IBM System Storage DS3000 series offers new DS3500 storage controllers and EXP3500 expansion units delivering high-performance and increased scalability

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At a glance

The IBM® System Storage™ DS3512 and DS3524 Express Storage™ Systems feature:

- Single or dual-active intelligent array controllers with a Turbo Performance option
- 6 Gb SAS host ports standard with optional 8 Gb FC or 1 Gb iSCSI host ports
- 12 (3.5-inch) or 24 (2.5-inch) SAS disk drive bays, with support for 96 disk drives with the attachment of EXP3500 expansion units
- Data security option with Full Disk Encryption (FDE) providing disk drive-level encryption
- Data replication options with FlashCopy®, Volume Copy, and Remote Mirroring over Fibre Channel
- IBM DS Storage Manager for administrative and management activities

The IBM System Storage EXP3512 and EXP3524 Express® Expansion Units feature:

- Single or dual-active environmental services modules (ESMs)
- 12 (3.5-inch) or 24 (2.5-inch) SAS disk drives bays
- 6 Gb SAS attachment to the DS3500 storage system or another EXP3500 expansion unit

All models of the DS3500 and EXP3500 feature:

- Compact, 2U, 19-inch rack mount enclosure
- Dual port, hot-swappable 6 Gb SAS high performance, high-capacity nearline, and self-encrypting (SED) disk drives
- Redundant, hot-swappable hardware components
- Three year warranty with customer replaceable units (CRU) and on-site service, along with optional warranty service upgrades

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 DS3500 Express Storage Systems and EXP3500 Express Expansion Units are the newest addition to the IBM System Storage DS3000 series family of entry disk storage systems. The DS3500 delivers affordable, entry-level

configurations for small and medium businesses in compact 2U, 19-inch rack mount enclosures, with the flexibility to scale in capacity, performance, host interfaces, and functions as your business grows or requirements change.

The DS3500 combines next-generation controller technology with a 6 gigabit per second (Gb) SAS interconnect to the disk drives and the latest, high-performance host interface technologies - 6 Gb SAS and 8 Gb Fibre Channel (FC) - to deliver new levels of performance to the DS3000 series. The DS3500 is available with single or dual controllers, with the option to further enhance the performance of your dual controller system with the Turbo Performance option. You choose the configuration to match your current performance requirements and budget, and IBM offers a way to protect your investment with an upgrade path to later add the options you need.

In addition to 6 Gb SAS and 8 Gb FC host interfaces, the DS3500 also supports 1 Gb iSCSI. You can intermix FC or iSCSI concurrently with SAS, giving you the flexibility to address your shared storage requirements within a single system.

The DS3500 flexibility and options also extends to the disk drives. The DS3500 is available in two models:

- The DS3512 Express Storage System holds up to twelve 3.5-inch SAS disk drives
- The DS3524 Express Storage System holds up to twenty-four 2.5-inch (small form factor) SAS disk drives

The capacity of a DS3500 system can be increased to up to 96 disk drives with the attachment of EXP3500 expansion units, also available in two models:

- The EXP3512 Express Expansion Unit holds up to twelve 3.5-inch SAS disk drives
- The EXP3524 Express Expansion Unit holds up to twenty-four 2.5-inch (small form factor) SAS disk drives

All models support dual-port, 6 Gb SAS high-performance, high-capacity nearline, and self-encrypting drives. Disk drives of the same form factor can be intermixed within the appropriate DS3500 or EXP3500 enclosure. You can even intermix EXP3512 and EXP3524 expansion units behind either a DS3512 or DS3524 storage system.

The DS3500 carries on the tradition of DS3000 series data protection features with support for multiple RAID levels (0 1, 3, 5, 6, and 10), storage partitions to manage volume-to-host access, and FlashCopy and Volume Copy to create logical or physical copies of your data.

The DS3500 brings the following new functions into the DS3000 series family:

- Remote Mirroring for data replication from one DS3500 system to another DS3500 system using either synchronous or asynchronous data transfers over FC communication links
- Full Disk Encryption (FDE) with local key management and self-encrypting disk drives (SED) for comprehensive data security and protection
- IBM DS Storage Manager, previously available only on the IBM System Storage DS4000™ and IBM System Storage DS5000 products, brings new robustness and functionality while maintaining the ease-of-use and intuitive nature of the DS3000 Storage Manager

Feature exchange

None

Key prerequisites

The DS3500 is supported for attachment to selected:

- IBM System x®, IBM BladeCenter®, and IBM Power® System servers and blades

- Intel® and AMD processor-based servers
- HP Itanium® and PA-RISC 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

June 15, 2010

Description

Introducing the IBM System Storage DS3500 and EXP3500

The IBM System Storage DS3500 Express Storage Systems and EXP3500 Express Expansion Units are the newest addition to the IBM System Storage DS3000 series family of entry disk storage systems. The DS3500 delivers affordable, entry-level configurations for small and medium businesses in compact 2U, 19-inch rack mount enclosures, with the flexibility to scale in capacity, performance, host interfaces, and advanced functions as your business grows or requirements change.

The DS3500 is available in two models:

- **IBM System Storage DS3512 Express Storage System**
  - Single or dual controllers
  - 6 Gb Serial Attached SCSI (SAS) host interface with optional 8 Gb Fibre Channel (FC) or 1 Gb iSCSI host interfaces
  - 1 GB or 2 GB cache (per controller)
  - Twelve 3.5-inch 6 Gb SAS disk drives bays
  - Support for 96 disk drives through the attachment of EXP3500 expansion units

- **IBM System Storage DS3524 Express Storage System**
  - Single or dual controllers
  - 6 Gb SAS host interfaces with optional 8 Gb Fibre Channel or 1 Gb iSCSI host interfaces
  - 1 GB or 2 GB cache (per controller)
  - Twenty-four 2.5-inch SAS disk drive bays
  - Support for 96 disk drives through the attachment of EXP3500 expansion units

The EXP3500 is available in two models:

- **IBM System Storage EXP3512 Express Expansion Unit**
  - Single or dual environmental services modules (ESM)
  - 6 Gb SAS connection to the DS3500 storage system or another EXP3500 expansion unit
  - Twelve 3.5-inch SAS disk drive bays

- **IBM System Storage EXP3524 Express Expansion Unit**
  - Single or dual environmental services modules (ESM)
  - 6 Gb SAS connection to the DS3500 storage system or another EXP3500 expansion unit
  - Twenty-four 2.5-inch SAS disk drive bays

New technology delivers new levels of performance

The DS3500 combines next-generation controller technology with the latest, high-performance host interface technologies to deliver new levels of performance to the DS3000 series.

