



# New IBM Storwize V7000 Disk System models 312 and 324 offer 10 Gigabit Ethernet connectivity

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## At a glance

The IBM® Storwize V7000 disk system is designed to use IBM System Storage® SAN Volume Controller (SVC) technology to deliver high performance, advanced function, high availability, and modular and scalable storage capacity:

- Supports RAID 0, 1, 5, 6, and 10
- Provides SAN-attached 8 Gbps Fibre Channel (FC) host connectivity and 10 Gigabit Ethernet (GbE) and Gigabit iSCSI host connectivity
- Accommodates up to twenty-four 2.5-inch disk drives or twelve 3.5-inch disk drives installed within the IBM Storwize V7000 Control Enclosure with attachment support for up to nine IBM Storwize V7000 Expansion Enclosures, providing modular and highly scalable storage solutions that range up to 240 TB physical storage capacity, and 480 TB physical storage capacity in a clustered system
- Supports intermixing of SAS drives, Nearline SAS drives, and solid state drives within IBM Storwize V7000 Control Enclosures and IBM Storwize V7000 Expansion Enclosures
- Includes IBM Easy Tier technology for automatically moving heavily used data extents onto high-performance SSD storage
- Supports attachment of other storage devices via the FC interface, just as the SVC
- Supports a complete set of SVC functions, including FlashCopy®, RemoteCopy, Volume Mirroring, and thin provisioning

For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL (Reference: YE001).

## Overview

IBM Storwize V7000 introduces new models with 10 GbE ports, to deliver 10 Gigabit iSCSI networks for data. IBM Storwize V7000 10 GbE connectivity allows host systems to connect directly via iSCSI at faster speeds without the need for FC cables or switches and provides the infrastructure for emerging 10 GbE protocols.

IBM Storwize V7000 Disk System 10 GbE Control Enclosure is available in two models:

- 2076-312 for 3.5-inch drives
- 2076-324 for 2.5-inch drives

The IBM Storwize V7000 Control Enclosure and up to nine IBM Storwize V7000 Expansion enclosures can be mixed in any combination of the 24-bay or 12-bay models and accommodate SAS, Nearline SAS, and SSD disk drives. The intermixing of these disk drives is supported to provide added versatility.

Leveraging the clustering technology from the SVC, the Storwize V7000 can now seamlessly grow their storage environment through scaling out as well as scaling up. If more performance, scalability and host ports are needed, a second control enclosure can be added to create a clustered system. Using up to 18 expansion enclosures and supporting up to 480 drives, the clustered Storwize V7000 system can deliver up to double the capacity and up to double the throughput of a system built using a single control enclosure.

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## Key prerequisites

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- Specific options for IBM Storwize V7000 must be ordered during the initial plant order for the IBM Storwize V7000 system. Refer to the [Description](#) section for details.
- Fibre Channel switch for FC host connectivity (not necessary for Gigabit or 10 Gigabit iSCSI host connectivity).
- IBM Power Systems™, IBM BladeCenter®, or IBM System x® servers.
- Selected Sun and HP UNIX® servers, and Intel-based servers running Microsoft® Windows® 2008, Windows Server 2003, or Linux®.

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## Planned availability date

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- June 10, 2011: IBM Storwize V7000 models 312 and 324 new order shipments begin
- July 1, 2011: Taiwan availability
- July 15, 2011: Korea availability
- August 15, 2011: Model conversions available

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## Description

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### **IBM Storwize V7000 with 10 Gigabit Ethernet connectivity**

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The new IBM Storwize V7000 models 312 and 324 have two-port 10 GbE cards built into each control canister. This 10 GbE card requires the addition of two Small Form-factor Pluggable (SFP) transceivers which are ordered as a separate feature number. This release offers feature number #5711 which provides two Optical SFP+ transceivers for 10 GbE connectivity.

Every model 312 and 324 requires that SFP transceivers be ordered.

### **IBM Storwize V7000 Control Enclosure packaging**

IBM Storwize V7000 Control Enclosure base model includes a 2U rack-mount enclosure containing:

- 24 drive bays (model 324) or 12 drive bays (model 312)
- Dual RAID controllers
- RAID 0, 1, 5, 6, and 10 support
- Dual power supplies
- Redundant cooling
- Rack mounting rails
- IBM Storwize V7000 Software Version 6.2, or later (preloaded on controller)
- Hardcopy documentation

Any rack PDU power cord or country-specific wall outlet power cords may be obtained via feature number 97xx.

*Requirements for initial plant order options:* IBM Storwize V7000 Control Enclosure initial plant orders must include the minimum number of controller enclosure plant order options or may include up to the maximum supported number of plant order options, shown in the table below.

IBM Storwize V7000 control enclosure required initial plant order options	Minimum number of plant order options	Maximum supported plant order options
Storage Preload	1	1
IBM Storwize V7000 (#0010)		
Cache 8 GB (#6008)	2	2
AC Power Supply (#9801)	2	2
Power Line Cords (#9716 thru #9737)	1	1

### **IBM Storwize V7000**

For IBM Storwize V7000 V6.2 Software capabilities with IBM Storwize V7000 Midrange Disk systems, refer to Software Announcement [211-184](#), dated May 09, 2011. You may also refer to the following support web page and IBM Storwize V7000 documentation for details

<http://www.ibm.com/storage/support/storwize/v7000>

### **System Storage Productivity Center**

IBM System Storage Productivity Center may be optionally ordered for IBM Storwize V7000 systems and is available via AAS.

