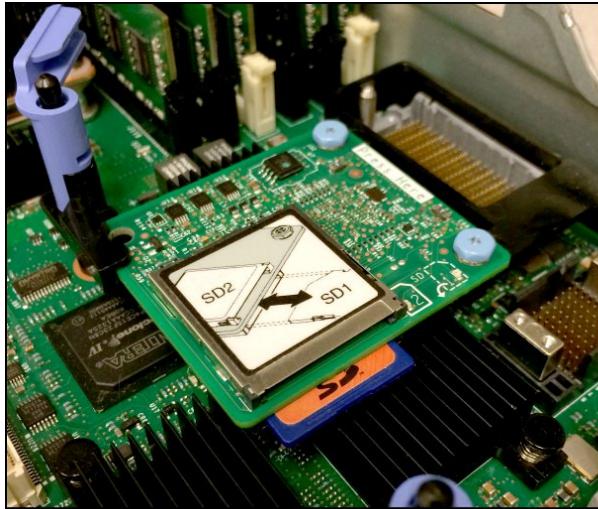


Figure 11. SD Media Adapter for System x

When only one SD card is installed in the adapter, you can create up to 16 volumes, each of which is presented to UEFI as a bootable device. When two SD Media cards are inserted, volumes can be mirrored (RAID-1) across both cards, up to a total of eight mirrored volumes. The use of mirrored volumes improves system availability because the server remains operational, even if one SD card fails. The RAID functionality is handled internally by the SD Media Adapter.

The following table shows the available options. The table also indicates whether the option includes the SD Media RAID Adapter and how many SD cards are included.

Table 23. Virtualization options

Part number	Feature code	Description	Includes Adapter	Includes Media
00ML706	A5TJ	SD Media Adapter for Systems x (Option 00ML706 includes 2 blank 32GB SD cards)	Yes	Yes (2)*
00ML700	AS2V	Blank 32GB SD Media for System x	No	Yes (1)
None**	ASCG	RAID Adapter for SD Media w/ VMware ESXi 5.1 U2 (1 SD Media)	Yes	Yes (1)
None**	AS4B	RAID Adapter for SD Media w/ VMware ESXi 5.1 U2 (2 SD Media, RAIDed)	Yes	Yes (2)
None**	ASCH	RAID Adapter for SD Media w/ VMware ESXi 5.5 U2 (1 SD Media)	Yes	Yes (1)
None**	AS4C	RAID Adapter for SD Media w/ VMware ESXi 5.5 U2 (2 SD Media, RAIDed)	Yes	Yes (2)
None**	ATZJ	RAID Adapter for SD Media w/ VMware ESXi 5.5 U3B (1 SD Media)	Yes	Yes (1)
None**	ATZK	RAID Adapter for SD Media w/ VMware ESXi 5.5 U3B (2 SD Media, RAIDed)	Yes	Yes (2)
None**	ATSA	RAID Adapter for SD Media w/ VMware ESXi 6.0 U1A (1 SD Media)	Yes	Yes (1)
None**	ATZM	RAID Adapter for SD Media w/ VMware ESXi 6.0 U2 (1 SD Media)	Yes	Yes (1)
None**	ATZL	RAID Adapter for SD Media w/ VMware ESXi 6.0 U2 (2 SD Media, RAIDed)	Yes	Yes (2)
None**	ATS9	RAID Adapter for SD Media w/VMware ESXi 6.0 U1A (2 SD Media, RAIDed)	Yes	Yes (2)
None**	AVNX	Adapter for SD Media w/ VMware ESXi 6.5 (1 SD Media)	Yes	Yes (1)
None**	AVNY	Adapter for SD Media w/ VMware ESXi 6.5 (2 SD Media, RAIDed)	Yes	Yes (2)

* Option 00ML706 includes two 32GB SD cards; however, for CTO orders, feature code A5TJ does not include SD media and the 32GB cards and VMware vSphere preload must be selected separately.

** CTO only.

Light path diagnostics

For quick problem determination when it is physically at the server, the x240 M5 offers the following three-step guided path:

1. The Fault LED on the front panel.
2. The light path diagnostics panel, as shown in the following figure.
3. LEDs next to key components on the system board.

