IBM System Storage DS8000 series (Machine types 2421, 2422, 2423, and 2424) offers higher scalability with additional tiering capabilities and drive options to address price and performance requirements

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  - Graphical user interface (GUI) support for resource groups
  - Parallel volume create and delete
  - DS8000 Storage Manager enhancement

Overview

IBM® System Storage® DS8000 series (machine types 2421, 2422, 2423, and 2424) offers higher scalability with additional tiering capabilities and drive options to address price and performance requirements. New options include:

- **Storage scalability and resiliency**
    - Third Expansion unit - With the additional expansion units, DS8800 can hold up to 1,536 drives providing up to 1.4 PB of physical capacity with 900 GB SAS disk drives, and up to 768 drives providing up to 2.3 PB of physical capacity with 3 TB nearline SAS disk drives.
    - Additional drive options - DS8800 provides additional capacity and another price and performance option for transaction processing workloads. Available capacities are:
        -- 300 GB 15,000 rpm SAS drive
        -- 900 GB 10,000 rpm SAS drive
        -- 3 TB 7,200 rpm nearline SAS drive
        -- 3.5" SAS drive enclosure support
    - Smart Rebuild - Reduces the risk of a second drive failure for RAID-5 ranks during rebuild, improving system availability.

- **System z synergy items**
    - DS8000 I/O Priority Manager (System z) - I/O Priority Manager together with z/OS® Workload Manager (zWLM) will enable more effective storage consolidation and performance management. This new function, now tightly integrated with (Workload Manager for z/OS), is intended to improve disk I/O performance for important workloads and drive I/O prioritization to the disk system by allowing WLM to give priority to the system's resources automatically when higher priority workloads are not meeting their performance goals. Integration with zWLM is exclusive to DS8000 and System z systems.
    - Extended Address Volumes - This capability can help relieve address constraints to support large storage capacity needs by addressing the capability of System z environments to support volumes that can scale up to approximately 1 TB (1,182,006 cylinders).
    - DS8000 enhancements to support new High Performance FICON for System z innovations - High Performance FICON for System z zHPF with z/OS V1.13 has been designed to deliver significant I/O performance improvements for certain I/O transfers for workloads using QSAM, BPAM, and BSAM access methods.
    - DS8000 enhancements to support new zHPF format writes - zHPF has also been enhanced to support format writes. The performance value of these enhancements are highest for small records, which are typically used for databases.
    - DB2 list prefetch enhancements - zHPF has been enhanced to support DB2 list prefetch. These enhancements include a new cache optimization algorithm that can greatly improve performance and hardware efficiency. When combined with the latest releases of z/OS and DB2, it can demonstrate up to 14x-60x increase in sequential or batch processing performance.
    - HyperSwap (GDPS) support - HyperSwap support is planned to be enhanced to improve recovery in HyperSwap-enabled configurations.
    - Quick initialization (System z) - IBM System Storage DS8000 supports quick volume initialization for System z environments, which can help customers who frequently delete volumes, allowing capacity to be reconfigured without waiting for initialization.

- **Enhanced tiering capabilities**
    - Three Tier Support - Easy Tier™ support for three tiers of storage allowing three types of drives within a managed pool. Easy Tier monitors disk activity

in real time and migrates data across tiers and within a tier to optimize performance automatically.

- – Thin provisioned device support - Easy Tier third generation also supports thin provision volumes within managed extent pools and volume migration between the pools.
- – Auto-rebalance of homogenous pool - Easy Tier will automatically adjust the load of each rank within any homogeneous pool to remove the skew and allow the DS8000 to reach its optimum performance. This can reduce the manual adjustments required to balance performance as drives are added, removed, or repurposed, reducing overall management costs. This function also supports workload rebalancing for single tiers to remove the skew and reduce hot-spots on the rank by balancing the load of the ranks within the single tier to achieve the optimum performance.

- **Thin provisioning enhancement**

  - – Thin provisioning support for FlashCopy (Open systems) - FlashCopy services are now supported on thin-provisioning volumes.
  - – Thin provisioning support for easy tier pools - Easy Tier supports thin provisioned volumes for extent space efficient devices (ESE). It also can support volume migration and depopulation of a rank.

- **User interface enhancement**

  - – GUI support for resource groups - The DS8000 GUI can support resource group configurations in addition to DS-CLI. This will enhance the user experience and simplify creation and management of multi-tenant environments.
  - – Parallel Volume Create and Delete - This function combines all requests from the users into a single command to create or delete a range of volumes (up to 64K in a single request). This improvement reduces configuration time and customer management costs.
  - – DS8000 Storage Manager enhancement - The DS8000 GUI can be launched directly from any remote browser.

Key prerequisites

All features and functions in this announcement are supported on the IBM System Storage DS8700 and DS8800 series, and require a DS8000 licensed machine code as follows:

- IBM System Storage DS8700 - level 7.6.2.xx.xx (bundle version 76.20.xxx.xx), or later.
- IBM System Storage DS8800 - level 7.6.2.xx.xx (bundle version 86.20.xxx.xx), or later.

Planned availability date

November 18, 2011, for all features except:

- Feature #2758 (900 GB 10K rpm SAS drive set), #2759(900 GB 10K rpm SAS CoD drive set), #5758 (900 GB 10K FDE drive set), and #5759 (900 GB 10K FDE CoD drive set)

December 9, 2011, for:

- Features #2758 (900 GB 10K rpm SAS drive set), #2759 (900 GB 10K rpm SAS CoD drive set), #5758 (900 GB 10K FDE drive set), and #5759 (900 GB 10K FDE CoD drive set)

For more details, please refer to the Description section.

Description

IBM System Storage DS8000 series is an industry leader in providing scalable, high-performance, intelligent storage systems. The DS8700 and DS8800 now introduce new capabilities and enhancements to current functions to deliver customer value for high-performance, business critical, consolidation and multi-tenant environments.

The DS8800 offers an additional expansion frame for additional scalability, along with several new drive options. This scalability allows exploitation of the third generation of Easy Tier algorithms, supporting three tiers that are now able to take advantage of SSD, 10K or 15K SAS, and nearline 7.2K drives in a single system. This provides incredible value, allowing configurations with the appropriate number of drives, less power consumption, and high performance to intelligently balance performance requirements for mixed customer workloads. Along with enhancements to the DS8000 series GUI supporting resources groups, integration with Workload Manager for System z and I/O Priority manager, the DS8000 is the clear leader in simple resource management. Each of these technologies works to manage resources and performance with a minimum of configuration required, and then constantly works to improve system performance and response time. These improvements are the latest in a series of enhancements delivered by the DS8000 product.

Third expansion unit support offers additional capacity options

The IBM System Storage DS8800 series (machine types 2421, 2422, 2423, and 2424) supports additional capacity options by providing third expansion unit (Model 95E) attachment to the DS8800 (Model 951). This capability is designed to allow DS8800 applications requiring large amounts of storage capacity to utilize up to 1,536 2.5" disk drives. With three DS8800 Model 95E expansion units, DS8800 Model 951 supports up to:

- 1,536 2.5-inch disk drives providing up to 1.4 PB of physical capacity with 900 GB SAS disk drives
- 768 3.5-inch disk drives providing up to 2.3 PB of physical capacity with 3 TB nearline SAS disk drives

Additional drive options

The DS8800 now offers 300 GB 15,000 rpm and 900 GB 10,000 rpm disk drive sets to provide additional price and performance options and capacity flexibility to address specific application and business requirements. This support is in addition to the already supported 146 GB (15,000 rpm), 450 GB (10,000 rpm), 600 GB (10,000 rpm) SAS disk drive sets and 300 GB SSD drive sets. The 900 GB 10,000 rpm disk drive provides additional 50% more physical capacity than 600 GB drives, increasing the total capacity of high-performance drives supported in a DS8800 system.

The 146 GB 15,000 rpm, 300 GB 15,000 rpm, and 900 GB 10,000 rpm SAS disk drives are additionally offered with Full Disk Encryption and Standby Capacity on Demand (Standby CoD).

For additional flexibility, feature conversions are available for the 300 GB 15,000 rpm and 900 GB 10,000 rpm disk drive sets to exchange existing disk drive sets when purchasing new disk drive sets with higher capacity. The 300 GB 15,000 rpm and 900 GB 10,000 rpm disk drive sets are optional to the DS8800 and are available with feature numbers 2xx8.

3 TB 7,200 rpm nearline SAS drive sets

The DS8800 now offers 3 TB 7,200 rpm nearline SAS disk drive sets, providing additional price and capacity flexibility to address specific application and business requirements. These drives can be added to DS8800 models to support various fixed-content, data-archival, reference-data, and streaming applications that require large amounts of storage capacity at lower cost per MB. Nearline SAS drives are

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not intended for use in applications that require drive utilization duty cycles greater than 20% and are only supported in RAID-6 configurations. Nearline drives will not share sparing capability with non-nearline drives due to the low duty cycle nature of nearline SAS drives.

The 3 TB 7,200 rpm nearline SAS disk drives provide more raw capacity than existing models, up to 2.3 PB for DS8800 Model 951 (4-way) and up to 360 TB for DS8800 Model 951 (2-way). These disk drive sets are optional to the DS8800 and are available with feature number 2858 under the standard Capacity on Demand offering.

Smart Rebuild Smart Rebuild is an improved algorithm designed to reduce the risk of secondary failures in RAID-5 Arrays. The array rebuild process has been optimized to read data from as few drives in the array as possible. This reduces the amount of time required to rebuild the data in the array, as well reduce the exposure to a second drive failure during the rebuild process.

Smart Rebuild supports RAID-5 non-encrypted and encrypted drives on the DS8700 and DS8800.

DS8000 I/O Priority Manager (System z)

The DS8000 now features I/O Priority Manager for CKD volumes. Together with z/OS Workload Manager (zWLM), this is designed to enable more effective storage consolidation and performance management combined with the ability to align quality of service levels to separate workloads in the system. This capability is exclusive to the DS8000 and System z systems.

The system will prioritize access to system resources to achieve the volume's desired quality of service based on defined performance goals (high, medium, or low) of any volume. I/O Priority Manager will constantly monitor and balance system resources to help applications meet their performance targets automatically without operator intervention based on input from the zWLM software.

The DS8000 I/O Priority Manager feature is available for System z. Support for DS8000 I/O Priority Manager is an optional feature for DS8700 Model 941 and DS8800 Model 951 and is available with the I/O Priority Manager licensed feature indicator DS8000 Function Authorization (239x-LFA) I/O Priority Manager feature number 784x.

IBM Extended Address Volumes (EAV) for System z environments

The DS8000 series today supports System z CKD volumes up to 262,668 cylinders (1 TB). With the EAV function, this capability has been extended to support volumes that can scale up to approximately 1 TB (1,182,006 cylinders) and to address constraints to support large storage capacity needs in System z environments. Larger devices can help simplify storage management as it fosters management of fewer, large volumes as opposed to many small volumes.