The DS3500 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. This balanced performance, combined with the ability to handle concurrent workloads, makes the DS3500 a great fit for consolidation and virtualization environments.

With the DS3500, you choose the initial system configuration that matches your performance requirements and budget:

- The DS3500 with a single controller provides an entry solution with low initial investment
- The DS3500 with dual controllers offers higher performance
- The DS3500 dual controller with the Turbo Performance option offers the highest level of performance

Furthermore, the ability to later upgrade your DS3500 to dual controllers and Turbo performance options offers a way to protect your initial investment in a DS3500 entry solution.

Latest host interface technologies with intermix flexibility

The DS3500 brings the latest host interface technologies, 6 Gb per second SAS and 8 Gb per second Fibre Channel, to the DS3000 series family. Along with 1 Gb per second iSCSI support and the capability to intermix host interface technologies, the DS3500 is designed to address your shared storage requirements within a single system.

- Second-generation, 6 Gb SAS builds upon the solid foundation of 3 Gb SAS with performance improvements and reliability enhancements. With direct attachment support and the capability to be shared by multiple host servers, the DS3500 with SAS provides ease-of-use and simplicity at an affordable price.
- Fibre Channel, a mature and proven technology now available at 8 Gb, is the host interface of choice for high performance environments. The DS3500 with Fibre Channel allows you to exploit the benefits offered by a SAN environment.
- iSCSI allows you to capitalize your existing IT skills and infrastructure by delivering block-based storage across the IP network. The DS3500 with iSCSI provides an alternative to direct attach SAS or the investment in a storage-only, Fibre Channel infrastructure.

SAS host interface ports are standard on all DS3500 models. You have the option to add more SAS ports or alternatively, you can add FC ports or iSCSI ports into the same DS3500 system with your SAS ports. The following configurations are available:

```
        Single Controller        Dual Controller
     _____      _____

     6 Gb   8 Gb   1 Gb       6 Gb   8 Gb   1 Gb
     SAS    FC     iSCSI      SAS    FC     iSCSI
     Ports  Ports  Ports      Ports  Ports  Ports

     _____  _____  _____      _____  _____  _____
     2      --     --         4      --     --
     4      --     --         8      --     --
     2      4      --         4      8      --
     2      --     4          4      --     8
```

Tiered storage options with high performance and nearline SAS disk drives

With support for mixed disk drives within a single system, the DS3500 is designed to support your complete range of data storage requirements, from highly-utilized applications to high-capacity, low usage applications.

The DS3500 supports the following dual-port, hot-swappable 6 Gb SAS disk drives:

- High-performance, enterprise class drives
  - 3.5-inch: 300 GB, 450 GB, and 600 GB 15,000 rpm
  - 2.5-inch: 146 GB 15,000 rpm and 300 GB 10,000 rpm

- High-capacity, archival-class nearline drives
  - 3.5-inch: 1 TB and 2 TB 7,200 rpm
  - 2.5-inch: 500 GB 7,200 rpm

- Self-encrypting drives (SED) for data security
  - 3.5-inch: 600 GB 15,000 rpm
  - 2.5-inch: 300 GB 10,000 rpm

All disk drives of the same form factor can be intermixed within the appropriate DS3500 or EXP3500 enclosure. Up to 96 disk drives are supported by a single DS3500 storage system with attachment of EXP3500 expansion units, doubling the scalability available, offered by the other DS3000 products. Additional disk drives and expansion units are designed to be dynamically added with virtually no downtime, helping you to quickly and seamlessly respond to your ever-growing capacity demands.

You can even intermix both EXP3512 and EXP3524 expansion units behind either a DS3512 or DS3524 storage system. This gives you the added flexibility to mix 3.5-inch and 2.5-inch disk drives within a single system to meet your specific needs.

Energy saving implementations for cost savings today and tomorrow

The DS3500 was developed with energy savings features designed to help reduce power consumption and provide a lower overall total cost of ownership:

- High-efficiency power supplies designed to meet power efficiency standards for reduce power consumption
- Small form factor (2.5-inch) disk drives which deliver comparable I/O performance when compared to 3.5-inch disk drives, but require less space and consume less power

And the DS3500 controller technology creates performance value by getting the most performance out of the fewest disk drives. This reduces the number of disk drives needed to meet performance and capacity demands, resulting in lower acquisition and operational expenditures.

High availability with new data protection and security options

The DS3500 carries on the DS3000 series legacy of 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 hardware, including power supplies and fans
- Hot-swappable and customer replaceable components
- Automated path failover support for the data path between the server and the disk drives

And, the DS3500 carries on the tradition of DS3000 series data protection features with:

- **RAID** levels 0, 1, 3, 5, 6, and 10 provide you the flexibility to choose the level of protection required
- **Storage partitions** that logically divide a single DS3500 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

The DS3500 brings the following new data protection and data security options into the DS3000 series family:

- **Remote Mirroring** to provide storage system-based data replication from one DS3500 system to another DS3500 system using either synchronous or asynchronous data transfers over Fibre Channel communication links.
- **Full Disk Encryption (FDE)** provides local key management and disk drive-level encryption for comprehensive data security and protection. The DS3500 locally manages and protects the self-encrypting drives (SED) by utilizing a single authorization scheme (or lock key) that can be set and applied to all SED drives within a DS3500. The DS Storage Manager maintains and controls the key linkage and communications with the SED drives, secures user-selected logical drive groups, and can even initiate an instant secure erase feature when servicing, decommissioning, or repurposing drives. The DS3500 FDE engine performs encryption without a performance penalty, which allows you to achieve new levels of data security without sacrificing performance. With these encryption services, FDE key management is transparent to day-to-day storage administration, making SED drives as easy to manage as traditional drives.

