IBM System Storage DCS3700 delivers optimal performance, scalability, and density for high-performance computing environments

At a glance

The IBM® System Storage® DCS3700 Storage System features:

- Dual-active intelligent array controllers enabled with Turbo Performance
- 6Gb SAS host ports standard with optional 8Gb Fibre Channel (FC) host ports
- 60 SAS drive bays, with support for up to 180 drives with the attachment of two DCS3700 Expansion Units
- Data replication options with FlashCopy®, Volume Copy, and Remote Mirroring over FC
- IBM DS Storage Manager for administrative and management activities

The IBM System Storage DCS3700 Expansion Unit features:

- Dual-active environmental services modules (ESMs)
- Sixty SAS drive bays
- 6Gb SAS attachment to the DCS3700 Storage System or to another DCS3700 Expansion Unit.

Both models feature:

- Slim 4U, 19-inch rack mount enclosure
- Dual port, hot-swappable 2 TB SAS nearline disk drives
- Redundant, hot-swappable hardware components
- IBM installation and a one year warranty with 24 x 7 on-site repair

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

Overview

The IBM System Storage DCS3700 is designed to meet the storage needs of highly scalable, data streaming applications in high-performance computing environments.

The DCS3700 consists of the following models:
IBM System Storage DCS3700 Storage System with dual-active, intelligent array controllers, 4 GB mirrored cache, four 6Gb SAS host interface ports, and 60 drive bays

IBM System Storage DCS3700 Expansion Unit with dual-active environmental services modules and 60 drive bays

Developed with density in mind, the DCS3700 Storage System delivers up to 120 TB of physical capacity in a slim, 4U form factor. With the attachment of up to two DCS3700 Expansion Units, the physical capacity can be scaled up to 360 TB, all within a 12U space.

The DCS3700 features the latest technologies, including 6 Gbps SAS and 8 Gbps Fibre Channel host interfaces, along with 6 Gbps SAS drives. The DCS3700 is designed to be equally adept at delivering throughput to bandwidth-intensive applications and I/O operations to transactional applications, such as databases and Microsoft® Exchange.

Key prerequisites

The DCS3700 is supported for attachment to selected:

- IBM System x®, IBM BladeCenter®, and IBM Power® System servers and blades
- Intel® and AMD processor-based servers

Refer to the IBM System Storage Interoperation Center (SSIC) for additional details
http://www.ibm.com/systems/support/storage/config/ssic

Planned availability date

May 27, 2011

Description

IBM System Storage DCS3700 is designed to meet the storage needs of highly scalable, data streaming applications in high-performance computing environments.

The DCS3700 consists of the following models:

- IBM System Storage DCS3700 Storage System with dual-active, intelligent array controllers, 4 GB mirrored cache, four 6Gb SAS host interface ports, and 60 drive bays
- IBM System Storage DCS3700 Expansion Unit with dual-active environmental services modules and 60 drive bays.

Massive scalability with density

The DCS3700 was developed with both scalability and density in mind. The DCS3700 Storage System supports up to 60 drives within a slim, 4U enclosure.

A DCS3700 system can scale up to 180 drives with the attachment of two DCS3700 Expansion Units. Each DCS3700 Expansion Unit also supports 60 drives within a 4U enclosure. With 2 TB high-capacity, SAS nearline disk drives, the DCS3700 delivers up to 360 TB of physical capacity within a 12U space.

Disk drives and expansion units are designed to be dynamically added with virtually no downtime, helping to quickly and seamlessly respond to growing capacity demands.
Latest host interface technologies with intermix flexibility

With support for the latest host interface technologies -- 6 Gbps SAS and 8 Gbps Fibre Channel - the DCS3700 is designed to address shared storage requirements within a single system:

- Second-generation, 6Gb SAS builds upon the solid foundation of 3Gb SAS with performance improvements and reliability enhancements. With direct attachment support and the capability to be shared by multiple host servers, the DCS3700 with SAS provides easy to use simplicity at an affordable price.
- Fibre Channel, a mature and proven technology now available at 8Gb, is the host interface of choice for high-performance environments. The DCS3700 with Fibre Channel exploits the benefits offered by a SAN environment.