The HyperPAV function available today complements EAV by allowing scaling of I/O rates against a single, larger volume. In addition, Dynamic Volume Expansion can also support nondisruptive migration to the larger volume sizes now available. The function is supported on DS8000 series running on IBM System z servers with z/OS V1.12, or later.

The EAV capability is provided with the DS8000 series at no additional charge.

High Performance FICON for System z innovations

With High Performance FICON for System z (zHPF) with z/OS V1.13, zEnterprise™ servers and IBM System Storage has been designed to deliver significant I/O performance improvements for certain I/O transfers for workloads using QSAM, BPAM, and BSAM access methods. Significant I/O performance improvements of up to 100% per adapter are expected without the need for application changes. This builds upon existing zHPF support for VSAM, Extended Format sequential, zFS,

and PDSE data sets, and provides support for these data set types when a new parameter is specified in the IGDSMSxx member of parmlib:

- Basic non-extended format physical sequential data sets
- Basic and large format sequential data sets

The zHPF function without the most recent enhancements is supported on DS8000 series systems running on IBM zEnterprise servers with all supported FICON features (CHPID type FC) and z/OS V1.11, or later.

Format writes

zHPF has also been enhanced to support format writes. This capability applies to all of the same data set types that were originally supported by the Modified Indirect Data Address Word (MIDAW) facility and zHPF, in addition to QSAM, BPAM, and BSAM data sets described above. The performance value of these enhancements are highest for small records, which are typically used for databases.

DB2 utilities use format writes. Those utilities that load or restore data into a table space or index with a 4K page size are expected to experience the most benefit.

The zHPF enhancement for format writes is supported on DS8000 series running on IBM zEnterprise servers with all supported FICON features (CHPID type FC) and z/OS V1.11, or later.

DB2 list prefetch

zHPF has also been enhanced to provide improvements for DB2 list prefetch processing when using 4K pages. zHPF list prefetch is supported by the FICON Express4 and FICON Express8 features. However, those features limit the number of discontinuities that a single zHPF channel program can have to 22. If the number exceeds 22, z/OS splits the pages into two I/Os. This applies to 4K pages, since DB2 for z/OS typically reads 32x4K pages. The FICON Express® 8S features remove this limitation. The result is fewer I/Os than when using FICON Express4 or FICON Express features. This capability is exclusive to the DS8000 and System z systems.

The function is supported on DS8000 series systems running on IBM zEnterprise servers with FICON Express8S features (CHPID type FC) and z/OS V1.11, or later.

HyperSwap (GDPS) support

HyperSwap support is designed to enhance and improve recovery in HyperSwap-enabled configurations. This support is intended to mitigate the impact of recovery scenarios and is targeted for GDPS/PPRC customers with IBM System Storage DS8700 or DS8800 series.

The DS8000 implements a new event reporting mechanism for events that greatly reduce the impact on host operating systems. This support is targeted to GDPS and PPRC customers with DS8000 disk. The DS8000 will notify GDPS and PPRC of any recovery processing that will impact host I/Os for an extended period.

The DS8000 and GDPS products are constantly working to reduce the impact of both planned and unplanned failover events. This deliverable continues that cooperation.

The function is supported on DS8000 series running on IBM System z servers with z/OS V1.13, or later, and GDPS V3.8, or later.

Quick initialization (System z)

Quick initialization dynamically initializes logical tracks on a newly created or newly expanded logical volume with the appropriate initialization pattern for the host while the logical volume is accessible to the host for normal I/O. With quick initialization, volume creation or volume expansion is not affected by the unavailability of pre-initialized capacity. Host I/O and copy services operations can also be performed immediately after logical volume creation or expansion. Quick initialization is

currently available on fixed block logical volumes and is also supported on CKD logical volumes.

IBM System Storage Easy Tier third generation

IBM System Storage Easy Tier third generation is designed to help automate data placement throughout the DS8000 disk pool between SSD drives (tier 1), enterprise class drives (tier 2), and nearline (tier 3) drives to intelligently align the system with current workload requirements. This includes the ability for the system to automatically and non-disruptively relocate data (at the extent level) across any three tiers of storage and within any tier. Relocation within tiers automatically rebalances workloads across available ranks, including ranks that are added to disk pools, to maximize the performance of each tier. Pools may be configured with one, two, or three tiers. The benefit is to align performance of the system with the appropriate application workloads. In addition, Easy tier allows the customer to manually migrate logical volumes between extent pools, to merge extent pools, or to re-distribute logical volumes across the available ranks within an unmanaged extent pool.

This enhancement can help clients improve storage utilization and address performance requirements for multi-tier systems that are not yet deploying solid-state drives (SSDs). They can incrementally add SSDs to these traditional configurations for performance and nearline drives for cost savings depending on requirements. The DS8000 system performance can be automatically balanced across the new drives within the managed pool.

The extended capabilities of Easy Tier third generation support

- Managed Extent Pools: Easy Tier third generation has extended support for one tier and three tier environments. Additionally, thin provisioned volumes can also be managed.
- Volume migration: Enables the manual relocation of logical volumes between extent pools, restriping of logical volumes within an unmanaged extent pool, and the ability to merge existing extent pools. Easy Tier third Generation has extended the support for thin provisioning volume migration and merging of extent pools that both contain thin provisioned volumes.
- Auto-rebalance: Relocates extents among the ranks within a tier to remove workload skews on the ranks in a managed extent pool. Easy Tier third Generation has extended the support for thin provisioning volumes and allows action on single tier and three tier pools to remove skews automatically including cases where ranks are added to a managed extent pool. This is an important enhancement for self-tuning performance on a tiered storage system.
- Rank depopulation: Allows customers to non-disruptively relocate extents away from selected ranks and stop using the ranks. Easy Tier third Generation has extended the support for thin provisioning volumes in addition to the standard volumes.

Thin provisioning support for FlashCopy (Open systems)

The FlashCopy advanced function is designed to provide a point-in-time copy capability for logical volumes. The FlashCopy function creates a physical point-in-time copy of the data, with minimal interruption to applications, and makes it possible to access both the source and target copies immediately. The FlashCopy function has extended the support of mixing thin provisioning volumes and logical volumes.

With this enhancement, existing customers that have thin provisioning volumes on the system and want to use FlashCopy function do not need any re-configuration.

GUI support for resource groups

An updated GUI now enables easier, more effective management of the resource groups configurations. This DS8000 GUI allows users to create, modify, and delete Logical Volume and Logical Subsystems (CKD/FB), and display the resource group attribute.

This GUI can greatly simplify configurations and management of the resource groups that use this GUI and significantly reduce the costs associated with administrator training. In addition, management of multi-tenant environments using the GUI is simplified.

Parallel volume create and delete

This function combines all requests (volume create or delete) for a single Logical Storage Subsystem from the user into a single request. This consolidation of requests can improve volume creation and deletion performance by up to 500%, reducing configuration time and associated management costs.

DS8000 Storage Manager enhancement

Enhancements are added to the DS Storage Manager (GUI) for the DS8800 for easier and more efficient storage management. The DS Storage Manager is installed as a GUI for the Windows™ and Linux™ operating systems. In addition to using TPC, the GUI can be accessed from any location that has network access using a web browser.

Supported browsers include:

- Microsoft™ Internet Explorer 7 or 8
- Mozilla Firefox 3.0 - 3.4 or 3.6

All the new functions introduced in this release will require Licensed Machine Code level 7.6.2.xx.xx, or later, for DS8700 and DS8800.

Release R6.2 LMC supports both DS8700 and DS8800.

Plant availability - November 18, 2011

- Smart Rebuild
- DS8000 I/O Priority Manager (System z)
- Extended Address Volumes
- High Performance FICON for System z enhancements
- DB2 list prefetch
- HyperSwap (GDPS) support
- Format writes
- IBM System Storage Easy Tier version 3
- Quick initialization (System z)
- Thin provisioning support for FlashCopy (Open systems only)
- GUI support for resource groups
- Parallel volume create and delete

DS8800 hardware features:

- Third expansion unit
- Additional drive options
- Nearline SAS drive support

Plant availability - December 09, 2011

- 900 GB 10K rpm SAS drive set
- 900 GB 10K rpm SAS CoD drive set
- 900 GB 10K rpm FDE drive set
- 900 GB 10K rpm FDE CoD drive set

Field availability - November 18, 2011

- Smart Rebuild
- DS8000 I/O Priority Manager (System z)
- Extended Address Volumes
- High Performance FICON for System z enhancements
- DB2 list prefetch
- HyperSwap (GDPS) support
- Format writes
- IBM System Storage Easy Tier version 3
- Quick initialization (System z)
- Thin provisioning support for FlashCopy (Open systems only)
- GUI support for resource groups
- Parallel volume create and delete

DS8800 hardware features:

- Third expansion unit
- Additional drive options
- Nearline SAS drive support

Field availability - December 09, 2011

- Top exit line cord (US/LA/AP/Canada)
- Top exit line cord (EMEA)
- Top exit line cord (Japan/US/Canada)
- Top exit bracket for Fibre cable
- 900 GB 10K rpm SAS drive set
- 900 GB 10K rpm SAS CoD drive set
- 900 GB 10K rpm FDE drive set
- 900 GB 10K rpm FDE CoD drive set

Accessibility by people with disabilities

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

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

Section 508 of the US Rehabilitation Act

The IBM System Storage DS8800 and IBM System Storage DS8800 Expansion Unit are capable, as of October 22, 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. A U.S. Section 508 Voluntary Product Accessibility Template (VPAT) can be requested at

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

Reference information

For more information, refer to the following announcements:

- Hardware Announcement 110-213, dated October 07, 2010, IBM System Storage DS8800 (Machine type 2421) high-performance flagship high-end disk, one-year warranty model addresses your business and financial needs.
- Hardware Announcement 110-214, dated October 07, 2010, IBM System Storage DS8800 (Machine type 2422) high-performance flagship high-end disk, two-year warranty model addresses your business and financial needs.
- Hardware Announcement 110-218, dated October 07, 2010, IBM System Storage DS8800 (Machine type 2423) high-performance flagship high-end disk, three-year warranty model addresses your business and financial needs.
- Hardware Announcement 110-215, dated October 07, 2010, IBM System Storage DS8800 (Machine type 2424) high-performance flagship high-end disk, four-year warranty model addresses your business and financial needs.
- Hardware Announcement 111-080, dated May 09, 2011, IBM System Storage DS8700 and DS8800 (M/T 242x) delivers DS8000 I/O Priority Manager and advanced features to enhance data protection for multi-tenant copy services.