Intuitive storage management with the IBM DS Storage Manager

The **IBM DS Storage Manager** provides a powerful, yet easy-to-use and intuitive graphical user interface (GUI) for DS3500 administrative activities, including configuration, reconfiguration, expansion, and routine maintenance, as well as performance tuning and management of advanced functions, such as data replication and Full Disk Encryption (FDE) keys. The DS Storage Manager extends the robustness and functionality of storage management previously only available on the DS4000 and DS5000 products to the DS3500, while maintaining the ease-of-use and intuitive nature of the DS3000 Storage Manager. It provides a complete physical view of your DS3500, but with expertise built into the interface and automated policy decisions, you no longer have to contend with low-level activities. With DS Storage Manager, dynamic and other high functionality capabilities are now available for the DS3500 through the GUI functions available only via the Command Line Interface (CLI).

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 DS3500 moving volumes to a different disk drive technology or RAID level.

Both FlashCopy and Volume Copy are performed by DS3500 storage system, so no host server resources are used.

Remote Mirroring provides storage system-based data replication from one DS3500 system to another DS3500 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.

IBM System Storage DS3500

Base models consist of the following components:

IBM System Storage DS3512 - Single Controller (Model C2A with feature 2801 (Part number/SEO 1746A2S)):

- 2U, 19-inch rack mount enclosure
- One intelligent array controller with 1 GB cache
- Two 6 Gb SAS host interface ports
- One 6 Gb SAS port for attachment of an EXP3500 expansion unit
- Two Ethernet ports for system management
- Twelve bays for 3.5-inch SAS disk drives
- Two AC power supplies and cooling units
- Two 2.8 meter rack power distribution (PDU) line cords (C13 to C14)

IBM System Storage DS3512 - Dual Controller (Model C2A with feature 2802 (Part number/SEO 1746A2D)):

- 2U, 19-inch rack mount enclosure
- Two intelligent array controllers with 2 GB cache (1 GB per controller)
- Four 6 Gb SAS host interface ports (two per controller)
- Two 6 Gb SAS ports for attachment of an EXP3500 expansion unit (one per controller)
- Four Ethernet ports for system management (two per controller)
- Twelve bays for 3.5-inch SAS disk drives
- Dual AC power supplies and cooling units
- Two 2.8 meter rack power distribution (PDU) line cords (C13 to C14)

IBM System Storage DS3524 - Single Controller (Model C4A with feature 2811 (Part number/SEO 1746A4S)):

- 2U, 19-inch rack mount enclosure
- One intelligent array controller with 1 GB cache
- Two 6 Gb SAS host interface ports
- One 6 Gb SAS port for attachment of an EXP3500 expansion unit
- Two Ethernet ports for system management
- Twenty-four bays for 2.5-inch SAS disk drives
- Two AC power supplies and cooling units
- Two 2.8 meter rack power distribution (PDU) line cords (C13 to C14)

IBM System Storage DS3524 - Dual Controller (Model C4A with feature 2812 (Part number/SEO 1746A4D)):

- 2U, 19-inch rack mount enclosure.
- Two intelligent array controllers with 2 GB cache (1 GB per controller).
- Four 6 Gb SAS host interface ports (two per controller).
- Two 6 Gb SAS ports for attachment of an EXP3500 expansion unit one per controller).
- Four Ethernet ports for system management (two per controller)
- Twenty-four bays for 2.5-inch SAS disk drives
- Two AC power supplies and cooling units
- Two 2.8 meter rack power distribution (PDU) line cords (C13 to C14)

All models of the DS3500 include the following functions at no additional charge:

- RAID levels 0, 1, 3, 5, 6, and 10
- Storage partitions (four partitions per system)
- FlashCopy (two active FlashCopy images per system)
- Host attachment support for Microsoft Windows®, Linux® on Intel, and VMware
- DS Storage Manager
- Support for 96 disk drives through attachment of EXP3512 and/or EXP3524 expansion units

The following optional features are available on the DS3500. Refer to the Product number section for feature numbers and part numbers:

- 6 Gb SAS 2 port daughter card
- 8 Gb FC 4 port daughter card (with two SFP transceivers)
- 1 Gb iSCSI 4 port daughter card
- 3.5-inch 6 Gb SAS disk drives:
  - High performance, enterprise class drives - 300 GB, 450 GB, and 600 GB 15,000 rpm
  - High-capacity, archival-class nearline drives - 1 TB and 2 TB 7,200 rpm
  - Self-encrypting drives (SED) for data security - 600 GB 15,000 rpm
- 2.5-inch 6 Gb SAS disk drives:
  - High performance, enterprise class drives - 146 GB 15,000 rpm and 300GB 10,000 rpm
  - High-capacity, archival-class nearline drives - 500 GB 7,200 rpm
  - Self-encrypting drives (SED) for data security - 300 GB 10,000 rpm
- Second controller (for single controller systems)
- 1 GB to 2 GB cache upgrade (per controller)
- Turbo Performance
- Full Disk Encryption (FDE)
- 8, 16, 32, or 64 partitions per system
- 4 or 8 active FlashCopy images per volume (64 per system)
- Volume Copy
- Remote Mirroring
- Host kits for AIX/VIOS, Linux on Power, and HP-UX
- FC SFP transceivers
- SAS and fiber optic host attachment cables
- Wall outlet line cords

IBM System Storage EXP3500

Base models consist of the following components:

IBM System Storage EXP3512 (Model E2A with feature 2821 (Part number/SEO 1746A2E)):

- 2U, 19-inch rack mount enclosure
- One Environmental Services Module (ESM)
- One 6 Gb SAS "out" port for attachment to a DS3500 storage system or another EXP3500 expansion unit
- Two 6 Gb SAS "in" ports for attachment of another EXP3500 expansion unit
- Twelve bays for 3.5-inch SAS disk drives
- Two AC power supplies and cooling units.
- Two 2.8 meter rack power distribution (PDU) line cords (C13 to C14)

IBM System Storage EXP3524 (Model E4A with feature 2822 (Part number/SEO 1746A4E)):

- 2U, 19-inch rack mount enclosure
- One Environmental Services Module (ESM)
- One 6 Gb SAS "out" port for attachment to a DS3500 storage system or another EXP3500 expansion unit
- Two 6 Gb SAS "in" ports for attachment of another EXP3500 expansion unit
- Twenty-four bays for 2.5-inch SAS disk drives
- Two AC power supplies and cooling units.
- Two 2.8 meter rack power distribution (PDU) line cords (C13 to C14)

The following optional features are available on the EXP3500. Refer to the Product number section for feature numbers and part numbers:

