

System x iDataPlex dx360 M4 Product Guide (withdrawn product)

The System x® iDataPlex® dx360 M4 compute node is designed to optimize density and performance within typical data center infrastructure limits. The unique half-depth form factor is designed to help you improve compute density in your space-constrained data center while also improving system cooling and energy efficiency. With more computing power per watt and the latest Intel Xeon processors including the new Intel Xeon E5-2600 v2, you can reduce costs while maintaining speed and availability.

Suggested use: Web 2.0, HPC clusters and large corporate data processing.



Figure 1. Two dx360 M4 compute nodes installed into a 2U iDataPlex chassis

Did you know?

With options from highly efficient low-voltage 60 W processors to high-performance 135 W processors, you can precisely balance your performance needs against energy usage. Up to two Graphics Processing Units (GPUs) or coprocessors can also be included as expansion options for those specialty workload needs. Networking choices include Ethernet up to 10 Gbps and InfiniBand connectivity. You can also choose from three storage configurations based on performance and capacity needs. A range of power supply selections round out flexible configuration options, so you can choose the right option to support your workloads within your data center power and cooling envelope and budget limits.

Key features

System x iDataPlex is an innovative data center solution that maximizes performance and optimizes energy and space efficiencies.

The iDataPlex dx360 M4 server is a modular, highly dense system, designed around a highly flexible architecture for companies running large scale-out data centers that need energy efficiency, optimized cooling, extreme scalability, high density at the data center level, and high performance at an affordable price. iDataPlex solutions can help cost-effectively scale processing power to meet even the most demanding high-performance computing workloads.

The iDataPlex design is a data center solution for customers finding limitations in their scale-out computing environments. By delivering customized solutions that help reduce overall data center costs, Lenovo addresses the business growth challenges in the massive scale-out marketplace. The iDataPlex solution incorporates innovative ways to integrate x86-based processing performance at the node, rack, and data center levels. The iDataPlex solution provides customers with outstanding energy and cooling efficiency, multi-rack level manageability, complete flexibility in configuration, and minimal deployment effort.

A typical iDataPlex solution consists of multiple fully populated rack installations. The groundbreaking iDataPlex solution offers increased density in a new rack design. It uses the dimensions of a standard 42U enterprise rack but can hold 100U of equipment, populated with up to 84 servers, plus sixteen 1U vertical slots for switches, appliances, and power distribution units (PDUs). This added density addresses the major problems that prevent most data centers today from reaching their full capacity: insufficient electrical power and excess heat.

The energy-efficient design of the iDataPlex servers and chassis can significantly reduce the incoming energy requirement compared with standard 1U servers. In addition, the optional liquid-cooled Rear Door Heat eXchanger mounted to the back of the rack can remove 100% of the heat generated within the rack, drawing it from the data center before it exits the rack. It can even go beyond that, to the point of helping to cool the data center itself and reducing the need for Computer Room Air Conditioning (CRAC) units. This allows racks to be positioned much closer together, eliminating the need for hot aisles between rows of fully populated racks.

With the iDataPlex chassis design, air needs to travel only 20 inches front to back, rather than the 30 plus inches of a typical enterprise server. This shallow depth is part of the reason that the cooling efficiency of iDataPlex servers is so high—shorter distance means better airflow. In addition, the new design uses four large 80 mm fans per 2U chassis for more efficiency and lower noise than the eight small 40 mm fans used in standard 1U servers. The increased air pressure resulting from the shorter distance through the rack and the larger fans makes for one of the most efficient air-cooled solutions on the market.

Unlike most conventional racks, which are often left largely empty due to power and cooling limitations, the iDataPlex Rack can be fully populated, while removing all rack heat from the data center (up to 100,000 BTUs or 30 kW), using the Rear Door Heat eXchanger. In addition, iDataPlex chassis uses highly efficient (80 PLUS Platinum) power supplies, reducing energy draw and waste heat further.

Scalability and performance

The dx360 M4 offers numerous features to boost performance, improve scalability, and reduce costs:

- The Intel Xeon processor E5-2600 v2 product family improves productivity by offering superior system performance with 12-core processors and up to 3.5 GHz core speeds, up to 25 MB of L3 cache, and QPI interconnect links of up to 8 GTps.
- Two processors, up to 24 cores, and 48 threads maximize the concurrent execution of multi-threaded applications.
- Intelligent and adaptive system performance with Intel Turbo Boost Technology 2.0 allows CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor TDP.
- Intel Hyper-Threading Technology boosts performance for multi-threaded applications by enabling simultaneous multi-threading 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 utilize the hardware for virtualization workloads.
- Intel Advanced Vector Extensions (AVT) significantly improve floating point performance for compute-intensive technical and scientific applications compared to previous generation processors.
- Support for high-performance Intel coprocessors and NVIDIA GPGPU adapters which offer significant additional single-precision floating point performance per server.
- 16 DIMMs of registered 1866 MHz or 1600 MHz DDR3 ECC memory provide speed, high availability, and a memory capacity of up to 512 GB.
- The use of solid-state drives (SSDs) instead of or along with traditional spinning drives (HDDs) can significantly improve I/O performance. An SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD.
- 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.
- Support for 10 Gb Ethernet and FDR mezzanine cards that offer network performance without consuming a PCIe slot.
- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E5 family. This helps to dramatically reduce I/O latency and increase overall system performance.
- Four USB 2.0 front-mounted ports for connectivity to external flash drives, optical drives, tape drives, and other USB devices.

Manageability and security

Powerful systems management features simplify local and remote management of the dx360 M4:

- The server includes an Integrated Management Module II (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 support enables advanced cryptographic functionality, such as digital signatures and remote attestation.
- Systems Director is included for proactive systems management. It offers comprehensive systems management tools that help to increase up-time, reduce costs, and improve productivity through advanced server management capabilities.
- 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, allowing the application to run in its own isolated space protected from all other software running on a system.

Energy efficiency

iDataPlex offers the following energy efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to the green environment:

- A shallow chassis design that minimizes the air flow from the front to the back of the server, thereby maximizing cooling effectiveness.
- The dx360 M4 is Energy Star 2.0 compliant. Energy Star is the trusted, US government-backed symbol for energy efficiency, with the goal of helping customers save money and protect the environment through energy efficient products and practices. For the Power and Performance Data Sheet, see <http://.com/systems/x/hardware/energy-star>
- Optional Rear Door Heat eXchanger that uses liquid cooling to remove from the data center, all heat generated by the servers.

- Large 80 mm fans to maximize air flow efficiencies.
- Choice of three power supplies to match the processor and GPGPU configuration of your servers and maximize energy efficiency.
- The Intel Xeon processor E5-2600 v2 product family offers significantly better performance over the previous generation while fitting into the same thermal design power (TDP) limits.
- Intel Intelligent Power Capability powers individual processor elements on and off as needed, to reduce 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 1.35 V DDR3 memory RDIMMs consume 15% less energy than 1.5 V DDR3 RDIMMs.
- Solid state drives (SSDs) consume as much as 80% less power than traditional spinning 2.5-inch HDDs.
- The server uses hexagonal ventilation holes in the front and rear of the casing, which can be grouped more densely than round holes, providing more efficient airflow through the system.
- Systems Director Active Energy Manager™ provides advanced power management features with actual real-time energy monitoring, reporting, and capping features.

Availability and serviceability

The dx360 M4 and the iDataPlex infrastructure provide many features to simplify serviceability and increase system uptime:

- The 2U chassis supports redundant power supply options, which means greater system uptime.
- All components can be removed from the front of the rack by sliding out the trays or the chassis for easy, quick servicing.
- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as HDDs and memory.
- The dx360 M4 offers memory mirroring and memory rank sparing for redundancy in the event of a non-correctable memory failure.
- Optional RAID arrays enable the server to keep operating in the event of a failure to any one drive.
- Solid-state drives (SSDs) offer significantly better reliability than traditional mechanical HDDs for greater uptime.
- Predictive Failure Analysis (PFA) detects when system components (processors, memory, and hard disk drives) operate outside of standard thresholds and generates pro-active alerts in advance of possible failure, therefore increasing uptime.
- Built-in Integrated Management Module II (IMM2) continuously monitors system parameters, triggers alerts, and performs recovering actions in case of failures to minimize downtime.
- The IMM2 offers optional remote management capability to enable remote keyboard, video, mouse (KVM) control of the server.
- Three-year customer replaceable unit and onsite limited warranty, next business day 9x5. Optional service upgrades available.

Locations of key components and connectors

Figure 2 shows the two dx360 M4 servers installed in the iDataPlex dx360 M4 2U chassis.

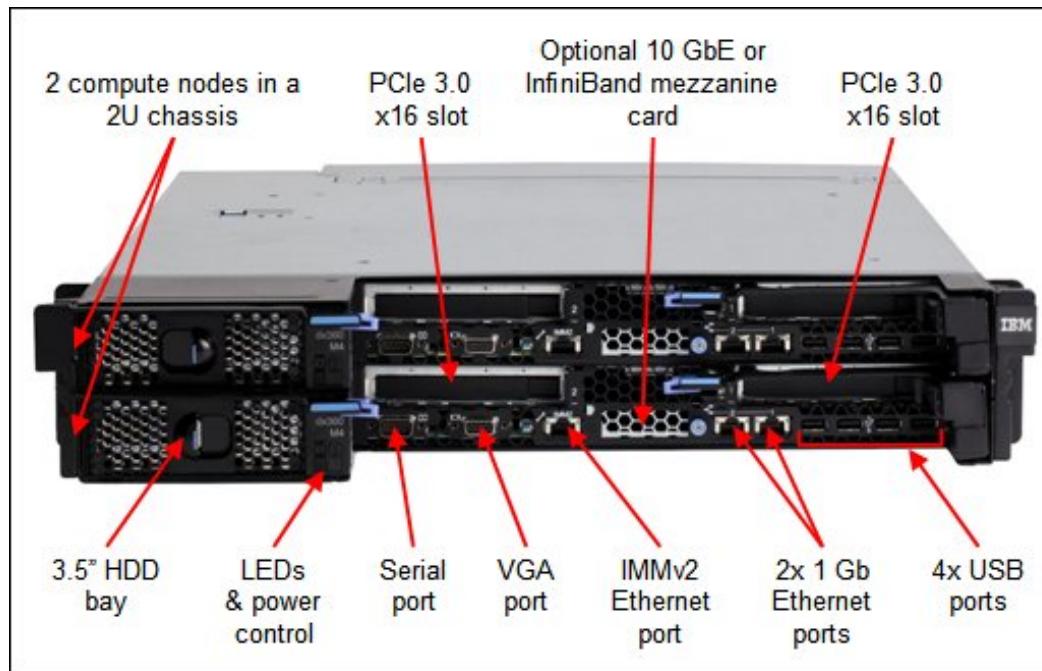


Figure 2. Front view of 2U chassis with two dx360 M4 servers installed

Figure 3 shows the rear of the 2U chassis showing the shared fan pack and power supplies.