For IBM statement on compliance with European Union Directive on Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (2002/95/EC) (RoHS), visit

http://www.ibm.com/ibm/environment/products/rohs.shtml

Product number

Description	Machine type	Model	Feature
DS8700	2421	941	
Attachment indicators:			
- IBM Storwize® V7000 indicator			0961
- IBM System Storage N series indicator			0962
- IBM System Storage SAN Volume Controller indicator			0963
DS8000 Licensed Machine Code:			
- DS8000 LMC R6.2			1723
Disk Drive Sets:			
- Customer supplied drive set			2990

Description	Machine type	Model	Feature
DS8700	2421	94E	
Attachment indicators:			
- IBM Storwize V7000 indicator			0961
- IBM System Storage N series indicator			0962
- IBM System Storage SAN Volume Controller indicator			0963
DS8000 Licensed Machine Code:			
- DS8000 LMC R6.2 indicator			1823
Disk Drive Sets:			
- Customer supplied drive set			2990

Description	Machine type	Model	Feature
DS8700	2422	941	
Attachment indicators:			
- IBM Storwize V7000 indicator			0961
- IBM System Storage N series indicator			0962
- IBM System Storage SAN Volume Controller indicator			0963
DS8000 Licensed Machine Code:			
- DS8000 LMC R6.2			1723

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Disk Drive Sets:
- Customer supplied drive set                                     2990

                                        Machine
Description                             type       Model    Feature

DS8700                                  2422       94E

Attachment indicators:
- IBM Storwize V7000 indicator                                    0961
- IBM System Storage N series indicator                          0962
- IBM System Storage SAN Volume Controller indicator             0963

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2  indicator                                     1823

Disk Drive Sets:
- Customer supplied drive set                                    2990

                                        Machine
Description                             type       Model    Feature

DS8700                                  2423       941

Attachment indicators:
- IBM Storwize V7000 indicator                                    0961
- IBM System Storage N series indicator                          0962
- IBM System Storage SAN Volume Controller indicator             0963

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                                1723

Disk Drive Sets:
- Customer supplied drive set                                    2990

                                        Machine
Description                             type       Model    Feature

DS8700                                  2423       94E

Attachment indicators:
- IBM Storwize V7000 indicator                                    0961
- IBM System Storage N series indicator                          0962
- IBM System Storage SAN Volume Controller indicator             0963

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator                                      1823

Disk Drive Sets:
- Customer supplied drive set                                    2990

                                        Machine
Description                             type       Model    Feature

DS8700                                  2424       941

Attachment indicators:
- IBM Storwize V7000 indicator                                    0961
- IBM System Storage N series indicator                          0962
- IBM System Storage SAN Volume Controller indicator             0963

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                                1723

Disk Drive Sets:
- Customer supplied drive set                                    2990

                                        Machine
Description                             type       Model    Feature

DS8700                                  2424       94E

Attachment indicators:
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                                                    0961
- IBM Storwize V7000 indicator                      0962
- IBM System Storage N series indicator             0963
- IBM System Storage SAN Volume Controller indicator

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator                         1823

Disk Drive Sets:
- Customer supplied drive set                       2990


                                 Machine
Description                      type     Model    Feature

DS8800                           2421     951

Model 9xE Position Indicators:
- 951 - 95E position 3                              0353


Initial System Capacity:
- 700.1 to 800.0 TB capacity                        0873
- 800.1 to 900.0 TB capacity                        0874
- 900.1 to 1000.0 TB capacity                       0875
- 1000.1 to 1100.0 TB capacity                      0876
- 1100.1 to 1200.0 TB capacity                      0877
- 1200.1 to 1300.0 TB capacity                      0878
- 1300.1 to 1400.0 TB capacity                      0879
- 1400.1 to 1500.0 TB capacity                      0880
- 1500.1 to 1600.0 TB capacity                      0881
- 1600.1 to 1700.0 TB capacity                      0882
- 1700.1 to 1800.0 TB capacity                      0883
- 1800.1 to 1900.0 TB capacity                      0884
- 1900.1 to 2000.0 TB capacity                      0885
- 2000.1 to 2200.0 TB capacity                      0886
- 2200.1 to 2400.0 TB capacity                      0887
- 2400.1 to 2600.0 TB capacity                      0888
- 2600.1 to 2800.0 TB capacity                      0889
- 2800.1 to 3000.0 TB capacity                      0890

Attachment indicators:
- IBM Storwize V7000 indicator                      0961
- IBM System Storage N series indicator             0962
- IBM System Storage SAN Volume Controller indicator 0963

Single Phase Power Cords:
- Top exit SPP cord group 1                         1070
- Top exit SPP cord group 3                         1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)              1095
- Top exit line cord (EMEA)                         1096
- Top exit line cord (Japan/US/Canada)              1097

Special tool:
- Universal ladder                                  1101

Disk Enclosure:
- 3.5" Disk enclosure indicator                     1244

Top Exit Bracket:
- Top exit bracket for Fibre cable                  1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                   1723

Disk Drive Sets:
- 300 GB 15K SAS drive set                          2308
- 900 GB 10K SAS drive set                          2758
- 3 TB 7.2K SAS half drive set                      2858
- Customer supplied drive set                       2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                      2309
- 900 GB 10K SAS CoD drive set                      2759
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- 3 TB 7.2K SAS CoD half drive set                          2859

Disk Enclosure Filler:
- 3.5" Disk enclosure filler set                           2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                                 5108
- 300 GB 15K FDE drive set                                 5308
- 900 GB 10K FDE drive set                                 5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                             5209
- 300 GB 15K FDE CoD drive set                             5309
- 900 GB 10K FDE CoD drive set                             5759
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Description	Machine type	Model	Feature
DS8800	2421	95E	

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Model 9xE Position Indicators:
- 951 - 95E position 3                                     0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                               0873
- 800.1 to 900.0 TB capacity                               0874
- 900.1 to 1000.0 TB capacity                              0875
- 1000.1 to 1100.0 TB capacity                             0876
- 1100.1 to 1200.0 TB capacity                             0877
- 1200.1 to 1300.0 TB capacity                             0878
- 1300.1 to 1400.0 TB capacity                             0879
- 1400.1 to 1500.0 TB capacity                             0880
- 1500.1 to 1600.0 TB capacity                             0881
- 1600.1 to 1700.0 TB capacity                             0882
- 1700.1 to 1800.0 TB capacity                             0883
- 1800.1 to 1900.0 TB capacity                             0884
- 1900.1 to 2000.0 TB capacity                             0885
- 2000.1 to 2200.0 TB capacity                             0886
- 2200.1 to 2400.0 TB capacity                             0887
- 2400.1 to 2600.0 TB capacity                             0888
- 2600.1 to 2800.0 TB capacity                             0889
- 2800.1 to 3000.0 TB capacity                             0890

Attachment indicators:
- IBM Storwize V7000 indicator                             0961
- IBM System Storage N series indicator                    0962
- IBM System Storage SAN Volume Controller indicator       0963

Single Phase Power Cords:
- Top exit SPP cord group 1                                1070
- Top exit SPP cord group 3                                1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)                     1095
- Top exit line cord (EMEA)                                1096
- Top exit line cord (Japan/US/Canada)                     1097

Disk Enclosure:
- 3.5" Disk enclosure indicator                            1244

Top Exit Bracket:
- Top exit bracket for Fibre cable                         1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                          1823

Disk Drive Sets:
- 300 GB 15K SAS drive set                                 2308
- 900 GB 10K SAS drive set                                 2758
- 3 TB 7.2K SAS half drive set                             2858
- Customer supplied drive set                              2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                             2309
```

```
- 900 GB 10K SAS CoD drive set                             2759
- 3 TB 7.2K SAS CoD half drive set                         2859

Disk Enclosure Filler:
- 3.5" Disk enclosure filler set                           2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                                 5108
- 300 GB 15K FDE drive set                                 5308
- 900 GB 10K FDE drive set                                 5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                             5209
- 300 GB 15K FDE CoD drive set                             5309
- 900 GB 10K FDE CoD drive set                             5759
```

Description	Machine type	Model	Feature
DS8800	2422	951	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                                     0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                               0873
- 800.1 to 900.0 TB capacity                               0874
- 900.1 to 1000.0 TB capacity                              0875
- 1000.1 to 1100.0 TB capacity                             0876
- 1100.1 to 1200.0 TB capacity                             0877
- 1200.1 to 1300.0 TB capacity                             0878
- 1300.1 to 1400.0 TB capacity                             0879
- 1400.1 to 1500.0 TB capacity                             0880
- 1500.1 to 1600.0 TB capacity                             0881
- 1600.1 to 1700.0 TB capacity                             0882
- 1700.1 to 1800.0 TB capacity                             0883
- 1800.1 to 1900.0 TB capacity                             0884
- 1900.1 to 2000.0 TB capacity                             0885
- 2000.1 to 2200.0 TB capacity                             0886
- 2200.1 to 2400.0 TB capacity                             0887
- 2400.1 to 2600.0 TB capacity                             0888
- 2600.1 to 2800.0 TB capacity                             0889
- 2800.1 to 3000.0 TB capacity                             0890

Attachment indicators:
- IBM Storwize V7000 indicator                             0961
- IBM System Storage N series indicator                    0962
- IBM System Storage SAN Volume Controller indicator       0963

Single Phase Power Cords:
- Top exit SPP cord group 1                                1070
- Top exit SPP cord group 3                                1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)                     1095
- Top exit line cord (EMEA)                                1096
- Top exit line cord (Japan/US/Canada)                     1097

Special tool:
- Universal ladder                                         1101

Disk Enclosure:
- 3.5" Disk enclosure indicator                            1244

Top Exit Bracket:
- Top exit bracket for Fibre cable                         1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                          1723

Disk Drive Sets:
- 300 GB 15K SAS drive set                                 2308
- 900 GB 10K SAS drive set                                 2758
- 3 TB 7.2K SAS half drive set                             2858
```

```
- Customer supplied drive set                      2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                     2309
- 900 GB 10K SAS CoD drive set                     2759
- 3 TB 7.2K SAS CoD half drive set                 2859

Disk Enclosure Filler:
- 3.5" Disk enclosure filler set                   2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                         5108
- 300 GB 15K FDE drive set                         5308
- 900 GB 10K FDE drive set                         5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                     5209
- 300 GB 15K FDE CoD drive set                     5309
- 900 GB 10K FDE CoD drive set                     5759
```

Description	Machine type	Model	Feature
DS8800	2422	95E	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                             0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                       0873
- 800.1 to 900.0 TB capacity                       0874
- 900.1 to 1000.0 TB capacity                      0875
- 1000.1 to 1100.0 TB capacity                     0876
- 1100.1 to 1200.0 TB capacity                     0877
- 1200.1 to 1300.0 TB capacity                     0878
- 1300.1 to 1400.0 TB capacity                     0879
- 1400.1 to 1500.0 TB capacity                     0880
- 1500.1 to 1600.0 TB capacity                     0881
- 1600.1 to 1700.0 TB capacity                     0882
- 1700.1 to 1800.0 TB capacity                     0883
- 1800.1 to 1900.0 TB capacity                     0884
- 1900.1 to 2000.0 TB capacity                     0885
- 2000.1 to 2200.0 TB capacity                     0886
- 2200.1 to 2400.0 TB capacity                     0887
- 2400.1 to 2600.0 TB capacity                     0888
- 2600.1 to 2800.0 TB capacity                     0889
- 2800.1 to 3000.0 TB capacity                     0890