The DCS3700 comes standard with four SAS host interface ports (two ports per controller). You have the option to add four additional SAS ports (two ports per controller) or eight FC ports (four ports per controller). The following configurations are available:

<table>
<thead>
<tr>
<th></th>
<th>6 Gb</th>
<th>8 Gb</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS Ports</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>FC Ports</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Standard configuration

Optional configuration 8

Optional configuration 4 8

High availability with data protection

The DCS3700 is designed for high system and data availability with:

- Dual-active, intelligent array controllers with mirrored cache
- Dual port disk drives with automatic disk drive failure detection and rebuild with global hot spares
- Redundant, hot-swappable components, including front loading drive drawers that can be extended while the drives are active
- Automated path failover support for the data path between the server and the disk drives

And the DCS3700 is designed to protect data with:

- RAID levels 0, 1, 3, 5, 6, and 10 to give the flexibility to choose the level of protection required
- Storage partitions that logically divide a single DCS3700 into multiple systems to manage volume-to-host access
- FlashCopy and Volume Copy to create logical or physical copies of data for file restoration and backup
- Remote Mirroring to provide storage system-based data replication from one DCS3700 system to another DCS3700 system using either synchronous or asynchronous data transfers over Fibre Channel communication links

Energy efficiencies for today and tomorrow

The DCS3700 was developed with energy saving features, such as power supplies designed to meet multiple efficiency standards and variable speed fans, to help reduce power consumption and provide a lower overall total cost of ownership. With 60 drives housed within just a 4U enclosure, the DCS3700 is optimized for maximum storage density.

Intuitive storage management with the IBM DS Storage Manager

IBM DS Storage Manager provides a powerful, yet easy-to-use and intuitive graphical user interface (GUI) for DCS3700 administrative activities. This includes configuration, reconfiguration, expansion, and routine maintenance, as well as performance tuning and management of advanced functions.
DS Storage Manager is ideally suited for full-time storage administrators looking for complete control over their storage configuration, and part-time system administrators in need of an intuitive interface to help them ensure optimal storage utilization.

**Rich set of data replication functions for business continuity needs**

**FlashCopy** creates a capacity-efficient, point-in-time copy of a physical volume for data protection uses, such as file restoration and backup. A FlashCopy volume is the logical equivalent of the physical volume, but is created more quickly than a physical copy and with minimal disruption to applications and production processes. Using copy-on-write technology, FlashCopy volumes preserve data in its original form even as data in the physical (source) volume is changed. FlashCopy volumes appear and function as standard storage volumes, and restoration of a FlashCopy volume is quick and easy.

**Volume Copy** creates a physical copy of a volume. Volume Copy is used with FlashCopy to create a physical copy of your data with minimal disruption to applications and production processes. Upon completion of the Volume Copy process, the new volume can be mapped to any host and functions as a standard volume. Volume Copy can also be used to redistribute data within the DCS3700 moving volumes to a different disk drive technology or RAID level.

Both FlashCopy and Volume Copy are performed by DCS3700 Storage System, so no host server resources are used.

**Remote Mirroring** provides storage system-based data replication from one DCS3700 system to another DCS3700 system over Fibre Channel communications links. Remote Mirroring supports synchronous or asynchronous data transfers, enabling you to choose the replication method that best meets your protection, distance, or performance requirements:

- Synchronous mirroring is designed to provide continuous mirroring between primary and remote volumes to help ensure absolute synchronization.
- Asynchronous mirroring queues remote writes to reduce the latency, thus enabling long distance replication while increasing local system performance. Asynchronous mirroring includes a write consistency option designed to ensure that writes to the remote system complete in the same order as the local system.

Remote Mirroring also includes features such as dynamic mode switching, suspend and resume with delta resynchronization, read-only and FlashCopy / Volume Copy access to secondary volumes, and cross-mirroring.

**Accessibility by people with disabilities**

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


**Statement of general direction**

It is IBM's current plan and intent to offer additional drive options for the DCS3700 in second half 2011, including high-performance disk drives.