### **Code preload**

#### **Storage Preload IBM Storwize V7000 Software (feature number 0010)**

This feature provides the required IBM Storwize V7000 software that must be preloaded by IBM on an IBM Storwize V7000 system. It must be included with each IBM Storwize V7000 enclosure ordered. This feature is plant-installed only.

### **Miscellaneous features**

- **Joint Engineering Manufacturing Test (JEMT) Indicator (feature number 0021):** This feature is used to indicate an IBM internal order for machine under the JEMT program. It is for administrative purposes only.
- **RFID tag - discretionary (feature number 0203):** This optional feature provides one RFID tag which will be attached to the outside of the product for potential use with the customer-designated tracking systems. While discretion has been used in the placement of the tag on the product, this tag is not necessarily designed to be aesthetically pleasing. The maximum order quantity for this feature is one, and this feature is for initial plant order only.
- **US TAA compliance indicator (feature number 0983):** This optional feature is for US Government customers and customers ordering on behalf of the US Government. When used, it delivers the Storwize V7000 as a TAA compliant system. It should not be used except where bids or customers require TAA compliance and orders with this feature number will be reviewed for relevance. The maximum order quantity for this feature is one, and this feature is for initial plant order only.
- **Rapid Application Storage (RAS) Implementation Services (feature number 1889):** This feature is used to indicate an order which is part of the RAS solution and includes IBM Implementation Services for Storwize Rapid Application Storage. It is for administrative purposes only.

- **RAS (feature number 6398):** This feature is used to indicate an order which is included as part of the RAS solution. It is for administrative purposes only. The maximum order quantity for this feature is one, and this feature is for initial plant order only.

### **Enclosures**

- **Cache 8 GB (feature number 6008):** Each IBM Storwize V7000 Control Enclosure (2076-312 or 2076-324) contains two sets of cache at 8 GB each, and one inside each canister. A quantity of two of the cache feature is required for each control enclosure. The cache feature must be specified during an initial plant order for every control enclosure in the order.
- **Battery (feature number 8002):** Each IBM Storwize V7000 Control Enclosure (2076-312 or 2076-324) includes two batteries, one inside each canister. In the event of a power failure, the battery can provide temporary power while the contents of the IBM Storwize V7000 cache and cluster information is written to the internal drive of the IBM Storwize V7000 canister. This battery (#8002) feature number is available in the event that additional batteries are needed by the customer.

### **Disk drives**

- **300 GB 2.5-inch 10k RPM SAS HDD (feature number 3203):** This is an optional feature for a single SAS 300 GB 2.5-inch disk drive with 10k RPM speed to be installed inside either a 24-bay IBM Storwize V7000 Control Enclosure (2076-124 or 2076-324) or a 24-bay IBM Storwize V7000 Expansion Enclosure (2076-224). This feature may be ordered during an initial plant order or as a field (MES) order in any quantity from 1 up to the 24 total intermixed drives allowed within the enclosure.
- **450 GB 2.5-inch 10k RPM SAS HDD (feature number 3204):** This is an optional feature for a single SAS 450 GB 2.5-inch disk drive with 10k RPM speed to be installed inside either a 24-bay IBM Storwize V7000 Control Enclosure (2076-124 or 2076-324), or a 24-bay IBM Storwize V7000 Expansion Enclosure (2076-224). This feature may be ordered during an initial plant order or as a field (MES) order in any quantity from 1 up to the 24 total intermixed drives allowed within the enclosure.
- **600 GB 2.5-inch 10k RPM SAS HDD (feature number 3206):** This is an optional feature for a single SAS 600 GB 2.5-inch disk drive with 10k RPM speed to be installed inside either a 24-bay IBM Storwize V7000 Control Enclosure (2076-124 or 2076-324), or a 24-bay IBM Storwize V7000 Expansion Enclosure (2076-224). This feature may be ordered during an initial plant order or as a field (MES) order in any quantity from 1 up to the 24 total intermixed drives allowed within the enclosure.
- **146 GB 2.5-inch 15k RPM SAS HDD (feature number 3251):** This is an optional feature for a single SAS 146 GB 2.5-inch disk drive with 15k RPM speed to be installed inside either a 24-bay IBM Storwize V7000 Control Enclosure (2076-124 or 2076-324), or a 24-bay IBM Storwize V7000 Expansion Enclosure (2076-224). This feature may be ordered during an initial plant order or as a field (MES) order in any quantity.
- **2 TB 3.5-inch 7.2k RPM Nearline SAS HDD (feature number 3302):** This is an optional feature for a single Nearline SAS 2 TB 3.5-inch disk drive with 7.2k RPM speed to be installed inside either a 12-bay IBM Storwize V7000 Control Enclosure (2076-112 or 2076-312) or a 12-bay IBM Storwize V7000 Expansion Enclosure (2076-212). This feature may be ordered during an initial plant order or as a field (MES) order in any quantity from 1 up to the 12 total intermixed drives allowed within the enclosure.
- **300 GB 2.5-inch E-MLC SSD (feature number 3504):** This is an optional feature for a single Enterprise-grade multi-level cell 300 GB 2.5-inch Solid State Device (SSD) to be installed inside either a 24-bay IBM Storwize V7000 Control Enclosure (2076-124 or 2076-324) or a 24-bay IBM Storwize V7000 Expansion Enclosure (2076-224). This feature number may be ordered during an initial plant order or as a field (MES) order in any quantity from 1 up to the 24 total intermixed drives allowed within the enclosure.
- **Bulk Ordering Feature Ind. (feature number 5555):** This feature designates bulk MES ordering capability for selected features of the IBM Storwize

