New IBM System Storage DCS3860 controller delivers high performance and efficiency

At a glance

The IBM® DCS3860 Storage System includes the following features:

- 4U, 19-inch rack mount enclosure
- Two intelligent array controllers with 24 GB cache (12 GB per controller)
- Eight 12 GB SAS, 10 Gbps iSCSI, 16 Gbps FC host interface ports (four per controller)
- Four 6 GB SAS ports for attachment of an EXP3800 or DCS3700 Expansion Unit (two per controller)
- Four Ethernet ports for system management (two per controller)
- Sixty bays for SAS drives
- Two ac power supplies and cooling units

DCS3860 also delivers the following functions at no additional cost:

- RAID levels 0, 1, 3, 5, 6, 10 and Dynamic Disk Pooling (DDP)
- 512 storage partitions
- Host attachment support for Linux™ on x86 architecture
- IBM DS Storage Manager for administrative and management activities
- Support for 360 drives (with a maximum of 120 of SSDs) through attachment of five EXP3800 or DCS3700 expansion units

As an additional premium feature option, the DCS3860 includes performance read cache which enables the utilization of SSDs for accelerating reads from the storage, helping to increase performance of the disk system for certain workloads.

Overview

IBM System Storage® DCS3860 is the next generation in controller technology designed to meet the need for rigorous, scalable bandwidth requirements for high-performance streaming applications, such as high-performance computing, rich media, weather forecasting, seismic processing, and life sciences research.

DCS3860 is an affordable storage platform capable of supporting up to 60 drives within a slim, 4U enclosure. A complete DCS3860 system configuration consists of one DCS3860 controller and five EXP3800 or DCS3700 expansion units. Since each expansion unit supports 60 drives, a complete DCS3860 system can scale up to 360 drives.
With 6 TB high-capacity nearline SAS disk drives, the DCS3860 can deliver up to 2.16 PB of physical capacity within a 24U space. The controller and the expansion unit support intermixing of SSD, high-performance SAS, and nearline SAS drives. A DCS3860 storage system can support a maximum of 120 SSDs.

Standard memory cache on the DCS3860 is 24 GB, with 12 GB per controller. The storage system provides eight 12 Gb SAS host interfaces (four per controller) and delivers performance read cache to enable the utilization of SSDs for accelerating reads from the storage, helping to increase performance for analytics and high-performance computing environments.

In order to ensure data integrity, the DCS3860 enables flexible levels of RAID protection (0, 1, 3, 5, 6 and 10), and also includes DDP for simplified installation, greater data protection, and more consistent performance than traditional RAID options.

**Key prerequisites**

None

**Planned availability date**

June 5, 2015

**Description**

Every day, massive volumes of data are created around the world. This data comes from everywhere, from sensors used to gather climate information, posts to social media sites, digital pictures and videos, to purchase transaction records and cell phone GPS signals. In order to effectively leverage this big data, organizations need fast and easy access to applications backed by high-performance storage architectures. At the same time, they need ways to improve operational efficiency while maintaining the same data center footprint, quality of service, and high availability.

IBM System Storage DCS3860 delivers the performance and scalability that organizations need to succeed in this new era of big data. Designed for high-performance computing applications, DCS3860 supports up to 60 drives in just 4U of rack space, and it can scale up to 360 drives, including up to 24 solid-state drives (SSDs), with the attachment of five expansion units. This high-density system also helps make the most of today’s IT budgets by increasing capacity while reducing the storage footprint, power consumption, and related operational costs.

DCS3860 provides a versatile, intuitive solution for SAN deployments. It works as a cost-effective, fully integrated complement to IBM Power Systems™ servers for a wide variety of intensive computing environments.

IBM System Storage DCS3860 highlights include:

- Expandable performance, flexibility, and operational efficiency with scalable, high-density storage systems
- Simplified data protection management and automated recovery tasks with DDP
- Data integrity with support for the T10 Protection Information (T10 PI) standard

**Increased availability with a next-generation performance controller**

DCS3860 includes a next-generation performance controller to deliver outstanding system performance. By increasing availability with a Turbo Performance feature,
DCS3860 is suitable for use in both general-purpose and high-performance computing environments.