All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice. Any reliance on these statements of general direction is at the relying party's sole risk and will not create liability or obligation for IBM.
<table>
<thead>
<tr>
<th>Description</th>
<th>Machine type</th>
<th>Model</th>
<th>Feature number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCS3700 Storage System</td>
<td>1818</td>
<td>80C</td>
<td></td>
</tr>
<tr>
<td>DCS3700 Expansion Unit</td>
<td>1818</td>
<td>80E</td>
<td></td>
</tr>
<tr>
<td><strong>Hardware Options</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4GB Cache</td>
<td>1818</td>
<td>80C</td>
<td>3000</td>
</tr>
<tr>
<td>8GB Cache</td>
<td>1818</td>
<td>80C</td>
<td>3001</td>
</tr>
<tr>
<td>4GB to 8GB Cache Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3002</td>
</tr>
<tr>
<td>Two 6Gb SAS 2 Port Cards</td>
<td>1818</td>
<td>80C</td>
<td>3300</td>
</tr>
<tr>
<td>Two 8Gb FC 4 Port Cards</td>
<td>1818</td>
<td>80C</td>
<td>3310</td>
</tr>
<tr>
<td><strong>Disk Drives</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2TB 7.2K SAS HDD 10 Pack</td>
<td>1818</td>
<td>80C, 80E</td>
<td>3450</td>
</tr>
<tr>
<td><strong>Host and Expansion Unit Cables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3m SAS Cable</td>
<td>1818</td>
<td>80C, 80E</td>
<td>3707</td>
</tr>
<tr>
<td>1m SAS Cable</td>
<td>1818</td>
<td>80C, 80E</td>
<td>3708</td>
</tr>
<tr>
<td>1m Fiber Cable (LC-LC)</td>
<td>1818</td>
<td>80C</td>
<td>5601</td>
</tr>
<tr>
<td>5m Fiber Cable (LC-LC)</td>
<td>1818</td>
<td>80C</td>
<td>5605</td>
</tr>
<tr>
<td>25m Fiber Cable (LC-LC)</td>
<td>1818</td>
<td>80C</td>
<td>5625</td>
</tr>
<tr>
<td><strong>Licensed Functions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 to 16 Partition Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3510</td>
</tr>
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<td>8 to 32 Partition Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3511</td>
</tr>
<tr>
<td>8 to 64 Partition Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3512</td>
</tr>
<tr>
<td>8 to 128 Partition Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3513</td>
</tr>
<tr>
<td>16 to 32 Partition Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3520</td>
</tr>
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<td>16 to 64 Partition Upgrade</td>
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<td>80C</td>
<td>3521</td>
</tr>
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<td>16 to 128 Partition Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3522</td>
</tr>
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<td>32 to 64 Partition Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3530</td>
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<td>1818</td>
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<td>3531</td>
</tr>
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<td>64 to 128 Partition Upgrade</td>
<td>1818</td>
<td>80C</td>
<td>3540</td>
</tr>
<tr>
<td>FlashCopy / Volume Copy</td>
<td>1818</td>
<td>80C</td>
<td>3900</td>
</tr>
<tr>
<td>Remote Mirroring</td>
<td>1818</td>
<td>80C</td>
<td>3950</td>
</tr>
<tr>
<td><strong>Host Kits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AIX/VIOS Host Kit</td>
<td>1818</td>
<td>80C</td>
<td>3600</td>
</tr>
<tr>
<td>Linux on Power Host Kit</td>
<td>1818</td>
<td>80C</td>
<td>3610</td>
</tr>
<tr>
<td><strong>Administrative</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk Order</td>
<td>1818</td>
<td>80C, 80E</td>
<td>5555</td>
</tr>
<tr>
<td>Plant Integrate 2101 Rack</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9201</td>
</tr>
<tr>
<td>Field Integrate</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9202</td>
</tr>
<tr>
<td><strong>Power Cords</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCS Power Cord Group 1</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9870</td>
</tr>
<tr>
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<td>80C, 80E</td>
<td>9871</td>
</tr>
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<td>80C, 80E</td>
<td>9872</td>
</tr>
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<td>1818</td>
<td>80C, 80E</td>
<td>9873</td>
</tr>
<tr>
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<td>1818</td>
<td>80C, 80E</td>
<td>9874</td>
</tr>
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<td>1818</td>
<td>80C, 80E</td>
<td>9875</td>
</tr>
<tr>
<td>DCS Power Cord Group 7</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9876</td>
</tr>
<tr>
<td>DCS Power Cord Group 8</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9877</td>
</tr>
<tr>
<td>DCS Power Cord Group 9</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9878</td>
</tr>
<tr>
<td>DCS Power Cord Group 10</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9879</td>
</tr>
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<td>DCS Power Cord Group 11</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9880</td>
</tr>
<tr>
<td>DCS Power Cord Group 12</td>
<td>1818</td>
<td>80C, 80E</td>
<td>9881</td>
</tr>
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<td>1818</td>
<td>80C, 80E</td>
<td>9884</td>
</tr>
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<td>1818</td>
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</table>
**IBM System Storage DCS3700 Storage System**