Attachment indicators:
- IBM Storwize V7000 indicator                     0961
- IBM System Storage N series indicator            0962
- IBM System Storage SAN Volume Controller indicator  0963

Single Phase Power Cords:
- Top exit SPP cord group 1                        1070
- Top exit SPP cord group 3                        1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)             1095
- Top exit line cord (EMEA)                        1096
- Top exit line cord (Japan/US/Canada)             1097

Disk Enclosure:
- 3.5" Disk enclosure indicator                    1244

Top Exit Bracket:
- Top exit bracket for Fibre cable                 1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                  1823

Disk Drive Sets:
- 300 GB 15K SAS drive set                         2308
- 900 GB 10K SAS drive set                         2758
```

```
- 3 TB 7.2K SAS half drive set                               2858
- Customer supplied drive set                                2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                               2309
- 900 GB 10K SAS CoD drive set                               2759
- 3 TB 7.2K SAS CoD half drive set                           2859

Disk Enclosure Filler:
- 3.5" Disk enclosure filler set                             2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                                   5108
- 300 GB 15K FDE drive set                                   5308
- 900 GB 10K FDE drive set                                   5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                               5209
- 300 GB 15K FDE CoD drive set                               5309
- 900 GB 10K FDE CoD drive set                               5759
```

Description	Machine type	Model	Feature
DS8800	2423	951	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                                       0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                                 0873
- 800.1 to 900.0 TB capacity                                 0874
- 900.1 to 1000.0 TB capacity                                0875
- 1000.1 to 1100.0 TB capacity                               0876
- 1100.1 to 1200.0 TB capacity                               0877
- 1200.1 to 1300.0 TB capacity                               0878
- 1300.1 to 1400.0 TB capacity                               0879
- 1400.1 to 1500.0 TB capacity                               0880
- 1500.1 to 1600.0 TB capacity                               0881
- 1600.1 to 1700.0 TB capacity                               0882
- 1700.1 to 1800.0 TB capacity                               0883
- 1800.1 to 1900.0 TB capacity                               0884
- 1900.1 to 2000.0 TB capacity                               0885
- 2000.1 to 2200.0 TB capacity                               0886
- 2200.1 to 2400.0 TB capacity                               0887
- 2400.1 to 2600.0 TB capacity                               0888
- 2600.1 to 2800.0 TB capacity                               0889
- 2800.1 to 3000.0 TB capacity                               0890

Attachment indicators:
- IBM Storwize V7000 indicator                               0961
- IBM System Storage N series indicator                      0962
- IBM System Storage SAN Volume Controller indicator         0963

Single Phase Power Cords:
- Top exit SPP cord group 1                                  1070
- Top exit SPP cord group 3                                  1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)                       1095
- Top exit line cord (EMEA)                                  1096
- Top exit line cord (Japan/US/Canada)                       1097

Special tool:
- Universal ladder                                           1101

Disk Enclosure:
- 3.5" Disk enclosure indicator                              1244

Top Exit Bracket:
- Top exit bracket for Fibre cable                           1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                            1723
```

```
Disk Drive Sets:
- 300 GB 15K SAS drive set                                       2308
- 900 GB 10K SAS drive set                                       2758
- 3 TB 7.2K SAS half drive set                                   2858
- Customer supplied drive set                                    2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                                   2309
- 900 GB 10K SAS CoD drive set                                   2759
- 3 TB 7.2K SAS CoD half drive set                               2859

Disk Enclosure Filler:
- 3.5" Disk enclosure filler set                                 2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                                       5108
- 300 GB 15K FDE drive set                                       5308
- 900 GB 10K FDE drive set                                       5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                                   5209
- 300 GB 15K FDE CoD drive set                                   5309
- 900 GB 10K FDE CoD drive set                                   5759
```

Description	Machine type	Model	Feature
DS8800	2423	95E	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                                           0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                                     0873
- 800.1 to 900.0 TB capacity                                     0874
- 900.1 to 1000.0 TB capacity                                    0875
- 1000.1 to 1100.0 TB capacity                                   0876
- 1100.1 to 1200.0 TB capacity                                   0877
- 1200.1 to 1300.0 TB capacity                                   0878
- 1300.1 to 1400.0 TB capacity                                   0879
- 1400.1 to 1500.0 TB capacity                                   0880
- 1500.1 to 1600.0 TB capacity                                   0881
- 1600.1 to 1700.0 TB capacity                                   0882
- 1700.1 to 1800.0 TB capacity                                   0883
- 1800.1 to 1900.0 TB capacity                                   0884
- 1900.1 to 2000.0 TB capacity                                   0885
- 2000.1 to 2200.0 TB capacity                                   0886
- 2200.1 to 2400.0 TB capacity                                   0887
- 2400.1 to 2600.0 TB capacity                                   0888
- 2600.1 to 2800.0 TB capacity                                   0889
- 2800.1 to 3000.0 TB capacity                                   0890

Attachment indicators:
- IBM Storwize V7000 indicator                                   0961
- IBM System Storage N series indicator                          0962
- IBM System Storage SAN Volume Controller indicator             0963

Single Phase Power Cords:
- Top exit SPP cord group 1                                      1070
- Top exit SPP cord group 3                                      1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)                           1095
- Top exit line cord (EMEA)                                      1096
- Top exit line cord (Japan/US/Canada)                           1097

Disk Enclosure:
- 3.5" Disk enclosure indicator                                  1244

Top Exit Bracket:
- Top exit bracket for Fibre cable                               1400

DS8000 Licensed Machine Code:
```

```
- DS8000 LMC R6.2                                       1823

Disk Drive Sets:
- 300 GB 15K SAS drive set                              2308
- 900 GB 10K SAS drive set                              2758
- 3 TB 7.2K SAS half drive set                          2858
- Customer supplied drive set                           2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                          2309
- 900 GB 10K SAS CoD drive set                          2759
- 3 TB 7.2K SAS CoD half drive set                      2859

Disk Enclosure Filler:
- 3.5" Disk enclosure filler set                        2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                              5108
- 300 GB 15K FDE drive set                              5308
- 900 GB 10K FDE drive set                              5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                          5209
- 300 GB 15K FDE CoD drive set                          5309
- 900 GB 10K FDE CoD drive set                          5759
```

Description	Machine type	Model	Feature
DS8800	2424	951	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                                  0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                            0873
- 800.1 to 900.0 TB capacity                            0874
- 900.1 to 1000.0 TB capacity                           0875
- 1000.1 to 1100.0 TB capacity                          0876
- 1100.1 to 1200.0 TB capacity                          0877
- 1200.1 to 1300.0 TB capacity                          0878
- 1300.1 to 1400.0 TB capacity                          0879
- 1400.1 to 1500.0 TB capacity                          0880
- 1500.1 to 1600.0 TB capacity                          0881
- 1600.1 to 1700.0 TB capacity                          0882
- 1700.1 to 1800.0 TB capacity                          0883
- 1800.1 to 1900.0 TB capacity                          0884
- 1900.1 to 2000.0 TB capacity                          0885
- 2000.1 to 2200.0 TB capacity                          0886
- 2200.1 to 2400.0 TB capacity                          0887
- 2400.1 to 2600.0 TB capacity                          0888
- 2600.1 to 2800.0 TB capacity                          0889
- 2800.1 to 3000.0 TB capacity                          0890

Attachment indicators:
- IBM Storwize V7000 indicator                          0961
- IBM System Storage N series indicator                 0962
- IBM System Storage SAN Volume Controller indicator    0963

Single Phase Power Cords:
- Top exit SPP cord group 1                             1070
- Top exit SPP cord group 3                             1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)                  1095
- Top exit line cord (EMEA)                             1096
- Top exit line cord (Japan/US/Canada)                  1097

Special tool:
- Universal ladder                                      1101

Disk Enclosure:
- 3.5" Disk enclosure indicator                         1244
```

```
Top Exit Bracket:
- Top exit bracket for Fibre cable                          1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                           1723

Disk Drive Sets:
- 300 GB 15K SAS drive set                                  2308
- 900 GB 10K SAS drive set                                  2758
- 3 TB 7.2K SAS half drive set                              2858
- Customer supplied drive set                               2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                              2309
- 900 GB 10K SAS CoD drive set                              2759
- 3 TB 7.2K SAS CoD half drive set                          2859

Disk Enclosure Filler:
- 3.5" Disk enclosure filler set                            2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                                  5108
- 300 GB 15K FDE drive set                                  5308
- 900 GB 10K FDE drive set                                  5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                              5209
- 300 GB 15K FDE CoD drive set                              5309
- 900 GB 10K FDE CoD drive set                              5759
```

Description	Machine type	Model	Feature
DS8800	2424	95E	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                                      0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                                0873
- 800.1 to 900.0 TB capacity                                0874
- 900.1 to 1000.0 TB capacity                               0875
- 1000.1 to 1100.0 TB capacity                              0876
- 1100.1 to 1200.0 TB capacity                              0877
- 1200.1 to 1300.0 TB capacity                              0878
- 1300.1 to 1400.0 TB capacity                              0879
- 1400.1 to 1500.0 TB capacity                              0880
- 1500.1 to 1600.0 TB capacity                              0881
- 1600.1 to 1700.0 TB capacity                              0882
- 1700.1 to 1800.0 TB capacity                              0883
- 1800.1 to 1900.0 TB capacity                              0884
- 1900.1 to 2000.0 TB capacity                              0885
- 2000.1 to 2200.0 TB capacity                              0886
- 2200.1 to 2400.0 TB capacity                              0887
- 2400.1 to 2600.0 TB capacity                              0888
- 2600.1 to 2800.0 TB capacity                              0889
- 2800.1 to 3000.0 TB capacity                              0890

Attachment indicators:
- IBM Storwize V7000 indicator                              0961
- IBM System Storage N series indicator                     0962
- IBM System Storage SAN Volume Controller indicator        0963

Single Phase Power Cords:
- Top exit SPP cord group 1                                 1070
- Top exit SPP cord group 3                                 1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)                      1095
- Top exit line cord (EMEA)                                 1096
- Top exit line cord (Japan/US/Canada)                      1097

Disk Enclosure:
- 3.5" Disk enclosure indicator                             1244
```

```
Top Exit Bracket:
- Top exit bracket for Fibre cable                        1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                                         1823