- Environmental Services Module (ESM) with one 6 Gb SAS "out" port and two 6 Gb SAS "in" ports
- 3.5-inch 6 Gb SAS disk drives:
  - High performance, enterprise class drives - 300 GB, 450 GB, and 600 GB 15,000 rpm
  - High-capacity, archival-class nearline drives - 1 TB and 2 TB 7,200 rpm.
  - Self-encrypting drives (SED) for data security - 600 GB 15,000 rpm
- 2.5-inch 6 Gb SAS disk drives:
  - High performance, enterprise class drives - 146 GB 15,000 rpm and 300GB 10,000 rpm
  - High-capacity, archival-class nearline drives - 500 GB 7,200 rpm
  - Self-encrypting drives (SED) for data security - 300 GB 10,000 rpm
- SAS expansion unit attachment cables
- Wall outlet line cords

Accessibility by people with disabilities

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

  http://www-03.ibm.com/able/product_accessibility/index.html

Section 508 of the U.S. Rehabilitation Act

The IBM System Storage DS3500 Storage Systems and EXP3500 Expansion Units are capable as of June 15, 2010, when used in accordance with IBM's associated

documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it.

Product number

Description	Mach type	Model	Feature	SEO number
IBM System Storage DS3512 (Single controller, two 6 Gb SAS ports, 1 GB cache)	1746	C2A	2801	1746A2S
IBM System Storage DS3512 (Dual controller, four 6 Gb SAS ports, 2 GB cache)	1746	C2A	2802	1746A2D
IBM System Storage DS3524 (Single controller, two 6 Gb SAS ports, 1 GB cache)	1746	C4A	2811	1746A4S
IBM System Storage DS3524 (Dual controller, four 6 Gb SAS ports, 2 GB cache)	1746	C4A	2812	1746A4D
IBM System Storage EXP3512 (Expansion unit, single ESM)	1746	E2A	2821	1746A2E
IBM System Storage EXP3524 (Expansion unit, single ESM)	1746	E4A	2822	1746A4E
3.5-inch Disk Drives:				
300GB 15K 3.5-inch HDD	1746	C2A,E2A	5100	49Y1856
450GB 15K 3.5-inch HDD	1746	C2A,E2A	5105	49Y1861
600GB 15K 3.5-inch HDD	1746	C2A,E2A	5110	49Y1866
600GB 15K 3.5-inch SED HDD	1746	C2A,E2A	5150	49Y1947
1TB 7.2K 3.5-inch NL HDD	1746	C2A,E2A	5165	49Y1876
2TB 7.2K 3.5-inch NL HDD	1746	C2A,E2A	5175	49Y1871
2.5-inch Disk Drives:				
146GB 15K 2.5-inch HDD	1746	C4A,E4A	5205	49Y1841
300GB 10K 2.5-inch HDD	1746	C4A,E4A	5210	49Y1836
300GB 10K 2.5-inch SED HDD	1746	C4A,E4A	5250	49Y1952
500GB 7.2K 2.5-inch NL HDD	1746	C4A,E4A	5265	49Y1851
Host Interface Cards:				
6Gb SAS 2 Port Card	1746	C2A,C4A	3610	68Y8431
8Gb FC 4 Port Card	1746	C2A,C4A	3611	68Y8432
1Gb iSCSI 4 Port Card	1746	C2A,C4A	3612	68Y8433
Hardware Options:				
Second Controller	1746	C2A,C4A	3600	68Y8479
8Gb FC SFP SW Transceivers	1746	C2A,C4A	3620	69Y2876
2GB Cache Upgrade	1746	C2A,C4A	3630	68Y8434
Environ Svcs Module (ESM)	1746	E2A,E4A	3680	69Y0245
Licensed Functions:				
4 to 8 Partition Upgrade	1746	C2A,C4A	4300	68Y8436
4 to 16 Partition Upgrade	1746	C2A,C4A	4301	68Y8437
4 to 32 Partition Upgrade	1746	C2A,C4A	4302	68Y8438
4 to 64 Partition Upgrade	1746	C2A,C4A	4304	68Y8439
8 to 16 Partition Upgrade	1746	C2A,C4A	4310	68Y8441
8 to 32 Partition Upgrade	1746	C2A,C4A	4311	68Y8442
8 to 64 Partition Upgrade	1746	C2A,C4A	4312	68Y8443
16 to 32 Partition Upgrade	1746	C2A,C4A	4320	68Y8445
16 to 64 Partition Upgrade	1746	C2A,C4A	4321	68Y8446
32 to 64 Partition Upgrade	1746	C2A,C4A	4330	68Y8448
Turbo Performance	1746	C2A,C4A	4400	69Y2871

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Full Disk Encryption (FDE)          1746   C2A,C4A  4410    68Y8490
FlashCopy: Base                     1746   C2A,C4A  4420    68Y8451
FlashCopy: 8/64 Upgrade             1746   C2A,C4A  4421    68Y8452
Volume Copy: Base                   1746   C2A,C4A  4430    68Y8453
FlashCopy / Volume Copy             1746   C2A,C4A  4440    68Y8454
Remote Mirroring: Base              1746   C2A,C4A  4450    68Y8455


Host Kits:
AIX/VIOS Host Kit                   1746   C2A,C4A  4700    68Y8458
Linux on Power Host Kit             1746   C2A,C4A  4710    68Y8459
HP-UX Host Kit                      1746   C2A,C4A  4720    68Y8461

Host and Expansion Unit Attachment Cables:
3m SAS Cable                        1746   C2A,C4A, 3707    39R6531 *
                                           E2A,E4A
1m SAS Cable                        1746   C2A,C4A, 3708    39R6529 *
                                           E2A,E4A
1m Fiber Cable (LC-LC)              1746   C2A,C4A  5601    39M5696 *
5m Fiber Cable (LC-LC)              1746   C2A,C4A  5605    39M5697 *
25m Fiber Cable (LC-LC)             1746   C2A,C4A  5625    39M5698 *