The base model consists of the following components:

- 4U, 19-inch rack mount enclosure
- Two intelligent array controllers with 4 GB cache (2 GB per controller)
- Four 6Gb SAS host interface ports (two ports per controller)
- Two 6Gb SAS ports for attachment of an DCS3700 Expansion Unit (one port per controller)
- Four Ethernet ports for system management (two ports per controller)
- Sixty drive bays
- Dual AC power supplies (200 to 240 V) and cooling units
- Two 2.5 meter rack power distribution (PDU) line cords (C19 to C20)

The base model includes the following functions at no additional charge:

- RAID levels 0, 1, 3, 5, 6, and 10
- Turbo performance
- Support for up to 512 volumes per system
- Eight storage partitions with up to 256 volumes per storage partition
- FlashCopy (two active FlashCopy images per system)
- Host attachment support for Microsoft Windows® and Linux® on Intel
- DS Storage Manager
- Support for 180 drives through attachment of two DCS3700 Expansion Units

The following optional features are available. Refer to the Product number section for feature numbers:

- Two 6Gb SAS 2 port daughter cards
- Two 8Gb FC 4 port daughter card (with eight SFP transceivers)
- 6Gb SAS disk drives:
  - High-capacity, archival-class nearline drives - 2 TB 7,200 rpm
- 4 GB to 8 GB cache upgrade (per controller)
- 16, 32, 64, or 128 partitions per system
- Flash Copy / Volume Copy
- Remote Mirroring
- Host kits for AIX/VIOS and Linux on Power
- SAS and fiber optic host attachment cables
- Wall outlet line cords

**IBM System Storage DCS3700 Expansion Unit**

The base model consists of the following components:

- 4U, 19-inch rack mount enclosure
- Two environmental services modules (ESM)
- Two 6Gb SAS "out" ports for attachment to a DCS3700 Storage System or another DCS3700 Expansion Unit (one port per ESM)
- Four 6Gb SAS "in" ports for attachment of another DCS3700 Expansion Unit (two ports per ESM)
• Two 6Gb SAS ports for attachment of an DCS3700 Expansion Unit (one port per controller)
• Sixty drive bays
• Dual AC power supplies (200 to 240 V) and cooling units
• Two 2.5 meter rack power distribution (PDU) line cords (C19 to C20)

The following optional features are available. Refer to the Product number section for feature numbers:

• 6Gb SAS disk drives:
  – High-capacity, archival-class nearline drives - 2 TB 7,200 rpm
• SAS expansion unit cables
• Wall outlet line cords

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).


Publications

The following publications are available for the DCS3700:

• IBM Systems Storage DCS3700 Quick Start Guide
• IBM Systems Storage DCS3700 Installation, User's, and Maintenance Guide
• IBM System Storage DS® Storage Manager Version 10.77 Installation and Host Support Guide
• IBM System Storage DS Storage Manager Version 10.77 Copy Services User's Guide
• IBM System Storage DS3000, DS4000™, and DS5000 Command Line Interface and Script Commands Programming Guide
• IBM System Storage DS3000, DS4000, and DS5000 Hard Disk Drive and Storage Expansion Enclosure Installation and Migration Guide
• IBM Remote Support Manager 1818-RS3 Quick Reference

Publications and product documentation are available at the IBM System Storage Support site

http://www.ibm.com/systems/support/storage/

Services

Global Technology Services

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
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


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

**System x and BladeCenter support services**

**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**

**Physical specifications**

- Height: 17.6 cm (6.9 in)
- Width: 48.3 cm (19.0 in)
- Depth: 86.6 cm (34.1 in)
- Approximate weight:
  - DCS3700 Storage System:
    -- Empty: 46.0 kg (101.4 lbs)
    -- Fully configured: 102.3 kg (225.5 lbs)
  - DCS3700 Expansion unit:
    -- Empty: 46.0 kg (101.4 lbs)
    -- Fully configured: 101.0 kg (222.6 lbs)

To assure installability and serviceability in non-IBM industry-standard racks, review the DCS3700 publications for any product-specific installation requirements.
**Operating environment**

