



# IBM System x iDataPlex dx360 M3 server offers an innovative data center solution to maximize performance and efficiency without compromise

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## At a glance

The IBM® System x® platform takes a new approach to solving data center challenges through its latest enhancement, a powerful performance configuration in the iDataPlex™ server line -- a flexible and power-efficient design that enables massive parallel scale-out deployments with affordable and customized value.

The new iDataPlex dx360 M3 server includes support for:

- A space-optimized I/O configuration for two GPU adapters and a high-speed network
- Two NVIDIA M1060 or M2050 GPU adapters per node, 42 GPU servers per rack
- 6 Gbps SAS drives and controllers for maximum storage performance
- Dual Intel® Xeon® Processors, 5600 Series
- Intel QuickPath<sup>1</sup> architecture, providing two full-width interconnect links up to 6.4 GT/s in each direction
- Up to 128 GB of registered ECC memory supporting Chipkill™
- Simple-swap SAS, SATA, and SSD, 2.5-inch and 3.5-inch drives in any 2U configuration
- Higher-capacity and higher-performance solid state drive (SSD) controller
- New high-efficiency 550 W power supply
- Available as a stand-alone chassis, in a standard rack, or in iDataPlex rack
- Dual Gigabit Ethernet standard
- Dedicated 10/100BASE-T port for management
- Predictive Failure Analysis® (PFA) alerts on:
  - Memory
  - HDDs

**IBM service options:** Three-year Customer Replaceable Unit (CRU) and on-site<sup>2</sup> limited warranty<sup>3</sup>

Easy-to-order, robust factory-built configurations are supported by IBM.

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: SE001).

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## Overview

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System x iDataPlex is an innovative data center solution for users of High Performance Computing (HPC) clusters, grid deployment, and large-scale cloud computing who want to reduce power, cooling, or physical space. It represents a new approach for maximum useable density in the data center through innovation at the server level, at the rack level, and at the data center level.

An iDataPlex solution is built with industry-standard components to create flexible configurations of servers, chassis, and networking switches that integrate easily. Customized solutions for your applications can be configured to meet your specific business needs for maximum compute power, hybrid CPU and GPU acceleration, storage intensity, and the right I/O and networking.

In addition to flexibility at the server level, iDataPlex offers flexibility at the rack level. It can be cabled either through the bottom, if it's set on a raised floor, or from the ceiling. Front-access cabling and Direct Dock Power enable you to make changes in networking, power connections, and storage quickly and easily. The rack also supports multiple networking topologies including Ethernet, InfiniBand, and Fibre Channel.

IBM manufacturing sites fully integrate the components on site and test them as a complete solution before shipping the rack to your location. When you receive the rack, it is uncrated, placed in its proper location, powered up, and connected to the network in minimal time. IBM personnel confirm that the servers and network are functioning properly before acceptance.

With the optional IBM Rear Door Heat eXchanger as part of an iDataPlex solution, you can have a high-density data center environment that can alleviate the cooling challenges. With further adjustments, the Rear Door Heat eXchanger can help cool the room -- helping reduce the need for air conditioning in the data center.

In summary, iDataPlex offers:

- An innovative design that helps save power and cooling costs for more affordable computing
- Unparalleled efficiency and easy deployment to help you get up and running quickly
- Flexible node and rack configuration that enables better customization for expanding data centers
- Front access and intelligent rack components to simplify serviceability and manageability

<sup>1</sup> The Intel QuickPath Interconnect (QPI) is a point-to-point processor interconnect developed by Intel. Performance numbers for QuickPath are reported as Gigatransfers per second (GT/s) per direction.

<sup>2</sup> You may be asked certain diagnostic questions before a technician is sent.

<sup>3</sup> For information on IBM's Statement of Limited Warranty, contact your IBM representative. Copies are available upon request.

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## Key prerequisites

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- Supported operating system
- USB CD-RW/DVD drive
- Device drivers, as required

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## Planned availability date

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July 2, 2010, for all except the following.

August 4, 2010, for:

Description	SEO/Part number
2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	49Y1405
4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	49Y1406
4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHz LP RDIMM	49Y1407
IBM 146GB 15K 6Gbps SAS 2.5" SFF SS HDD	49Y1996
IBM 300GB 10K 6Gbps SAS 2.5" SFF SS HDD	49Y1991