The x240 M5 light path diagnostics panel is inside the server between the two processors, as shown in the following figure.

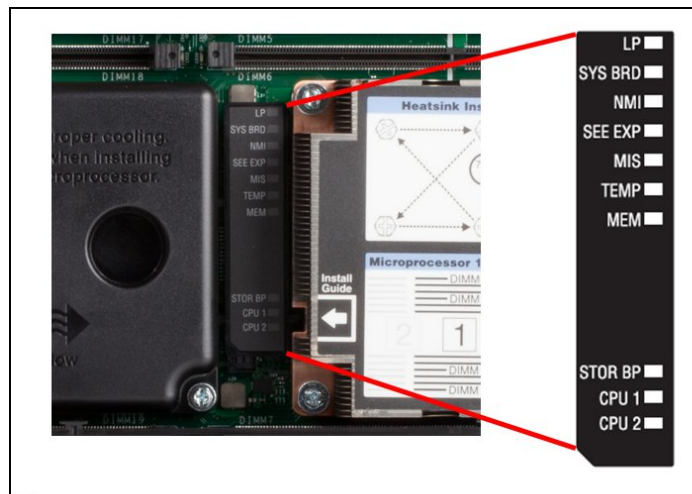


Figure 12. Location of x240 M5 light path diagnostics panel

To illuminate the light path diagnostics LEDs, power off the compute node, slide it out of the chassis, and press the power button. The power button doubles as the light path diagnostics reminder button when the server is removed from the chassis.

The meanings of the LEDs in the light path diagnostics panel are listed in the following table.

Table 24. Light path diagnostic panel LEDs

LED	Meaning
LP	The light path diagnostics panel is operational.
SYS BRD	A system board error is detected.
NMI	A non-maskable interrupt (NMI) occurred.
SEE EXP	A fault is detected in the adjacent expansion unit (if installed).
MIS	A mismatch occurred between the processors, DIMMs, or HDDs within the configuration as reported by POST.
TEMP	An over-temperature condition occurred that was critical enough to shut down the server.
MEM	A memory fault occurred. The corresponding DIMM error LEDs on the system board are also lit.

Remote management

The server contains an Integrated Management Module II (IMM2), which interfaces with the advanced management module in the chassis. The combination of these modules provides advanced service-processor control, monitoring, and an alerting function. If an environmental condition exceeds a threshold or if a system component fails, LEDs on the system board are lit to help you diagnose the problem, the error is recorded in the event log, and you are alerted to the problem. A virtual presence capability comes standard for remote server management.

Remote server management is provided through the following industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Web browser

The server also supports virtual media and remote control features, which provide the following functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel, regardless of the system state.
- Remotely accessing the server by using the keyboard and mouse from a remote client.
- Mapping the CD or DVD drive, diskette drive, and USB flash drive on a remote client, and mapping ISO and diskette image files as virtual drives that are available for use by the server.
- Uploading a diskette image to the IMM2 memory and mapping it to the server as a virtual drive.
- Capturing blue-screen errors.

Operating system support

The server supports the following operating systems:

- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2016
- Red Hat Enterprise Linux 6.5 x64
- Red Hat Enterprise Linux 6.6 x64
- Red Hat Enterprise Linux 6.7 x64
- Red Hat Enterprise Linux 6.8 x64
- Red Hat Enterprise Linux 6.10 x64
- Red Hat Enterprise Linux 7.0
- Red Hat Enterprise Linux 7.1
- Red Hat Enterprise Linux 7.2
- Red Hat Enterprise Linux 7.3
- Red Hat Enterprise Linux 7.4
- Red Hat Enterprise Linux 7.5
- SUSE Linux Enterprise Server 11 Xen x64 SP3
- SUSE Linux Enterprise Server 11 Xen x64 SP4
- SUSE Linux Enterprise Server 11 x64 SP3
- SUSE Linux Enterprise Server 11 x64 SP4
- SUSE Linux Enterprise Server 12
- SUSE Linux Enterprise Server 12 SP1
- SUSE Linux Enterprise Server 12 SP2
- SUSE Linux Enterprise Server 12 SP3
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 12 Xen
- SUSE Linux Enterprise Server 12 Xen SP1
- SUSE Linux Enterprise Server 12 Xen SP2
- SUSE Linux Enterprise Server 12 Xen SP3
- SUSE Linux Enterprise Server 12 Xen SP4
- VMware ESXi 5.1 U2
- VMware ESXi 5.1 U3
- VMware ESXi 5.5 U2
- VMware ESXi 5.5 U3
- VMware ESXi 6.0
- VMware ESXi 6.0 U1
- VMware ESXi 6.0 U2
- VMware ESXi 6.0 U3
- VMware ESXi 6.5
- VMware ESXi 6.5 U1
- VMware ESXi 6.5 U3