Air temperature:

- Operating: 10°C to 35°C (50°F to 95°F) at 30.5
- Non-operating: -10°C to 50°C (14°F to 125°F)
- Operating: 10°C to 35°C (50°F to 140°F) to 1000 m (3280 ft) above sea level
- Storage: -10°C to 65°C (14°C to 149°F)
- Transit: -40°C to 65°C (-40°F to 149°F)

Relative humidity:

- Operating: 20% to 80%
- Storage: 10% to 90%
- Transit: 5% to 95%

Electrical power:

- Voltage range: 200-240 V ac
- Frequency: 50-60 Hz
- Power:
  - DCS3700 Storage System: 896 watts
  - DCS3700 Expansion Unit: 802 watts

Heat dissipation (BTU per hour):

- DCS3700 Storage System: 3,057
- DCS3700 Expansion Unit: 2,736

Acoustical noise emission:

- Sound power: 7.0 bels

**Hardware requirements**

The DCS3700 requires:

- Controller firmware level 07.77, or later
- DS Storage Manager version 10.77, or later

Refer to the DCS3700 product documentation and the IBM Systems Support site for additional information on firmware levels and other requirements


**Compatibility**

Refer to the IBM System Storage Interoperation Center (SSIC) for a comprehensive list of supported environments, devices, and configurations

[http://www.ibm.com/systems/support/storage/config/ssic](http://www.ibm.com/systems/support/storage/config/ssic)

**Planning information**

**Customer responsibilities**

Physical configuration and installation planning are customer responsibilities. Refer to the *IBM Systems Storage DCS3700 Installation, User's, and Maintenance Guide* for additional information.

All activities associated with activation of licensed functions are a customer responsibility during both initial machine installation and field upgrades:
• Storage partition upgrades
• Host kits
• FlashCopy / Volume Copy
• Remote Mirroring

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**

**Host Attachment Cables**

Host attachment cables are required to connect DCS3700 host ports to server or fabric ports. As a convenience, a limited selection of cables can be ordered with your DCS3700. Refer to the Product number section for feature numbers.

In many situations, the required lengths and installation of host attachment cables will be unique to each customer's configuration and facility specifications. IBM Network Integration and Deployment Services, offered by IBM Global Services, can provide assistance for these unique cabling and installation requirements.

**SAS:** The DCS3700 requires a mini SAS 4x cable terminated with a SFF-8088 connector. The following SAS cables can be ordered with your DCS3700:

- 1 m SAS Cable
- 3 m SAS Cable

**Fibre Channel:** The DCS3700 requires a 50.0/125 micrometer fiber optic cable terminated with an LC Duplex connector. The following fiber optic cables can be ordered with your DCS3700:

- 1 m Fiber Cable (LC-LC)
- 5 m Fiber Cable (LC-LC)
- 25 m Fiber Cable (LC-LC)

**Expansion Unit Attachment Cables**

Expansion unit cables are required to connect a DCS3700 Expansion Unit to the DCS3700 Storage System or to another DCS3700 Expansion Unit. As a convenience, a limited selection of cables can be ordered with your DCS3700. Refer to the Product number section for feature numbers.

The DCS3700 Expansion Unit requires a mini SAS 4x cable terminated with a SFF-8088 connector. The following SAS cables can be ordered with your DCS3700:

- 1 m SAS Cable
- 3 m SAS Cable

**Management**

Cables are required if the DCS3700 configuration will be managed "out of band" using the 1 Gb Ethernet management ports. The DCS3700 requires a Category 5 or Category 5E Ethernet cable terminated with a 8P8C modular connector (RJ45 compatible connector). This cable must be supplied by the customer and is not available for ordering with your DCS3700.
Security, auditability, and control

This product uses the security and auditability features of host hardware, host software, and 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.

IBM Electronic Services

IBM has transformed its delivery of hardware and software support services to help you achieve higher system availability. Electronic Services is a Web-enabled solution that offers an exclusive, no-additional-charge enhancement to the service and support available for IBM servers. These services are designed to provide the opportunity for greater system availability with faster problem resolution and preemptive monitoring. Electronic Services comprises two separate, but complementary, elements: Electronic Services news page and Electronic Services Agent.