Disk Drive Sets:
- 300 GB 15K SAS drive set                               2308
- 900 GB 10K SAS drive set                               2758
- 3 TB 7.2K SAS half drive set                           2858
- Customer supplied drive set                            2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                           2309
- 900 GB 10K SAS CoD drive set                           2759
- 3 TB 7.2K SAS CoD half drive set                       2859

Disk Enclosure Filler:
- 3.5" Disk enclosure filler set                         2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                               5108
- 300 GB 15K FDE drive set                               5308
- 900 GB 10K FDE drive set                               5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                           5209
- 300 GB 15K FDE CoD drive set                           5309
- 900 GB 10K FDE CoD drive set                           5759
```

Model conversions - None

There are no new model conversions with this announcement. This is a reminder that model conversions are disruptive. In addition, data may not be preserved during the model conversion.

DS8300 and DS8700 to DS8800 model conversions can only be done using IBM Global Financing. IBM Global Financing can assist with alternatives to convert installed DS8300 and DS8700 to DS8800. Contact IBM Global Services for model conversion upgrade planning solutions. With this program, disruptive upgrades are avoidable. Data migration can be done side by side to reduce implementation time and cost. Returned hardware will be assigned value according to condition.

For more information on IBM Global Financing offerings, visit

   http://www-03.ibm.com/financing/us/lifecycle/acquire/diskx.html

Feature conversions

Feature conversions (Machine types 2421, 2422, 2423, and 2424 Model 951 and 95E):

```
Disk Drive Sets:

Feature         Returned
From   To       Parts *   Description

2208   2308     Yes       Disk drive set conversion
2208   2758     Yes       Disk drive set conversion
2308   2608     Yes       Disk drive set conversion
2308   2708     Yes       Disk drive set conversion
2308   2758     Yes       Disk drive set conversion
2608   2758     Yes       Disk drive set conversion
2708   2758     Yes       Disk drive set conversion


Standby CoD Disk Drive Sets:

Feature         Returned
From   To       Parts *   Description

2309   2308     No        CoD disk drive conversion
2759   2758     No        CoD disk drive conversion
2859   2858     No        CoD disk half drive conversion


Encryption Disk Drive Sets:

Feature         Returned
From   To       Parts *   Description

5108   5308     Yes       Encryption disk drive set conversion
5108   5608     Yes       Encryption disk drive set conversion
5108   5708     Yes       Encryption disk drive set conversion
5108   5758     Yes       Encryption disk drive set conversion

5308   5608     Yes       Encryption disk drive set conversion
5308   5708     Yes       Encryption disk drive set conversion
5308   5758     Yes       Encryption disk drive set conversion
5608   5758     Yes       Encryption disk drive set conversion
5708   5758     Yes       Encryption disk drive set conversion


Encryption Standby CoD Disk Drive Sets:

Feature         Returned
From   To       Parts *   Description

5209   5108     No        Encryption CoD disk drive conversion
5309   5308     No        Encryption CoD disk drive conversion
5759   5758     No        Encryption CoD disk drive conversion


* Parts removed or replaced become the property of IBM and must be
returned
```

Business Partner information

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

   https://www.ibm.com/partnerworld/mem/sla.jsp?num=111-172

Publications

The *IBM System Storage DS8000 Introduction and Planning Guide (GC27-2297)* has
been updated to reflect this announcement and will be available by November 11,
2011.

The following CD is included with the DS8000 series:

Title	Order number
IBM System Storage DS8000 Series Documentation CD	P/N 98Y1544

The following documents are on the CD but are not included hardcopy:

Title	Order number
IBM System Storage DS8700 and DS8800 Introduction and Planning Guide	GC27-2297
IBM System Storage DS8000 Host Systems Attachment Guide	SC27-2298
IBM System Storage DS® Command-Line Interface User's Guide for the DS6000 series and DS8000 series	GC53-1127
IBM System Storage DS Open Application Programming Interface Referee	GC35-0516
IBM System Storage Multipath Subsystem Device driver User's Guide	GC52-1309

The following documents are on the CD and are also included hardcopy:

Title	Order number
IBM System Storage DS Storage Mgr R6.2 & CIM Agent for DS Open Application Programming Interface 5.6.2	GC27-3907
IBM Warranty Information	GC26-7919
IBM System Storage DS8000 Licensed Machine Code Agreement	GC26-7918
IBM System Storage Notice Regarding Storage Encryption	GA32-0642
IBM System Storage DS8000 series Non_IBM_ Licenses_and_Notices-Rel_5.x-6.x	P/N 98Y1569

For DS8000 publications, visit

  http://www.ibm.com/shop/publications/order/

The DS8000 information center is designed to provide comprehensive, browser-based information. It can help provide easy access to tasks, concepts, referee information, tutorials, code samples, scenarios, and other product information. It contains assistance for the tasks that users must perform and links to additional information. To find information, users can search, browse the contents, use the index, follow links from one topic to related topics, and print the topics they want to read offline.

The information center is available at

  http://www.ibm.com/support/publications/us/library/

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

Hardware requirements

Licensed Machine Code

All features and functions in this announcement are supported on the IBM System Storage DS8700 and DS8800 series and require a DS8000 licensed machine code as follows:

- IBM System Storage DS8700 - level 7.6.2.xx.xx (bundle version 76.20.xxx.xx), or later.
- IBM System Storage DS8800 - level 7.6.2.xx.xx (bundle version 86.20.xxx.xx), or later.

Some DS8000 series features and functions may not be available or supported in all environments. Current information on supported environments, prerequisites, and minimum operating system levels is available online at

http://www-03.ibm.com/systems/support/storage/config/ssic

Planning information

Customer responsibilities

Physical configuration planning

Physical configuration planning is a customer responsibility. Your disk marketing specialist can help you plan and select the DS8000 series physical configuration and features. Introductory information, including required and optional features, can be found in the *IBM System Storage DS8000 Introduction and Planning Guide (GC27-2297).*

Capacity and performance planning assistance is also available. Through the use of Disk Magic, your disk marketing specialist can help you plan and anticipate performance characteristics for specific workloads by modeling proposed configurations.

Installation planning

Installation planning is a customer responsibility. Information about planning the installation of your DS8000 series, including equipment, site, and power

requirements, can be found in the *IBM System Storage DS8000 Introduction and Planning Guide (GC27-2297).*

Logical configuration planning and application

Logical configuration planning is a customer responsibility. Logical configuration refers to the creation of RAID ranks, volumes, or LUNs, and the assignment of the configured capacity to servers.

Application of the initial logical configuration and all subsequent modifications to the logical configuration is a customer responsibility. The logical configuration can be created, applied, and modified using the DS Storage Manager, DS CLI, or DS Open API.

IBM Global Services will also apply or modify your logical configuration (fee-based services).

Licensed Machine Code planning and application

IBM may release changes to the DS8000 series Licensed Machine Code. IBM plans to make most DS8000 series Licensed Machine Code changes available for download by the DS8000 series system from the IBM System Storage technical support website.

Note: Not all Licensed Machine Code changes may be available via the support website. If the machine does not function as warranted and your problem can be resolved through your application of downloadable Licensed Machine Code, you are responsible for downloading and installing these designated Licensed Machine Code changes as IBM specifies. IBM has responsibility for installing changes that IBM does not make available for you to download. The DS8000 series includes many enhancements to make the Licensed Machine Code change process simpler, quicker, and more automated. If you would prefer, you may request IBM to install downloadable Licensed Machine Code changes; however, you may be charged for that service.

Calculating physical and effective capacity

Refer to the *IBM System Storage DS8000 Introduction and Planning Guide (GC27-2297)* for capacity calculation guidelines.

Encryption planning

Encryption planning is a customer responsibility. There are three major planning components to the implementation of an encryption environment. Review all planning requirements and include them in your installation considerations.

- Key Server Planning
- Tivoli® Key Lifecycle Manager Planning
- Full Disk Encryption Activation Review Planning

Key server planning

Key server planning is a customer responsibility. Introductory information, including required and optional features, can be found in the *IBM System Storage DS8000 Introduction and Planning Guide (GC27-2297).*

DS8800 requires at least two key servers and associated software for each site which has one or more encryption-enabled DS8000 systems, according to the encryption best practices. One server must be isolated and the others can be of any supported key server configuration. Any site that operates independently of other sites must have key servers for the encryption enabled DS8000 systems at that site.

DS8000 Encryption environments are recommended to configure external Laptop HMC for high availability (feature #1130).

It is the customer's responsibility to replicate any key labels across all key servers attached to a given encryption-enabled DS8000 before configuring that key label on the DS8000.

Dual platform key server planning

DS8000 supports the ability to configure two independent key labels for each encryption-enabled DS8000. This capability allows the use of two independent key server platforms when one or both key server platforms are using secure-key mode key stores allowing the isolated key server platform to be used in conjunction with a second key server platform that is operating with a secure-key mode key store.

For customers needing dual platform key server support on DS8000, the installation of TKLM IFIX 2 (TKLM Version 1.0.0.2) is recommended to support displaying both key labels in the GUI. Additionally, for customers who intend to replicate keys between separate sysplexes using ICSF with the JCECCARACFKS key store in secure key mode and with the secure key configuration flag set in TKLM, TKLM Fix Pack 3 (TKLM Version 1.0.0.3) is required.

Tivoli Key Lifecycle Manager planning

The DS8000 series supports IBM Tivoli Key Lifecycle Manager V1.0 and V2.0.

