



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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At a glance

New functional capabilities for the DS8000® series (Machine types 2421, 2422, 2423, and 2424) include:

- **Storage scalability and resiliency**
 - Third expansion unit
 - Additional drive options
 - Smart Rebuild
- **System z® Synergy items**
 - DS8000 I/O Priority Manager (System z)
 - Extended Address Volumes
 - High Performance FICON® for System z (zHPF) enhancements for QSAM/BSAM
 - Format writes
 - DB2® list prefetch
 - HyperSwap® (GDPS®) support
 - Quick initialization (System z)
- **Enhanced tiering capabilities**
 - Three tier support
 - Thin provisioned device support
 - Auto-rebalance of homogenous pools
- **Thin provisioning enhancement**
 - Thin provisioning support for FlashCopy® (open systems only)
 - Thin provisioning support for easy tier pools
- **User interface enhancement**
 - Graphical user interface (GUI) support for resource groups
 - Parallel volume create and delete
 - DS8000 Storage Manager enhancement

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.

Availability of programs with an encryption algorithm in France is subject to French government approval.

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

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

Reference information

For more information, refer to the following announcements:

- Hardware Announcement [ZG10-0328](#), 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 [ZG10-0329](#), 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 [ZG10-0335](#), 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 [ZG10-0330](#), 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 [ZG11-0130](#), 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
Disk Drive Sets:			
- Customer supplied drive set			2990

Description	Machine 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

Description	Machine 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

Description	Machine 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

Description	Machine 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

Description	Machine type	Model	Feature
DS8700	2424	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
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
- 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	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 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
	Machine		
Description	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 From	To	Returned 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 From	To	Returned 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 From	To	Returned 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 From	To	Returned 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

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

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.

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/ 2.0.0	IBM Tivoli Key Lifecycle Manager
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 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/>

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.

Global Technology Services

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

IBM Electronic Services

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

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

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

To learn how Electronic Services can work for you, visit

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

Terms and conditions

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

For all local charges, contact your IBM representative.

Announcement countries

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