The Electronic Services news page is a single Internet entry point that replaces the multiple entry points traditionally used to access IBM Internet services and support. The news page enables you to gain easier access to IBM resources for assistance in resolving technical problems.

The Electronic Service Agent™ is no-additional-charge software that resides on your server. It monitors events and transmits system inventory information to IBM on a periodic, client-defined timetable. The Electronic Service Agent automatically reports hardware problems to IBM. Early knowledge about potential problems enables IBM to deliver proactive service that may result in higher system availability and performance. In addition, information collected through the Service Agent is made available to IBM service support representatives when they help answer your questions or diagnose problems. Installation and use of IBM Electronic Service Agent for problem reporting enables IBM to provide better support and service for your IBM server.

To learn how Electronic Services can work for you, visit

http://www.ibm.com/support/electronic

Terms and conditions

IBM Global Financing

Yes

Warranty period

One year

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 Web site. 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:

- None

**CRU and On-site Service**

At IBM's discretion, you will receive specified CRU service, or 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 level is:

- 24 hours per day, 7 days a week, 4 hour average, same day response. Same day service level includes the installation of Tier 1 CRUs at no additional charge.

**Warranty service upgrades**

During the warranty period, warranty service upgrades provide an enhanced level of On-site Service for an additional charge. Service levels are response-time objectives and are not guaranteed. See the Warranty services section for additional details.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. 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.

**Maintenance services**

If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically, via an IBM Web site. 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. Service levels are response-time objectives and are not guaranteed. The specified level of maintenance 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. The following service selections are available as maintenance options for your machine type.

**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
- 9 hours per day, Monday through Friday, excluding holidays, 4 hour average response, same business day
- 24 hours per day, 7 days a week, 4 hour average response, same day
- 24 hours per day, 7 days a week, 2 hour average response, same day

**Customer Replaceable Unit (CRU) Service**

If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), and depending upon the maintenance service offerings in your geography, IBM will ship the replacement CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request.

Based upon availability, CRUs will be shipped for next business day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU, and 2) 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.

CRUs may be provided as part of the machine's standard maintenance service except that you may install a CRU yourself or request IBM installation, at no additional charge, under any of the On-site Service levels specified above.

**Warranty service upgrades**

**Usage plan machine**

No

**IBM hourly service rate classification**

One
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**
No

**Machine installation**
Installation is performed by IBM. IBM will install the machine in accordance with the IBM installation procedures for the machine. In the United States, contact IBM at 1-800-IBM-SERV (426-7378). In other countries, contact the local IBM office.

All activities associated with activation of licensed functions are a customer responsibility during the machine installation:

- Storage partition upgrades
- Host kits
- FlashCopy / Volume Copy
- Remote Mirroring

**Graduated program license charges apply**
No

**Licensed machine code**
IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement at


IBM may release changes to the Machine Code. IBM plans to make the Machine Code changes available for download from the IBM System Storage technical support Web site

http://www.ibm.com/systems/support/storage/

You may also obtain updated code by contacting your IBM representative.

If the machine does not function as warranted and your problem can be resolved through your application of downloadable Machine Code, you are responsible for downloading and installing these designated Machine Code changes as IBM specifies. If you would prefer, you may request IBM to install downloadable Machine Code changes; however, you may be charged for that service.

**Educational allowance**
A reduced charge is available to qualified education customers. The educational allowance may not be added to any other discount or allowance.