```
Program
number      VRM     Program name

5724-T60    1.0.0/  IBM Tivoli Key Lifecycle Manager
            2.0.0
5608-A91    1.0.0   IBM Tivoli Key Lifecycle Manager (distributed
                     for non-Passport Advantage)
                    IBM Tivoli Key Lifecycle Manager for z/OS V1.0


Program
number      VRM     Program name

5698-B35    1.0.0   IBM Tivoli Key Lifecycle Manager for z/OS
```

Isolated key servers ordered with feature number 1760 will have a Linux operating system and TKLM software preinstalled. Customers will need to acquire a TKLM license for use of the TKLM software, ordered separately from the standalone server hardware.

Refer to the following publications:

- IBM Tivoli Key Lifecycle Manager Quick Start Guide (GI11-8738)
- IBM Tivoli Key Lifecycle Manager Installation and Configuration Guide (SC27-2741)
- IBM Tivoli Key Lifecycle Manager Program Directory (for z/OS) (GI11-4300)

Full Disk Encryption Activation review planning

Full Disk Encryption Activation is a customer responsibility. IBM Full Disk Encryption offerings must be activated prior to use. This activation is part of the installation and configuration steps required for use of the technology. This installation and activation review is performed by the IBM Systems and Technology Lab Services group.

Send email to

   storsvcs@us.ibm.com

Visit the website below and click on "Contact now" to submit your inquiry or request.

   http://www-03.ibm.com/systems/services/labservices/

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.

Model conversions

DS8300 and DS8700 to DS8800 model conversions are disruptive. In addition, data may not be preserved during the conversion. Data migration or backup/restore is a customer responsibility. Fee-based data migration services are available from IBM Global Services.

For more information on the IBM Global Financing offering, visit

  http://www-03.ibm.com/financing/us/lifecycle/acquire/diskx.html

IBM Global Finance can assist with alternatives to convert installed DS8300 and DS8700 to DS8800. Please contact IBM Global Financing for Model Conversion Upgrade Planning solutions.

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

Cables are required to connect DS8000 series 8 Gb FCP/FICON host adapters ports to server or fabric ports.

Cables can be purchased using DS8000 series feature numbers. Additional cable options, along with product support services such as installation, is offered by IBM Global Services' Networking Services.

Fibre Channel/FICON (shortwave): Shortwave Fibre Channel and FICON ports on the DS8000 series require a 50-micron (multimode) fiber optic cable terminated with an LC connector.

Fibre Channel cables can be purchased using feature numbers 141x for 50-micron cables.

Fibre Channel/FICON (longwave): Longwave Fibre Channel and FICON ports on the DS8000 series require either a 9-micron (single mode) or 50-micron (multimode) fiber optic cable terminated with an LC connector. A 50-micron cable is required when the longwave port is operating at a 4 Gb per second transfer rate.

Fibre Channel cables can be purchased using feature numbers 141x for 50-micron cables and numbers 142x for 9-micron cables.

Security, auditability, and control

This product uses the security and auditability features of the host hardware, host software and application software to which it is attached.

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

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

No cables required.

Direct customer support

Direct customer support for the DS8000 series is provided by IBM Operational Support Services - Support Line. This fee service can enhance your productivity by providing voice and electronic access into the IBM support organization. IBM Operational Support Services - Support Line will help 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 the following website

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 the host hardware, host software and application software to which it is attached.

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

MES Discount Applicable

No

Field Installable Feature

Yes

Warranty period

Machine type 2421: One year

Machine type 2422: Two years

Machine type 2423: Three years

Machine type 2424: Four years This product is provided with 1 year of standard warranty and additional years of extended warranty services to make these offerings. Customers should consult with their financial personnel on the appropriate financial treatment for this offering.

Customer setup

No

Licensed Internal Code

Same license terms and conditions as designated machine.

Pricing

```
                                   Machine          Feature
        Description                type     Model   number

        System Storage DS8700      2421     941

        Attachment indicators:
        - IBM Storwize V7000 indicator               0961
        - IBM System Storage N series indicator      0962
        - IBM System Storage SAN Volume Controller   0963
          indicator

        DS8000 Licensed Machine Code:
        - DS8000 LMC R6.2                            1723

        Disk Drive Sets:
        - Customer supplied drive set               2990

                                   Machine          Feature
        Description                type     Model   number

        System Storage DS8700      2421     94E

        Attachment indicators:
        - IBM Storwize V7000 indicator               0961
        - IBM System Storage N series indicator      0962
        - IBM System Storage SAN Volume Controller   0963
          indicator

        DS8000 Licensed Machine Code:
        - DS8000 LMC R6.2 indicator                 1823

        Disk Drive Sets:
        - Customer supplied drive set               2990
```

Description	Machine type	Model	Feature number
System Storage DS8700	2422	941	

Attachment indicators:
- IBM Storwize V7000 indicator			0961
- IBM System Storage N series indicator			0962
- IBM System Storage SAN Volume Controller indicator			0963

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2			1723

Disk Drive Sets:
- Customer supplied drive set			2990

Description	Machine type	Model	Feature number
System Storage DS8700	2422	94E	

Attachment indicators:
- IBM Storwize V7000 indicator			0961
- IBM System Storage N series indicator			0962
- IBM System Storage SAN Volume Controller indicator			0963

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator			1823

Disk Drive Sets:
- Customer supplied drive set			2990

Description	Machine type	Model	Feature number
System Storage DS8700	2423	941	

Attachment indicators:
- IBM Storwize V7000 indicator			0961
- IBM System Storage N series indicator			0962
- IBM System Storage SAN Volume Controller indicator			0963

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2			1723

Disk Drive Sets:
- Customer supplied drive set			2990

Description	Machine type	Model	Feature number
System Storage DS8700	2423	94E	

Attachment indicators:
- IBM Storwize V7000 indicator			0961
- IBM System Storage N series indicator			0962
- IBM System Storage SAN Volume Controller indicator			0963

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator			1823

Disk Drive Sets:
- Customer supplied drive set			2990

Description	Machine type	Model	Feature number
System Storage DS8700	2424	941	

```
Attachment indicators:
- IBM Storwize V7000 indicator          0961
- IBM System Storage N series indicator 0962
- IBM System Storage SAN Volume Controller  0963
  indicator


DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                        1723


Disk Drive Sets:
- Customer supplied drive set            2990


                             Machine         Feature
Description                  type    Model   number


System Storage DS8700        2424    94E


Attachment indicators:
- IBM Storwize V7000 indicator          0961
- IBM System Storage N series indicator 0962
- IBM System Storage SAN Volume Controller  0963
  indicator


DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator              1823


Disk Drive Sets:
- Customer supplied drive set            2990


                             Machine         Feature
Description                  type    Model   number


System Storage DS8800        2421    951


Model 9xE Position Indicators:
- 951 - 95E position 3                   0353


Initial System Capacity:
- 700.1 to 800.0 TB capacity             0873
- 800.1 to 900.0 TB capacity             0874
- 900.1 to 1000.0 TB capacity            0875
- 1000.1 to 1100.0 TB capacity           0876
- 1100.1 to 1200.0 TB capacity           0877
- 1200.1 to 1300.0 TB capacity           0878
- 1300.1 to 1400.0 TB capacity           0879
- 1400.1 to 1500.0 TB capacity           0880
- 1500.1 to 1600.0 TB capacity           0881
- 1600.1 to 1700.0 TB capacity           0882
- 1700.1 to 1800.0 TB capacity           0883
- 1800.1 to 1900.0 TB capacity           0884
- 1900.1 to 2000.0 TB capacity           0885
- 2000.1 to 2200.0 TB capacity           0886
- 2200.1 to 2400.0 TB capacity           0887
- 2400.1 to 2600.0 TB capacity           0888
- 2600.1 to 2800.0 TB capacity           0889
- 2800.1 to 3000.0 TB capacity           0890


Attachment indicators:
- IBM Storwize V7000 indicator          0961
- IBM System Storage N series indicator 0962
- IBM System Storage SAN Volume Controller  0963
  indicator


Single Phase Power Cords:
- Top exit SPP cord group 1              1070
- Top exit SPP cord group 3              1071


Line Cords:
- Top exit line cord (US/LA/AP/Canada)   1095
- Top exit line cord (EMEA)              1096
- Top exit line cord (Japan/US/Canada)   1097


Special tool:
- Universal ladder                       1101
```

```
Disk Enclosure:
- 3.5" Disk enclosure indicator          1244

Top Exit Bracket:
- Top exit bracket for Fibre cable       1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                        1723

Disk Drive Sets:
- 300 GB 15K SAS drive set               2308
- 900 GB 10K SAS drive set               2758
- 3 TB 7.2K SAS half drive set           2858
- Customer supplied drive set            2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set           2309
- 900 GB 10K SAS CoD drive set           2759
- 3 TB 7.2K SAS CoD half drive set       2859

Disk Enclosure filler:
- 3.5" Disk enclosure filler set         2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set               5108
- 300 GB 15K FDE drive set               5308
- 900 GB 10K FDE drive set               5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set           5209
- 300 GB 15K FDE CoD drive set           5309
- 900 GB 10K FDE CoD drive set           5759
```

Description	Machine type	Model	Feature number
System Storage DS8800	2421	95E	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                   0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity             0873
- 800.1 to 900.0 TB capacity             0874
- 900.1 to 1000.0 TB capacity            0875
- 1000.1 to 1100.0 TB capacity           0876
- 1100.1 to 1200.0 TB capacity           0877
- 1200.1 to 1300.0 TB capacity           0878
- 1300.1 to 1400.0 TB capacity           0879
- 1400.1 to 1500.0 TB capacity           0880
- 1500.1 to 1600.0 TB capacity           0881
- 1600.1 to 1700.0 TB capacity           0882
- 1700.1 to 1800.0 TB capacity           0883
- 1800.1 to 1900.0 TB capacity           0884
- 1900.1 to 2000.0 TB capacity           0885
- 2000.1 to 2200.0 TB capacity           0886
- 2200.1 to 2400.0 TB capacity           0887
- 2400.1 to 2600.0 TB capacity           0888
- 2600.1 to 2800.0 TB capacity           0889
- 2800.1 to 3000.0 TB capacity           0890

Attachment indicators:
- IBM Storwize V7000 indicator           0961
- IBM System Storage N series indicator  0962
- IBM System Storage SAN Volume Controller  0963
  indicator

Single Phase Power Cords:
- Top exit SPP cord group 1              1070
- Top exit SPP cord group 3              1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)   1095
```

```
- Top exit line cord (EMEA)                    1096
- Top exit line cord (Japan/US/Canada)         1097


Disk Enclosure:
- 3.5" Disk enclosure indicator                1244


Top Exit Bracket:
- Top exit bracket for Fibre cable             1400


DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator                    1823


Disk Drive Sets:
- 300 GB 15K SAS drive set                     2308
- 900 GB 10K SAS drive set                     2758
- 3 TB 7.2K SAS half drive set                 2858
- Customer supplied drive set                  2990


Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                 2309
- 900 GB 10K SAS CoD drive set                 2759
- 3 TB 7.2K SAS CoD half drive set             2859


Disk Enclosure filler:
- 3.5" Disk enclosure filler set               2997


Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                     5108
- 300 GB 15K FDE drive set                     5308
- 900 GB 10K FDE drive set                     5758


Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                 5209
- 300 GB 15K FDE CoD drive set                 5309
- 900 GB 10K FDE CoD drive set                 5759
```

Description	Machine type	Model	Feature number
System Storage DS8800	2422	951	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                         0353


Initial System Capacity:
- 700.1 to 800.0 TB capacity                   0873
- 800.1 to 900.0 TB capacity                   0874
- 900.1 to 1000.0 TB capacity                  0875
- 1000.1 to 1100.0 TB capacity                 0876
- 1100.1 to 1200.0 TB capacity                 0877
- 1200.1 to 1300.0 TB capacity                 0878
- 1300.1 to 1400.0 TB capacity                 0879
- 1400.1 to 1500.0 TB capacity                 0880
- 1500.1 to 1600.0 TB capacity                 0881
- 1600.1 to 1700.0 TB capacity                 0882
- 1700.1 to 1800.0 TB capacity                 0883
- 1800.1 to 1900.0 TB capacity                 0884
- 1900.1 to 2000.0 TB capacity                 0885
- 2000.1 to 2200.0 TB capacity                 0886
- 2200.1 to 2400.0 TB capacity                 0887
- 2400.1 to 2600.0 TB capacity                 0888
- 2600.1 to 2800.0 TB capacity                 0889
- 2800.1 to 3000.0 TB capacity                 0890