Line Cords:
Line Cord (China)                   1746   C2A,C4A, 6210    39Y7928 *
                                           E2A,E4A
Line Cord (Australia/NZ)            1746   C2A,C4A, 6211    39Y7924 *
                                           E2A,E4A
Line Cord (Europe)                  1746   C2A,C4A, 6212    39Y7917 *
                                           E2A,E4A
Line Cord (Denmark)                 1746   C2A,C4A, 6213    39Y7918 *
                                           E2A,E4A
Line Cord (S Africa)                1746   C2A,E4A, 6214    39Y7922 *
                                           E2A,E4A
Line Cord (UK)                      1746   C2A,C4A, 6215    39Y7923 *
                                           E2A,E4A
Line Cord (Swiss)                   1746   C2A,C4A, 6216    39Y7919 *
                                           E2A,E4A
Line Cord (Italy)                   1746   C2A,C4A, 6217    39Y7921 *

Line Cord (Israel)                  1746   C2A,C4A, 6218    39Y7920 *
                                           E2A,E4A
Line Cord (Argentina)               1746   C2A,C4A, 6222    39Y7930 *
                                           E2A,E4A
Line Cord (Brazil)                  1746   C2A,C4A, 6223    69Y1988 *
                                           E2A,E4A
Line Cord (India)                   1746   C2A,C4A, 6269    39Y7927 *
                                           E2A,E4A
Line Cord (US)                      1746   C2A,C4A, 6313    69Y2909
                                           E2A,E4A
Line Cord (Japan)                   1746   C2A,C4A, 6314    23R6982 *
                                           E2A,E4A
Line Cord (Taiwan)                  1746   C2A,C4A, 6386    23R7158 *
                                           E2A,E4A
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* These SEO numbers have been previously announced on other machine-type/ models and are shown here only for completeness of the product structure.

Publications

The following DS3500 publications are available:

- IBM Systems Storage DS3500 and EXP3500 Rack Installation and Quick Start Guide
- IBM Systems Storage DS3500 and EXP3500 Installation, User's, and Maintenance Guide
- IBM System Storage DS® Storage Manager Version 10 Installation and Host Support Guide
- IBM System Storage DS Storage Manager Version 10.70 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-RS2 Quick Reference
- IBM Remote Support Manager Version 2.4 Planning, Installation, and User's Guide

The most up-to-date product documentation is available and downloadable from the following IBM 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

   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.

Technical information

Specified operating environment

Physical specifications
DS3512 and EXP3512

- Height: 8.6 cm (3.4 in)
- Width: 44.9 cm (17.7 in)
- Depth: 54.0 cm (21.3 in)
- DS3512 approximate weight:
  - Empty: 8.5 kg (18.5 lb)
  - Fully configured: 27.0 kg (59.6 lb)
- EXP3512 approximate weight:
  - Empty: 8.5 kg (18.5 lb)
  - Fully configured: 26.3 kg (57.9 lb)

DS3524 and EXP3524

- Height: 8.8 cm (3.5 in)
- Width: 44.9 cm (17.7 in)
- Depth: 48.7 cm (19.2 in)
- DS3524 approximate weight:
  - Empty: 10.7 kg (23.6 lb)
  - Fully configured: 25.9 kg (57.2 lb)
- EXP3524 approximate weight:
  - Empty: 10.7 kg (23.6 lb)
  - Fully configured: 25.2 kg (55.5 lb)

To assure installability and serviceability in non-IBM industry-standard racks, review the IBM Systems Storage DS3500 and EXP3500 Rack Installation and Quick Start Guide (part number 49Y8727) for any product-specific installation requirements.

Operating environment

Temperature:

- Operating: 0 to 35° C (32 to 95° F) at 30.5 to 3,000 m (100 to 9,840 ft)
- Non-operating: -10 to 50° C (-14 to 120° F)

Relative humidity:

- Operating: 20% to 80%
- Non-operating: 10% to 90%

Electrical power:

- Voltage range: 100-240 V ac
- Frequency: 50-60 HZ
- Power:
  - DS3512: 382 watts
  - DS3524: 330 watts
  - EXP3512: 276 watts
  - EXP3524: 240 watts

Heat dissipation (BTU per hour):

- DS3512: 1,307
- DS3524: 1,127
- EXP3512: 945
- EXP3524: 821

Maximum noise level (normal operation):

- DS3512 and EXP3512: 6.2 bels
- DS3524 and EXP3524: 6.4 bels

Hardware requirements

The DS3500 requires:

- Controller firmware level 7.70, or later
- DS Storage Manager version 10.70, or later

Refer to the DS3500 product documentation and the IBM Systems Support site for additional information on firmware levels and other requirements

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

Software requirements

None

Compatibility

Refer to the IBM System Storage Interoperation Center SSIC) for a comprehensive list of environments, devices, and configurations supported by the DS3500

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

Limitations

None

Planning information

Customer responsibilities

Physical configuration and installation planning, along with machine set up and configuration, are customer responsibilities. Refer to the *IBM Systems Storage DS3500 and EXP3500 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 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

DS3500 Host Attachment

Host attachment cables are required to connect DS3500 host ports to server or fabric ports. As a convenience, a limited selection of cables can be ordered with your DS3500. Refer to the Product number section for feature numbers and part 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 DS3500 requires a mini SAS 4x cable terminated with an SFF-8088 connector. The following SAS cables can be ordered with your DS3500:

- 1 m SAS Cable
- 3 m SAS Cable

Fibre Channel: The DS3500 requires 50.0/125 micrometer fiber optic cable terminated with an LC Duplex connector. The following fiber optic cables can be ordered with your DS3500:

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

iSCSI: The DS3500 requires a Category 5 or Category 5E Ethernet cable terminated with a 8P8C modular connector (RJ45 compatible connector). This cable must be customer-supplied and is not available for ordering with your DS3500.

DS3500 Expansion Unit Attachment

Expansion unit cables are required to connect a EXP3500 expansion unit to the DS3500 storage system or another EXP3500 expansion unit. As a convenience, a limited selection of cables can be ordered with your EXP3500. Refer to the Product number section for feature numbers and part numbers.

The EXP3500 requires a mini SAS 4x cable terminated with an SFF-8088 connector. The following SAS cables can be ordered with your EXP3500:

- 1 m SAS Cable
- 3 m SAS Cable

DS3500 Management

Cables are required if the DS3500 configuration will be managed "out of band" using the 1 Gb Ethernet management ports. The DS3500 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 DS3500.