For a complete list of supported, certified and tested operating systems, plus additional details and links to relevant web sites, see the Operating System Interoperability Guide:

<https://lenovopress.com/osig#servers=x240-m5-9532-e5-v3>

Physical specifications

The server features the following dimensions and weight (approximate):

- Height: 51 mm (2.0 in)
- Depth: 493 mm (19.4 in)
- Width: 215 mm (8.5 in)
- Maximum weight: 7.1 kg (15.6 lb)

The server features the following shipping dimensions and weight (approximate):

- Height: 197 mm (7.8 in)
- Depth: 603 mm (23.7 in)
- Width: 430 mm (16.9 in)
- Weight: 8 kg (17.6 lb)

Supported environment

The Flex System x240 M5 compute node complies with ASHRAE Class A3 specifications.

The following Power on operating environment is supported:

- Temperature: 5 - 40 °C (41 - 104 °F)
- Humidity, non-condensing: -12 °C dew point (10.4 °F) and 8 - 85% relative humidity
- Maximum dew point: 24 °C (75 °F)
- Maximum altitude: 3048 m (10,000 ft)
- Maximum rate of temperature change: 5 °C/hr (41 °F/hr)

The following Power off operating environment is supported:

- Temperature: 5 - 45 °C (41 - 113 °F)
- Relative humidity: 8 - 85%
- Maximum dew point: 27 °C (80.6 °F)

The following Storage (non-operating) operating environment is supported:

- Temperature: 1 - 60 °C (33.8 - 140 °F)
- Altitude: 3050 m (10,006 ft)
- Relative humidity: 5 - 80%
- Maximum dew point: 29 °C (84.2°F)

The following Shipment (non-operating) environment is supported:

- Temperature: -40 - 60 °C (-40 - 140 °F)
- Altitude: 10,700 m (35,105 ft)
- Relative humidity: 5 - 100%
- Maximum dew point: 29 °C (84.2 °F)

Warranty options

The system has a three-year warranty with 24x7 standard call center support and 9x5 Next Business Day onsite coverage. Also available are Lenovo Services warranty maintenance upgrades and post-warranty maintenance agreements, with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

Lenovo warranty service upgrade offerings are region-specific. Not all warranty service upgrades are available in every region. For more information about Lenovo warranty service upgrade offerings that are available in your region, go to the Data Center Advisor and Configurator website <http://dcsc.lenovo.com>, then do the following:

1. In the Customize a Model box in the middle of the page, select the **Services** option in the Customization Option dropdown menu
2. Enter in the machine type & model of the system
3. From the search results, you can click either **Deployment Services** or **Support Services** to view the offerings

The following table explains warranty service definitions in more detail.

Table 25. Warranty service definitions

Term	Description
On-site service	A service technician will arrive at the client's location for equipment service.
24x7x2 hour	A service technician is scheduled to arrive at the client's location within two hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
24x7x4 hour	A service technician is scheduled to arrive at the client's location within four hours after remote problem determination is completed. Lenovo provides service around the clock, every day, including Lenovo holidays.
9x5x4 hour	A service technician is scheduled to arrive at the client's location within four business hours after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday-Friday, excluding Lenovo holidays. For example, if a customer reports an incident at 3:00 pm on Friday, the technician will arrive by 10:00 am the following Monday.
9x5 next business day	A service technician is scheduled to arrive at the client's location on the business day after remote problem determination is completed. Lenovo provides service 8:00 am - 5:00 pm in the client's local time zone, Monday - Friday, excluding Lenovo holidays. Calls received after 4:00 pm local time require an extra business day for service dispatch. Next business day service is not guaranteed.
Committed Repair	Problems receive priority handling so that repairs are completed within the committed time of 6, 8, or 24 hours. Lenovo provides service 24 hours/day, every day, including Lenovo holidays.