Attachment indicators:
- IBM Storwize V7000 indicator                 0961
- IBM System Storage N series indicator        0962
- IBM System Storage SAN Volume Controller     0963
  indicator


Single Phase Power Cords:
- Top exit SPP cord group 1                    1070
- Top exit SPP cord group 3                    1071
```

```
Line Cords:
- Top exit line cord (US/LA/AP/Canada)      1095
- Top exit line cord (EMEA)                 1096
- Top exit line cord (Japan/US/Canada)      1097

Special tool:
- Universal ladder                          1101

Disk Enclosure:
- 3.5" Disk enclosure indicator             1244

Top Exit Bracket:
- Top exit bracket for Fibre cable          1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                           1723

Disk Drive Sets:
- 300 GB 15K SAS drive set                  2308
- 900 GB 10K SAS drive set                  2758
- 3 TB 7.2K SAS half drive set              2858
- Customer supplied drive set               2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set              2309
- 900 GB 10K SAS CoD drive set              2759
- 3 TB 7.2K SAS CoD half drive set          2859

Disk Enclosure filler:
- 3.5" Disk enclosure filler set            2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                  5108
- 300 GB 15K FDE drive set                  5308
- 900 GB 10K FDE drive set                  5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set              5209
- 300 GB 15K FDE CoD drive set              5309
- 900 GB 10K FDE CoD drive set              5759
```

Description	Machine type	Model	Feature number
System Storage DS8800	2422	95E	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                      0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                0873
- 800.1 to 900.0 TB capacity                0874
- 900.1 to 1000.0 TB capacity               0875
- 1000.1 to 1100.0 TB capacity              0876
- 1100.1 to 1200.0 TB capacity              0877
- 1200.1 to 1300.0 TB capacity              0878
- 1300.1 to 1400.0 TB capacity              0879
- 1400.1 to 1500.0 TB capacity              0880
- 1500.1 to 1600.0 TB capacity              0881
- 1600.1 to 1700.0 TB capacity              0882
- 1700.1 to 1800.0 TB capacity              0883
- 1800.1 to 1900.0 TB capacity              0884
- 1900.1 to 2000.0 TB capacity              0885
- 2000.1 to 2200.0 TB capacity              0886
- 2200.1 to 2400.0 TB capacity              0887
- 2400.1 to 2600.0 TB capacity              0888
- 2600.1 to 2800.0 TB capacity              0889
- 2800.1 to 3000.0 TB capacity              0890

Attachment indicators:
- IBM Storwize V7000 indicator              0961
- IBM System Storage N series indicator     0962
- IBM System Storage SAN Volume Controller  0963
  indicator
```

```
Single Phase Power Cords:
- Top exit SPP cord group 1                    1070
- Top exit SPP cord group 3                    1071


Line Cords:
- Top exit line cord (US/LA/AP/Canada)         1095
- Top exit line cord (EMEA)                    1096
- Top exit line cord (Japan/US/Canada)         1097


Disk Enclosure:
- 3.5" Disk enclosure indicator                1244


Top Exit Bracket:
- Top exit bracket for Fibre cable             1400


DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator                    1823


Disk Drive Sets:
- 300 GB 15K SAS drive set                     2308
- 900 GB 10K SAS drive set                     2758
- 3 TB 7.2K SAS half drive set                 2858
- Customer supplied drive set                  2990


Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set                 2309
- 900 GB 10K SAS CoD drive set                 2759
- 3 TB 7.2K SAS CoD half drive set             2859


Disk Enclosure filler:
- 3.5" Disk enclosure filler set               2997


Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                     5108
- 300 GB 15K FDE drive set                     5308
- 900 GB 10K FDE drive set                     5758


Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set                 5209
- 300 GB 15K FDE CoD drive set                 5309
- 900 GB 10K FDE CoD drive set                 5759
```

Description	Machine type	Model	Feature number
System Storage DS8800	2423	951	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                         0353


Initial System Capacity:
- 700.1 to 800.0 TB capacity                   0873
- 800.1 to 900.0 TB capacity                   0874
- 900.1 to 1000.0 TB capacity                  0875
- 1000.1 to 1100.0 TB capacity                 0876
- 1100.1 to 1200.0 TB capacity                 0877
- 1200.1 to 1300.0 TB capacity                 0878
- 1300.1 to 1400.0 TB capacity                 0879
- 1400.1 to 1500.0 TB capacity                 0880
- 1500.1 to 1600.0 TB capacity                 0881
- 1600.1 to 1700.0 TB capacity                 0882
- 1700.1 to 1800.0 TB capacity                 0883
- 1800.1 to 1900.0 TB capacity                 0884
- 1900.1 to 2000.0 TB capacity                 0885
- 2000.1 to 2200.0 TB capacity                 0886
- 2200.1 to 2400.0 TB capacity                 0887
- 2400.1 to 2600.0 TB capacity                 0888
- 2600.1 to 2800.0 TB capacity                 0889
- 2800.1 to 3000.0 TB capacity                 0890


Attachment indicators:
- IBM Storwize V7000 indicator                 0961
- IBM System Storage N series indicator        0962
```

```
    - IBM System Storage SAN Volume Controller    0963
      indicator

    Single Phase Power Cords:
    - Top exit SPP cord group 1                    1070
    - Top exit SPP cord group 3                    1071

    Line Cords:
    - Top exit line cord (US/LA/AP/Canada)         1095
    - Top exit line cord (EMEA)                    1096
    - Top exit line cord (Japan/US/Canada)         1097

    Special tool:
    - Universal ladder                             1101

    Disk Enclosure:
    - 3.5" Disk enclosure indicator                1244

    Top Exit Bracket:
    - Top exit bracket for Fibre cable             1400

    DS8000 Licensed Machine Code:
    - DS8000 LMC R6.2                              1723

    Disk Drive Sets:
    - 300 GB 15K SAS drive set                     2308
    - 900 GB 10K SAS drive set                     2758
    - 3 TB 7.2K SAS half drive set                 2858
    - Customer supplied drive set                  2990

    Standby CoD Disk Drive Sets:
    - 300 GB 15K SAS CoD drive set                 2309
    - 900 GB 10K SAS CoD drive set                 2759
    - 3 TB 7.2K SAS CoD half drive set             2859

    Disk Enclosure filler:
    - 3.5" Disk enclosure filler set               2997

    Encryption Disk Drive Sets:
    - 146 GB 15K FDE drive set                     5108
    - 300 GB 15K FDE drive set                     5308
    - 900 GB 10K FDE drive set                     5758

    Encryption Standby CoD Disk Drive Sets:
    - 146 GB 15K FDE CoD drive set                 5209
    - 300 GB 15K FDE CoD drive set                 5309
    - 900 GB 10K FDE CoD drive set                 5759
```

Description	Machine type	Model	Feature number
System Storage DS8800	2423	95E	

```
    Model 9xE Position Indicators:
    - 951 - 95E position 3                         0353

    Initial System Capacity:
    - 700.1 to 800.0 TB capacity                   0873
    - 800.1 to 900.0 TB capacity                   0874
    - 900.1 to 1000.0 TB capacity                  0875
    - 1000.1 to 1100.0 TB capacity                 0876
    - 1100.1 to 1200.0 TB capacity                 0877
    - 1200.1 to 1300.0 TB capacity                 0878
    - 1300.1 to 1400.0 TB capacity                 0879
    - 1400.1 to 1500.0 TB capacity                 0880
    - 1500.1 to 1600.0 TB capacity                 0881
    - 1600.1 to 1700.0 TB capacity                 0882
    - 1700.1 to 1800.0 TB capacity                 0883
    - 1800.1 to 1900.0 TB capacity                 0884
    - 1900.1 to 2000.0 TB capacity                 0885
    - 2000.1 to 2200.0 TB capacity                 0886
    - 2200.1 to 2400.0 TB capacity                 0887
    - 2400.1 to 2600.0 TB capacity                 0888
    - 2600.1 to 2800.0 TB capacity                 0889
```

```
- 2800.1 to 3000.0 TB capacity        0890

Attachment indicators:
- IBM Storwize V7000 indicator         0961
- IBM System Storage N series indicator 0962
- IBM System Storage SAN Volume Controller  0963
  indicator

Single Phase Power Cords:
- Top exit SPP cord group 1            1070
- Top exit SPP cord group 3            1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)  1095
- Top exit line cord (EMEA)            1096
- Top exit line cord (Japan/US/Canada)  1097

Disk Enclosure:
- 3.5" Disk enclosure indicator        1244

Top Exit Bracket:
- Top exit bracket for Fibre cable     1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator            1823

Disk Drive Sets:
- 300 GB 15K SAS drive set             2308
- 900 GB 10K SAS drive set             2758
- 3 TB 7.2K SAS half drive set         2858
- Customer supplied drive set          2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set         2309
- 900 GB 10K SAS CoD drive set         2759
- 3 TB 7.2K SAS CoD half drive set     2859

Disk Enclosure filler:
- 3.5" Disk enclosure filler set       2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set             5108
- 300 GB 15K FDE drive set             5308
- 900 GB 10K FDE drive set             5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set         5209
- 300 GB 15K FDE CoD drive set         5309
- 900 GB 10K FDE CoD drive set         5759
```

Description	Machine type	Model	Feature number
System Storage DS8800	2424	951	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                 0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity           0873
- 800.1 to 900.0 TB capacity           0874
- 900.1 to 1000.0 TB capacity          0875
- 1000.1 to 1100.0 TB capacity         0876
- 1100.1 to 1200.0 TB capacity         0877
- 1200.1 to 1300.0 TB capacity         0878
- 1300.1 to 1400.0 TB capacity         0879
- 1400.1 to 1500.0 TB capacity         0880
- 1500.1 to 1600.0 TB capacity         0881
- 1600.1 to 1700.0 TB capacity         0882
- 1700.1 to 1800.0 TB capacity         0883
- 1800.1 to 1900.0 TB capacity         0884
- 1900.1 to 2000.0 TB capacity         0885
- 2000.1 to 2200.0 TB capacity         0886
- 2200.1 to 2400.0 TB capacity         0887
```

```
                                              - 2400.1 to 2600.0 TB capacity          0888
                                              - 2600.1 to 2800.0 TB capacity          0889
                                              - 2800.1 to 3000.0 TB capacity          0890

Attachment indicators:
- IBM Storwize V7000 indicator              0961
- IBM System Storage N series indicator     0962
- IBM System Storage SAN Volume Controller  0963
  indicator

Single Phase Power Cords:
- Top exit SPP cord group 1                 1070
- Top exit SPP cord group 3                 1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)      1095
- Top exit line cord (EMEA)                 1096
- Top exit line cord (Japan/US/Canada)      1097

Special tool:
- Universal ladder                          1101

Disk Enclosure:
- 3.5" Disk enclosure indicator             1244

Top Exit Bracket:
- Top exit bracket for Fibre cable          1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2                           1723

Disk Drive Sets:
- 300 GB 15K SAS drive set                  2308
- 900 GB 10K SAS drive set                  2758
- 3 TB 7.2K SAS half drive set              2858
- Customer supplied drive set               2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set              2309
- 900 GB 10K SAS CoD drive set              2759
- 3 TB 7.2K SAS CoD half drive set          2859

Disk Enclosure filler:
- 3.5" Disk enclosure filler set            2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set                  5108
- 300 GB 15K FDE drive set                  5308
- 900 GB 10K FDE drive set                  5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set              5209
- 300 GB 15K FDE CoD drive set              5309
- 900 GB 10K FDE CoD drive set              5759
```