V7000. SSDs are not included with those features available using the Bulk Ordering Feature Indicator feature. Specifying this feature on MES orders will allow ordering of up to a maximum of 99 features. This bulk ordering feature is available for the following features:

- 300 GB 2.5-inch 10k SAS disk (#3203)
- 450 GB 2.5-inch 10k SAS disk (#3204)
- 600 GB 2.5-inch 10k SAS disk (#3206)
- 146 GB 2.5-inch 15k SAS disk (#3251)
- 2 TB 3.5-inch 7.2k Nearline SAS disk (#3302)
- 1 m Fiber Optic Cable LC-LC (#5301)
- 5 m Fiber Optic Cable LC-LC (#5305)
- 25 m Fiber Opt Cable LC-LC (#5325)
- 8 Gbps LW SFP (#5608)

### ***Cables, interfaces, and power***

- **1 m Fiber Optic Cable LC-LC (feature 5301):** This feature provides one 1-meter fiber optic cable with LC connectors on each end. Unless you are connecting host systems through an Ethernet connection (using iSCSI), a minimum of two Fibre Optic Cables will be necessary to redundantly connect the host systems. Twelve of this feature may be ordered with each IBM Storwize V7000 Control Enclosure (2076-312 or 2076-324). This feature is both plant and field ordered, but customer-installed.
- **5 m Fiber Optic Cable LC-LC (feature number 5305):** This feature provides one 5-meter fiber optic cable with LC connectors on each end. Unless you are connecting host systems through an Ethernet connection (using iSCSI), a minimum of two Fibre Optic Cables will be necessary to redundantly connect the host systems. Twelve of this feature may be ordered with each IBM Storwize V7000 Control Enclosure (2076-312 or 2076-324). This feature is both plant and field ordered, but customer-installed.
- **25 m Fiber Opt Cable LC-LC (feature number 5325):** This feature provides one 25-meter fiber optic cable with LC connectors on each end. Unless you are connecting host systems through an Ethernet connection (using iSCSI), a minimum of two Fibre Optic Cables will be necessary to redundantly connect the host systems. Twelve of this feature may be ordered with each IBM Storwize V7000 Control Enclosure (2076-112 or 2076-124). This feature is both plant and field ordered, but customer-installed.
- **8 Gbps LW SFP (feature number 5608):** The 8 Gbps longwave SFP is available to connect across long distances. This feature is both plant and field ordered, but customer installed. SAN must also meet documented requirements before implementing such a configuration. Refer to the support web page and Storwize V70000 documentation for details  
<http://www.ibm.com/storage/support/storwize/v7000>
- **10 Gigabit Ethernet Optical SW SFP kit (feature number 5711):** This is a feature to provide four 10 Gigabit Ethernet Optical shortwave SFP+ transceivers to be used on the integrated 10 GbE cards on models 312 and 324 of the Storwize V7000. A minimum quantity of one of this feature number (#5711) needs to be ordered per IBM Storwize V7000 Control Enclosure. The feature enables all four 10 GbE ports. This feature is plant-installed.
- **AC Power Supply (feature number 9801):**
- Each IBM Storwize V7000 Control Enclosure (2076-112, 2076-124, 2076-312 or 2076-324) contains two AC Power supplies. The preferred configuration is to provide a power source to each from unique power circuits to minimize the impact from power failures. Each of the two power sources are required to be 100 - 240 V, minimum 5 amp, 50/60 Hz, single phase, and to have IEC320-C19 type outlets. The power cable, between the power source and AC Power Supply, is rated at 10 amps. A quantity of two AC Power Supply features is required for each IBM Storwize V7000 Control Enclosure. The AC Power Supply feature must be specified during an initial plant order for every control enclosure in the order.

## Accessibility by people with disabilities

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)

## Reference information

For more information on IBM Storwize V7000, refer to:

- Software Announcement [211-184](#), dated May 09, 2011
- Software Announcement [210-356](#), dated October 07, 2010
- Software Announcement [210-350](#), dated October 07, 2010
- Hardware Announcement [110-220](#), dated October 07, 2010