The following Lenovo warranty service upgrades are available:

- Warranty and maintenance service upgrades:
 - Three, four, or five years of 9x5 or 24x7 service coverage
 - Onsite response from next business day to 2 or 4 hours
 - Committed repair service
 - Warranty extension of up to 5 years
 - Post warranty extensions
- Committed Repair Service

Committed Repair Services enhances the level of Warranty Service Upgrade or Post Warranty/Maintenance Service offering associated with the selected systems. Offerings vary and are available in select countries.

 - Priority handling to meet defined time frames to restore the failing machine to good working condition
 - Committed repair service levels are measured within the following coverage hours:
 - 24x7x6: Service performed 24 hours per day, 7 days per week, within 6 hours
 - 24x7x8: Service performed 24 hours per day, 7 days per week, within 8 hours
 - 24x7x24: Service performed 24 hours per day, 7 days per week, within 24 hours

- **Hard Disk Drive Retention**
Lenovo's Hard Disk Drive Retention (HDDR) service is a multi-drive hard drive retention offering that ensures your data is always under your control, regardless of the number of hard drives that are installed in your Lenovo server. In the unlikely event of a hard drive failure, you retain possession of your hard drive while Lenovo replaces the failed drive part. Your data stays safely on your premises, in your hands. The Hard Drive Retention service can be purchased in convenient bundles with our warranty upgrades and extensions.
- **Microcode Support**
Keeping microcode current helps prevent hardware failures and security exposure. There are two levels of service: analysis of the installed base and analysis and update where required. Offerings vary by region and can be bundled with other warranty upgrades and extensions.
- **Remote Technical Support Services (RTS)**
RTS provides comprehensive technical call center support for covered servers, storage, operating systems, and applications. Providing a single source for support of hardware and software issues, RTS can reduce problem resolution time, decreasing the cost to address technical problems and increasing uptime. Offerings are available for Windows, Linux, IBM Systems Director, VMware, Microsoft business applications, and Lenovo System x storage devices, and IBM OEM storage devices.

Regulatory compliance

The server conforms to the following standards:

- Energy Star 2.0
- ASHRAE Class A3
- FCC - Verified to comply with Part 15 of the FCC Rules Class A
- Canada ICES-004, issue 3 Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1
- Japan VCCI, Class A
- IEC 60950-1 (CB Certificate and CB Test Report)
- Taiwan BSMI CNS13438, Class A; CNS14336
- Australia/New Zealand AS/NZS CISPR 22, Class A
- Korea KN22, Class A, KN24
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- TUV-GS (EN60950-1/IEC 60950-1, EK1-ITB2000)

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Related publications and links

For more information, see the following resources:

- Flex System x240 M5 Compute Node product page
<https://www3.lenovo.com/us/en/data-center/servers/flex-blade-servers/compute-nodes/Flex-System-x240-M5/p/77XS7PF7P0C>
- Customer Successes - case studies & videos of customers using the x240 M5
https://lenovosuccess.com/search#term=&systems=Flex%2520System&system_models=x240%2520M5
- Flex System Information Center
<http://flexsystem.lenovofiles.com/help/index.jsp>
- Flex System x240 M5 Compute Node Installation and Service Guide
http://flexsystem.lenovofiles.com/help/topic/com.lenovo.acc.9532.doc/product_page.html
- ServerProven hardware compatibility page for the x240 M5
<http://www.lenovo.com/us/en/serverproven/flex/9532.shtml>
- Operating System Interoperability Guide for x240 M5 (E5-2600 v3)
<https://lenovopress.com/osig#servers=x240-m5-9532-e5-v3&support=all>
- Flex System Interoperability Guide
<http://lenovopress.com/fsig>
- xREF - System x Reference
<http://lenovopress.com/xref>
- Support Portal for the x240 M5
<http://support.lenovo.com/products/Servers/Lenovo-x86-servers/Lenovo-x240-M5-Compute-Node/9532>
- US Announcement Letter
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS114-140>

Related product families

Product families related to this document are the following:

- [Blade Servers](#)

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