Description	Machine type	Model	Feature number
System Storage DS8800	2424	95E	

```
Model 9xE Position Indicators:
- 951 - 95E position 3                      0353

Initial System Capacity:
- 700.1 to 800.0 TB capacity                0873
- 800.1 to 900.0 TB capacity                0874
- 900.1 to 1000.0 TB capacity               0875
- 1000.1 to 1100.0 TB capacity              0876
- 1100.1 to 1200.0 TB capacity              0877
- 1200.1 to 1300.0 TB capacity              0878
- 1300.1 to 1400.0 TB capacity              0879
- 1400.1 to 1500.0 TB capacity              0880
- 1500.1 to 1600.0 TB capacity              0881
- 1600.1 to 1700.0 TB capacity              0882
```

```
- 1700.1 to 1800.0 TB capacity          0883
- 1800.1 to 1900.0 TB capacity          0884
- 1900.1 to 2000.0 TB capacity          0885
- 2000.1 to 2200.0 TB capacity          0886
- 2200.1 to 2400.0 TB capacity          0887
- 2400.1 to 2600.0 TB capacity          0888
- 2600.1 to 2800.0 TB capacity          0889
- 2800.1 to 3000.0 TB capacity          0890

Attachment indicators:
- IBM Storwize V7000 indicator          0961
- IBM System Storage N series indicator 0962
- IBM System Storage SAN Volume Controller  0963
  indicator

Single Phase Power Cords:
- Top exit SPP cord group 1             1070
- Top exit SPP cord group 3             1071

Line Cords:
- Top exit line cord (US/LA/AP/Canada)  1095
- Top exit line cord (EMEA)             1096
- Top exit line cord (Japan/US/Canada)  1097

Disk Enclosure:
- 3.5" Disk enclosure indicator         1244

Top Exit Bracket:
- Top exit bracket for Fibre cable      1400

DS8000 Licensed Machine Code:
- DS8000 LMC R6.2 indicator             1823

Disk Drive Sets:
- 300 GB 15K SAS drive set              2308
- 900 GB 10K SAS drive set              2758
- 3 TB 7.2K SAS half drive set          2858
- Customer supplied drive set           2990

Standby CoD Disk Drive Sets:
- 300 GB 15K SAS CoD drive set          2309
- 900 GB 10K SAS CoD drive set          2759
- 3 TB 7.2K SAS CoD half drive set      2859

Disk Enclosure filler:
- 3.5" Disk enclosure filler set        2997

Encryption Disk Drive Sets:
- 146 GB 15K FDE drive set              5108
- 300 GB 15K FDE drive set              5308
- 900 GB 10K FDE drive set              5758

Encryption Standby CoD Disk Drive Sets:
- 146 GB 15K FDE CoD drive set          5209
- 300 GB 15K FDE CoD drive set          5309
- 900 GB 10K FDE CoD drive set          5759


NC = No charge

Feature change options
```

Description	Feature Number	Install* Type	Feature Conversion	Feature Exchange	Feature Remove
Model 9xE Position Indicators:					
- 951 - 95E position 3	0353	Both	No	No	Yes
Initial System Capacity:					
- 700.1 to 800.0 TB capacity	0873	Plant only	No	No	Yes
- 800.1 to 900.0 TB capacity	0874	Plant only	No	No	Yes
- 900.1 to 1000.0 TB capacity	0875	Plant only	No	No	Yes
- 1000.1 to 1100.0 TB capacity	0876	Plant only	No	No	Yes
- 1100.1 to 1200.0 TB capacity	0877	Plant only	No	No	Yes

```
  - 1200.1 to 1300.0 TB capacity 0878   Plant only  No       No       Yes
  - 1300.1 to 1400.0 TB capacity 0879   Plant only  No       No       Yes
  - 1400.1 to 1500.0 TB capacity 0880   Plant only  No       No       Yes
  - 1500.1 to 1600.0 TB capacity 0881   Plant only  No       No       Yes
  - 1600.1 to 1700.0 TB capacity 0882   Plant only  No       No       Yes
  - 1700.1 to 1800.0 TB capacity 0883   Plant only  No       No       Yes
  - 1800.1 to 1900.0 TB capacity 0884   Plant only  No       No       Yes
  - 1900.1 to 2000.0 TB capacity 0885   Plant only  No       No       Yes
  - 2000.1 to 2200.0 TB capacity 0886   Plant only  No       No       Yes
  - 2200.1 to 2400.0 TB capacity 0887   Plant only  No       No       Yes
  - 2400.1 to 2600.0 TB capacity 0888   Plant only  No       No       Yes
  - 2600.1 to 2800.0 TB capacity 0889   Plant only  No       No       Yes
  - 2800.1 to 3000.0 TB capacity 0890   Plant only  No       No       Yes

  Attachment indicators:
  - IBM Storwize V7000 indicator 0961   Both        No       No       No
  - IBM System Storage N series  0962   Both        No       No       No
    indicator
  - IBM System Storage SAN Volume 0963  Both        No       No       No
    Controller indicator

  Single Phase Power Cords:
  - Top exit SPP cord group 1    1070   Plant only  No       No       No
  - Top exit SPP cord group 3    1071   Plant only  No       No       No

  Line Cords:
  - Top exit line cord           1095   Both        No       No       No
    (US/LA/AP/Canada)
  - Top exit line cord (EMEA)    1096   Both        No       No       No
  - Top exit line cord           1097   Both        No       No       No
    (Japan/US/Canada)

  Special tool:
  - Universal ladder             1101   Both        No       No       No

  Disk Enclosure:
  - 3.5" Disk enclosure indicator 1244  Both        No       No       No

  Top Exit Bracket:
  - Top exit bracket for         1400   Both        No       No       No
    Fibre cable

  DS8000 Licensed Machine Code:
  - DS8000 LMC R6.2              1723   Both        No       No       Yes
  - DS8000 LMC R6.2 indicator    1823   Both        No       No       Yes

  Disk Drive Sets:
  - 300 GB 15K SAS drive set     2308   Both        Yes      Yes      No
  - 900 GB 10K SAS drive set     2758   Both        Yes      Yes      No
  - 3 TB 7.2K SAS half drive set 2858   Both        Yes      Yes      No
  - Customer supplied drive set  2990   Field only  No       No       No

  Standby CoD Disk Drive Sets:
  - 300 GB 15K SAS CoD drive set 2308   Both        Yes      Yes      No
  - 900 GB 10K SAS CoD drive set 2759   Both        Yes      Yes      No
  - 3 TB 7.2K SAS CoD half drive 2859   Both        Yes      Yes      No
    set

  Disk Enclosure filler:
  - 3.5" Disk enclosure filler   2997   Both        No       No       Yes
    set

  Encryption Disk Drive Sets:
  - 146 GB 15K FDE drive set     5108   Both        Yes      Yes      No
  - 300 GB 15K FDE drive set     5308   Both        Yes      Yes      No
  - 900 GB 10K FDE drive set     5758   Both        Yes      Yes      No

  Encryption Standby CoD Disk Drive Sets:
  - 146 GB 15K FDE CoD drive set 5209   Both        Yes      Yes      No
  - 300 GB 15K FDE CoD drive set 5309   Both        Yes      Yes      No
  - 900 GB 10K FDE CoD drive set 5759   Both        Yes      Yes      No


  * Parts removed or replaced become the property of IBM and must be
```

returned.

- Feature Conversion: As necessary, IBM service personnel will remove components from the machine and/or install additional components required to complete the conversion.
- Feature Remove: This is an administrative transaction and only updates IBM machine and inventory records, except under the following condition:
  - IBM will remove components from the machine if the Feature Remove is ordered in conjunction with a Feature Add transaction.

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ENUS-111-172-List_prices_2011_10_11.PDF

Feature conversion purchase price

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Feature Conversions (Machine Types 2421, 2422, 2423, and 2424
Models 951 and 95E):

Feature      Returned                      Continuous
From  To     Parts *  Description          Maintenance

Disk Drive Sets:
2208  2308   Yes      Disk drive set            Yes
                        conversion
2208  2758   Yes      Disk drive set            Yes
                        conversion
2308  2608   Yes      Disk drive set            Yes
                        conversion
2308  2708   Yes      Disk drive set            Yes
                        conversion
2308  2758   Yes      Disk drive set            Yes
                        conversion
2608  2758   Yes      Disk drive set            Yes
                        conversion
2708  2758   Yes      Disk drive set            Yes
                        conversion

Feature      Returned                      Continuous
From  To     Parts *  Description          Maintenance

CoD Disk Drive Sets:
2309  2308   No       CoD disk drive            Yes
                        conversion
2759  2758   No       CoD disk drive            Yes
                        conversion
2859  2858   No       CoD disk half drive       Yes
                        conversion

Feature      Returned                      Continuous
From  To     Parts *  Description          Maintenance

Encryption Disk Drive Sets:
5108  5308   Yes      Encryption disk drive   Yes
                        set conversion
5108  5608   Yes      Encryption disk drive   Yes
                        set conversion
5108  5708   Yes      Encryption disk drive   Yes
                        set conversion
5108  5758   Yes      Encryption disk drive   Yes
                       set conversion

5308  5608   Yes      Encryption disk drive   Yes
                        set conversion
5308  5708   Yes      Encryption disk drive   Yes
```

```
                              set conversion
5308  5758   Yes          Encryption disk drive  Yes
                              set conversion
5608  5758   Yes          Encryption disk drive  Yes
                              set conversion
5708  5758   Yes          Encryption disk drive  Yes
                              set conversion


Feature      Returned                        Continuous
From  To     Parts *  Description            Maintenance

Encryption CoD Disk Drive Sets:
5209  5108    No     Encryption CoD disk        Yes
                       drive conversion
5309  5308    No     Encryption CoD disk        Yes
                       drive conversion
5759  5758    No     Encryption CoD disk        Yes
                       drive conversion
```

* Parts removed or replaced become the property of IBM and
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