

IBM DS8880 storage family delivers a 3.8 TB flash capacity option, additional functions, and DS8870 to DS8886 model conversions

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At a glance

A new 3.8 TB 2.5-inch high-capacity flash option for the IBM^(R) DS8880 family is being added to the list of current flash drives for a greater choice in price and performance.

The following is also available in this release:

- Additional features and functions that allow lower latency between IBM z14 and DS8886F, transparent cloud tiering (TCT) support, and copy services and graphical user interface (GUI) improvements.
- Cache options available with DDR4 technology.
- RAID-5 support for HDDs is being removed in this release. RAID-5 support for new HDDs builds under 1 TB is available through RPQ 8S1624.
- Machine type model conversions from DS8870 enterprise configurations to DS8886 models 985 and 986 are available for investment protection.

Overview

New features and functions

- 3.8 TB high-capacity flash drive sets are added to the list of available flash capacity options
- RAID-5 support removed from HDDs but RAID-5 support is available for new HDD builds under 1 TB builds through RPQ 8S1624
- Lower latency with zHyperlink on DS8886 models with 16-core and 128 GB or 256 GB cache attached to mainframe

The zHyperlink enhancements in this release partially fulfill the Statements of General Direction found in Hardware Announcement [117-003](#), dated January 10, 2017.

- Support for TCT to improve business efficiency and flexibility
- Cascading FlashCopy^(R) support for flash copy back from target to source without having to destroy other target volumes
- GUI with incorporated Easy Tier^(R) reports
- Cache technology refresh
- Field model conversion from DS8870 to DS8886 models 985 and 986

Key prerequisites

All announced features and functions that are supported on the IBM DS8000^(R) series require DS8000 LMC 8.8.30.xx.xx (bundle version 88.30.xxx.xx), or later, except zHyperlink read functionality, which requires DS8000 LMC 8.8.31.xx.xx (bundle version 88.31.xxx.xx), or later.

Planned availability date

- September 8, 2017: All features and functions except DS8870 to DS8886 Gen 2 model conversions
- December 8, 2017: DS8870 to DS8886 Gen 2 model conversions

zHyperlink read functionality requires LMC 88.31.xxx or higher, available on December 8, 2017.

Description

High-capacity 3.8 TB flash drive set

IBM DS8880 offers a 3.8 TB flash capacity performance option to address application and business requirements.

This high-capacity flash drive is in addition to the already supported 400 GB, 800 GB, 1.6 TB, and 3.2 TB high-performance flash drive sets.

Intermixing of high-performance flash drives in the same enclosure can be requested as a field MES through RPQ.

Intermixing of high-performance and high-capacity flash drives in the same enclosure is not supported.

With this additional flash option, the maximum flash storage capacity supported per flash enclosure is 182.4 TB raw.

Easy Tier has been enhanced to support the use of high-capacity flash drives and will treat them as a separate tier when combined with high-performance flash drives. This enables both types of flash drives to be contained in the same storage pool with Easy Tier promoting the most active data to the high-performance flash drives. Additional combinations of drive types are possible including Enterprise and Nearline drives as long as all four drive types are not contained in the same storage pool.

zHyperlink

The DS8880 family introduces a low latency hardware attachment supporting direct point-to-point connectivity to IBM z14 servers at distances up to 150 meters called zHyperlink. The hardware required to support zHyperlink connectivity is available in this release. The enablement of the zHyperLink connections for use with host IO on the DS8886 models and hardware MES requires R8.3.1 microcode, which is planned to be generally available on December 8, 2017.

The initial release of zHyperLink will only support read IO.

zHyperLink works in conjunction with a FICON^(R) point-to-point or SAN infrastructure to provide extremely low latency connectivity to FICON storage systems.

As per the Statement of Direction found in Hardware Announcement [117-003](#), dated January 10, 2017, IBM intends to provide write support to improve active log throughput in a future release. zHyperLink improves application response

time, cutting IO sensitive workload response time by up to 50% without requiring application changes.

Note: This response time estimate is based on IBM internal measurements and projections that assume 75% or more of the workload response time is associated with read DASD I/O and the storage system random read cache hit ratio is above 80%. The actual performance experienced by any user may vary.

zHyperLink connectivity to IBM z14 servers supports distances up to 150 meters. For each zHyperLink connection on the DS8000, a CXP transceiver must be ordered (feature #3500) which provides the cable connector. Details of the IBM z14 server requirements can be found in Hardware Announcement [117-044](#), dated July 17, 2017.