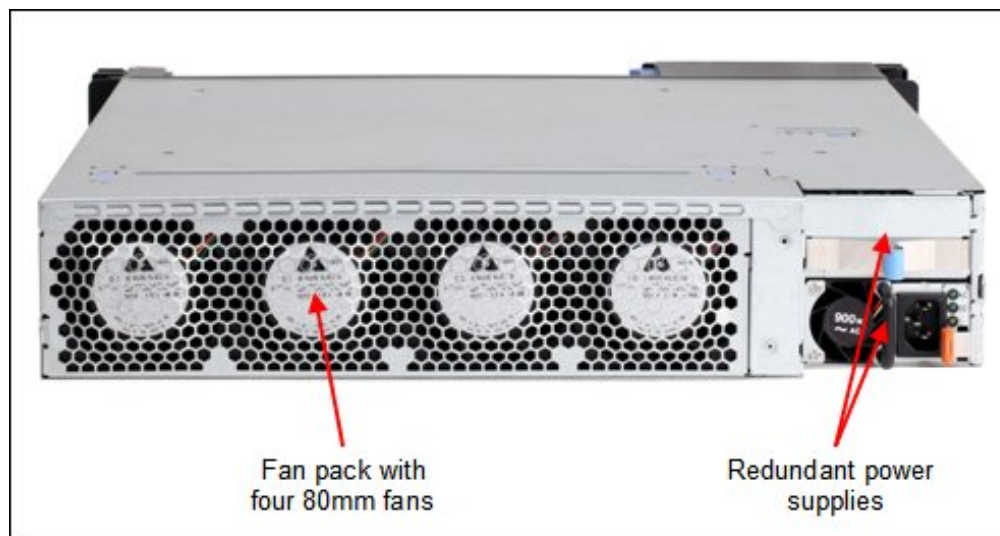


Figure 3. Rear view of the iDataPlex 2U chassis

Figure 4 shows the locations of key components inside the server.

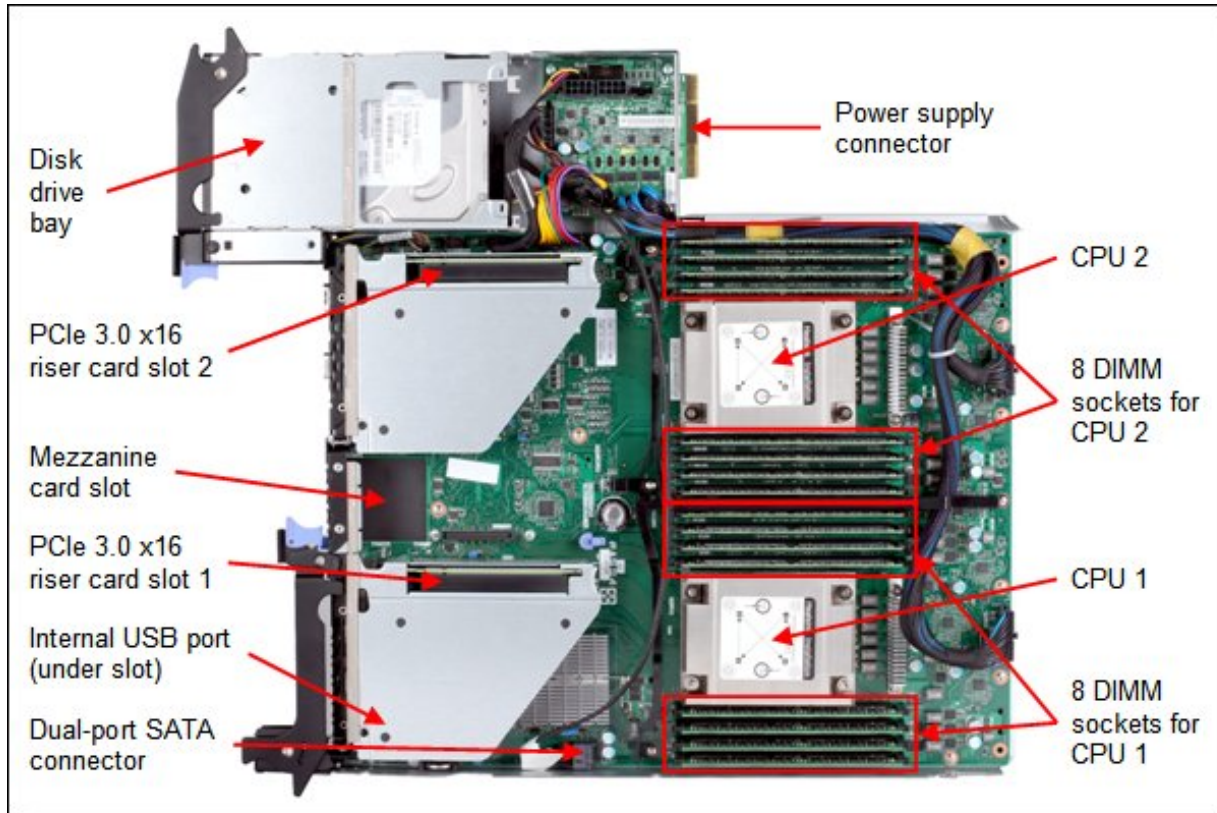


Figure 4. Inside view of the iDataPlex dx360 M4

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications

Components	Specification
Form factor	Half-depth, 2U chassis with up to two planar trays.
Supported chassis	System x iDataPlex dx360 M4 2U chassis, type 7913.
Processor	Two Intel Xeon Processor E5-2600 or E5-2600 v2 series processors; QuickPath Interconnect (QPI) links speed up to 8.0 GTps. Hyper-Threading Technology and Turbo Boost Technology. Intel C602J (Patsburg-J) chipset. Up to 12 cores per processor. Core speeds up to 3.5 GHz. Integrated L3 cache up to 25 MB.
Memory cache	Up to 20 MB.
Chipset	Intel C600 Series.
Memory	Up to 16 DIMM sockets (8 DIMMs per processor) supporting DDR3 DIMMs. Four memory channels per processor (two DIMMs per channel). For E5-2600-based systems: RDIMMs with memory speeds of 1600 MHz or 1333 MHz, or UDIMMs at 1333 MHz are supported. For E5-2600 v2-based systems: RDIMMs with memory speeds of 1866 MHz or 1600 MHz, or UDIMMs at 1600 MHz are supported.
Memory maximums	For E5-2600-based systems: Up to 512 GB with 16x 32 GB LRDIMMs and two processors. For E5-2600 v2-based systems: Up to 256 GB with 16x 16 GB LRDIMMs and two processors.

Components	Specification
Memory protection	ECC, memory mirroring, and memory sparing.
Disk drive bays	One 3.5" simple-swap SATA or two 2.5" simple swap SAS/SATA HDDs or SSDs, or four 1.8" simple-swap SSDs.
Maximum internal storage	Up to 12 TB per 2U chassis using two 6 TB 3.5-inch drives.
RAID support	Two-port 6 Gbps PCIe 3.0 SATA controller with Intel C600 chipset. Optional RAID with supported 6Gbps RAID controllers.
Optical drive bays	No internal bays; use an external USB drive. See http://support.lenovo.com/en/documents/pd011281 for options.
Tape drive bays	No internal bays. Use an external USB drive.
Network interfaces	Two Gigabit Ethernet ports using onboard Intel I350 Gb Ethernet controller. Optionally, two FDR InfiniBand ports or two 10 GbE ports via a mezzanine card (which does not occupy a PCIe slot).
PCI Expansion slots	<p>One PCIe 3.0 x8 mezzanine slot supports 10 GbE or InfiniBand. Standard models include two riser cards, each riser providing one slot:</p> <ul style="list-style-type: none"> ● Slot 1: PCIe 3.0 x16 - full-height/half-length ● Slot 2: PCIe 3.0 x16 - full-height/half-length <p>Use of both riser slots requires two CPUs to be installed. For CTO configurations, alternative risers can be used with PCIe chassis trays to provide GPU support.</p> <p>With a GPGPU chassis tray installed in the chassis (one node per 2U chassis):</p> <ul style="list-style-type: none"> ● 2x PCIe 3.0 x16 (for GPU or coprocessor) - full-height/full-length/double-wide ● 2x PCIe 3.0 x8 (x16 mechanical) - full-height/half-length
Ports	One RS232 serial port, one VGA port, one 1 Gbps RJ45 connector for dedicated systems management (wired to the IMM), a slot for the mezzanine card ports (SFP+ or 10BaseT RJ45 depending on the card), two 1 Gbps Ethernet ports, five USB 2.0 ports - four on the front of the server, one internal.
Cooling	Supplied by the 2U chassis using four 80mm fans in the standard fan pack.
Power supply	Supplied by the 2U chassis; 1 standard, 2 maximum; Options are 550 W, 750 W, or 900 W, all with 80 PLUS Platinum certification. When two are installed, they form a redundant pair. iDataPlex rack offers Direct Dock power cord connections for easy installation and removal. Chassis 7913-A2x includes one 900W High Efficiency Platinum AC Power Supply (second supply optional).
Systems management	UEFI, Integrated Management Module II (IMM2) with Renesas SH7757 controller, Predictive Failure Analysis, Light Path Diagnostics, Automatic Server Restart, Systems Director and Active Energy Manager, ServerGuide.
Video	Matrox G200eR2 video core with 16 MB DDR3 video memory integrated into the IMM2. Maximum resolution is 1600x1200 with 16M colors (32 bpp) at 75 Hz, or 1680x1050 with 16M colors at 60 Hz.
Security features	Power-on password, administrator's password, Trusted Platform Module 1.2.
Operating systems supported	Red Hat Enterprise Linux, SUSE Linux Enterprise Server, Microsoft Windows Server 2008 R2 and 2008, VMware vSphere Hypervisor.
Limited warranty	3-year customer-replaceable unit and onsite limited warranty with 9x5/NBD.
Service and support	Optional service upgrades are available through ServicePacs: 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 some Lenovo and OEM software.

Components	Specification
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Dimensions	dx360 M4 server: Width: 444 mm (17.5"), height: 46 mm (1.8"), depth: 509 mm (20.0") 2U chassis: Width: 446 mm (17.6"), height: 87 mm (3.4"), depth: 555 mm (21.8")
Weight	dx360 M4 weight: 6.7 kg (with 1 processor and 2 DIMMs) 2U chassis weight (no servers): 5.4 kg (shell without power supplies), 7.2 kg (with two power supplies)

The dx360 M4 servers are shipped with the following items:

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

Standard models

The following table lists the standard models.

Table 2. Standard models

Model	Processor† (2 maximum)	Memory and speed	RAID controller	Disk bays	Disks	Network	Optical
Models announced March 2012							
7912-22x	2x Intel Xeon E5-2630L 6C 2.0GHz 15MB 1333MHz 60W	4x 8 GB 1333 MHz	6 Gbps SATA	1x 3.5" SS bay	Open	2x GbE	None
7912-42x	2x Intel Xeon E5-2609 4C 2.40GHz 10MB 1066MHz 80W	4x 4 GB 1066 MHz	6 Gbps SATA	2x 2.5" or 4x 1.8" SS bays	Open	2x GbE + 2x QDR*	None
7912-62x	2x Intel Xeon E5-2660 8C 2.2GHz 20MB 1600MHz 95W	4x 8 GB 1333 MHz	6 Gbps SATA	2x 2.5" or 4x 1.8" SS bays	Open	2x GbE + 2x QDR*	None
Models announced September 2013							
7912-13x	2x Intel Xeon E5-2620 v2 6C 2.1GHz 15MB 1600MHz 80W	4x 4 GB 1600 MHz	6 Gbps SATA	1x 3.5" SS bay	Open	2x GbE	None
7912-63x	2x Intel Xeon E5-2650 v2 8C 2.6GHz 20MB 1866MHz 95W	4x 8 GB 1866 MHz	6 Gbps SATA	2x 2.5" or 4x 1.8" SS bays	Open	2x GbE	None
7912-83x	2x Intel Xeon E5-2670 v2 10C 2.5GHz 25MB 1866MHz 115W	4x 8 GB 1866 MHz	6 Gbps SATA	1x 3.5" SS bay	Open	2x GbE	None

† Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, power consumption.

* Models 42x and 62x include a Mellanox ConnectX-3 Dual Port QDR/FDR10 Mezzanine Card, 90Y6338, which installs in the dedicated mezzanine slot.