## Product number

Description	Machine type	Model	Feature
Required (default) features:			
IBM Storwize V7000 10 GbE Controller LFF 12-drive enclosure	2076	312	
IBM Storwize V7000 10 GbE Controller SFF 24-drive enclosure (SSDs)	2076	324	
Storage Preload IBM Storwize V7000 SW	2076	312,324	0010*
Cache 8 GB	2076	312,324	6008*
Battery	2076	312,324	8002
AC Power Supply	2076	312,324	9801*
Other (optional) features:			
JEMT Indicator	2076	312,324	0021*
RFID tag - discretionary	2076	312,324	0203*
US TAA compliance indicator	2076	312,324	0983*
RAS Implementation Services	2076	312,324	1889*
Rapid Application Storage	2076	312,324	6398*
300GB 2.5-inch 10k HDD	2076	324	3203*
450GB 2.5-inch 10k HDD	2076	324	3204*
600GB 2.5-inch 10k HDD	2076	324	3206*
146GB 2.5-inch 15k HDD	2076	324	3251*
2TB 3.5-inch 7.2k HDD	2076	312	3302*
300GB 2.5-inch SSD (E-MLC)	2076	324	3504*
Bulk Ordering Feature Ind.	2076	312,324	5555*
IBM Storwize V7000 engine removal	2076	312,324	3905*
1 m Fiber Optic Cable LC-LC	2076	312,324	5301*
5 m Fiber Optic Cable LC-LC	2076	312,324	5305*
25 m Fiber Optic cable LC-LC	2076	312,324	5325*
IBM 10GbE Optical SW SFP pair	2076	312,324	5711
IBM 8 Gbps LW SFP	2076	312,324	5608*
Power (line) cords (one selection required):			
Power Cord - EMEA	2076	312,324	9716*
Power Cord - Austr/NZ	2076	312,324	9717*
Power Cord - Eur.,Africa	2076	312,324	9718*
Power Cord - Eur.,Denmark	2076	312,324	9719*
Power Cord - Pakist SAfrica	2076	312,324	9720*
Power Cord - Switz, Liecht	2076	312,324	9721*
Power Cord - Chile,It,Eth	2076	312,324	9722*
Power Cord - Israel	2076	312,324	9723*
Power Cord - Argentina	2076	312,324	9725*
Power Cord - China	2076	312,324	9726*

Power Cord - PDU connection	2076	312,324	9730*
Power Cord - Group 1 (incl. USA)	2076	312,324	9731*
Power Cord - Taiwan	2076	312,324	9732*
Power Cord - Brazil	2076	312,324	9733*
Power Cord - India	2076	312,324	9734*
Power Cord - Japan	2076	312,324	9735*
Power Cord - Korea	2076	312,324	9736*
Power Cord - US, Chicago	2076	312,324	9737*

\* Previously announced feature, but not for these models

### Model conversions

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From model	To model	Model Descriptions
2076-112	2076-312	IBM Storwize v7000 Model 312
2076-124	2076-324	IBM Storwize v7000 Model 324

Parts removed as a result of a model conversion remain the property of the customer. IBM recommends disposal in accordance with applicable environmental regulations.

### Business Partner information

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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=111-085>

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### Education support

The following courses are available worldwide for this product:

Course number	Course title
SSE0	IBM System Storage Storwize v7000 Implementation workshop

For more information and course schedules, visit

[http://www.ibm.com/services/learning/ites.wss/zz/en?pageType=tp\\_search](http://www.ibm.com/services/learning/ites.wss/zz/en?pageType=tp_search)

Search on the course number - 'SSE0'

Or link to course offering information directly as follows

SSE0 course information

[http://www.ibm.com/services/learning/ites.wss/tp/en?pageType=tp\\_search\\_results&rowStart=0&rowsToReturn=20&searchString=sse0](http://www.ibm.com/services/learning/ites.wss/tp/en?pageType=tp_search_results&rowStart=0&rowsToReturn=20&searchString=sse0)

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### Publications

The following publications are shipped as hardcopy with the product.

Title	Order number
IBM Storwize v7000 Quick Installation Guide	GC27-2290-01
IBM Storwize v7000 Read First	GC27-2293-00

IBM Storwize V7000 Safety Notices GC27-3924-00

IBM Storwize V7000  
Customer Documentation SK5T-8813-01  
(DVD containing the customer  
documentation and information center)

Additional copies of the above listed publications will be available on June 10, 2011.

To view online information and link to a download site, visit the IBM Storwize V7000 Information Center at

<http://publib.boulder.ibm.com/infocenter/storwize/ic/index.jsp>

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## IBM Publications Center Portal

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Hardcopy of selected IBM Storwize V7000 publications are available for a fee from the IBM Publications Center, as well as free softcopy publications. The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as well as payment options via credit card. A large number of publications are available online in

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### Additional publications information

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- To order additional selected hardcopy publications for a fee or download free PDF format publications, visit the IBM Publications Center website  
<http://www.ibm.com/shop/publications/order>
- To directly download publications in PDF format, visit the IBM product support website  
<http://www.ibm.com/storage/support/storwize/v7000>
- Call the Publications Support Group at 800-879-2755, and select option 1
- Contact your IBM representative

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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.



### **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>

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## Technical information

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### **Specified operating environment**

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#### ***IBM Storwize V7000 12-bay enclosures (2076-112, 2076-312, and 2076-212)***

- Width: 483 mm (19.0 in)
- Depth: 630 mm (24.8 in)
- Height: 87.9 mm (3.46 in)
- Weight:
  - Drive-ready (without drive modules installed): 17.7 kg (37.6 lb)
  - Fully configured (12 drive modules installed): 27.2 kg (59.8 lb)

#### ***IBM Storwize V7000 24-bay enclosures (2076-124, 2076-324, and 2076-224)***

- Width: 483 mm (19.0 in)
- Depth: 630 mm (24.8 in)
- Height: 87.9 mm (3.46 in)
- Weight:
  - Drive-ready (without drive modules installed): 17.7 kg (37.6 lb)
  - Fully configured (24 drive modules installed): 25.2 kg (55.4 lb)