Description	Feature number
Server RAID M5015 SAS/SATA Controller (Battery not included)	0093
Intel Xeon Processor E5507 QC 2.26GHz 4MB Cache 800MHz 80W	0727
Intel Xeon Processor E5503 DC 2.0GHz 4MB Cache 800MHz 80W	0728
8GB (1x8GB, Quad Rankx8) PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM	1706
IBM 6Gb SSD HBA	3876
IDPX HDD TRAY, 3.5"X4 / 2.5"X8 MECH; HDD CAGE, 2 X 2.5" HDD GEN-II, CONVERT TO 3.5" BAY	4790
2U Storage Rich SS SFF SATA/SAS/SDD RAID Configuration (Config 2E)	4791
2U I/O Rich SS SFF SATA/SAS/SDD RAID Configuration (config 3E)	4794
NVIDIA Tesla M2050	4795
Server RAID M5000 Series Advance Feature Key	4797
2.5" SS SAS 146GB 15K 6Gbps	5106
2.5" SS SAS 300GB 15K 6Gbps	5426
iDataPlex 3U 6Gb GEN II Backplane	5427
Server RAID M5000 Series Battery Assembly	5726
High Efficiency 550 W Power Supply	5744
POWER RATING, (2X) PLANAR TRAY	5746
HDD BAY, 2.5" (0-7)	6447
Thermal Profile Code #10J	6452
6391 Power Rating Label - Storage Tray, HE550 W	6464
CRU/FRU Label, 3U Chassis, 6391	6465
6Gb Backplane 20P-16P Power Cable	6466
Battery Holder w/Battery Extension cable for Server RAID™ M5015	6467
HDD SIGNAL, 2 2PM SAS TO 4X Cable	6471
HDD POWER, 16 PIN 8 DROP Cable	7468
L1 CBL; I2C cables for 6Gb BPs	7470
HDD power cable for 6Gb BPs	7472
RIGHT ANGLE IPASS Cable	7473
	7474

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## Description

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The dx360 M3 system-board tray uses the following features and technologies:

- Active PCI Express® x16 adapter capabilities

The system-board tray has up to two connectors for PCI Express adapters on up to three riser cards. These connectors accept x16 or x8 adapters.

- Dynamic System Analysis (DSA) programs

The DSA programs collect and analyze system information to aid in diagnosing problems. The diagnostic programs collect a large amount of information, some of which is listed below:

- System configuration
- Network interfaces and settings
- Installed hardware
- Service processor status and configuration
- Vital product data, firmware, and uEFI configuration
- RAID controller configuration and status
- Event logs for ServeRAID controllers and service processors
- Operating system configuration<sup>4</sup>
- Installed device drivers<sup>4</sup>
- System services<sup>4</sup>

<sup>4</sup> Online DSA only

DSA comes in both online (run under the operating system) and preboot (boot its own media) versions. Online DSA, which is a Web download, collects additional software information and operating system vital product data. DSA Preboot runs additional diagnostics such as the memory test which can help to detect faulty hardware. Both versions can transmit data back to IBM for analysis by service and support or can have the results analyzed locally.

- Integrated Management Module

The Integrated Management Module (IMM) combines the baseboard management controller (BMC) and video controller functions in a single chip that provides basic service-processor environmental monitoring functions. If an environmental condition exceeds a threshold or if a system component fails, the BMC lights LEDs to help you diagnose the problem and records the error in the error log. The BMC also provides remote server management capabilities, using the Intelligent Platform Management Interface (IPMI) version 2.0 protocol.

**Note:** In messages and documentation, the term "service processor" refers to the baseboard management controller.

- Integrated network support

The system-board tray comes with an integrated Intel dual-port Gigabit Ethernet controller, which supports connection to a 10 Mbps, 100 Mbps, or 1000 Mbps network.

- Large data-storage capacity and hot-swap capability

The system-board tray supports one 3.5-inch simple-swap SAS, one 3.5-inch simple-swap SATA, or two 2.5-inch simple-swap SATA or solid-state HDDs. An optional SAS controller must be installed when using SAS HDDs.

With the storage enclosure attached, the system-board tray can support up to four 3.5-inch simple-swap SAS (with optional SAS controller) hard disk drives, up to five 3.5-inch simple-swap SATA HDDs, or up to eight 2.5-inch simple-swap SATA, simple-swap SAS, or solid-state HDDs (with optional RAID controller).

With the I/O enclosure attached, the system-board tray can support up to two 3.5-inch simple-swap SATA HDDs, up to two 3.5-inch simple-swap SAS HDDs (with optional SAS controller), or up to four 2.5-inch simple-swap SATA, simple-swap SAS, or solid-state HDDs (with optional RAID controller).

When it is installed in a Type 3686 3U chassis, the system-board tray can support up to twelve 3.5-inch hot-swap SAS or SATA (with optional SAS controller) HDDs. With the hot-swap feature, you can remove or replace HDDs without turning off the dx360 M3 server.

- Large system-memory capacity

The dx360 M3 server system-board tray supports up to 128 GB of system memory. The memory controller supports up to 16 industry-standard, registered ECC double-data-rate 3 (DDR3) -800, -1066, and -1333 DIMMs.

- Memory mirroring

Memory mirroring stores data in two pairs of DIMMs simultaneously.

- Redundant connection

The addition of an optional network interface card (NIC) provides a failover capability to a redundant Ethernet connection. If a problem occurs with the primary Ethernet connection, all Ethernet traffic that is associated with the primary connection is automatically switched to the redundant NIC. If the applicable device drivers are installed, this switching can occur without data loss and without user intervention.