Refer to the Specifications section for information about standard features of the server.

2U chassis configurations

The dx360 M4 is supported in the System x iDataPlex dx360 M4 2U chassis, type 7913. The standard chassis model is listed in the following table.

Table 3. Standard 2U chassis models

Model	Description	Fan pack (std / max)	Power (std / max)
Models announced March 2012			
7913-A2x	System x iDataPlex dx360 M4 2U chassis	1 (4x 80mm) / 1	1x 900 W / 2

The chassis ships with these:

- Rail kit
- AC power cord, 12A, IEC320 C14 to C13

One or two servers are supported in the 2U chassis depending on the whether a PCIe tray is attached:

- Compute-intensive configurations
For the highest compute performance, two servers are installed in one single 2U chassis. Each server can have:
 - Two PCIe 3.0 x16 full-height/half-length adapters (a total of four in the 2U chassis)
 - One 3.5" simple-swap SATA drive, or two 2.5" simple swap SAS/SATA HDDs, or SSDs, or four 1.8" simple-swap SSDs

Figure 2 shows this chassis configuration.

- GPU and coprocessor configurations
The PCIe tray (feature code A1UH) attaches to a single dx360 M4 server and forms a 2U server that installs in the 2U chassis. With two 2U riser cards, the combined unit has the following expansions:
 - Two double-wide PCIe graphics cards in the upper half of the chassis, slots 3 and 4, each PCIe 3.0 x16 supporting full-height, full-length, double-width PCIe adapters
 - Two PCIe cards in the lower half of the chassis, slots 1 and 2, each PCIe 3.0 x8 supporting full-height, half-length PCIe adapters
 - Two disk bays on the left for either two 3.5-inch disk drives, four 2.5-inch disk drives, or eight 1.8-inch solid-state disks

Figure 5 shows the configuration with the PCIe tray.

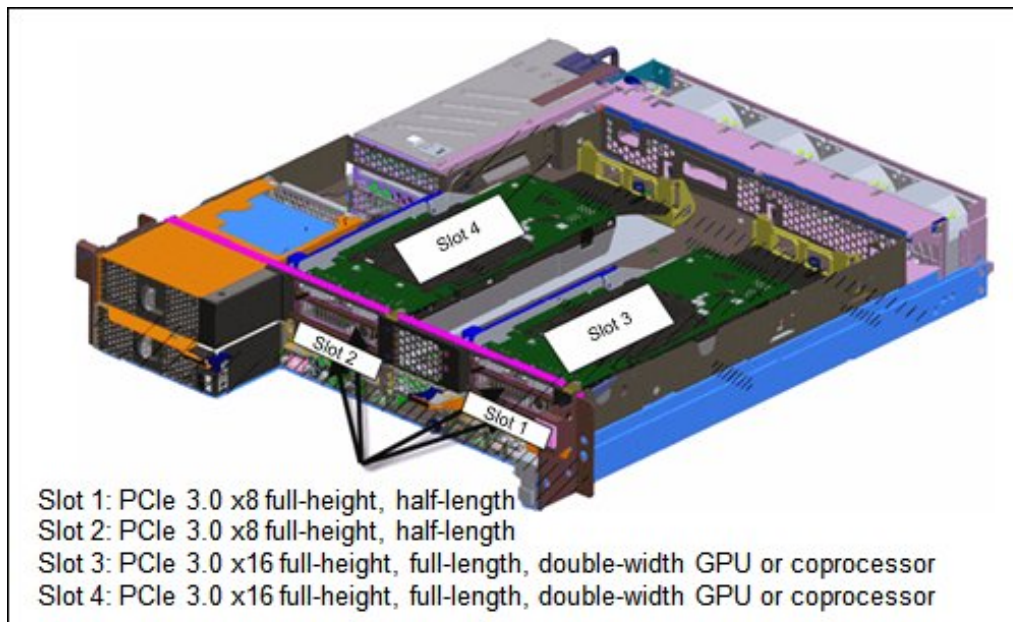


Figure 5. PCIe tray

Each iDataPlex chassis provides a shared high-efficiency power supply and fans. The iDataPlex uses Direct Dock Power to power the nodes in the chassis. Industry standard power cords power each node, but the cords are attached to the rack in a fixed location. When you slide in the chassis, the power receptacle of the chassis simply connects to the power cord, which means that you do not have to access the rear of the rack to attach the power cord.

Processor options

The dx360 M4 supports the processor options listed in the following table.

Table 4. Processor options

Feature code	Intel Xeon processors*	Where used
Intel Xeon Processor E5-2600 family (requires dx360 M4 base feature code A1T3)		
A1TE	Intel Xeon Processor E5-2603 4C 1.8GHz 10MB Cache 1066MHz 80W	-
A1TG	Intel Xeon Processor E5-2609 4C 2.40GHz 10MB Cache 1066MHz 80W	42x
A1TH	Intel Xeon Processor E5-2620 6C 2.0GHz 15MB Cache 1333MHz 95W	-
A1TJ	Intel Xeon Processor E5-2630 6C 2.3GHz 15MB Cache 1333MHz 95W	-
A1TS	Intel Xeon Processor E5-2630L 6C 2.0GHz 15MB Cache 1333MHz 60W	22x
A1TF	Intel Xeon Processor E5-2637 2C 3.0GHz 5MB Cache 1600MHz 80W	-
A1TK	Intel Xeon Processor E5-2640 6C 2.5GHz 15MB Cache 1333MHz 95W	-
A2FV	Intel Xeon Processor E5-2648L 8C 1.8GHz 20MB Cache 1600MHz 70W	-
A1TL	Intel Xeon Processor E5-2650 8C 2.0GHz 20MB Cache 1600MHz 95W	-
A1TT	Intel Xeon Processor E5-2650L 8C 1.8GHz 20MB Cache 1600MHz 70W	-
A1TR	Intel Xeon Processor E5-2658 8C 2.1GHz 20MB Cache 1600MHz 95W	-
A1TM	Intel Xeon Processor E5-2660 8C 2.2GHz 20MB Cache 1600MHz 95W	62x
A2FW	Intel Xeon Processor E5-2665 8C 2.4GHz 20MB Cache 1600MHz 115W	-
A1TQ	Intel Xeon Processor E5-2667 6C 2.9GHz 15MB Cache 1600MHz 130W	-
A1TU	Intel Xeon Processor E5-2670 8C 2.6GHz 20MB Cache 1600MHz 115W	-
A1TN	Intel Xeon Processor E5-2680 8C 2.7GHz 20MB Cache 1600MHz 130W	-
A3MY	Intel Xeon Processor E5-2690 8C 2.9GHz 20MB Cache 1600MHz 135W	-
Intel Xeon Processor E5-2600 v2 family (requires dx360 M4 base feature code A4BV)		
A455	Intel Xeon Processor E5-2603 v2 4C 1.8GHz 10MB Cache 1333MHz 80W	-
A456	Intel Xeon Processor E5-2609 v2 4C 2.5GHz 10MB Cache 1333MHz 80W	-
A45F	Intel Xeon Processor E5-2618L v2 6C 2.0GHz 15MB Cache 1333MHz 50W	-
A3ZA	Intel Xeon Processor E5-2620 v2 6C 2.1GHz 15MB Cache 1600MHz 80W	13x
A45G	Intel Xeon Processor E5-2628L v2 8C 2.2GHz 20MB Cache 1600MHz 70W	-
A457	Intel Xeon Processor E5-2630 v2 6C 2.6GHz 15MB Cache 1600MHz 80W	-
A45D	Intel Xeon Processor E5-2630L v2 6C 2.4GHz 15MB Cache 1600MHz 60W	-
A45A	Intel Xeon Processor E5-2637 v2 4C 3.5GHz 15MB Cache 1866MHz 130W	-
A458	Intel Xeon Processor E5-2640 v2 8C 2.0GHz 20MB Cache 1600MHz 95W	-
A45B	Intel Xeon Processor E5-2643 v2 6C 3.5GHz 25MB Cache 1866MHz 130W	-
A45H	Intel Xeon Processor E5-2648L v2 10C 2.0GHz 25MB Cache 1866MHz 70W	-
A40M	Intel Xeon Processor E5-2650 v2 8C 2.6GHz 20MB Cache 1866MHz 95W	63x
A45E	Intel Xeon Processor E5-2650L v2 10C 1.7GHz 25MB Cache 1600MHz 70W	-
A45J	Intel Xeon Processor E5-2658 v2 10C 2.4GHz 25MB Cache 1866MHz 95W	-
A3ZB	Intel Xeon Processor E5-2660 v2 10C 2.2GHz 25MB Cache 1866MHz 95W	-
A45C	Intel Xeon Processor E5-2667 v2 8C 3.3GHz 25MB Cache 1866MHz 130W	-
A40N	Intel Xeon Processor E5-2670 v2 10C 2.5GHz 25MB Cache 1866MHz 115W	83x
A3ZC	Intel Xeon Processor E5-2680 v2 10C 2.8GHz 25MB Cache 1866MHz 115W	-

A459	Intel Xeon Processor E5-2690 v2 10C 3.0GHz 25MB Cache 1866MHz 130W	-
A3TZ	Intel Xeon Processor E5-2695 v2 12C 2.4GHz 30MB Cache 1866MHz 115W	-
A3TY	Intel Xeon Processor E5-2697 v2 12C 2.7GHz 30MB Cache 1866MHz 130W	-

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

Memory options

Lenovo DDR3 memory is compatibility tested and tuned for optimal System x performance and throughput. Lenovo memory specifications are integrated into the light path diagnostics for immediate system performance feedback and optimum system uptime. From a service and support standpoint, Lenovo memory automatically assumes the system warranty, and Lenovo provides service and support worldwide.

The dx360 M4 supports DDR3 memory. The server supports up to eight DIMMs when one processor is installed and up to 16 DIMMs when two processors are installed. Each processor has four memory channels, and there are two DIMMs per memory channel (2 DPC). Up to 16 LRDIMMs, RDIMMs or UDIMMs are supported (8 per processor).

In the dx360 M4, the maximum memory speed of a configuration is the lower of the following two values:

- The memory speed of the processor (See Table 4.)
- The memory speed of the DIMM (See Table 5 or Table 6)

The server supports both 1.5 V and 1.35 V DIMMs. Mixing 1.5 V and 1.35 V DIMMs in the same server is supported. In such a case all DIMMs operate at 1.5 V.

The following memory protection technologies are supported:

- ECC
- Memory mirroring
- Memory rank sparing

If memory mirroring is used, then DIMMs must be installed in pairs (minimum of one pair per each CPU), and both DIMMs in a pair must be identical in type and size. If memory sparing is used, then DIMMs must be installed in sets of three, and all DIMMs in the same set must be identical in type and size.

The following two tables lists memory options available for the dx360 M4 server. The first table is memory options for systems with E5-2600 processors. The second table is memory options for systems with E5-2600 v2 processors.