To assure installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

## **Operating environment**

### **IBM Storwize V7000 12-bay control enclosure 2076-312**

- Temperature (operating):
  - 10° to 35° C (50° to 95° F) at 0 to 914 m (0 to 3,000 ft)
  - 10° to 32° C (50° to 90° F) at 914 to 2,133 m (3,000 to 7,000 ft)
- Temperature (powered off): 10° to 43° C (50° to 109° F)
- Temperature (storage): 1° to 60° C (34° to 140° F) at 0 to 2,133 m (0 to 7,000 ft)
- Temperature (shipping): -20 to 60 C (-4 to 140 F) at 0 to 10,668 m (0 to 35,000 ft)
- Electrical power: 100-240 V ac, 3.8 - 9.0 A, 50/60 Hz
- Relative humidity (operating and powered off): 8% to 80%
- Relative humidity (storage): 5% to 80%
- Relative humidity (shipping): 5% to 100% (including condensation but excluding rain)
- Wet bulb:
  - Wet bulb (operating temp): 23° C
  - Wet bulb (powered off temp): 27° C
  - Wet bulb (storage and shipping temp): 29° C
- Noise level (Operating): 7.5 bels LwAd
- Noise level (Idle): 7.5 bels LwAd
- Additional Information on system noise characteristics: No impulsive noise, no prominent tones

**Note:** The noise emission level stated is the declared (upper limit) A-weighted sound power level, in bels, for a random sample of machines. All measurements are made in accordance with ISO 7779 and reported in conformance with ISO 9296.

### **IBM Storwize V7000 24-bay control enclosure 2076-324**

- Temperature (operating):
  - 10°to 35° C (50°to 95° F) at 0 to 914 m (0 to 3,000 ft)
  - 10°to 32° C (50°to 90° F) at 914 to 2,133 m (3,000 to 7,000 ft)
- Temperature (powered off): 10°to 43° C (50°to 109° F)
- Temperature (storage): 1°to 60° C (34°to 140° F) at 0 to 2,133 m (0 to 7,000 ft)
- Temperature (shipping): -20°to 60° C (-4°to 140° F) at 0 to 10,668 m (0 to 35,000 ft)
- Electrical power: 100-240 V ac, 3.8 - 9.0 A, 50/60 Hz
- Relative humidity (operating and powered off): 8% to 80%
- Relative humidity (storage): 5% to 80%
- Relative humidity (shipping): 5% to 100% (including condensation but excluding rain)
- Wet bulb:
  - Wet bulb (operating temp): 23° C
  - Wet bulb (powered off temp): 27° C
  - Wet bulb (storage and shipping temp): 29° C
- Noise level (Operating): 7.5 bels LwAd
- Noise level (Idle): 7.5 bels LwAd
- Additional Information on system noise characteristics: No impulsive noise, no prominent tones

**Note:** The noise emission level stated is the declared (upper limit) A-weighted sound power level, in bels, for a random sample of machines. All measurements are made in accordance with ISO 7779 and reported in conformance with ISO 9296.

## **Hardware requirements**

### **Power cords**

Two power cords to connect the IBM Storwize V7000 enclosure to a standard PDU can be specified by feature number.

A country-specific power cord may be specified by feature number for connection to wall-type outlets should the rack not have a compatible PDU or if the PDU has wall-type outlets. One of the following power cord specific features is required to connect the IBM Storwize V7000 to the alternate power source.

Each power cord feature provides two country-specific power cords. Countries supported by these features include:

- Power cord feature number 9731:
  - Provides power cords for Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bolivia, Canada, Cayman Islands, Costa Rica, Columbia, Cuba, Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Jamaica, Mexico, Micronesia (Federal States of), Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Thailand, Turks and Caicos Islands, United States, and Venezuela
  - Nine feet (2.8 m) unshielded, rated 125 v / 10 a
  - Attached plug (nema L5-15) designed for 125 v ac input
  - Part number: 39M5081
- Power Cord feature number 9737:
  - Provides power cords for US/Chicago
  - Six feet (1.8 m) unshielded, rated 125 v / 15 a
  - Attached plug (NEMA L5-15P) designed for 125 v ac input
  - Part number: 39M5080
- Power cord feature number 9718:
  - Provides power cords for Afghanistan, Albania, Algeria, Andorra, Angola, Armenia, Austria, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Democratic Republic of), Congo (Republic of), Cote D'Ivoire (Ivory Coast), Croatia (Republic of), Czech Rep, Dahomey, Djibouti, Egypt, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Finland, France, French Guyana, French Polynesia, Gabon, Georgia, Germany, Greece, Guadeloupe, Guinea, Guinea Bissau, Hungary, Iceland, Indonesia, Iran, Kazakhstan, Kyrgyzstan, Laos (Peoples Democratic Republic of), Latvia, Lebanon, Lithuania, Luxembourg, Macedonia (former Yugoslav Republic of), Madagascar, Mali, Martinique, Mauritania, Mauritius, Mayotte, Moldova (Republic of), Monaco, Mongolia, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Reunion, Romania, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia (Republic of), Somalia, Spain, Suriname, Sweden, Syrian Arab Republic, Tajikistan, Tahiti, Togo, Tunisia, Turkey, Turkmenistan, Ukraine, Upper Volta, Uzbekistan, Vanuatu, Vietnam, Wallis and Futuna, Yugoslavia (Federal Republic of), and Zaire
  - Nine feet (2.8 m), unshielded, rated 250 v / 10 a
  - Attached plug (CEE 7/7) designed for 200 - 240 V ac input
  - Part number: 39M5123
- Power cord feature number 9719:
  - Provides power cords for Denmark
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a