- Remote presence capability

The optional remote presence hardware key is required to enable the remote graphical user interface. The remote graphical user interface provides the following functions:

- Around-the-clock remote access and system management of the server
- Remote management independent of the status of the managed server
- Remote control of hardware and operating systems
- Web-based management with standard Web browsers

- ServeRAID support

The dx360 M3 server system-board tray supports ServeRAID adapters to create redundant array of independent disks (RAID) configurations.

- Symmetric multiprocessing (SMP)

The dx360 M3 server system-board tray comes with one or two Intel microprocessors. If the system-board tray comes with only one microprocessor, you can not add a second microprocessor.

- Systems-management capabilities

The dx360 M3 system-board tray supports IPMI version 2.0 over LAN system management protocol. It supports an optional rack-level management controller that uses industry-standard management tools.

## **A System x iDataPlex offering consists of the following:**

### **iDataPlex Rack 42U (7825)**

- Up to 42 flexible 2U chassis (6385) or combinations of 3U (6386) storage nodes
  - One power supply per 2U or 3U
  - One or two mother board or tray solutions
    - Processor
    - Memory
    - HDDs (with or without RAID)
    - Option cards
  - Cooling fans
  - AC power cord attachment
- PDUs
- Ethernet switch solutions
- Rack management appliance (4369)
- Optional Rear Door Heat eXchanger
- AC line power cable

## **Rack management appliance (4369)**

The iDataPlex solution comes configurable with a rack management appliance based on the Avocent MergePoint 5300 device. The device, which uses the IPMI 2.0 protocol for multiple management functions, offers an intelligent aggregated rack solution. Clients with custom solutions that depend on IPMI 2.0 can find full functionality with iDataPlex servers and can manage systems management data at the rack level.

## **IBM System x iDataPlex Rack (7825)**

This specially designed rack is used in iDataPlex configurations.

The iDataPlex Rack is designated as IBM-installed for easy on-site installation. This designation, coupled with the factory integration services and optional on-site installation and verification of software, results in a ready-to-run cluster system.

The iDataPlex solution offers increased density in a holistic rack design for up to 100U: 84U of compute and 16U for network and PDU infrastructure. The mechanical design is optimized for cooling efficiency with half the airflow distance to reduce the amount of heat produced and cooling required.

For ease of serviceability, all hard drive, planar, and I/O access is from the front of the rack.

## **Flex nodes**

Technology for flexible node configurations enables the servers for iDataPlex to be configured in numerous ways. In addition to compute-oriented configurations, the iDataPlex solution offers a storage-rich configuration and I/O networking intense configuration.

## **System x iDataPlex 2U Flex chassis (6385)**

- One or two server nodes
- Support for both high-performance SAS and low-cost, high-capacity SATA, or solid-state HDDs
- High-density storage offering
- Shared high-efficiency power supply
- Shared low power-consuming fans
- Choice of SAS, Ethernet, or iSCSI host interface

**System x iDataPlex 3U chassis (6386):** For intensive storage applications.

## **Power and cooling advantages**

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iDataPlex servers help pack more processors into the same power and cooling envelope, better utilize floor space, and "right size" data center design. With the iDataPlex solution, less power per processor means more processing capacity per kilowatt. The iDataPlex can run cooler to deliver greater reliability.

## **System x iDataPlex Rear Door Heat eXchanger (43V6048)**

For dense data center environments, IBM offers smart rack-level heat management solutions like the super-efficient IBM Rear Door Heat eXchanger. The water-cooled door is designed to dissipate heat generated from the back of the rack to reduce the overall room temperature. With this combination of benefits at the server and data center level, IBM systems deliver strong power and cooling benefits to iDataPlex clients.

The iDataPlex Rear Door Heat eXchanger for iDataPlex racks helps reduce the air temperature in your growing data center to approximately the same air temperature as that entering the rack, alleviating the need to add air conditioning units. This

unobtrusive solution brings more cooling capacity to areas where the heat is greatest, around racks of servers with multiple, more powerful processors.

Design simplicity delivers chilling results. This cooling efficiency can help alleviate or even eliminate the need for additional air conditioning power and the associated construction cost.

### **Solution Enablement Consulting**

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Solution Enablement Consulting is available at a flat-rate price per day that includes resource, travel, and expenses for predefined engagements.

The fee covers expenses for solution enablement engagements of the following types:

- Staging and integration of hardware and software components at the manufacture site or another location
- Solution integration into an existing cluster or cluster upgrades
- Solution acceptance testing
- Software installation and integration, including operating system, management software, file system, compilers, or customer applications
- Instructor-led on-site training
- Project management

### **Factory integration -- product customization services**

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The iDataPlex offering features several hardware validation and test services collectively referred to as product customization services. These services include the integration of hardware and software on Intel processor-based System x servers in technologically advanced manufacturing facilities. You can deploy systems in almost any IT environment. This means your IT resources can be better used elsewhere.