Direct customer support

Direct customer support for DS3000 Disk Systems is provided by IBM Operational Support Services--Support Line. This fee service provides voice and electronic access into the IBM support organization. IBM Operational Support Services--Support Line helps answer questions pertaining to product and feature usage ("how to"), configuration, and product compatibility for eligible products. For a list of the products supported via Support Line, visit

http://www.ibm.com/services/sl/products/

For more information on services, call 800-IBM-4YOU (426-4968).

Security, auditability, and control

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

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

Volume orders: Contact your IBM representative.

IBM Global Financing

Yes

Warranty period and warranty service

Warranty period

- System (including the cache backup battery module): Three years
- Optional features: Three years, unless specified otherwise

Optional IBM features initially installed in an IBM system carry the same warranty and warranty service support category as the system. If installed after the initial system installation, they carry the balance of the system warranty or the optional feature warranty, whichever is greater.

Warranty service

Customer Replaceable Unit (CRU) and On-Site 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

```
Bezel
Cache
Cache backup battery module
Controller
Disk drive
Filler panel
I/O adapter
I/O cable
I/O transceiver
Line cord
Power supply unit
Rack kit
Services module
```

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 holidays, next business day response. Calls must be received by 5 p.m. local time in order to qualify for next business day response.

International Warranty Service

International Warranty Service (IWS) is available in selected countries or regions.

The warranty service type and the service level provided in the servicing country may be different from that provided in the country in which the machine was purchased.

Under IWS, warranty service will be provided with the prevailing warranty service type and service level available for the IWS-eligible machine type in the servicing country, and the warranty period observed will be that of the country in which the machine was purchased.

To determine the eligibility of your machine and to view a list of countries where service is available, visit

    http://www-304.ibm.com/jct01004c/systems/support/supportsite.wss/warrantyform?brandind=5000008

For more information on IWS, refer to Services Announcement 601-034, dated September 25, 2001.

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 service 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.

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. 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 holidays, 4 hour average, same business day response
- 24 hours per day, 7 days a week, 4 hour average response
- 24 hours per day, 7 days a week, 2 hour average 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 one of the On-site Service levels 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 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
- 24 hours per day, 7 days a week, 4 hour average response

- 24 hours per day, 7 days a week, 2 hour average response

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 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.

IBM hourly service rate classification

Three

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

http://www.ibm.com/servers/eserver/support/machine_warranties/ machine_code.html

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

None

Pricing

Product charges

The following are newly announced features on specified models of IBM machine type 1746.

```
                                    Model     Feature SEO      Install
        Description                 number    number  number   type **

IBM System Storage DS3512           C2A       2801    1746A2S
(Single controller)

IBM System Storage DS3512           C2A       2802    1746A2D
(Dual controller)

IBM System Storage DS3524           C4A       2811    1746A4S
(Single controller)

IBM System Storage DS3524           C4A       2812    1746A4D
(Dual controller)

IBM System Storage EXP3512          E2A       2821    1746A2E

IBM System Storage EXP3524          E4A       2822    1746A4E

3.5-inch Disk Drives:
300GB 15K 3.5-inch HDD              C2A,E2A   5100    49Y1856  Both
450GB 15K 3.5-inch HDD              C2A,E2A   5105    49Y1861  Both
600GB 15K 3.5-inch HDD              C2A,E2A   5110    49Y1866  Both
600GB 15K 3.5-inch SED HDD          C2A,E2A   5150    49Y1947  Both
1TB 7.2K 3.5-inch NL HDD            C2A,E2A   5165    49Y1876  Both
2TB 7.2K 3.5-inch NL HDD            C2A,E2A   5175    49Y1871  Both

2.5-inch Disk Drives:
146GB 15K 2.5-inch HDD              C4A,E4A   5205    49Y1841  Both
300GB 10K 2.5-inch HDD              C4A,E4A   5210    49Y1836  Both
300GB 10K 2.5-inch SED HDD          C4A,E4A   5250    49Y1952  Both
500GB 7.2K 2.5-inch NL HDD          C4A,E4A   5265    49Y1851  Both

Host Interface Cards:
6Gb SAS 2 Port Card                 C2A,C4A   3610    68Y8431  Both
8Gb FC 4 Port Card                  C2A,C4A   3611    68Y8432  Both
1Gb iSCSI 4 Port Card               C2A,C4A   3612    68Y8433  Both

Hardware Options:
Second Controller                   C2A,C4A   3600    68Y8479  Field
8Gb FC SFP SW Transceivers          C2A,C4A   3620    69Y2876  Both
2GB Cache Upgrade                   C2A,C4A   3630    68Y8434  Both
Environ Svcs Module (ESM)           E2A,E4A   3680    69Y0245  Both

Licensed Functions:
4 to 8 Partition Upgrade            C2A,C4A   4300    68Y8436  Both
4 to 16 Partition Upgrade           C2A,C4A   4301    68Y8437  Both
4 to 32 Partition Upgrade           C2A,C4A   4302    68Y8438  Both
4 to 64 Partition Upgrade           C2A,C4A   4304    68Y8439  Both
8 to 16 Partition Upgrade           C2A,C4A   4310    68Y8441  Field
8 to 32 Partition Upgrade           C2A,C4A   4311    68Y8442  Field
8 to 64 Partition Upgrade           C2A,C4A   4312    68Y8443  Field
16 to 32 Partition Upgrade          C2A,C4A   4320    68Y8445  Field
16 to 64 Partition Upgrade          C2A,C4A   4321    68Y8446  Field
32 to 64 Partition Upgrade          C2A,C4A   4330    68Y8448  Field
Turbo Performance                   C2A,C4A   4400    69Y2871  Both
Full Disk Encryption (FDE)          C2A,C4A   4410    68Y8490  Both
```

```
FlashCopy: Base                 C2A,C4A   4420   68Y8451  Both
FlashCopy: 8/64 Upgrade         C2A,C4A   4421   68Y8452  Both
Volume Copy: Base               C2A,C4A   4430   68Y8453  Both
FlashCopy / Volume Copy         C2A,C4A   4440   68Y8454  Both
Remote Mirroring: Base          C2A,C4A   4450   68Y8455  Both


Host Kits:
AIX/VIOS Host Kit               C2A,C4A   4700   68Y8458  Both
Linux on Power Host Kit         C2A,C4A   4710   68Y8459  Both
HP-UX Host Kit                  C2A,C4A   4720   68Y8461  Both

Host and Expansion Unit Attachment Cables:
3m SAS Cable                    C2A,C4A,  3707   39R6531* Both
                                E2A,E4A
1m SAS Cable                    C2A,C4A,  3708   39R6529* Both
                                E2A,E4A
1m Fiber Cable (LC-LC)          C2A,C4A   5601   39M5696* Both
5m Fiber Cable (LC-LC)          C2A,C4A   5605   39M5697* Both
25m Fiber Cable (LC-LC)         C2A,C4A   5625   39M5698* Both

Line Cords:
Line Cord (China)               C2A,C4A,  6210   39Y7928* Both
                                E2A,E4A
Line Cord (Australia/NZ)        C2A,C4A,  6211   39Y7924* Both
                                E2A,E4A
Line Cord (Europe)              C2A,C4A,  6212   39Y7917* Both
                                E2A,E4A
Line Cord (Denmark)             C2A,C4A,  6213   39Y7918* Both
                                E2A,E4A
Line Cord (S Africa)            C2A,E4A,  6214   39Y7922* Both
                                E2A,E4A
Line Cord (UK)                  C2A,C4A,  6215   39Y7923* Both
                                E2A,E4A
Line Cord (Swiss)               C2A,C4A,  6216   39Y7919* Both
                                E2A,C4A
Line Cord (Italy)               C2A,C4A,  6217   39Y7921* Both
                                E2A,E4A
Line Cord (Israel)              C2A,C4A,  6218   39Y7920* Both
                                E2A,E4A
Line Cord (Argentina)           C2A,C4A,  6222   39Y7930* Both
                                E2A,E4A
Line Cord (Brazil)              C2A,C4A,  6223   69Y1988* Both
                                E2A,E4A
Line Cord (India)               C2A,C4A,  6269   39Y7927* Both
                                E2A,E4A
Line Cord (US)                  C2A,C4A,  6313   69Y2909  Both
                                E2A,E4A
Line Cord (Japan)               C2A,C4A,  6314   23R6982* Both
                                E2A,E4A
Line Cord (Taiwan)              C2A,C4A,  6386   23R7158* Both
                                E2A,C4A
```