- Attached plug (SB 107-2-D1/DK 5-2a) designed for 200 - 240 v ac input
- Part number: 39M5130
- Power cord feature number 9716:
  - Provides power cords for Abu Dhabi, Bahrain, Botswana, Brunei Darussalam, Channel Islands, Cyprus, Dominica, Gambia, Ghana, Grenada, Guyana, Hong Kong, Iraq, Ireland, Jordan, Kenya, Kuwait, Liberia, Malawi, Malaysia, Malta, Myanmar (Burma), Nigeria, Oman, Qatar, Saint Kitts 1 Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Sudan, Tanzania (United Republic of), Trinidad 1 Tobago, United Arab Emirates (Dubai), United Kingdom, Yemen, Zambia, Zimbabwe, and Uganda
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (bs 1363a) designed for 200 - 240 v ac input
  - Part number: 39M5151
- Power cord feature number 9723:
  - Provides power cords for Israel
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (si 32) designed for 200 - 240 v ac input
  - Part number: 39M5172
- Power cord feature number 9721:
  - Provides power cords for Liechtenstein and Switzerland
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (iec 60884 Stnd. Sheet 416534-2 (ch type 12)) designed for 200 - 240 v ac input
  - Part number: 39M5158
- Power cord feature number 9720:
  - Provides power cords for Bangladesh, Lesotho, Maceo, Maldives, Namibia, Nepal, Pakistan, Samoa, South Africa, Sri Lanka, Swaziland, and Uganda
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (sans 164-1) designed for 200 - 240 v ac input
  - Part number: 39M5144
- Power cord feature number 9722:
  - Provides power cords for Italy, Chile, and Libyan Arab Jamahiriya
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (cei-unfl table 23-16) designed for 200 - 240 v ac input
  - Part number: 39M5165
- Power cord feature number 9717:
  - Provides power cords for Australia, Fiji, Kiribati, Nauru, New Zealand, and Papua New Guinea
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (as/nzs 3112/2000) designed for 200 - 240 v ac input
  - Part number: 39M5102
- Power cord feature number 9725:
  - Provides power cords for Uruguay, Argentina, and Paraguay
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (IRAM 2073) designed for 200 - 240 v ac input
  - Part number: 39M5068
- Power cord feature number 9726:
  - Provides power cords for Peoples Republic of China
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (gb 2099.1 1002) designed for 200 - 240 v ac input

- Part number: 39M5206
- Power cord feature number 9732:
  - Provides power cords for Taiwan
  - Nine feet (2.8 m) unshielded, rated 125 v / 10 a
  - Attached plug (cns 10917-3) designed for 125 v ac input
  - Part number: 39M5247
- Power cord feature number 9734:
  - Provides power cords for India
  - Nine feet (2.8 m) unshielded, rated 250 v / 10 a
  - Attached plug (is 6538) designed for 200 - 240 v ac input
  - Part number: 39m5226
- Power cord feature number 9735:
  - Provides power cords for Japan
  - Fourteen feet (4.3 m) unshielded, rated 125 v / 12 a
  - Attached plug (JIS C8303, C8306) designed for 125 v ac input
  - Part number: 39m5200
- Power Cord feature number 9736:
  - Provides power cords for Korea
  - Nine feet (2.8 m) unshielded, rated 250 v / 12 a
  - Attached plug (ks c8305, k60884-1) designed for 200 - 240 v ac input
  - Part number: 39m5219
- Power cord feature number 9733:
  - Provides power cords for Brazil
  - Nine feet (2.8 m) unshielded, rated 125 v / 10 a
  - Attached plug (InMetro) designed for 125 v ac input
  - Part number: 39m5233

### **Software requirements**

You must purchase the appropriate IBM Storwize V7000 software license for each IBM Storwize V7000 Control Enclosure and Expansion Enclosure acquired. Some advanced features also require a software license. See the [Reference information](#) section for more information about IBM Storwize V7000 software.

Feature number 0010 indicates that the required IBM Storwize V7000 Software has been preloaded by IBM on the IBM Storwize V7000 system. It must be included with each IBM Storwize V7000 Control Enclosure ordered. This feature is plant-installed only.

### **Planning information**

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You are responsible for downloading or obtaining from IBM, and installing designated Machine Code (microcode, basic input/output system code (called BIOS), utility programs, device drivers, and diagnostics delivered with an IBM machine) and other software updates in a timely manner from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides. You may request IBM to install Machine Code changes; however, you may be charged for that service.

### **Cable orders**

Cables can be ordered by feature number.

- 5301 - 1 m Fiber Optic Cable LC-LC
- 5305 - 5 m Fiber Optic Cable LC-LC

- 5325 - 25 m Fiber Opt Cable LC-LC
- 5608 - 8 Gbps LW SFP

### ***Direct customer support***

For technical support or assistance, visit the following website and select appropriate country, or contact your IBM representative for additional assistance.

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

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

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This product uses the security and auditability features of the preloaded application software.

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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**Volume orders:** Contact your IBM representative.