Table 5. Memory options for systems with Intel Xeon Processor E5-2600 family (requires dx360 M4 base feature code A1T3)

Part number	Feature code	Description	Maximum supported	Models where used
UDIMMs				
49Y1403	A0QS	2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 ECC DDR3 1333MHz LP UDIMM	16	-
49Y1404	8648	4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP UDIMM	16	-
RDIMMs - 1333 MHz				
49Y1405	8940	2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	16	-
49Y1406	8941	4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	16	42x
49Y1397	8923	8GB (1x8GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	16	22x, 62x
49Y1563	A1QT	16GB (1x16GB, 2Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	16	-
RDIMMs - 1600 MHz				
90Y3178	A24L	4GB (1x4GB, 2Rx8, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM	16	-
90Y3109	A292	8GB (1x8GB, 2Rx4, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM	16	-
00D4968	A2U5	16GB (1x16GB, 2Rx4, 1.5V) PC3-12800 CL11 ECC DDR3 1600MHz LP RDIMM	16	-
LRDIMMs				
90Y3105	A291	32GB (1x32GB, 4Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP LRDIMM	16	-

Table 6. Memory options for systems with Intel Xeon Processor E5-2600 v2 family (requires dx360 M4 base feature code A4BV)

Part number	Feature code	Description	Maximum supported	Models where used
UDIMMs				
00D5012	A3QB	4GB (1x4GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP UDIMM	16	-
RDIMMs - 1600 MHz				
00D5024	A3QE	4GB (1x4GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	16	-
46W0735	A3ZD	4GB (1x4GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	16	13x
00D5036	A3QH	8GB (1x8GB, 1Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	16	-
00D5044	A3QK	8GB (1x8GB, 2Rx8, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	16	-
46W0672	A3QM	16GB (1x16GB, 2Rx4, 1.35V) PC3L-12800 CL11 ECC DDR3 1600MHz LP RDIMM	16	-
RDIMMs - 1866 MHz				
00D5020	A3QD	4GB (1x4GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	16	-
00D5028	A3QF	4GB (1x4GB, 2Rx8, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	16	-
00D5032	A3QG	8GB (1x8GB, 1Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	16	-
00D5040	A3QJ	8GB (1x8GB, 2Rx8, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	16	63x, 83x
00D5048	A3QL	16GB (1x16GB, 2Rx4, 1.5V) PC3-14900 CL13 ECC DDR3 1866MHz LP RDIMM	16	-

The following table shows the maximum memory speeds that are achievable for systems with E5-2600 processors based on the installed DIMMs and the number of DIMMs per channel. In the table, cells highlighted with a grey background indicate when the specific combination of DIMM voltage and number of DIMMs per channel still allows the DIMMs to operate at rated speed.

Table 7. Maximum memory speeds for systems with Intel Xeon Processor E5-2600 family (requires dx360 M4 base feature code A1T3)

Part number	Ranks	DIMM capacity	Rated speed	Rated voltage	Maximum memory channel speed and voltage support by DIMM per channel			
					1 DIMM per channel		2 DIMMs per channel	
					1.35 V	1.5 V	1.35 V	1.5 V
UDIMMs								
49Y1403	1	2 GB	1333 MHz	1.35V	1333 MHz	1333 MHz	1333 MHz	1333 MHz
49Y1404	2	4 GB	1333 MHz	1.35 V	1333 MHz	1333 MHz	1333 MHz	1333 MHz
RDIMMs - 1333 MHz								
49Y1405	1	2 GB	1333 MHz	1.35 V	1333 MHz	1333 MHz	1333 MHz	1333 MHz
49Y1406	1	4 GB	1333 MHz	1.35 V	1333 MHz	1333 MHz	1333 MHz	1333 MHz
49Y1397	2	8 GB	1333 MHz	1.35 V	1333 MHz	1333 MHz	1333 MHz	1333 MHz
49Y1563	2	16 GB	1333 MHz	1.35 V	1333 MHz	1333 MHz	1333 MHz	1333 MHz
RDIMMs - 1600 MHz								
90Y3178	2	4 GB	1600 MHz	1.5 V	No support	1600 MHz	No support	1600 MHz
90Y3109	2	8 GB	1600 MHz	1.5 V	No support	1600 MHz	No support	1600 MHz
00D4968	2	16 GB	1600 MHz	1.5 V	No support	1600 MHz	No support	1600 MHz
LRDIMMs								
90Y3105	4	32 GB	1333 MHz	1.35V	1066 MHz	1333 MHz	1066 MHz	1333 MHz

The following table shows the maximum memory speeds that are achievable for systems with E5-2600 v2 processors based on the installed DIMMs and the number of DIMMs per channel. In the table, cells highlighted with a grey background indicate when the specific combination of DIMM voltage and number of DIMMs per channel still allows the DIMMs to operate at rated speed.

Table 8. Maximum memory speeds for systems with Intel Xeon Processor E5-2600 v2 family (requires dx360 M4 base feature code A4BV)

Part number	Ranks	DIMM capacity	Rated speed	Rated voltage	Maximum memory channel speed and voltage support by DIMM per channel			
					1 DIMM per channel		2 DIMMs per channel	
					1.35 V	1.5 V	1.35 V	1.5 V
UDIMMs								
00D5012	2	4 GB	1600 MHz	1.35 V	1600 MHz	1600 MHz	1600 MHz	1600 MHz
RDIMMs - 1600 MHz								
00D5024	1	4 GB	1600 MHz	1.35 V	1600 MHz	1600 MHz	1600 MHz	1600 MHz
46W0735	2	4 GB	1600 MHz	1.35 V	1600 MHz	1600 MHz	1600 MHz	1600 MHz
00D5036	1	8 GB	1600 MHz	1.35 V	1600 MHz	1600 MHz	1600 MHz	1600 MHz
00D5044	2	8 GB	1600 MHz	1.35 V	1600 MHz	1600 MHz	1600 MHz	1600 MHz
46W0672	2	16 GB	1600 MHz	1.35 V	1600 MHz	1600 MHz	1600 MHz	1600 MHz
RDIMMs - 1866 MHz								
00D5020	1	4 GB	1866 MHz	1.5 V	No support	1866 MHz	No support	1866 MHz
00D5028	2	4 GB	1866 MHz	1.5 V	No support	1866 MHz	No support	1866 MHz
00D5032	1	8 GB	1866 MHz	1.5 V	No support	1866 MHz	No support	1866 MHz
00D5040	2	8 GB	1866 MHz	1.5 V	No support	1866 MHz	No support	1866 MHz
00D5048	2	16 GB	1866 MHz	1.5 V	No support	1866 MHz	No support	1866 MHz

Internal storage

As described in "Chassis configurations," the iDataPlex dx360 M4 server supports 3.5" simple-swap SATA drives, 2.5" simple-swap SAS/SATA HDDs or SSDs, or 1.8" simple-swap SSDs. The number of drives supported depends on the configuration as listed in the following table. The table also lists the adapters supported for each drive configuration.

Table 9. Drive type and RAID adapter support.

Configuration	Drive type	Quantity of drives	Software RAID or no RAID		Hardware RAID using ServeRAID adapter	
			On board SATA	With 6 Gb Performance HBA	With H1110	With M1115
Compute-intensive	3.5" SS SATA	1	Yes	No	No	No
	2.5" SS SATA	2	Yes	No	Yes	Yes
	2.5" SS SAS	2	No	No	Yes	Yes
	2.5" SS SSD	2	No	Yes	No	No
	1.8" SS SSD	4	No	Yes	No	No
GPGPU	3.5" SS SATA	2	Yes	No	Yes	Yes
	2.5" SS SATA	4	No	No	No	Yes
	2.5" SS SAS	4	No	No	No	Yes
	2.5" SS SSD	4	No	Yes	No	No
	1.8" SS SSD	8	No	Yes	No	No

Controllers for internal storage

The following table lists the RAID controllers and additional options used for internal disk storage of the dx360 M4 server.

Table 10. RAID controllers for internal storage

Part number	Feature code	Description
81Y4492	A1XL	ServeRAID H1110 SAS/SATA Controller
81Y4448	A1MZ	ServeRAID M1115 SAS/SATA Controller
81Y4481	A1WW	ServeRAID M5110 SAS/SATA Controller
46M0907	5982	6Gb SAS HBA
46M0912	3876	6Gb Performance Optimized HBA

The ServeRAID H1110 adapter has the following specifications:

- Four internal 6 Gbps SAS/SATA ports.
- One x4 mini-SAS internal connector (SFF-8087).
- 6 Gbps throughput per port.
- Based on LSI SAS2004 6 Gbps RAID on Chip (ROC) controller.
- x4 PCI Express 2.0 host interface.
- Supports RAID 0, 1, 1E, and 10.
- SAS and SATA drives are supported, but the mixing of SAS and SATA in the same integrated volume is not supported.
- Supports up to two integrated volumes.
- Supports up to two global hot-spare drives.
- Supports drive sizes greater than 2 TB for RAID 0, 1E, and 10 (not RAID 1).
- Fixed stripe size of 64 KB.

The ServeRAID M1115 adapter has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M1100 Series RAID 5 upgrades
- 6 Gbps throughput per port
- PCIe x8 Gen 3 host interface
- Based on the LSI SAS2008 6 Gbps ROC controller

The ServeRAID M5110 adapter has the following specifications:

- Eight internal 6 Gbps SAS/SATA ports
- Two x4 mini-SAS internal connectors (SFF-8087)
- Supports RAID levels 0, 1, and 10
- Supports RAID levels 5 and 50 with optional M5100 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5100 Series RAID 6 Upgrade
- Supports 512 MB battery-backed cache or 512 MB or 1 TB flash-backed cache
- 6 Gbps throughput per port

- PCIe x8 Gen 3 host interface
- Based on the LSI SAS2208 6 Gbps ROC controller

The 6Gb SAS Host Bus Adapter has the following specifications:

- Four internal SATA connectors
- One external SAS x4 connector (SFF-8088)
- PCI Express x8 2.0 host interface
- SAS Controller: LSI SAS2008
- 6 Gbps per port data transfer rate
- MD2 small form factor
- High performance I/O Processor: PowerPC® 440 @ 533 MHz
- RAID levels : None (uses RAID as provided by external disk enclosures)
- Maximum endpoint devices: 512

The 6Gb Performance Optimized HBA has the following specifications:

- Two internal mini-SAS x4 connectors (SFF-8087)
- PCI Express x8 2.0 host interface
- SAS Controller: LSI SAS2008
- 6 Gbps per port data transfer rate
- MD2 small form factor
- High performance I/O Processor: PowerPC 440 @ 533MHz
- RAID levels : None (uses RAID as provided by external disk enclosures)
- Maximum endpoint devices: 256

For more information, see the list of Lenovo Press Product Guides in the RAID adapters category:
<https://lenovopress.com/servers/options/raid>

Internal drive options

The following table lists hard drive options for internal disk storage of dx360 M4 server.