* These SEO numbers have been previously announced on other machine-type/
models and are shown here only for completeness of the product structure.


```
** Install type:
 - "Plant" denotes plant installation only.
 - "Field" denotes field installation only.
 - "Both" denotes both plant and field installation.
                                     List price
       1746A2S                       $5,499
       1746A2D                       $8,799
       1746A4S                       $5,999
       1746A4D                       $9,299
       1746A2E                       $3,399
       1746A4E                       $3,999
       49Y1856                       $799
       49Y1861                       $899
       49Y1866                       $1,029
       49Y1947                       $1,369
       49Y1876                       $669
```

49Y1871	$989
49Y1841	$579
49Y1836	$579
49Y1952	$770
49Y1851	$538
68Y8431	$1,499
68Y8432	$1,599
68Y8433	$1,599
68Y8479	$3,799
69Y2876	$399
68Y8434	$2,499
69Y0245	$849
68Y8436	$1,500
68Y8437	$3,900
68Y8438	$7,700
68Y8439	$15,000
68Y8441	$2,400
68Y8442	$6,200
68Y8443	$13,500
68Y8445	$3,800
68Y8446	$11,100
68Y8448	$7,300
69Y2871	$13,700
68Y8490	$3,500
68Y8451	$2,750
68Y8452	$3,200
68Y8453	$1,995
68Y8454	$4,100
68Y8455	$8,499
68Y8458	$5,250
68Y8459	$1,000
68Y8461	$7,000
69Y2909	$10
2801	$5,499
2802	$8,799
2811	$5,999
2812	$9,299
2821	$3,399
2822	$3,999
5100	$799
5105	$899
5110	$1,029
5150	$1,369
5165	$669
5175	$989
5205	$579
5210	$579
5250	$770
5265	$538
3610	$1,499
3611	$1,599
3612	$1,599
3600	$3,799
3620	$399
3630	$2,499
3680	$849
4300	$1,500
4301	$3,900
4302	$7,700
4304	$15,000
4310	$2,400

4311	$6,200
4312	$13,500
4320	$3,800
4321	$11,100
4330	$7,300
4400	$13,700
4410	$3,500
4420	$2,750
4421	$3,200
4430	$1,995
4440	$4,100
4450	$8,499
4700	$5,250
4710	$1,000
4720	$7,000
3707	$135
3708	$119
5601	$79
5605	$129
5625	$189
6210	$10
6211	$10
6212	$10
6213	$10
6214	$10
6215	$10
6216	$10
6217	$10
6218	$10
6222	$10
6223	$10
6269	$10
6313	$10
6314	$10
6386	$10

ServicePac Offerings

DS3512 Warranty service upgrades

Machine type-Model (SEO number)	ServicePac® SEO	ServicePac PN	Description
1746-C2A (1746A2D, 1746A2S)	88Y8185	67567DM	3 year On-Site Service 9 x 5, 4 hour response
1746-C2A (1746A2D, 1746A2S)	88Y8186	67567DN	3 year On-Site Service 24 x 7, 4 hour response
1746-C2A (1746A2D, 1746A2S)	88Y8187	67567DP	3 year On-Site Service 24 x 7, 2 hour response
1746-C2A (1746A2D, 1746A2S)	88Y8188	67567DQ	5 year On-Site Service 24 x 7, 4 hour response
1746-C2A (1746A2D, 1746A2S)	88Y8189	67567DR	5 year On-Site Service 24 x 7, 2 hour response

DS3524 Warranty service upgrades

Machine type-Model (SEO number)	ServicePac SEO	ServicePac PN	Description
1746-C4A (1746A4D, 1746A4S)	88Y8198	67567DS	3 year On-Site Service 9 x 5, 4 hour response
1746-C4A (1746A4D, 1746A4S)	88Y8199	67567DT	3 year On-Site Service 24 x 7, 4 hour response
1746-C4A (1746A4D, 1746A4S)	88Y8200	67567DU	3 year On-Site Service 24 x 7, 2 hour response
1746-C4A (1746A4D, 1746A4S)	88Y8201	67567DV	5 year On-Site Service 24 x 7, 4 hour response
1746-C4A (1746A4D, 1746A4S)	88Y8202	67567DW	5 year On-Site Service 24 x 7, 2 hour response