### ***IBM Global Financing***

Yes

### ***Warranty period***

Three years

An IBM part or feature installed during the initial installation of an IBM machine is subject to a full warranty effective on the date of installation of the machine. An IBM part or feature which replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty effective on its date of installation. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature is the same as the machine it is installed.

### ***Warranty service***

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM website. Certain Machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country and location-specific information.

### ***CRU Service***

IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM

upon your request. CRUs are designated as being either a Tier 1 (mandatory) or a Tier 2 (optional) CRU.

#### *Tier 1 (mandatory) CRU*

Installation of Tier 1 CRUs, as specified in this announcement, is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

#### *Tier 2 (optional) CRU*

You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

Based upon availability, CRUs will be shipped for next-business-day (NBD) delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, return instructions and a container are shipped with the replacement CRU. You may be charged for the replacement CRU if IBM does not receive the defective CRU within 15 days of your receipt of the replacement. The following parts have been designated as Tier 1 CRUs:

- Node canister
- Expansion canister
- Power supplies
- Battery back up unit
- SAS cables
- Fiber cables
- Power Cords
- Disk Drives (including SSDs) in Carrier Assembly
- SFP transceivers
- Blank carriers
- Rail Kit
- Enclosure end caps
- USB Key

#### ***On-site Service***

IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well lit, and suitable for the purpose.

Service levels are:

- 9 hours per day, Monday through Friday, excluding holidays, next business day response

#### ***Warranty service upgrades***

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#### ***Usage plan machine***

No

#### ***IBM hourly service rate classification***

Three

When a type of service involves the exchange of a machine part, the replacement may not be new, but will be in good working order.

**Field-installable features**

Yes

**Model conversions**

Yes

**Machine installation**

Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

**Graduated program license charges apply**

No

**Licensed internal code and licensed machine code**

This product does not contain Licensed Internal Code or Licensed Machine Code.

**Educational allowance**

A limited time offering reduced tuition charges may be available to qualified IBM and business partner education customers for IBM Storwize V7000 courses.

The educational allowance is 15% for the products in this announcement.

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**Pricing**


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**Product charges**

Description	Machine type	Model number	Feat number
IBM Storwize V7000 10 GbE Controller LFF 12-drive enclosure	2076	312	
IBM Storwize V7000 10 GbE Controller SFF 24-drive enclosure (SSDs)	2076	324	
Preload IBM Storwize V7000 SW	2076	312,324	0010
Cache 8 GB	2076	312,324	6008
Battery	2076	312,324	8002
AC Power Supply	2076	312,324	9801
JEMT Indicator	2076	312,324	0021
RFID tag - discretionary	2076	312,324	0203
US TAA compliance indicator	2076	312,324	0983
RAS Implementation Services	2076	312,324	1889
Rapid Application Storage	2076	312,324	6398
300 GB 2.5-inch 10k HDD	2076	324	3203
450 GB 2.5-inch 10k HDD	2076	324	3204
600 GB 2.5-inch 10k HDD	2076	324	3206
146 GB 2.5-inch 15k HDD	2076	324	3251
2 TB 3.5-inch 7.2k HDD	2076	312	3302
300 GB 2.5-inch SSD (E-MLC)	2076	324	3504
Bulk Ordering Feature Ind.	2076	312,324	5555
IBM Storwize V7000 engine removal	2076	312,324	3905
1 m Fiber Optic Cable LC-LC	2076	312,324	5301
5 m Fiber Optic Cable LC-LC	2076	312,324	5305
25 m Fiber Optic Cable LC-LC	2076	312,324	5325
IBM 10GbE Optical SW SFP pair	2076	312,324	5711
IBM 8 Gbps LW SFP	2076	312,324	5608

**POWER (LINE) CORDS (ONE SELECTION REQUIRED):**

Power Cord - EMEA	2076	312,324	9716
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Power Cord - Austr/NZ	2076	312,324	9717
Power Cord - Eur.,Africa	2076	312,324	9718
Power Cord - Eur.,Denmark	2076	312,324	9719
Power Cord - Pakist SAfrica	2076	312,324	9720
Power Cord - Switz, Liecht	2076	312,324	9721
Power Cord - Chile,It,Eth	2076	312,324	9722
Power Cord - Israel	2076	312,324	9723
Power Cord - Argentina	2076	312,324	9725
Power Cord - China	2076	312,324	9726
Power Cord - PDU connection	2076	312,324	9730
Power Cord - Group 1 (incl. USA)	2076	312,324	9731
Power Cord - Taiwan	2076	312,324	9732
Power Cord - Brazil	2076	312,324	9733
Power Cord - India	2076	312,324	9734
Power Cord - Japan	2076	312,324	9735
Power Cord - Korea	2076	312,324	9736
Power Cord - US, Chicago	2076	312,324	9737