These options are integrated into the servers. IBM can install the chassis in an iDataPlex Rack and have it shipped to you. Performing the same services on site could take hours or even days.

In addition, iDataPlex manufacturing offers specific services for the iDataPlex called Cluster Systems Validation and Test to confirm that all system settings are enabled and tested to enable smooth on-site deployment:

- Enable uEFI management
- Configure uEFI on each node
- Set up ASM and RSA
- Create disk partitioning
- Configure network, firewall, language, and time zone
- Configure services
- Set up storage
- Install terminal server
- Set up DNS
- Test, debug, and confirm that cluster is ready for operation

IBM has the skills and technology to offer this type of service. The iDataPlex product customization portfolio delivers tremendous value, especially for clients interested in complex offerings such as Linux® cluster.

## Services

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### Installation and deployment services

The System x iDataPlex solutions deployed in the iDataPlex rack enclosures include on-site hardware installation service:

- Basic installation planning services
- On-site installation of hardware

Additional optional on-site software installation and customization services include Linux and Microsoft® Windows® customization and skills transfer for system administration personnel.

### Lab services

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#### iDataPlex installation planning

Features:

- Assess the client's air conditioning and air distribution in support of iDataPlex systems
- Evaluate the need for any Rear Door Heat eXchanger installations and offer necessary guidance
- Review the iDataPlex power specifications based on the client's hardware configurations and offer necessary guidance

Typical benefits:

- Offers accurate environmental information as required for supporting iDataPlex systems most reliably
- Identifies the most efficient approach to the iDataPlex system cooling and ventilation needs
- Reduces potential installation shortfalls with open and ongoing communication with the client surrounding their specific iDataPlex system requirements

#### On-site post installation services

Cluster setup and configuration:

- Configure and verify console switches
- Configure management node:
  - Verify and update uEFI
  - Verify and configure RAID
  - Install and configure operating system
  - Install and configure cluster manager
- Configure and verify Ethernet networking equipment:
  - Configure switch
  - Test and validate Gb Ethernet network operation
- Configure storage subsystem
- Verify and configure storage node RAID
- Load and validate operating system on compute nodes and storage nodes
- Check and update node uEFI and firmware
- Configure and verify InfiniBand networking equipment (depending on configuration):
  - Configure InfiniBand switch
  - Test and validate InfiniBand network



- Implement and verify:
  - File system
  - Default configurations of resource manager, scheduler resource manager, and scheduler
  - Miscellaneous cluster software and functions, including compilers, MPI, and SSH

Testing and validation cluster operation:

- Perform power-down and power-up test
- Perform testing (stream, ping-pong) to place load on the cluster
- Analyze results for anomalies and address problems

Skills transfer

### **Quarterly health check**

One-year support agreement includes:

- 8 x 5 support (except weekends and holidays) with 24-hour response time
- Remote monitoring and alerting of the systems and monitoring of the operating system
- Maintaining patch and firmware releases (Red Hat, SUSE Linux, and Storage Manager) as validated by IBM on an ongoing basis
- Four site visits per year (one per quarter):
  - Health check assessment
  - Software update (firmware, device drivers, and patches for other software if applicable)
  - Skills transfer on best practices, such as TRES administration and updates and Storage Manager (if applicable)
  - Performance tuning (if applicable)

For more information on these services, visit

<http://www.ibm.com/services/servers>

### **iDataPlex systems management**

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The System x iDataPlex product family offers systems management support for large scale-out compute environments via standards-based, scriptable interfaces. This support starts with the embedded Intelligent Platform Management Interface (IPMI) baseboard management controller (BMC).

For rapid diagnosis of problems, iDataPlex supports IBM Dynamic System Analysis (DSA) preboot diagnostics as well as online data collection for problem determination in supported Microsoft Windows and Linux environments. Refer to the Dynamic System Analysis product documentation for additional detail on DSA features.

For large-scale environments where out-of-band management aggregation is needed, the iDataPlex product portfolio includes the Avocent MergePoint 5300. This device enables aggregation of IPMI BMC devices on the management network with serial terminal server-style behavior for serial over LAN (SOL) as well as proxy services for the Distributed Management Task Force (DMTF), Systems Management Architecture for Server Hardware (SMASH), Command Line Protocol (CLP), DMTF Web Services for Management (WS-Management), and Simple Network Management Protocol (SNMP). A dedicated management network and shared network topology are both supported.

iDataPlex compute nodes support IBM Systems Director with limited function. Refer to IBM Systems Director product documentation for specific details on supported functions on iDataPlex hardware.