EXP3512 Warranty service upgrades

Machine type-Model (SEO number)	ServicePac SEO	ServicePac PN	Description
1746-E2A (1746A2E)	88Y8211	67567DX	3 year On-Site Service 9 x 5, 4 hour response
1746-E2A (1746A2E)	88Y8212	67567DY	3 year On-Site Service 24 x 7, 4 hour response
1746-E2A (1746A2E)	88Y8213	67567DZ	3 year On-Site Service 24 x 7, 2 hour response
1746-E2A (1746A2E)	88Y8214	67567F0	5 year On-Site Service 24 x 7, 4 hour response
1746-E2A (1746A2E)	88Y8215	67567F1	5 year On-Site Service 24 x 7, 2 hour response

EXP3524 Warranty service upgrades

Machine type-Model (SEO number)	ServicePac SEO	ServicePac PN	Description
1746-E4A (1746A4E)	88Y8224	67567F2	3 year On-Site Service 9 x 5, 4 hour response
1746-E4A (1746A4E)	88Y8225	67567F3	3 year On-Site Service 24 x 7, 4 hour response
1746-E4A (1746A4E)	88Y8226	67567F4	3 year On-Site Service 24 x 7, 2 hour response
1746-E4A (1746A4E)	88Y8227	67567F5	5 year On-Site Service 24 x 7, 4 hour response
1746-E4A (1746A4E)	88Y8228	67567F6	5 year On-Site Service 24 x 7, 2 hour response

DS3512 Maintenance agreements

Machine type-Model (SEO number)	ServicePac SEO	ServicePac PN	Description
1746-C2A (1746A2D, 1746A2S)	88Y8190	6756MDG	1 year On-Site Service 9 x 5, NBD response
1746-C2A (1746A2D, 1746A2S)	88Y8191	6756MDH	1 year On-Site Service 9 x 5, 4 hour response
1746-C2A	88Y8192	6756MDJ	1 year On-Site Service

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(1746A2D, 1746A2S                                       24 x 7, 4 hour response

1746-C2A              88Y8193      6756MDK      1 year On-Site Service
(1746A2D, 1746A2S)                              24 x 7, 2 hour response

1746-C2A              88Y8194      6756MDM      2 year On-Site Service
(1746A2D, 1746A2S)                              9 x 5, NBD response

1746-C2A              88Y8195      6756MDN      2 year On-Site Service
(1746A2D, 1746A2S)                              9 x 5, 4 hour response

1746-C2A              88Y8196      6756MDP      2 year On-Site Service
(1746A2D, 1746A2S)                              24 x 7, 4 hour response

1746-C2A              88Y8197      6756MDQ      2 year On-Site Service
(1746A2D, 1746A2S)                              24 x 7, 2 hour response
```

DS3524 Maintenance agreements

```
Machine type-Model  ServicePac   ServicePac
(SEO number)        SEO          PN           Description

1746-C4A              88Y8203      6756MDR      1 year On-Site Service
(1746A4D, 1746A4S)                              9 x 5, NBD response

1746-C4A              88Y8204      6756MDS      1 year On-Site Service
(1746A4D, 1746A4S)                              9 x 5, 4 hour response

1746-C4A              88Y8205      6756MDT      1 year On-Site Service
(1746A4D, 1746A4S)                              24 x 7, 4 hour response

1746-C4A              88Y8206      6756MDU      1 year On-Site Service
(1746A4D, 1746A4S)                              24 x 7, 2 hour response

1746-C4A              88Y8207      6756MDV      2 year On-Site Service
(1746A4D, 1746A4S)                              9 x 5, NBD response

1746-C4A              88Y8208      6756MDW      2 year On-Site Service
(1746A4D, 1746A4S)                              9 x 5, 4 hour response

1746-C4A              88Y8209      6756MDX      2 year On-Site Service
(1746A4D, 1746A4S)                              24 x 7, 4 hour response

1746-C4A              88Y8210      6756MDY      2 year On-Site Service
(1746A4D, 1746A4S)                              24 x 7, 2 hour response
```

EXP3512 Maintenance agreements

```
Machine type-Model  ServicePac   ServicePac
(SEO number)        SEO          PN           Description

1746-E2A              88Y8216      6756MDZ      1 year On-Site Service
(1746A2E)                                       9 x 5, NBD response

1746-E2A              88Y8217      6756MF0      1 year On-Site Service
(1746A2E)                                       9 x 5, 4 hour response

1746-E2A              88Y8218      6756MF1      1 year On-Site Service
(1746A2E)                                       24 x 7, 4 hour response

1746-E2A              88Y8219      6756MF2      1 year On-Site Service
(1746A2E)                                       24 x 7, 2 hour response

1746-E2A              88Y8220      6756MF3      2 year On-Site Service
(1746A2E)                                       9 x 5, NBD response

1746-E2A              88Y8221      6756MF4      2 year On-Site Service
(1746A2E)                                       9 x 5, 4 hour response

1746-E2A              88Y8222      6756MF5      2 year On-Site Service
(1746A2E)                                       24 x 7, 4 hour response

1746-E2A              88Y8223      6756MF6      2 year On-Site Service
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(1746A2E)                                   24 x 7, 2 hour response
```

EXP3524 Maintenance agreements

```
Machine type-Model ServicePac  ServicePac
(SEO number)       SEO         PN          Description

1746-E4A           88Y8229     6756MF7     1 year On-Site Service
(1746A4E)                                  9 x 5, NBD response

1746-E4A           88Y8230     6756MF8     1 year On-Site Service
(1746A4E)                                  9 x 5, 4 hour response

1746-E4A           88Y8231     6756MF9     1 year On-Site Service
(1746A4E)                                  24 x 7, 4 hour response

1746-E4A           88Y8232     6756MFA     1 year On-Site Service
(1746A4E)                                  24 x 7, 2 hour response

1746-E4A           88Y8233     6756MFB     2 year On-Site Service
(1746A4E)                                  9 x 5, NBD response

1746-E4A           88Y8234     6756MFC     2 year On-Site Service
(1746A4E)                                  9 x 5, 4 hour response

1746-E4A           88Y8235     6756MFD     2 year On-Site Service
(1746A4E)                                  24 x 7, 4 hour response

1746-E4A           88Y8236     6756MFF     2 year On-Site Service
(1746A4E)                                  24 x 7, 2 hour response
```

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