	Machine Model Mach/Mod/Feat	Field Install Only	Plant Install Only	MES Remov
Preload	2076/312/0010	N	Y	N
IBM Storwize v7000 SW				
Cache 8GB	2076/312/6008	N	Y	N
Battery	2076/312/8002	Y	N	N
AC Power Supply	2076/312/9801	N	Y	N
JEMT Indicator	2076/312/0021	N	Y	N
RFID tag - discretionary	2076/312/0203	N	Y	N
US TAA compliance indicator government	2076/312/0983	N	Y	N
RAS Implementation Services	2076/312/1889	N	N	N
Rapid Application Storage	2076/312/6398	N	N	N
2 TB 3.5-inch 7.2k HDD	2076/312/3302	N	N	N
Bulk Ordering Feature Ind.	2076/312/5555	Y	N	N
1 m Fiber Optic Cable LC-LC	2076/312/5301	N	N	N
5 m Fiber Optic Cable LC-LC	2076/312/5305	N	N	N
25 m Fiber Optic Cable LC-LC	2076/312/5325	N	N	N
IBM 10GbE Optical SW SFP pair	2076/312/5711	N	N	N
IBM 8 Gbps LW SFP	2076/312/5608	N	N	N
Power Cord - EMEA	2076/312/9716	N	N	N
Power Cord - Austr/NZ	2076/312/9717	N	N	N
Power Cord - Eur.,Africa	2076/312/9718	N	N	N
Power Cord - Eur.,Denmark	2076/312/9719	N	N	N
Power Cord - Pakist SAfrica	2076/312/9720	N	N	N
Power Cord - Switz, Liecht	2076/312/9721	N	N	N
Power Cord - Chile,It,Eth	2076/312/9722	N	N	N
Power Cord - Israel	2076/312/9723	N	N	N
Power Cord - Argentina	2076/312/9725	N	N	N
Power Cord - China	2076/312/9726	N	N	N
Power Cord - PDU connection	2076/312/9730	N	N	N
Power Cord - Group 1(incl. USA)	2076/312/9731	N	N	N
Power Cord - Taiwan	2076/312/9732	N	N	N
Power Cord - Brazil	2076/312/9733	N	N	N
Power Cord - India	2076/312/9734	N	N	N
Power Cord - Japan	2076/312/9735	N	N	N
Power Cord - Korea	2076/312/9736	N	N	N
Power Cord - US, Chicago	2076/312/9737	N	N	N
Preload	2076/324/0010	N	Y	N
IBM Storwize v7000 SW				
Cache 8 GB	2076/324/6008	N	Y	N
Battery	2076/324/8002	Y	N	N
AC Power Supply	2076/324/9801	N	Y	N
JEMT Indicator	2076/324/0021	N	Y	N
RFID tag - discretionary	2076/324 0203	N	Y	N
US TAA compliance indicator government	2076/324/0983	N	Y	N
RAS Implementation Services	2076/324/1889	N	N	N
Rapid Application Storage	2076/324/6398	N	N	N
300 GB 2.5-inch 10k HDD	2076/324/3203	N	N	N
450 GB 2.5-inch 10k HDD	2076/324/3204	N	N	N
600 GB 2.5-inch 10k HDD	2076/324/3206	N	N	N
146 GB 2.5-inch 15k HDD	2076/324/3251	N	N	N

300 GB 2.5-inch SSD (E-MLC)	2076/324/3504	N	N	N
Bulk Ordering Feature Ind.	2076/324/5555	Y	N	N
IBM Storwize V7000 engine removal	2076/324/3905	N	N	N
1 m Fiber Optic Cable LC-LC	2076/324/5301	N	N	N
5 m Fiber Optic Cable LC-LC	2076/324/5305	N	N	N
25 m Fiber Optic Cable LC-LC	2076/324/5325	N	N	N
IBM 10GbE Optical SW SFP pair	2076/324/5711	N	N	N
IBM 8 Gbps LW SFP	2076/324/5608	N	N	N
Power Cord - EMEA	2076/324/9716	N	N	N
Power Cord - Austr/NZ	2076/324/9717	N	N	N
Power Cord - Eur.,Africa	2076/324/9718	N	N	N
Power Cord - Eur.,Denmark	2076/324/9719	N	N	N
Power Cord - Pakist SAfrica	2076/324/9720	N	N	N
Power Cord - Switz, Liecht	2076/324/9721	N	N	N
Power Cord - Chile,It,Eth	2076/324/9722	N	N	N
Power Cord - Israel	2076/324/9723	N	N	N
Power Cord - Argentina	2076/324/9725	N	N	N
Power Cord - China	2076/324/9726	N	N	N
Power Cord - PDU connection	2076/324/9730	N	N	N
Power Cord - Group 1(incl. USA)	2076/324/9731	N	N	N
Power Cord - Taiwan	2076/324/9732	N	N	N
Power Cord - Brazil	2076/324/9733	N	N	N
Power Cord - India	2076/324/9734	N	N	N
Power Cord - Japan	2076/324/9735	N	N	N
Power Cord - Korea	2076/324/9736	N	N	N
Power Cord - US, Chicago	2076/324/9737	N	N	N

## Pricing terms

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Prices in the following PDF prices link are suggested list prices on day of announcement for the U.S. only. They are provided for your information only. Dealer prices may vary, and prices may also vary by country. IBM list price does not include tax or shipping and is subject to change without notice.

[ENUS-111-085-List\\_prices\\_2011\\_05\\_09.PDF](#)

## ServicePac prices

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For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

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Internet: [callserv@ca.ibm.com](mailto:callserv@ca.ibm.com)  
Mail: IBM Teleweb Customer Support  
ibm.com® Sales Execution Center, Americas North  
3500 Steeles Ave. East, Tower 3/4  
Markham, Ontario  
Canada  
L3R 2Z1

Reference: YE001

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## Corrections

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### **(Corrected on July 1, 2011)**

The description for the 10 Gigabit Ethernet Optical SW SFP kit has been updated in the Description section.