The compute nodes have been tested with the Extreme Cluster Administration Toolkit (xCAT), an open source community-based cluster administration tool set tailored to scale-out compute environments. You can download xCAT from SourceForge at

<http://sourceforge.net/projects/xcat/>

For additional information on xCAT, contact your IBM Sales and Support Team, or visit

<http://www.xcat.org/>

### **Accessibility by people with disabilities**

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A U.S. Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be requested at

[http://www.ibm.com/able/product\\_accessibility/index.html](http://www.ibm.com/able/product_accessibility/index.html)

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## **Product positioning**

IBM delivers innovations that meet your specific needs. The right choice depends on your business requirements, target applications, and operating environment. iDataPlex focuses on:

- Compute performance in gigaflops per dollar and performance per watt
- Rapidly scaling and large scale-out deployments
- Maximum useable compute density in the data center
- Software-resilient workloads such as HPC, grid, and cloud computing
- Optional dual AC redundant power supply for nongrid workloads

The iDataPlex hardware platform is positioned for large-scale enterprise deployments that rely on recovery-oriented architecture that primarily enables redundancy through the software layer instead of redundant hardware. The new hardware architecture with two NVIDIA GPU acceleration adapters allows computation-intensive tasks to take advantage of iDataPlex efficiency in High Performance Computing applications as they scale without having to compromise density.

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## **Product number**

The following are newly announced features on the specified models of the IBM xSeries® 6385, 6386, and 6391 machine types:

Description	MT	Model	Feature
ServerAID M5015 SAS/SATA Controller (Battery not included)	6391	AC1	0093
ServerAID M1015 SAS/SATA Controller	6391	AC1	0095
Intel Xeon Processor E5507 QC 2.26GHz 4MB Cache 800MHz 80W	6391	AC1	0727
Intel Xeon Processor E5503 DC 2.0GHz 4MB Cache 800MHz 80W	6391	AC1	0728
8GB (1x8GB, Quad Rankx8) PC3-8500 CL7 ECC DDR3 1066MHz LP RDIMM	6391	AC1	1706
IBM 6Gb SSD HBA	6391	AC1	3876
4X 2.5" SAS HDD ID Label	6391	AC1	4011
IDPX PCI TRAY, DOUBLE-WIDE PCI X2	6391	AC1	4789
IDPX HDD TRAY, 3.5"X4 / 2.5"X8 MECH; HDD CAGE, 2 X 2.5" HDD GEN-II, CONVERT TO 3.5" BAY	6391	AC1	4791
RISER, 2U Graphic PCIE 3 slots Riser	6391	AC1	4792

IDPX 1U PCI RISER ASM FOR BACK SLOT	6391	AC1	4793
2U Storage Rich SS SFF SATA/SAS/SDD RAID Configuration (Config 2E)	6385	HC1	4794
2U I/O Rich SS SFF SATA/SAS/SDD RAID Configuration (config 3E)	6385	HC1	4795
NVIDIA Tesla M1060	6391	AC1	4796
NVIDIA Tesla M2050	6391	AC1	4797
Server RAID M5000 Series Advance Feature Key	6391	AC1	5106
2.5" SS SAS 146GB 15K 6Gbps	6391	AC1	5426
2.5" SS SAS 300GB 15K 6Gbps	6391	AC1	5427
IBM 600GB 10K 6Gbps SAS 2.5" SFF SS HDD	6391	AC1	5435
iDataPlex 3U 6Gb GEN II Backplane	6386	HC1	5726
Server RAID M5000 Series Battery Assembly	6391	AC1	5744
High Efficiency 550 W Power Supply	6385	HC1	5746
POWER RATING, (2X) PLANAR TRAY	6385	HC1	6447
POWER RATING, PLANAR+PCI/GRAPHIC TRAY	6385	HC1	6448
POWER RATING, PLANAR+PCI/GRAPHIC TRAY, W/N+N PWR	6385	HC1	6449
HDD BAY, 2.5" (0-7)	6391	AC1	6452
FRU/CRU, Label	6391	AC1	6454
Thermal Profile Code #10J	6391	AC1	6464
6391 Power Rating Label - Storage Tray, HE550 W	6385	HC1	6465
CRU/FRU Label, 3U Chassis, 6391	6386	HC1	6466
6Gb Backplane 20P-16P Power Cable	6386	HC1	6467
Battery Holder w/Battery Extension cable for Server RAID M5015	6391	AC1	6471
HDD SIGNAL, 2 2PM SAS TO 4X Cable	6391	AC1	7468
POWER, GRAPHIC 2U RISER CARD TO DOMAIN B Cable	6391	AC1	7469
HDD POWER, 16 PIN 8 DROP Cable	6391	AC1	7470
Power Cable, Graphics, 8P-8P	6391	AC1	7471
L1 CBL; I2C cables for 6Gb BPs	6386	HC1	7472
HDD power cable for 6Gb BPs	6386	HC1	7473
RIGHT ANGLE IPASS Cable	6386	HC1	7474
Server RAID M1000 Series Advance Feature Key	6391	AC1	9749

The following are features already announced for the 6391 machine type:

Description	MT	Model	Feature
2GB (1x2GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	6391	AC1	8922
2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	6391	AC1	8940
4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	6391	AC1	8941
4GB (2Gb, 2Rx8) PC3L-10600R-999 LP ECC RDIMM (1.35V Capable)	6391	AC1	8942

#### Option SEOs

Description	SEO number
2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	49Y1405
4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	49Y1406
4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	49Y1407
IBM 146GB 15K 6Gbps SAS 2.5" SFF SS HDD	49Y1996
IBM 300GB 10K 6Gbps SAS 2.5" SFF SS HDD	49Y1991

### Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld® ID and password are required (use IBM ID).