Table 11. Disk drive options for internal disk storage

Part number	Feature code	Description
3.5" Simple-Swap NL SATA HDDs		
81Y9802	A22U	500GB 7.2K 6Gbps NL SATA 3.5" G2SS HDD
81Y9806	A22X	1TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD
81Y9810	A22W	2TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD
81Y9814	A22V	3TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD
49Y6012	A3WA	4TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD
00FN118	A5VE	2TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD
00FN133	A5VG	3TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD
00FN148	A5VJ	4TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD
00FN163	A5VL	5TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD
00FN178	A5VN	6TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD
2.5" Simple-Swap 10K SAS		

00AD080	A4CG	1.2TB 10K 6Gbps SAS 2.5" SS HDD
81Y9654	A24H	900GB 10K 6Gbps SAS 2.5" SFF SS HDD
49Y2027	5435	600GB 10K 6Gbps SAS 2.5" SFF SS HDD
49Y1991	5427	300GB 10K 6Gbps SAS 2.5" SFF SS HDD
2.5" Simple-Swap 15K SAS		
81Y9674	A24J	300GB 15K 6Gbps SAS 2.5" SFF SS HDD
49Y1996	5426	146GB 15K 6Gbps SAS 2.5" SFF SS HDD
2.5" Simple-Swap SAS-SSD Hybrid Drives		
00AD107	A4G8	600GB 10K 6Gbps SAS 2.5" G2SS Hybrid
2.5" Simple-Swap NL SATA HDDs		
81Y9742	A1P2	1TB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD
81Y9738	A1P0	500GB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD
81Y9734	A1NY	250GB 7.2K 6Gbps NL SATA 2.5" SFF SS HDD
2.5" Simple-Swap SSDs - Enterprise		
41Y8361	A4FR	S3700 800GB SATA 2.5" MLC SS Enterprise SSD
41Y8356	A4FP	S3700 400GB SATA 2.5" MLC SS Enterprise SSD
41Y8351	A4FM	S3700 200GB SATA 2.5" MLC SS Enterprise SSD
49Y6200	A4GJ	1.6TB SAS 2.5" MLC SS Enterprise SSD
49Y6154	A3F1	800GB SAS 2.5" MLC SS Enterprise SSD
49Y6149	A3EZ	400GB SAS 2.5" MLC SS Enterprise SSD
49Y6144	A3EX	200GB SAS 2.5" MLC SS Enterprise SSD
00W1130	A3HS	100GB SATA 2.5" MLC SS Enterprise SSD
2.5" Simple-Swap SSDs - Enterprise Value		
00AJ020	A4KR	S3500 120GB SATA 2.5" MLC SS Enterprise Value SSD
00AJ025	A4KS	S3500 240GB SATA 2.5" MLC SS Enterprise Value SSD
00AJ030	A4KT	S3500 480GB SATA 2.5" MLC SS Enterprise Value SSD
00AJ035	A4KU	S3500 800GB SATA 2.5" MLC SS Enterprise Value SSD
00FN273	A5U5	S3500 1.6TB SATA 2.5" MLC SS Enterprise Value SSD
00AJ375	A573	120GB SATA 2.5" MLC SS Enterprise Value SSD
00AJ380	A574	240GB SATA 2.5" MLC SS Enterprise Value SSD
00AJ385	A575	480GB SATA 2.5" MLC SS Enterprise Value SSD
00AJ390	A576	800GB SATA 2.5" MLC SS Enterprise Value SSD
1.8" Simple-Swap SSDs		
00AJ040	A4KV	S3500 80GB SATA 1.8" MLC Enterprise Value SSD

Internal tape drives

The server does not support internal tape drive options.

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.

GPU and coprocessor adapters

The dx360 M4 supports GPU adapters and coprocessors when the PCIe tray is attached, as described in "Chassis configurations." The following table lists the supported adapters.

The operating systems supported by each GPU and coprocessor adapter is listed in the [Supported operating systems](#) section.

Table 12. GPU and coprocessor support

Part number	Feature code	Description	Maximum supported
00J6162	A3GP	Intel Xeon Phi 7120P	2
00J6163	A3GQ	Intel Xeon Phi 5110P	2
00J6164	A3J7	NVIDIA Tesla K20	2
00J6165	A3J8	NVIDIA Tesla K20X	2
00J6160	A3GM	NVIDIA VGX K1	2
00J6161	A3GN	NVIDIA VGX K2	2
94Y5960	A1R4	NVIDIA Tesla M2090, 6 GB GDDR5	2

Network adapters

The dx360 M4 offers two Gigabit Ethernet ports with the following features:

- Intel I350 Gb Ethernet controller
- IEEE 802.3 Ethernet interface for 1000BASE-T, 100BASE-TX, and 10BASE-T applications (802.3, 802.3u, and 802.3ab)
- IPv6 Offloads: Checksum, LSO
- Wake on LAN support
- Virtualization: I/OAT, VMDq (8 queues per port), SR-IOV (PCI SIG compliant)
- 16 TX & 16 RX queues per port
- Supports MSI-X
- Supports SGMII, SCTP, NC-SI
- Supports IEEE 1588 (TimeSynch) per packet
- Supports Energy Efficient Ethernet

The iDataPlex dx360 M4 server also supports an additional mezzanine card with a dedicated PCIe x8 slot at the front of the chassis, as shown in Figure 2. The supported adapters are listed in the following table.

Table 13. Mezzanine adapters

Part number	Feature code	Description
10 Gb Ethernet Mezzanine Card		
44T1360	A4YQ	Broadcom NetXtreme 2x10 GbE SFP+ Mezz Adapter for System x
90Y6456*	A22J*	Emulex Dual Port 10GbE SFP+ Embedded VFA III for System x
00Y7730	A4MC**	Emulex Dual Port 10GbE SFP+ Embedded VFA IIIr for System x
49Y7980	A3JS	Intel X520 Dual Port 10GbE SFP+ Embedded Adapter for System x
49Y7990	A3JT	Intel X540 Dual Port 10GBase-T Embedded Adapter for System x
90Y6454	A22H	QLogic Dual Port 10GbE SFP+ Embedded VFA for System x
90Y5179	A2TF	QLogic Embedded VFA FCoE/iSCSI License for System x (FoD)
InfiniBand Mezzanine Card		
90Y6338	A24F	Mellanox ConnectX-3 2-port QDR/FDR-10 Mezzanine Adapter
00D4143	A36R	Dual Port FDR Embedded Adapter

* Not supported in systems with Intel Xeon E5-2600 v2 processors.

** Not supported in systems with Intel Xeon E5-2600 processors

Table 14. Network adapters

Part number	Feature code	Description
10 Gb Ethernet		
44T1370	A5GZ	Broadcom NetXtreme 2x10GbE BaseT Adapter for System x
42C1780	2995	Broadcom NetXtreme 2xGbE BaseT Adapter for System x
94Y5180	A4Z6	Broadcom NetXtreme Dual Port 10GbE SFP+ Adapter for System x
49Y7950*	A18Z*	Emulex 10 GbE Virtual Fabric Adapter II for System x
95Y3762*	A2U1*	Emulex Dual Port 10GbE SFP+ VFA III for System x
00D8540	A4XH**	Emulex Dual Port 10GbE SFP+ VFA IIIr for System x
00JY830	A5UU	Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW for System x
None	AS3M	Emulex VFA5 2x10 GbE SFP+ Integrated Adapter for System x
00JY820	A5UT	Emulex VFA5 2x10 GbE SFP+ PCIe Adapter for System x
00JY824	A5UV	Emulex VFA5 FCoE/iSCSI SW for PCIe Adapter for System x (FoD) (Features on Demand upgrade for 00JY820 and feature AS3M)
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for System x
49Y7970	A2ED	Intel X540-T2 Dual Port 10GBaseT Adapter for System x
81Y3520	AS73	Intel X710 2x10GbE SFP+ Adapter for System x
00D9690	A3PM	Mellanox ConnectX-3 10 GbE Adapter for System x
81Y9990	A1M4	Mellanox ConnectX-2 Dual Port 10GbE Adapter for System x
90Y4600	A3MR	QLogic 8200 Dual Port 10GbE SFP+ VFA for System x
00Y5624	A3MT	QLogic 8200 VFA FCoE/iSCSI License for System x (FoD) (Features on Demand upgrade for 90Y4600)
42C1800	5751	QLogic 10 Gb Dual Port CNA for System x
47C9952	A47H	Solarflare SFN5162F MR Dual Port 10GbE SFP+ Adapter for System x
47C9960	A47J	Solarflare SFN6122F LL Dual Port 10GbE SFP+ Adapter for System x
Gigabit Ethernet		
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter for System x
90Y9352	A2V3	Broadcom NetXtreme I Quad Port GbE Adapter for System x
49Y4230	5767	Intel Ethernet Dual Port Server Adapter I340-T2 for System x
49Y4240	5768	Intel Ethernet Quad Port Server Adapter I340-T4 for System x
00AG500	A56K	Intel I350-F1 1xGbE Fiber Adapter for System x
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter for System x
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter for System x
42C1780	2995	NetXtreme II 1000 Express Dual Port Ethernet Adapter
InfiniBand		
00D9550	A3PN	Mellanox ConnectX-3 FDR VPI IB/E Adapter for System x

* Not supported in systems with Intel Xeon E5-2600 v2 processors.

** Not supported in systems with Intel Xeon E5-2600 processors

Storage host bus adapters

The following table lists storage HBAs supported by the dx360 M4 server.

Table 15. Storage adapters

Part number	Feature code	Description
Fibre Channel - 16 Gb		
81Y1675	A2XV	Brocade 16Gb FC Dual-port HBA for System x
81Y1668	A2XU	Brocade 16Gb FC Single-port HBA for System x
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA for System x
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA for System x
00Y3341	A3KX	QLogic 16Gb FC Dual-port HBA for System x
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA for System x
Fibre Channel - 8 Gb		
46M6049	3589	Brocade 8 Gb FC Single-port HBA for System x
46M6050	3591	Brocade 8 Gb FC Dual-port HBA for System x
42D0485	3580	Emulex 8 Gb FC Single-port HBA for System x
42D0494	3581	Emulex 8 Gb FC Dual-port HBA for System x
42D0501	3578	QLogic 8 Gb FC Single-port HBA for System x
42D0510	3579	QLogic 8 Gb FC Dual-port HBA for System x
Fibre Channel - 4 Gb		
42C2071	1699	Emulex 4Gb FC Dual-Port PCI-E HBA for System x
42C2069	1698	Emulex 4Gb FC Single-Port PCI-E HBA for System x
39R6527	3568	QLogic 4Gb FC Dual-Port PCIe HBA for System x
39R6525	3567	QLogic 4Gb FC Single-Port PCIe HBA for System x
SAS		
46M0907	5982	6 Gb SAS HBA Controller

PCIe SSD adapters

The server supports the High IOPS SSD adapters listed in the following table.

Table 16. High IOPS SSD adapters

Part number	Feature code	Description	Maximum supported
46C9078	A3J3	365GB High IOPS MLC Mono Adapter	2
46C9081	A3J4	785GB High IOPS MLC Mono Adapter	2
90Y4377	A3DY	1.2TB High IOPS MLC Mono Adapter	2
90Y4397	A3DZ	2.4TB High IOPS MLC Duo Adapter	2
90Y4361	A3MZ	300GB High IOPS MLC Modular Adapter	2
90Y4365	A3N0	600GB High IOPS MLC Modular Adapter	2
90Y4369	A3N1	800GB High IOPS MLC Modular Adapter	2
90Y4373	A3N2	300GB High IOPS SLC Modular Adapter	2

For more information, see the list of Lenovo Press Product Guides in the PCIe SSD Adapters category:
<https://lenovopress.com/servers/options/ssdadapter>

Power supplies

The System x iDataPlex dx360 M4 2U chassis, type 7913, supports up to two redundant hot-plug power supplies, providing N+N redundancy. These High Efficiency (HE) Platinum AC power supplies are 80 PLUS Platinum certified to allow for the best efficiency values of your data center. Power supplies support 100 - 240 V. The following table lists the power supplies.

Table 17. Power supplies

Part number	Feature code	Description	Max quantity supported	Chassis model where used
94Y5975	A22M	System x 550W High Efficiency Platinum AC Power Supply	2	-
94Y5974	A1G8	System x 750W High Efficiency Platinum AC Power Supply	2	-
94Y5973	A1G7	System x 900W High Efficiency Platinum AC Power Supply	2	A2x

The power supply options support the following configuration maximums:

System x 550W High Efficiency Platinum AC Power Supply:

- Processors with TDP of 70 W or less
- Two processors
- Eight UDIMMs
- Any drive configurations
- PCIe slots (no PCIe tray support)
- 1+1 redundant (second power supply is redundant)

System x 750W High Efficiency Platinum AC Power Supply:

- Processors with TDP of 80 W or less
- Two processors
- 16 DIMMs
- Any drive configurations
- PCIe slots (no PCIe tray support)
- 1+1 redundant (second power supply is redundant)

System x 900W High Efficiency Platinum AC Power Supply:

- All processors
- Two processors
- 16 DIMMs
- Any drive configurations
- PCIe slots and PCIe tray support
- 1+1 redundant (second power supply is redundant)

Integrated virtualization

The server supports VMware ESXi installed on a USB memory key. The key is installed in a USB socket inside the server. The following table lists the virtualization options.