The DCS3860 storage system is built on a powerful hardware platform that features two 2.2 Ghz, 6-core Ivy Bridge Intel\textsuperscript{TM} processors for up to 24 GB cache memory and two host interface cards (HICs) with four 12 Gbps SAS ports, four 10 Gbps iSCSI port HICs, or four 16 Gbps Fibre Channel (FC) port HICs. Drive density increases with two 6 Gbps SAS ports per expansion unit.

**Intuitive storage management without sacrificing control**

IBM System Storage DS\textsuperscript{(R)} Storage Manager software combines robustness with ease of use, two attributes not commonly found together in entry to midrange storage systems. With its industry-unique dynamic capabilities and intuitive graphical user interface, DS Storage Manager supports dynamic reconfiguration without interrupting storage system input/output (I/O).

In addition, DS Storage Manager has fully integrated features that allow administrators to choose the data protection method that best meets their organizational requirements:

- For highly secure implementations, administrators can use new password settings to designate users who can monitor the system, but are unauthorized to make any changes
- For effective storage consolidation and virtualization, support is available for up to 512 partitions at no additional cost

An optional premium feature that delivers enhanced capabilities for the DCS3860 system is the Performance Read Cache option which utilizes SSDs as a level-two data cache, significantly improving read performance from spinning media. This option is extremely easy to set up and, once implemented, automatically identifies the data that is read most frequently and copies it into cache for fast access.

DCS3860 helps to reduce operational costs as storage requirements grow. With up to 60 SAS drives in just 4U of rack space, improving storage density for capacity-intensive applications has never been easier.

- **Support for distributed, enterprise-wide and file-based storage:** When combined with IBM Spectrum\textsuperscript{TM} Scale, DCS3860 becomes a holistic, policy-driven, shared-disk file management solution that can provide faster, more reliable access to a common set of file-based data. IBM Spectrum Scale is designed for advanced business analytics, big data, or technical computing applications that require application access to very large data files or very large numbers of data files.

- **Continuous uptime enablement:** DCS3860 storage system ensures not only high-speed data access, but also continuous access to data. It carries on the IBM legacy of high-availability system design with redundant components, automated path failover, and extensive online administration capabilities that maximize computational efficiency and productivity, helping to ensure there is virtually no single point of failure. This design helps keep these environments universally productive. DDP technology plays an important role in ensuring availability because it virtually eliminates maintenance worries by self tuning, rebalancing data, and maintaining consistent performance, even during drive failures.

- **Helps ensure data integrity with T10 PI:** By enabling T10 PI between the storage controller and its disk drives, administrators can help ensure data integrity at the drive level. T10 PI requires the use of PI-formatted disk drives. The drives are formatted at 520 bytes per sector, with 512 bytes for user data and 8 bytes for integrity metadata. The drives can be used with or without the T10 PI function enabled and can be intermixed within a storage enclosure or across storage systems with non-PI formatted drives. T10 PI can be used with any RAID level. To use the T10 PI function, all drives within the RAID array must be PI-formatted drives.

- **Help to lower total cost of ownership:** DCS3860 delivers scalable performance in a cost-effective system that delivers the best value for your investment and protects your budget over time. DDP, the self-healing technology
embedded within DCS3860, helps ensure consistent performance in the event of a drive failure, helping to eliminate the potential costs of downtime. Key features for improved overall storage efficiency include:

- DCS3860 system provides high capacity at an affordable price, and it can easily scale with expansion units for even more performance at a low cost.
- Advanced administration features in System Storage DS Storage Manager help reduce storage complexity and save time for administrators, enabling them to focus on more strategic activities.