<https://www.ibm.com/partnerworld/mem/sla.jsp?num=110-138>

### Product customization services

The following product customization services are included with iDataPlex.

For information, refer to the following and contact your IBM representative.

Description	Feature
iDataPlex Rack Assembly (100U)	2312
Rack Installation of 1U Component in iDataPlex	2313
Rack Installation of >1U Component in iDataPlex	2314
iDataPlex Hardware / Configuration verification	2315

Applicable quantities are configuration-dependent and will be determined in the configuration process.

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## Publications

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The *Installation Guide*, *Maintenance Guide*, and *Problem Determination and Service Guide* for iDataPlex solutions, in U.S. English versions, are available from

<https://www-304.ibm.com/systems/support/>

Under Product Support, select System x, and under Popular links, select Publications lookup. Select the Product family and click on continue.

IBM Systems Information Center provides you with a single information center where you can access product documentation for IBM systems hardware, operating systems, and server software. Through a consistent framework, you can efficiently find information and personalize your access. The IBM Systems information Center is at

<http://publib14.boulder.ibm.com/infocenter/systems>

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## Services

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### Global Technology Services

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IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an On Demand Business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

<http://www.ibm.com/services/>

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

<http://www.ibm.com/services/continuity>

For details on education offerings related to specific products, visit

<http://www.ibm.com/services/learning/index.html>

Select your country, and then select the product as the category.

### System x and BladeCenter support services

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#### ***Recommended core technical support***

When you buy IBM System x technology, include the support services you need -- to help keep both your hardware and software working for you, day after day, at

peak performance. It's your first step toward helping to protect your investment and sustain high levels of system availability. We offer service-level and response-time options to fit your business needs. And we'll help you get started with a core support package that includes:

- **Continuous system monitoring**

Electronic monitoring that helps speed up problem-solving with automated, early detection of potential problems and system errors.

- **Hardware maintenance**

World-class remote and on-site hardware problem determination and repair services.

- **Software technical support**

Access to help line calls for fast, accurate answers to your questions during installation and throughout ongoing operations.

For more information, visit

<http://www.ibm.com/servers/eserver/xseries/services.html>

## Technical information

### Specified operating environment

#### **NVIDIA M1060**

##### *Power requirements*

Voltage rail (Volts)	Tolerance		Maximum current (Amp)
	Minimum	Maximum	
3.3	-8%	+8%	1
12 (PCIe)	-8%	+8%	7
12 (External)	-8%	+5%	12.5

The system design should provision for 225 W of total power draw from each module. The following two options are available for the required external power connection:

- Single 2 - 4 connector capable of 150 W power delivery
- Two 2 - 3 connectors capable of 75 W power delivery

#### **NVIDIA M2050**

The estimated total power of the M2050 is 225 W that is primarily consumed by major thermal components. In the thermal simulation modeling process, the power data in the table below should be assigned to corresponding components. The rest of the power can be assumed to be uniformly distributed across the board.

##### *Power dissipation for major thermal components*

Major thermal component	Power (W) for each component
GPU	128
Memory	1.6
MOSFET	3.24
Power regulator	5

#### **System x iDataPlex dx360 M3 server**

6391-xxx

Processor -	Xeon
Intel QPI	Up to 6.4 GT/s (1)
Number standard -	0

Maximum -	2
Cache	12 MB, 8 MB or 4 MB (CPU dependent)
Memory (DDR3)	800, 1066, or 1333 MHz RDIMMs
DIMMs standard -	0
DIMM sockets -	16
Address capability	128 GB
Video -	VSC452
Memory -	16 MB (shared with IMM)
HDD controller	SATA
Channels -	6
Connector internal -	6
Connector external -	0
Total slots -	2
PCI 2.2 (32/33 MHz)	0
PCI-X (64/133 MHz)	0
PCI_E slot Gen 2 x16	2
PCI_E slot Gen 2 x8	1
Slots available -	2
Management proc -	IMM
Ethernet controller -	2 x 1 Gb
DVD-ROM -	None