Table 18. Virtualization options

Part number	Feature code	Description	Maximum supported
41Y8300	A2VC	USB Memory Key for VMware ESXi 5.0	1
41Y8307	A383	USB Memory Key for VMware ESXi 5.0 Update1	1
41Y8311	A2R3	USB Memory Key for VMware ESXi 5.1	1
41Y8382	A4WZ	USB Memory Key for VMware ESXi 5.1 Update 1	1
41Y8385	A584	USB Memory Key for VMware ESXi 5.5	1
41Y8298	A2G0	Blank USB Memory Key for VMware ESXi Downloads	1

Remote management

The server contains Integrated Management Module II (IMM2), which provides advanced service-processor control, monitoring, and an alerting function. If an environmental condition exceeds a threshold or if a system component fails, the IMM2 lights LEDs to help you diagnose the problem, records the error in the event log, and alerts you to the problem. Optionally, the IMM2 also provides a virtual presence capability for remote server management capabilities.

The IMM2 provides remote server management through 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 optional virtual media key is required to enable the remote presence and blue-screen capture features. The remote presence feature provides the following functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with 16 M colors, regardless of the system state
- Remotely accessing the server 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

The blue-screen capture feature captures the video display contents before the IMM2 restarts the server when the IMM2 detects an operating-system hang condition. A system administrator can use the blue-screen capture to assist in determining the cause of the hang condition. The following table lists the remote management option.

Table 19. Remote management option

Part number	Description	Maximum quantity supported
90Y3901	Integrated Management Module II Advanced Upgrade	1

Supported operating systems

The dx360 M4 with E5-2600 v2 processors supports the following operating systems:

- Microsoft Windows HPC Server 2008
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2
- Red Hat Enterprise Linux 6 Server x64 Edition
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- VMware vSphere 5.0 (ESXi)
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

The dx360 M4 with E5-2600 processors supports the following operating systems:

- Microsoft Windows HPC Server 2008
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2008, Datacenter x64 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Web x64 Edition
- Microsoft Windows Server 2012
- Red Hat Enterprise Linux 5 Server with Xen x64 Edition
- Red Hat Enterprise Linux 5 Server x64 Edition
- Red Hat Enterprise Linux 6 Server x64 Edition
- SUSE LINUX Enterprise Server 10 for AMD64/EM64T
- SUSE LINUX Enterprise Server 10 with Xen for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 for AMD64/EM64T
- SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T
- VMware ESX 4.1
- VMware ESXi 4.1
- VMware vSphere 5.0 (ESXi)
- VMware vSphere 5.1 (ESXi)
- VMware vSphere 5.5 (ESXi)

See the Operating System Interoperability Guide for the latest information about the specific versions and service levels supported and any other prerequisites: <http://lenovopress.com/osig>

The supported GPU and coprocessor adapters can be used with the operating systems as listed in the following table:

Table 20. Operating system support for GPU and coprocessor adapters

	NVIDIA Tesla M2090	NVIDIA Tesla K20	NVIDIA Tesla K20X	NVIDIA Grid K1	NVIDIA Grid K2	Intel Xeon Phi 5110P	Intel Xeon Phi 7120P
Operating system							
Microsoft Windows Server 2012	Y	Y	Y	Y	Y	N	N
Microsoft Windows Server 2008 R2 (SP1)	Y	Y	Y	Y	Y	N	N
Microsoft Windows Server 2008, Datacenter x64 Edition (SP2)	Y	Y	Y	Y	Y	N	N
Microsoft Windows Server 2008, Enterprise x64 Edition (SP2)	Y	Y	Y	Y	Y	N	N
Microsoft Windows Server 2008, Standard x64 Edition (SP2)	Y	Y	Y	Y	Y	N	N
Microsoft Windows Server 2008, Web x64 Edition (SP2)	Y	Y	Y	Y	Y	N	N
Microsoft HPC Server 2008	N	N	N	N	N	N	N
SUSE LINUX Enterprise Server 11 for AMD64/EM64T (SP2)	Y	Y	Y	N	N	Y	Y
SUSE LINUX Enterprise Server 11 w/ Xen for AMD64/EM64T (SP1)	N	N	N	N	N	N	N
SUSE LINUX Enterprise Server 10 for AMD64/EM64T (SP4)	N	N	N	N	N	N	N
Red Hat Enterprise Linux 6 Server x64 Edition (U4)	Y	Y	Y	N	N	Y	Y
Red Hat Enterprise Linux 5 Server x64 Edition (U9)	Y	Y	Y	N	N	N	N
Red Hat Enterprise Linux 5 Server w/ Xen x64 Edition	N	N	N	N	N	N	N
VMware vSphere (ESXi) 5.1 (U1)	N	N	N	Y	Y	N	N
VMware vSphere (ESXi) 5.0	N	N	N	N	N	N	N
VMware ESXi 4.1	N	N	N	N	N	N	N

Physical and electrical specifications

dx360 M4:

- Width: 444 mm (17.5")
- Height: 46 mm (1.8")
- Depth: 509 mm (20.0")
- Weight: 6.7 kg (with 1 processor and 2 DIMMs)

dx360 M4 2U chassis dimensions:

- Width: 446 mm (17.6")
- Height: 87 mm (3.4")
- Depth: 555 mm (21.8")
- Weight: 5.4 kg (shell without power supplies), 7.2 kg (with two power supplies)

Supported environment

Temperature:

- Server powered on: 5 - 40 °C (50 - 104 °F)
- Server powered off: 5 - 45 °C (50 - 113 °F)

Relative humidity: 10 - 80%

Electrical requirements

- Models with 900 W power supplies:
 - 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 7.8 A
 - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 3.8 A
 - Input kilovolt-amperes (kVA) (approximately):
 - Minimum configuration: 0.12 kVA
 - Maximum configuration: 1.04 kVA
- Models with 750 W power supplies:
 - 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 5.3 A
 - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 2.6 A
 - Input kilovolt-amperes (kVA) (approximately):
 - Minimum configuration: 0.12 kVA
 - Maximum configuration: 0.86 kVA
- Models with 550 W power supplies:
 - 100 - 127 (nominal) V ac; 50 Hz or 60 Hz; 5.3 A
 - 200 - 240 (nominal) V ac; 50 Hz or 60 Hz; 2.6 A
 - Input kilovolt-amperes (kVA) (approximately):
 - Minimum configuration: 0.12 kVA
 - Maximum configuration: 0.63 kVA

BTU output

- Minimum configuration: 348 Btu/hr (120 watts)
- Maximum configuration: 3013 Btu/hr (1040 watts)

Noise level

- 5.7 bels (idle)

Warranty options

The System x iDataPlex dx360 M4 has a 3-year onsite warranty with 9x5/next business day terms. Lenovo offers the warranty service upgrades through ServicePacs, discussed in this section. The ServicePac is a series of prepackaged 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.

ServicePac offerings are country-specific. That is, each country might have its own service types, service levels, response times, and terms and conditions. Not all covered types of ServicePacs might be available in a particular country. For more information about ServicePac offerings available in your country visit the ServicePac Product Selector here:

<https://www-304..com/sales/gss/download/spst/servicepac>

The following table explains warranty service definitions in more detail.

Table 21. Warranty service definitions

Term	Description
Onsite repair	A service technician will come to the server's location for equipment repair.
24x7x2 hour	A service technician is scheduled to arrive at your customer's location within two hours after remote problem determination is completed. We provide service around the clock, every day, including holidays.
24x7x4 hour	A service technician is scheduled to arrive at your customer's location within four hours after remote problem determination is completed. We provide service around the clock, every day, including holidays.
9x5x4 hour	A service technician is scheduled to arrive at your customer's location within four business hours after remote problem determination is completed. We provide service from 8:00 a.m. to 5:00 p.m. in the customer's local time zone, Monday through Friday, excluding holidays. If after 1:00 p.m. it is determined that onsite service is required, the customer can expect the service technician to arrive the morning of the following business day. For noncritical service requests, a service technician will arrive by the end of the following business day.
9x5 next business day	A service technician is scheduled to arrive at your customer's location on the business day after we receive your call, following remote problem determination. We provide service from 8:00 a.m. to 5:00 p.m. in the customer's local time zone, Monday through Friday, excluding holidays.

In general, these are the types of ServicePacs:

- Warranty and maintenance service upgrades
 - One, 2, 3, 4, or 5 years of 9x5 or 24x7 service coverage
 - Onsite repair from next business day to 4 or 2 hours
 - One or 2 years of warranty extension
- Remote technical support services
 - One or three years with 24x7 coverage (severity 1) or 9x5/next business day for all severities
 - Installation and startup support for System x servers
 - Remote technical support for System x servers
 - Software support - Support Line
 - Microsoft or Linux software
 - VMware
 - Systems Director

Regulatory compliance

The server conforms to the following international standards:

- Energy Star 2.0
- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 4, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 69950-1-03
- NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22:2006, Class A
- IEC-60950-1:2001 (CB Certificate and CB Test Report)
- Taiwan BSMI CNS 13438, Class A; CNS 14336
- China CCC (4943.1-2011), GB 9254-2008 Class A, GB 17625.1:2003
- Korea KN22, Class A; KN24
- Russia/GOST ME01, IEC-60950-1, GOST R 51318.22-99, GOST R 51318.24-99, GOST R 51317.3.2-2006, GOST R 51317.3.3-99
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- TUV-GS (EN60950-1 /IEC60950-1,EK1-ITB2000)

Rack cabinets

The dx360 M4 and the iDataPlex dx360 M4 2U chassis are designed to be installed in the System x iDataPlex Rack, machine type 7825. This 100U rack (50U in each half) was specifically designed with a reduced depth to meet high-density data center requirements. It allows infrastructure components, such as switches and power distribution units, to be installed into the rack in vertical pockets without sacrificing valuable server space. The following figure shows the iDataPlex Rack.

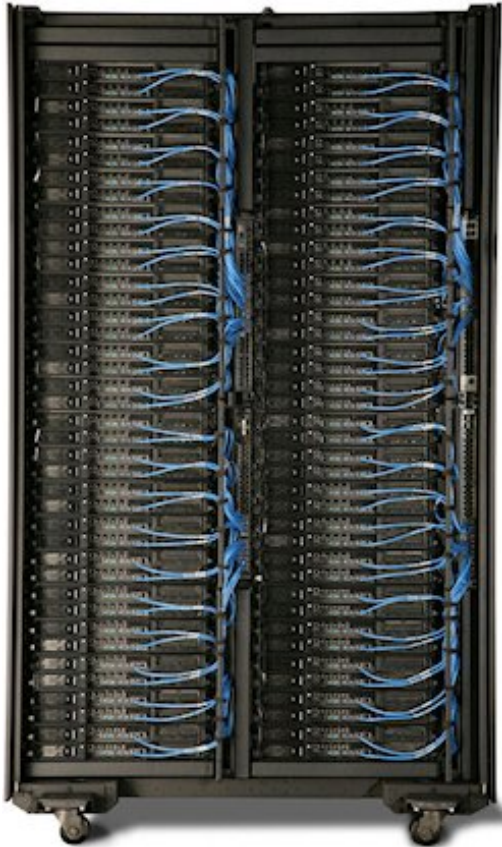


Figure 6. System x iDataPlex Rack, machine type 7825

The following figure compares the footprint of the iDataPlex rack with enterprise racks.