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Feature number</th>
<th>Machine type</th>
<th>Model number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCS3700 Storage System</td>
<td>1818</td>
<td>80C</td>
<td></td>
</tr>
<tr>
<td>DCS3700 Expansion Unit</td>
<td>1818</td>
<td>80E</td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>Hardware Options</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4GB Cache</td>
<td>3000</td>
<td>1818</td>
<td>80C</td>
</tr>
<tr>
<td>8GB Cache</td>
<td>3001</td>
<td>1818</td>
<td>80C</td>
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<tr>
<td>4GB to 8GB Cache Upgrade</td>
<td>3002</td>
<td>1818</td>
<td>80C</td>
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<tr>
<td>Two 6Gb SAS 2 Port Cards</td>
<td>3300</td>
<td>1818</td>
<td>80C</td>
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<tr>
<td>Two 8Gb FC 4 Port Cards</td>
<td>3310</td>
<td>1818</td>
<td>80C</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Disk Drives</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2TB 7.2K SAS HDD 10 Pack</td>
<td>3450</td>
<td>1818</td>
<td>80C, 80E</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Host and Expansion Unit Cables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3m SAS Cable</td>
<td>3707</td>
<td>1818</td>
<td>80C, 80E</td>
</tr>
<tr>
<td>1m SAS Cable</td>
<td>3708</td>
<td>1818</td>
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<tr>
<td>1m Fiber Cable (LC-LC)</td>
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<tr>
<td>5m Fiber Cable (LC-LC)</td>
<td>5605</td>
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<tr>
<td>25m Fiber Cable (LC-LC)</td>
<td>5625</td>
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<td></td>
<td></td>
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<td><strong>Licensed Functions</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8 to 16 Partition Upgrade</td>
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<td>80C</td>
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<td>8 to 32 Partition Upgrade</td>
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<td>80C</td>
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<td>1818</td>
<td>80C</td>
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<td>3530</td>
<td>1818</td>
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<td>32 to 128 Partition Upgrade</td>
<td>3531</td>
<td>1818</td>
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<td>64 to 128 Partition Upgrade</td>
<td>3540</td>
<td>1818</td>
<td>80C</td>
</tr>
<tr>
<td>FlashCopy / Volume Copy</td>
<td>3900</td>
<td>1818</td>
<td>80C</td>
</tr>
<tr>
<td>Remote Mirroring</td>
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<td>1818</td>
<td>80C</td>
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<tr>
<td><strong>Host Kits</strong></td>
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<tr>
<td>AIX/VIOS Host Kit</td>
<td>3600</td>
<td>1818</td>
<td>80C</td>
</tr>
<tr>
<td>Linux on Power Host Kit</td>
<td>3610</td>
<td>1818</td>
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<tr>
<td><strong>Administrative</strong></td>
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<tr>
<td>Bulk Order</td>
<td>5555</td>
<td>1818</td>
<td>80C, 80E</td>
</tr>
<tr>
<td>Plant Integrate 2101 Rack</td>
<td>9201</td>
<td>1818</td>
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</tr>
<tr>
<td>Field Integrate</td>
<td>9202</td>
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<tr>
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<td><strong>Power Cords</strong></td>
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<tr>
<td>DCS Power Cord Group 1</td>
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<td>1818</td>
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<td>DCS Power Cord Group 2</td>
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<td>DCS Power Cord Group 4</td>
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<td>1818</td>
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<td>9884</td>
<td>1818</td>
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<tr>
<td>DCS Power Cord Group 16</td>
<td>9885</td>
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### Hardware Options

<table>
<thead>
<tr>
<th>Description</th>
<th>Feature number</th>
<th>Machine type</th>
<th>Model number</th>
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<tbody>
<tr>
<td>4GB Cache</td>
<td>3000</td>
<td>Plant</td>
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</table>

IBM United States Hardware Announcement 111-101

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8GB Cache                      3001  Plant  
4GB to 8GB Cache Upgrade       3002  Field  
Two 6Gb SAS 2 Port Cards       3300  Both  
Two 8Gb FC 4 Port Cards         3310  Both  

Disk Drives                    
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Host and Expansion Unit Cables 
3m SAS Cable                    3707  Both  
1m SAS Cable                    3708  Both  
1m Fiber Cable (LC-LC)          5601  Both  
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8 to 64 Partition Upgrade       3512  Both  
8 to 128 Partition Upgrade      3513  Both  
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16 to 64 Partition Upgrade      3521  Field  
16 to 128 Partition Upgrade     3522  Field  
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DCS Power Cord Group 4         9873  Both  
DCS Power Cord Group 5         9874  Both  
DCS Power Cord Group 6         9875  Both  
DCS Power Cord Group 7         9876  Both  
DCS Power Cord Group 8         9877  Both  
DCS Power Cord Group 9         9878  Both  
DCS Power Cord Group 10        9879  Both  
DCS Power Cord Group 11        9880  Both  
DCS Power Cord Group 12        9881  Both  
DCS Power Cord Group 15        9884  Both  
DCS Power Cord Group 16        9885  Both  

* Install type:  
  - "Plant" denotes plant installation only.  
  - "Field" denotes field installation only.  
  - "Both" denotes both plant and field installation.

Pricing terms

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**Corrections**

(Corrected on July 29, 2011)
The Additional information section has been updated.