- Xeon L5609 1.86GHz/5.86GTS-12MB 4C (40W)
- Xeon L5630 2.13GHz/5.86GTS-12MB 4C (40W)
- Xeon E5620 2.40GHz/5.86GTS-12MB 4C (80W)
- Xeon E5630 2.53GHz/5.86GTS-12MB 4C (80W)
- Xeon E5640 2.66GHz/5.86GTS-12MB 4C (80W)
- Xeon X5667 3.06GHz/6.4GTS-12MB 4C (95W)
- Xeon L5640 2.26GHz/5.86GTS-12MB 6C (60W)
- Xeon X5650 2.66GHz/6.4GTS-12MB 6C (95W)
- Xeon X5660 2.80GHz/6.4GTS-12MB 6C (95W)
- Xeon X5670 2.93GHz/6.4GTS-12MB 6C (95W)
- Xeon E5504 2.0GHz/4.8GTS-4MB 4C (80W)
- Xeon L5520 2.26GHz/5.86GTS-8MB 4C (60W)
- Xeon E5520 2.26GHz/5.86GTS-8MB 4C (80W)
- Xeon E5540 2.53GHz/5.86GTS-8MB 4C (80W)
- Xeon X5550 2.66GHz/6.4GTS-8MB 4C (95W)
- Xeon X5560 2.8GHz/6.4GTS-8MB 4C (95W)
- Xeon X5570 2.93GHz/6.4GTS-8MB 4C (95W)
- Xeon E5502 1.86GHz/4.8GTS-4MB 2C (80W)
- Xeon E5503 2.00GHz/4.8GTS-4MB 2C (80W)
- Xeon E5507 2.26GHz/4.8GTS-4MB 4C (80W)
- Xeon L5506 2.13GHz/5.86GTS-8MB 4C (60W)
- Xeon E5506 2.13GHz/4.8GTS-4MB 4C (80W)
- Xeon L5530 2.4GHz/5.86GTS-8MB 4C (60W)
- Xeon E5530 2.4GHz/5.86GTS-8MB 4C (80W)

### ***iDataPlex dx360 M3 server specifications***

#### Electrical

- 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 8.39 A
- **Note:** Not applicable to 750 W dual AC input power supply
- 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 4.11 A
- Input kilovolt-amperes (kVA) (approximately):
  - Minimum configuration: 0.150 kVA
  - Maximum configuration: 0.839 kVA

- Btu output:
  - Ship configuration: 433 Btu/hr (127 watts)
  - Full configuration: 2852 Btu/hr (836 watts)

Power requirements (per rack) max configuration

- Operating voltage: 100 to 240 V ac at 50/60 Hz
  - Note:** For nonredundant power supply
- Electrical output: 41.5 kW (maximum)
- Power source loading: 51.9 kVA (maximum) - Three 60 A 3ph PDUs at 17.3 kVA each
- Thermal output: 41.5 kW (141460 Btu/hr) (maximum configuration)

#### ***900-watt PSU electrical power specifications***

- 100 V ac to 240 V ac auto-ranging operation
- Built-in overload and surge protection
- 100 to 127 (nominal) V ac; 50 or 60 Hz; 12.0 A (maximum)
- 200 to 240 (nominal) V ac; 50 or 60 Hz; 5.5 A (maximum)

#### ***550-watt PSU electrical power specifications***

- 100 V ac to 240 V ac auto-ranging operation
- Built-in overload and surge protection
- 100 to 127 (nominal) V ac; 50 or 60 Hz; 6.6 A (maximum)
- 200 to 240 (nominal) V ac; 50 or 60 Hz; 3.03 A (maximum)

#### ***750-watt Dual AC PSU electrical power specifications***

- 200 V ac to 240 V ac auto-ranging operation
- Built-in overload and surge protection
- 200 to 240 (nominal) V ac; 50 or 60 Hz; 4.7 A (maximum)
- Accompanied with Dual AC inlet cable (part number 49Y6836, feature number 6293)

#### ***Standards***

##### **Equipment approvals and safety**

- 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. 60950-1
- NOM-019

#### ***Operating environment***

The iDataPlex products are designed to operate in a general business environment, such as a Class A or A1, temperature and humidity-controlled room.

- Temperature:
  - 10.0 to 35.0 degrees C (50 to 95 degrees F) (server on).
  - 0.0 to 60.0 degrees C (-32 to 140 degrees F) (server off).
- Relative humidity: 10% to 80%.
- Maximum altitude: 3,048 m (10,000 ft) at 28 degrees C. Decrease maximum altitude by 1,000 ft for every 1 degree C increase in ambient temperature up to 3,000 ft at 35 degrees C ambient.
- Declared noise level: 5.7 bels (idling).