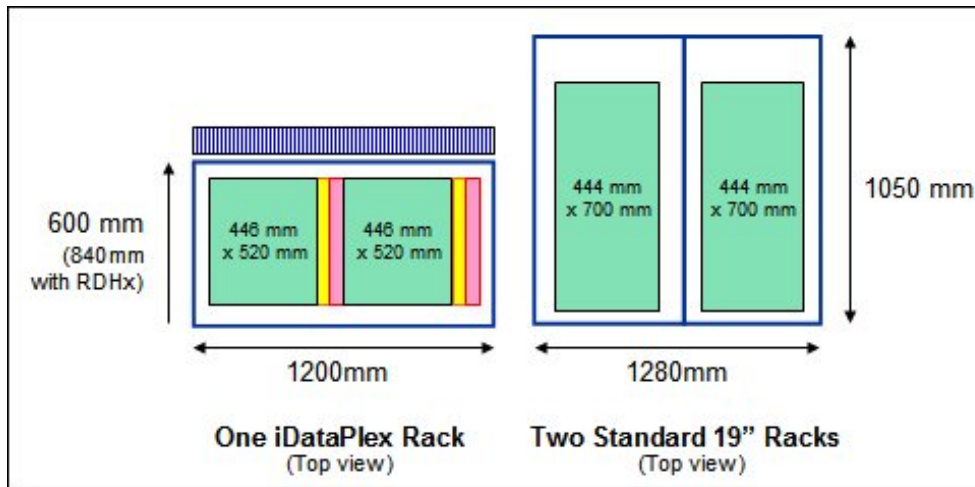


Figure 7. Comparing the footprint of the iDataPlex rack with enterprise racks

The iDataPlex dx360 M4 2U chassis can be installed in the iDataPlex rack or a standard enterprise rack. Rail kits are listed in the following table.

Table 22. Rail kits

Part number	Feature code	Description
90Y6333	A1U9	Rail kit, iDataPlex rack with Direct Dock Power cord mounting
90Y6334	A1UB	Rail kit, iDataPlex rack (without Direct Dock Power)
90Y6335	A1UA	Rail kit, Standard rack

Direct Dock Power is an innovative way to connect power cords to servers. The power cords are industry standard cables, but each is attached to the rack in a fixed location. When you slide in the chassis, the power receptacle of the chassis simply connects to the power cord, which means that you do not have to access the rear of the rack to attach the power cord.

The following figure shows the Direct Dock Power mounting.



Figure 8. Direct Dock Power

With the standard rack rail kit, 90Y6335, the rack is supported in the enterprise racks listed in the following table.

Table 23. Rack cabinets

Part number	Description
7825	System x iDataPlex Rack
201886X	11U Office Enablement Kit
93072PX	25U Static S2 Standard Rack
93072RX	25U Standard Rack
93074RX	42U Standard Rack
93074XX	42U Standard Rack Extension
93084EX	42U Enterprise Expansion Rack
93084PX	42U Enterprise Rack
93604EX	42U 1200 mm Deep Dynamic Expansion Rack
93604PX	42U 1200 mm Deep Dynamic Rack
93614EX	42U 1200 mm Deep Static Expansion Rack
93614PX	42U 1200 mm Deep Static Rack
93624EX	47U 1200 mm Deep Static Expansion Rack
93624PX	47U 1200 mm Deep Static Rack
99564RX	S2 42U Dynamic Standard Rack
99564XX	S2 42U Dynamic Standard Expansion Rack

For more information, see the list of Lenovo Press Product Guides in the Rack cabinets category:
<https://lenovopress.com/servers/options/racks>

Rear Door Heat eXchanger

Lenovo offers an alternative to standard air cooling systems with the Rear Door Heat eXchanger (part number 43V6048). The Rear Door Heat eXchanger replaces the existing rear door of an iDataPlex rack and provides an extremely efficient water-based cooling solution. The exchanger dissipates heat generated by all servers and provides the data center with cooling at the most efficient place, which is immediately behind the exhaust of the system fans.

The Rear Door Heat eXchanger has the following specifications:

- Dimensions:
 - Width: 1190 mm (46.9 in.)
 - Depth: 120 mm (4.7 in.)
 - Height: 1995 mm (78.5 in.)

The heat exchanger adds 127 mm (5 in.) to iDataPlex Rack depth if the casters are removed.

- Doorway dimensions:
 - Minimum height: 2020 mm (79.5 in.)
 - Recommended height: 2057 mm (81 in.)
- Weight:
 - 77 kg (170 lb) empty
 - 91 kg (200 lb) full, with water

Depending on conditions, the Rear Door Heat eXchanger can extract all heat produced by equipment using 30 kWh of energy (while operating at 90 - 94% of the door's maximum efficiency). The Rear Door Heat eXchanger does not use electricity.

Rack options

The server supports the rack console switches and monitor kits listed in the following table.

Table 24. Rack options

Part number	Description
Monitor kits and keyboard trays	
172317X	1U 17in Flat Panel Console Kit
172319X	1U 19in Flat Panel Console Kit
Console switches	
1754D2X	Global 4x2x32 Console Manager (GCM32)
1754D1X	Global 2x2x16 Console Manager (GCM16)
1754A2X	Local 2x16 Console Manager (LCM16)
1754A1X	Local 1x8 Console Manager (LCM8)
Console cables	
43V6147	Single Cable USB Conversion Option (UCO)
39M2895	USB Conversion Option (4 Pack UCO)
39M2897	Long KVM Conversion Option (4 Pack Long KCO)
46M5383	Virtual Media Conversion Option Gen2 (VCO2)
46M5382	Serial Conversion Option (SCO)

For more information, see the list of Lenovo Press Product Guides in the KVM Switches & Consoles category:

<https://lenovopress.com/servers/options/kvm>

External disk storage expansion

The server supports attachment to external storage expansion enclosures by using the ServeRAID M5120 SAS/SATA Controller. The server can also be attached to supported external storage systems by using a supported HBA (see the earlier "[Storage HBA](#)" section). The following table shows the RAID controllers and options for external disk storage expansion.

Table 25. RAID controllers and options for external disk storage expansion

Part number	Feature code	Description
81Y4478	A1WX	ServeRAID M5120 SAS/SATA Controller
Hardware upgrades for the M5120		
81Y4487	A1J4	ServeRAID M5100 Series 512MB Flash/RAID 5 Upgrade
81Y4559	A1WY	ServeRAID M5100 Series 1GB Flash/RAID 5 Upgrade
Feature on Demand upgrades for the M5120*		
90Y4318	A2MD	ServeRAID M5100 Series SSD Caching Enabler
90Y4273	A2MC	ServeRAID M5100 Series SSD Performance Key
81Y4546	A1X3	ServeRAID M5100 Series RAID 6 Upgrade

* These M5120 features upgrades require a cache memory upgrade (81Y4487 or 81Y4559).

The ServeRAID M5120 SAS/SATA Controller has the following specifications:

- Eight external 6 Gbps SAS/SATA ports
- Up to 6 Gbps throughput per port
- Two external x4 mini-SAS connectors (SFF-8088)
- Supports RAID 0, 1, and 10
- Supports RAID 5 and 50 with optional M5100 Series RAID 5 upgrades
- Supports RAID 6 and 60 with the optional M5100 Series RAID 6 upgrade
- Supports 512 MB or 1 GB flash-backed cache
- PCIe 3.0 x8 host interface
- Based on the LSI SAS2208 6 Gbps ROC controller
- Supports connectivity to the EXP2512 and EXP2524 storage expansion enclosures

For more information, see the Lenovo Press Product Guide *ServeRAID M5120 SAS/SATA Controller for System x*, TIPS0858, found at the following web page:
<https://lenovopress.com/tips0858-serveraid-m5120>

The controllers support connectivity to the external expansion enclosures that are listed in the following table. Up to nine expansion enclosures can be daisy-chained per one controller external port. For better performance, distribute expansion enclosures evenly across both controller ports.

Table 26. External expansion enclosures

Part number	Description	Maximum quantity supported per one controller
610012X	EXP2512 Express	18
610024X	EXP2524 Express	9

The external SAS cables listed in the following table support connectivity between external expansion enclosures and the controller.

Table 27. External SAS cables for external storage expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
ServeRAID M5120 - Server to Expansion enclosure connectivity (Mini-SAS x4 to Mini-SAS x4)		
39R6529	1 m SAS Cable	1
39R6531	3 m SAS Cable	1
Expansion enclosure to Expansion enclosure connectivity (Mini-SAS x4 to Mini-SAS x4)		
39R6529	1 m SAS Cable	1
39R6531	3 m SAS Cable	1

The following table lists the drives that are supported by EXP2512 external expansion enclosures.

Table 28. Drive options for EXP2512 external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
3.5" NL SAS HS HDDs		
00NC555	2TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12
00NC557	3TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12
00NC559	4TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12

The following table lists the hard disk drives that are supported by EXP2524 external expansion enclosures.

Table 29. Drive options for EXP2524 external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
2.5" NL SAS HS HDDs		
00NC571	1TB 7,200 rpm 6Gb SAS NL 2.5" HDD	24
2.5" SAS HS HDDs		
00NC561	146GB 15,000 rpm 6Gb SAS 2.5" HDD	24
00NC563	300GB 15,000 rpm 6Gb SAS 2.5" HDD	24
00NC565	600GB 10,000 rpm 6Gb SAS 2.5" HDD	24
00NC567	900GB 10,000 rpm 6Gb SAS 2.5" HDD	24
00NC569	1.2TB 10,000 rpm 6Gb SAS 2.5" HDD	24
2.5" SAS HS SSDs		
00NC573	200GB 6Gb SAS 2.5" SSD	24
00NC575	400GB 6Gb SAS 2.5" SSD	24

External disk storage systems

Lenovo offers the ThinkSystem DE Series, ThinkSystem DG Series and ThinkSystem DM Series external storage systems for high-performance storage. See the DE Series, DG Series and DM Series product guides for specific controller models, expansion enclosures and configuration options:

- ThinkSystem DE Series Storage
<https://lenovopress.com/storage/thinksystem/de-series#rt=product-guide>
- ThinkSystem DM Series Storage
<https://lenovopress.com/storage/thinksystem/dm-series#rt=product-guide>
- ThinkSystem DG Series Storage
<https://lenovopress.com/storage/thinksystem/dg-series#rt=product-guide>

External backup units

The following table lists the external backup options that are offered by Lenovo.

Table 1. External backup options

Part number	Description
External RDX USB drives	
4T27A10725	ThinkSystem RDX External USB 3.0 Dock
External SAS tape backup drives	
6160S7E	IBM TS2270 Tape Drive Model H7S
6160S8E	IBM TS2280 Tape Drive Model H8S
6160S9E	IBM TS2290 Tape Drive Model H9S
External SAS tape backup autoloaders	
6171S7R	IBM TS2900 Tape Autoloader w/LTO7 HH SAS
6171S8R	IBM TS2900 Tape Autoloader w/LTO8 HH SAS
6171S9R	IBM TS2900 Tape Autoloader w/LTO9 HH SAS
External tape backup libraries	
6741A1F	IBM TS4300 3U Tape Library-Base Unit
6741A3F	IBM TS4300 3U Tape Library-Expansion Unit
Full High 8 Gb Fibre Channel for TS4300	
01KP938	LTO 7 FH Fibre Channel Drive
01KP954	LTO 8 FH Fibre Channel Drive
02JH837	LTO 9 FH Fibre Channel Drive
Half High 8 Gb Fibre Channel for TS4300	
01KP936	LTO 7 HH Fibre Channel Drive
01KP952	LTO 8 HH Fibre Channel Drive
02JH835	LTO 9 HH Fibre Channel Drive
Half High 6 Gb SAS for TS4300	
01KP937	LTO 7 HH SAS Drive
01KP953	LTO 8 HH SAS Drive
02JH836	LTO 9 HH SAS Drive

For more information, see the list of Product Guides in the Backup units category:

<https://lenovopress.com/servers/options/backup>

Top-of-rack Ethernet switches

The server supports the top-of-rack Ethernet switches that are listed in the following table. These switches have front-to-rear (reverse) airflow for use with servers where the networking ports are at the front of the server.