### Product number

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<tr>
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<th>Model</th>
<th>Feature number</th>
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<td>96C</td>
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**Publications**

The following publications are available for the DS3860

- *IBM System Storage DCS3860 Quick Start Guide*
- *IBM System Storage DCS3860 Installation, User's, and Maintenance Guide*
- *IBM System Storage DS© Storage Manager Version 11.2 Installation and Host Support Guide*
- *IBM System Storage DS Storage Manager Version 11.2 Command Line Interface and Script Commands Programming Guide*
- *IBM System Storage DS Storage Manager Version 11.2 Copy Services User's Guide*

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

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

The IBM Publications Center Portal is located at

http://www.ibm.com/shop/publications/order
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. A large number of publications are available online in various file formats, which can currently be downloaded.

**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

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


**Technical information**

**Specified operating environment**

**Physical specifications**

- Width: 48.3 cm (19.0 in)
- Depth: 86.6 cm (34.1 in)
- Height: 17.6 cm (6.93 in)

Fully configured approximate weight:

- DCS3860 Storage System: 103.16 Kg
- Expansion unit: 101 Kg

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

**Operating environment**

Air temperature:

- Operating: 10°C to 35°C (50°F to 95°F) to 1000 m (3280 ft) above sea level
- Storage: -10°C to 65°C (14°F 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:
  – DCS3860 Storage System: 1,108.6 watts
  – Expansion Unit: 802 watts

Heat dissipation (BTU per hour):
• DCS3860 Storage System: 3,791
• Expansion Unit: 2,736

Acoustical noise emission:
• Sound power: 7.2 bels

Homologation
This product is not certified for direct connection by any means whatsoever to interfaces of public telecommunications networks. Certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

Hardware requirements
The DCS3860 requires:
• IBM Storage Manager V11.2, or later
• Controller firmware level 8.2, or later

Refer to the DCS3860 product documentation and the IBM Systems Support site for additional information on firmware levels and other requirements

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

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

Planning information

Customer responsibilities
Physical configuration and installation planning are customer responsibilities. Refer to the IBM Systems Storage DCS3860 Installation, User’s, and Maintenance Guide for additional information.

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 website 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 are required to connect DCS3860 host ports to server or fabric ports.

Expansion unit cables are required to connect an EXP3800 or DCS3700 Expansion Unit to the DCS3860 Storage System or to another expansion unit.

As a convenience, a limited selection of cables can be ordered with your DCS3860. Refer to the **Product number** section for feature numbers.

For expansion attachment, four SAS expansion cables are required for the first EXP3800 or DCS3700 expansion enclosure. All the following expansion units require two SAS expansion cables.

To utilize expansion attachment, the following SAS cables can be ordered with your DCS3860 controller, EXP3800 or DCS3700 Expansion units:

- 1 m SAS Cable (Feature 3708)
- 3 m SAS Cable (Feature 3707)

To utilize host attachment consider the following guidelines:

- 16 Gb FC and 8 Gb FC: The DCS3860 requires a 50.0/125 micrometer fiber optic cable terminated with an LC Duplex connector. For FC host connectivity, the following cables can be ordered with the DCS3860 control enclosure model:
  - Fiber Cable, 1 m multimode LC-LC
  - Fiber Cable, 5 m multimode LC-LC
  - OM3 Fiber Optic Cable LC/LC 10 m

- 10 Gb iSCSI: DCS3860 requires a 10GBASE-SR cable terminated with an LC Duplex connector. For iSCSI connectivity, the following cables can be ordered with the DCS3860 control enclosure model:
  - OM3 Fiber Optic Cable LC/LC 10 m

- A 50.0/125 micrometer fiber optic cable can also be used, subject to distance limitations. An OM3 cable is strongly recommended for use with 10 Gb iSCSI.

- 12 Gb SAS: DCS3860 requires a mSAS HD cable terminated with a SFF-8644 connector. For SAS connectivity, the following cables can be ordered with the DCS3860 control enclosure model:
  - 1.5 m SAS cable (mSAS HD to mSAS)
  - 3 m SAS cable (mSAS HD to mSAS)
  - 1.5 m SAS cable (mSAS HD to mSAS HD)
  - 3 m SAS cable (mSAS HD to mSAS HD)

Management cables are required if the DCS3860 configuration will be managed out of band using the 1 Gb Ethernet management ports. The DCS3860 requires a Category 5 or a higher grade 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 DCS3860.