## **Hardware requirements**

For service, the iDataPlex requires a compatible:

- Monitor
- Combination USB keyboard and pointing device such as IBM part number 40K5372
- USB CD-RW/DVD drive such as the IBM and Lenovo® part number 73P4515 or 73P4516

**Note:** Rack must have 784.86 mm (30.9 in) minimum clearance on the front and back sides of the rack to allow service.

## **Software requirements**

The following network operating systems are supported in the iDataPlex:

- Microsoft Windows Server 2003, Enterprise Edition (64-bit) with Windows Compute Cluster Service (WCCS)
- Linux
  - SUSE Linux Enterprise Server 10 64 bit
  - Red Hat Enterprise Linux AS, ES, WS 4 64 bit
  - Red Hat Enterprise Linux Server 5 64 bit
- VMware
  - VMware vSphere 4.0 and 3.5 ESX and ESXi

**Note:** For additional support, certification, and version information on network operating systems, visit

<http://www-03.ibm.com/servers/eserver/serverproven/compat/us/>

## **Compatibility**

All components of the System x iDataPlex are compatible when purchased as a supported iDataPlex solution.

## **Limitations**

System x iDataPlex options are supported only when ordered and deployed in a iDataPlex solution. They will not be supported when ordered without a corresponding order for an iDataPlex Rack configuration.

## **Planning information**

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### **Customer responsibilities**

Installation of hardware components is provided by IBM on the iDataPlex.

Clients are responsible for preparing their site for installation.

You are expected to review the *Installation Planning Guide* before the delivery of your iDataPlex. Clients' responsibilities must be verified as complete before scheduling an IBM installer to come on site. Visit

<https://www-304.ibm.com/systems/support/>

To service your iDataPlex or obtain IBM service, the iDataPlex requires a compatible:

- Monitor
- Combination USB keyboard and pointing device such as IBM part number 40K5372
- USB CD-RW/DVD drive such as the IBM and Lenovo part number 73P4515 or 73P4516



**Note:** Rack must have 784.86 mm (30.9 in) minimum clearance on the front and back sides of the rack to allow service.

### ***Cable orders***

All cables are supplied with the iDataPlex. Depending on the applications, the cables may be fully installed, partially installed (plugged at one end and packaged for shipping), or included as part of a shipment group.

### ***Installability***

Installation of hardware components is provided by IBM with the exception of plumbing connections to the optional Rear Door Heat eXchanger. (Refer to the [Limitations](#) section for additional information.)

### ***Packaging***

System x iDataPlex shipping contents

iDataPlex CD, which contains the following documentation in portable document format (PDF):

- IBM Safety Information (multilingual)
- IBM Rack Safety Information (multilingual)
- IBM iDataPlex Rack Type 7825 Installation and User's Guide
- IBM Rear Door Heat exchanger for the iDataPlex Rack Installation and Maintenance Guide
- IBM System x iDataPlex dx340 User's Guide for Types 7831, 7832, and 7834
- IBM System x iDataPlex dx340 Problem Determination and Service Guide for Types 7831, 7832, and 7834
- IBM System x iDataPlex dx360 User's Guide for Types 7831 and 7833
- IBM System x iDataPlex dx360 Problem Determination and Service Guide for Types 7831 and 7833
- IBM System x iDataPlex dx360 M2 User's Guide for Type 7321, 7323
- IBM System x iDataPlex dx360 M2 Problem Determination and Service Guide for Type 7321, 7323
- IBM System x iDataPlex dx360 M3 User's Guide for Type 6391
- IBM System x iDataPlex dx360 M3 Problem Determination and Service Guide for Type 6391
- IBM DPI® C13 PDU+, DPI C13 3-phase PDU+ DPI C19 PDU+, and DPI C19 3-phase PDU+ Installation and Maintenance Guide
- IBM License Agreement for Machine Code
- IBM Types 7825, 6313, 6385, 6386, 6391, and Rear Door Heat exchanger Warranty and Support Information is in printed format

Important Notices multilingual document that contains all of the legal, safety, emissions, and environmental statements in printed format.

### ***Supplies***

None

### ***Security, auditability, and control***

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This offering uses the security and auditability features from standard IBM offerings and supported Linux distributions.

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

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## **Terms and conditions**

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### ***Warranty period***

One year.

Options assume the same warranty or maintenance terms as the machine in which they are installed for the remainder of the warranty or maintenance period for such machine.

### **Customer setup**

Yes

### **Machine code**

No.

All other terms and conditions are the same as those applicable to the IBM machine type in which the feature is installed.

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## **Pricing**

For current prices, contact IBM at 888-Shop-IBM (746-7426) or visit

<http://www-03.ibm.com/systems/x/>

Description	SEO number	Initial/ MES/ Both		RP	
		support	CSU	MES	
2GB (1x2GB, 1Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	49Y1405	Both	Yes		
4GB (1x4GB, 1Rx4, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	49Y1406	Both	Yes		
4GB (1x4GB, 2Rx8, 1.35V) PC3L-10600 CL9 ECC DDR3 1333MHZ LP RDIMM	49Y1407	Both	Yes		
146GB 15K 6Gbps SAS 2.5" SFF SS HDD	49Y1996	Both	Yes		
300GB 10K 6Gbps SAS 2.5" SFF SS HDD	49Y1991	Both	Yes		

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