Table 2. Top-of-rack switches

Part number	Description
1 Gb top-of-rack switches	
7Y810012WW	Lenovo ThinkSystem NE0152T RackSwitch (Front to Rear)
715952F	Lenovo RackSwitch G8052 (Front to Rear)
10 Gb top-of-rack switches	
7159A2X	Lenovo ThinkSystem NE1032 RackSwitch (Front to Rear)
7159B2X	Lenovo ThinkSystem NE1032T RackSwitch (Front to Rear)
7159C2X	Lenovo ThinkSystem NE1072T RackSwitch (Front to Rear)
715964F	Lenovo RackSwitch G8264 (Front to Rear)
7159DFX	Lenovo RackSwitch G8264CS (Front to Rear)
7159CFV	Lenovo RackSwitch G8272 (Front to Rear)
7159GR5	Lenovo RackSwitch G8296 (Front to Rear)
7159BF7	Lenovo RackSwitch G8124E (Front to Rear)
25 Gb top-of-rack switches	
7159E2X	Lenovo ThinkSystem NE2572 RackSwitch (Front to Rear)
40 Gb top-of-rack switches	
7159BFX	Lenovo RackSwitch G8332 (Front to Rear)
100 Gb top-of-rack switches	
7159D2X	Lenovo ThinkSystem NE10032 RackSwitch (Front to Rear)

For more information, see the list of Product Guides in the Top-of-rack switches categories:

- 1 Gb Ethernet switches: <http://lenovopress.com/networking/tor/1gb?rt=product-guide>
- 10 Gb Ethernet switches: <http://lenovopress.com/networking/tor/10gb?rt=product-guide>
- 25 Gb Ethernet switches: <https://lenovopress.com/networking/tor/25gb?rt=product-guide>
- 40 Gb Ethernet switches: <http://lenovopress.com/networking/tor/40gb?rt=product-guide>
- 100 Gb Ethernet switches: <https://lenovopress.com/networking/tor/100Gb?rt=product-guide>

Uninterruptible power supply units

The following table lists the uninterruptible power supply (UPS) units that are offered by Lenovo.

Table 3. Uninterruptible power supply units

Part number	Description
Rack-mounted or tower UPS units - 100-125VAC	
7DD5A001WW	RT1.5kVA 2U Rack or Tower UPS-G2 (100-125VAC)
55941AX	RT1.5kVA 2U Rack or Tower UPS (100-125VAC)
55942AX	RT2.2kVA 2U Rack or Tower UPS (100-125VAC)
7DD5A003WW	RT3kVA 2U Rack or Tower UPS-G2 (100-125VAC)
55943AX	RT3kVA 2U Rack or Tower UPS (100-125VAC)
Rack-mounted or tower UPS units - 200-240VAC	
7DD5A002WW	RT1.5kVA 2U Rack or Tower UPS-G2 (200-240VAC)
55941KX	RT1.5kVA 2U Rack or Tower UPS (200-240VAC)
55942KX	RT2.2kVA 2U Rack or Tower UPS (200-240VAC)
7DD5A005WW	RT3kVA 2U Rack or Tower UPS-G2 (200-240VAC)
55943KX	RT3kVA 2U Rack or Tower UPS (200-240VAC)
7DD5A007WW	RT5kVA 3U Rack or Tower UPS-G2 (200-240VAC)
55945KX	RT5kVA 3U Rack or Tower UPS (200-240VAC)
7DD5A008WW	RT6kVA 3U Rack or Tower UPS-G2 (200-240VAC)
55946KX	RT6kVA 3U Rack or Tower UPS (200-240VAC)
55948KX	RT8kVA 6U Rack or Tower UPS (200-240VAC)
7DD5A00AWW	RT11kVA 6U Rack or Tower UPS-G2 (200-240VAC)
55949KX	RT11kVA 6U Rack or Tower UPS (200-240VAC)
55943KT†	ThinkSystem RT3kVA 2U Standard UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)
55943LT†	ThinkSystem RT3kVA 2U Long Backup UPS (200-230VAC) (2x C13 10A, 2x GB 10A, 1x C19 16A outlets)
55946KT†	ThinkSystem RT6kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)
5594XKT†	ThinkSystem RT10kVA 5U UPS (200-230VAC) (2x C13 10A outlets, 1x Terminal Block output)
Rack-mounted or tower UPS units - 380-415VAC	
55948PX	RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)
55949PX	RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)

† Only available in China and the Asia Pacific market.

For more information, see the list of Product Guides in the UPS category:

<https://lenovopress.com/servers/options/ups>

Power distribution units

The following table lists the power distribution units (PDUs) that are offered by Lenovo.

Table 4. Power distribution units

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
0U Basic PDUs															
4PU7A93176	C0QH	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93169	C0DA	0U 36 C13 and 6 C19 Basic 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93177	C0QJ	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93170	C0D9	0U 24 C13/C15 and 24 C13/C15/C19 Basic 32A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
00YJ776	ATZY	0U 36 C13/6 C19 24A 1 Phase PDU	N	Y	Y	N	N	N	N	N	N	Y	Y	Y	N
00YJ779	ATZX	0U 21 C13/12 C19 48A 3 Phase PDU	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
00YJ777	ATZZ	0U 36 C13/6 C19 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y
00YJ778	AU00	0U 21 C13/12 C19 32A 3 Phase PDU	Y	Y	N	Y	Y	Y	Y	Y	Y	N	N	Y	Y
0U Switched and Monitored PDUs															
4PU7A93181	C0QN	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 48A 3 Phase Delta PDU v2 (60A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
4PU7A93174	C0D5	0U 21 C13/C15 and 21 C13/C15/C19 Switched and Monitored 48A 3 Phase Delta PDU (60A derated)	N	Y	N	N	N	N	N	Y	N	N	N	Y	N
4PU7A93178	C0QK	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93171	C0D8	0U 20 C13 and 4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93182	C0QP	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93175	C0CS	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 63A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93180	C0QM	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU v2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A93173	C0D6	0U 18 C13/C15 and 18 C13/C15/C19 Switched and Monitored 32A 3 Phase WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
4PU7A93179	C0QL	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 24A 1 Phase PDU v2 (30A derated)	N	Y	N	N	N	N	N	Y	N	Y	N	Y	N
4PU7A93172	C0D7	0U 16 C13/C15 and 16 C13/C15/C19 Switched and Monitored 24A 1 Phase PDU(30A derated)	N	Y	N	N	N	N	N	Y	N	N	N	Y	N
00YJ783	AU04	0U 12 C13/12 C19 Switched and Monitored 48A 3 Phase PDU	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
00YJ781	AU03	0U 20 C13/4 C19 Switched and Monitored 24A 1 Phase PDU	N	N	Y	N	Y	N	Y	N	N	Y	Y	Y	N
00YJ782	AU02	0U 18 C13/6 C19 Switched and Monitored 32A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
00YJ780	AU01	0U 20 C13/4 C19 Switched and Monitored 32A 1 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y
1U Switched and Monitored PDUs															
4PU7A90808	C0D4	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 ETL	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A81117	BNDV	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU - ETL	N	N	N	N	N	N	N	N	N	N	N	Y	N
4PU7A90809	C0DE	1U 18 C19/C13 Switched and monitored 48A 3P WYE PDU V2 CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A81118	BNDW	1U 18 C19/C13 switched and monitored 48A 3P WYE PDU – CE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
4PU7A90810	C0DD	1U 18 C19/C13 Switched and monitored 80A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A77467	BLC4	1U 18 C19/C13 Switched and Monitored 80A 3P Delta PDU	N	N	N	N	N	N	N	N	N	Y	N	Y	N
4PU7A90811	C0DC	1U 12 C19/C13 Switched and monitored 32A 3P WYE PDU V2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A77468	BLC5	1U 12 C19/C13 switched and monitored 32A 3P WYE PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4PU7A90812	C0DB	1U 12 C19/C13 Switched and monitored 60A 3P Delta PDU V2	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N
4PU7A77469	BLC6	1U 12 C19/C13 switched and monitored 60A 3P Delta PDU	N	N	N	N	N	N	N	N	N	N	N	Y	N
46M4002	5896	1U 9 C19/3 C13 Switched and Monitored DPI PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4004	5894	1U 12 C13 Switched and Monitored DPI PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4003	5897	1U 9 C19/3 C13 Switched and Monitored 60A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
46M4005	5895	1U 12 C13 Switched and Monitored 60A 3 Phase PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U Ultra Density Enterprise PDUs (9x IEC 320 C13 + 3x IEC 320 C19 outlets)															
71763NU	6051	Ultra Density Enterprise C19/C13 PDU 60A/208V/3PH	N	N	Y	N	N	N	N	N	N	Y	Y	Y	N
71762NX	6091	Ultra Density Enterprise C19/C13 PDU Module	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U C13 Enterprise PDUs (12x IEC 320 C13 outlets)															
39M2816	6030	DPI C13 PDU+	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8941	6010	Enterprise C13 PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U C19 Enterprise PDUs (6x IEC 320 C19 outlets)															
39Y8948	6060	Enterprise C19 PDU	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Part number	Feature code	Description	ANZ	ASEAN	Brazil	EET	MEA	RUCIS	WE	HTK	INDIA	JAPAN	LA	NA	PRC
39Y8923	6061	Enterprise C19 3 phase PDU (60a)	N	N	Y	N	N	N	Y	N	N	N	Y	Y	N
1U Front-end PDUs (3x IEC 320 C19 outlets)															
39Y8938	6002	DPI 30amp/125V Front-end PDU with NEMA L5-30P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8939	6003	DPI 30amp/250V Front-end PDU with NEMA L6-30P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8934	6005	DPI 32amp/250V Front-end PDU with IEC 309 2P+Gnd	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
39Y8940	6004	DPI 60amp/250V Front-end PDU with IEC 309 2P+Gnd connector	Y	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N
39Y8935	6006	DPI 63amp/250V Front-end PDU with IEC 309 2P+Gnd connector	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
1U NEMA PDUs (6x NEMA 5-15R outlets)															
39Y8905	5900	DPI 100-127v PDU with Fixed Nema L5-15P line cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Line cords for 1U PDUs that ship without a line cord															
40K9611	6504	DPI 32a Cord (IEC 309 3P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9612	6502	DPI 32a Cord (IEC 309 P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9613	6503	DPI 63a Cord (IEC 309 P+N+G)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9614	6500	DPI 30a Cord (NEMA L6-30P)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9615	6501	DPI 60a Cord (IEC 309 2P+G)	N	N	Y	N	N	N	Y	N	N	Y	Y	Y	N
40K9617	6505	4.3m, 32A/230V, Souriau UTG to AS/NZS 3112 (Aus/NZ) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
40K9618	6506	4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

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Related publications and links

For more information see these resources:

- Lenovo Press publication *Implementing an System x iDataPlex Solution* , SG24-7629
<http://lenovopress.com/sg247629>
- ServerProven hardware compatibility page for the dx360 M4
<http://www.lenovo.com/us/en/serverproven/scaleout.shtml>
- Configuration and Option Guide
<https://support.lenovo.com/us/en/documents/SCOD-3ZVQ5W>
- xREF - System x Reference
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