**Security, auditability, and control**

This product uses the security and auditability features of host hardware, host software, 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.
**Global Technology Services**

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings, for the efficient installation, implementation, and/or integration of this product.

**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**

**Volume orders**

Contact your IBM representative.

**Products - terms and conditions**

**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 that 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 are the same as those for the machine in which 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-specific 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:

- Controller
- Bezel
- Backup battery module
- Fans
- Rail kit
- Chassis handle
- AC power cord
- AC power supply
- Disk drive
- Cables
- Memory modules

The following parts have been designated as Tier 2 CRU parts:

- Host Interface Adapter

**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:

- 9 hours per day, Monday through Friday, excluding public or national holidays, next business day response. Calls must be received by 15:00 local time in order to qualify for next business day response.

**Non-IBM parts service**

**Warranty service**

IBM is now shipping machines with selected non-IBM parts that contain an IBM field replaceable unit (FRU) part number label. These parts are to be serviced during the IBM machine warranty period. IBM is covering the service on these selected non-IBM parts as an accommodation to their customers, and normal warranty service procedures for the IBM machine apply.

**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 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.

**Maintenance service options**

**CRU and On-site Service**

At IBM's discretion you will receive 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. The following on-site response-time objectives are available as warranty service upgrades for your machine. Available offerings are:

- 9 hours per day, Monday through Friday, excluding public or national holidays, same business day response. Calls must be received by 12:00 local time in order to qualify for same business day response.
- 18 hours per day, Monday through Saturday, excluding public or national holidays, same business day response. Calls must be received by 18:00 local time in order to qualify for same business day response.
- 24 hours per day, 7 days a week, 6 hour average, same day response.

ESA and SSU customers: 2 hour coverage extension at no additional charge, 9 hours per day, Monday through Friday, excluding holidays, same business day response. Calls must be received by 12:00 local time in order to qualify for same business day response.

Customer Replaceable Units (CRUs) may be provided as part of the machine's standard warranty CRU Service except that you may install a CRU yourself or request IBM installation, at no additional charge, under the CRU and On-site Service level specified above. For additional information on the CRU Service, see the warranty information.

**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 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. 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-specific and location-specific information. The following service selections are available as maintenance options for your machine type.

**Non-IBM parts service**

Under certain conditions, IBM provides services for selected non-IBM parts at no additional charge for machines that are covered under warranty service upgrades or maintenance services.

This service includes hardware problem determination (PD) on the non-IBM parts (for example, adapter cards, PCMCIA cards, disk drives, memory) installed within IBM machines and provides the labor to replace the failing parts at no additional charge.

If IBM has a Technical Service Agreement with the manufacturer of the failing part, or if the failing part is an accommodations part (a part with an IBM FRU label), IBM may also source and replace the failing part at no additional charge. For all other non-IBM parts, customers are responsible for sourcing the parts. Installation labor is provided at no additional charge, if the machine is covered under a warranty service upgrade or a maintenance service.

**Usage plan machine**

No

**IBM hourly service rate classification**

Two

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.

**Maintenance service offerings**

These machines are eligible under terms and conditions of IBM ServiceElite, the IBM Enterprise Service Agreement (ESA), or the IBM Maintenance Agreement. Consult your IBM representative for details.

**General terms and conditions**

**Field-installable features**

Yes

**Model conversions**

No

**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 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


Access to Machine Code updates is conditioned on entitlement and license validation in accordance with IBM policy and practice. IBM may verify entitlement through customer number, serial number, electronic restrictions, or any other means or methods employed by IBM in its discretion.

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.

**Prices**

For all local charges, contact your IBM representative.

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**Corrections**

*(Corrected on June 2, 2015)*

The information in the Cable orders section for the 12 Gb SAS option has been updated.