A 24x MTP-MTP cable is required for each zHyperLink connection which can be ordered with the DS8000 (feature #1450 for a 40 m OM4 cable and feature #1451 for a 150 m OM4 cable) or can be obtained separately. This is a single 24-fiber cable with multi-fiber termination push-on (MTP) connectors.

Two fiber type options are available with specifications supporting different distances for the zHyperLink connection for customer provided cables:

- Up to 150 m: OM4 50/125 micrometer multimode fiber optic cable with a fiber bandwidth at wavelength: 4.7 GHz-km at 850 nm
- Up to 40 m: OM4 50/125 micrometer multimode fiber optic cable with a fiber bandwidth at wavelength: 2.0 GHz-km at 850 nm

zHyperlink connectivity requires operating system and middleware changes to exploit and requires z/OS^(R) V2.1/V2.2/V2.3 with PTFs and Db2 V12 with PTFs. Software Announcement [217-246](#), dated July 17, 2017, provides more details on the z/OS and Db2 support.

IBM also intends to extend the software support for zHyperLinks to other middleware and has provided statements of direction contained in the Software Announcement above.

Initial zHyperLink connectivity supports two zHyperlink connections on each IO bay, providing up to 16 physical connections in a fully configured system with eight IO bays. At general availability zHyperlink support will be restricted to DS8886 configurations with 16 cores and 256 GB or 512 GB of memory, and only four active zHyperlink connections will be able to be used. These restrictions are intended to be lifted in the first half of 2018, enabling up to twelve zHyperlink connections to be used and providing support for all configurations of DS8886 systems.

IBM also intends to extend zHyperlink support to all DS8880 and DS8880F models in future releases.

Transparent cloud tiering

DS8880 enables TCT support to allow organizations to introduce hybrid cloud as a new storage tier for simplified archive operations on IBM Z environments. TCT improves business efficiency and flexibility while reducing capital and operating expenses with direct data transfer from DS8880 to the cloud without any impact on performance. TCT can provide more than 50% savings in CPU utilization when archiving large data sets, as compared to archiving to tape¹. An additional server or gateway is not required, TCT is a software feature that leverages the existing DS8880 infrastructure.

¹ Results are based on internal IBM data measurements on an EC12 (8 CPs, 32GB Main Memory) when migrating data sets exceeding 5,000 3390 tracks in size. Results will vary by customer based on particular workloads, configurations, software levels and the quantity and size of data sets being migrated.

In addition to connectivity to cloud storage using the OpenStack Swift API, TCT supports the Amazon S3 API, enabling organizations to send data to IBM Cloud Object Storage, IBM Bluemix^(R), and Amazon S3 object storage systems. This

provides additional capability and flexibility, whether public or private cloud infrastructures.

This release also includes the capability for DFSMSHsm to direct the DS8880 to recall data to volumes that participate in a two-site Metro Mirror environment. This integration with Metro Mirror is seamless in that data which is recalled is automatically replicated to the Metro Mirror Secondary, allowing for support of high availability (HyperSwap^(R)) and disaster recovery environments.

TCT requires z/OS V2.1, V2.2, or V2.3 operating system changes with PTFs to exploit its capability. Contact your IBM representative for PTF availability.

Cascading FlashCopy

This release includes Cascading FlashCopy support to enable a FlashCopy source device to become a FlashCopy source, or a FlashCopy target device to become a FlashCopy source. This provides improvements to a range of scenarios including the following use cases:

- Reverse one of several FlashCopy relationships from a source device to restore this copy without first removing the other relationships
- Recover a Global Mirror environment without needing to withdraw an existing FlashCopy used for disaster recovery testing
- Use dataset FlashCopy between devices that are both also the sources of full volume FlashCopy relationships, including in Remote Pair FlashCopy environments
- Perform an object-level restore using FlashCopy from a Db2 system backup that still has an active FlashCopy relationship
- Increase the flexibility of dataset FlashCopy where an existing source track can become a target of a new FlashCopy and an existing target track can become a source of a new FlashCopy

GUI improvements

With an increase in GUI logins from around 6,000 per month at the start of 2016 and over 16,000 per month at the start of 2017, the utilization of the DS8000 management GUI has exploded due to its fast response time, ease of use, and intuitive design. As of this release, many enhancements continue to be added to greatly improve productivity of storage administrators.

The management GUI delivers the following enhancements:

- Fully integrated Easy Tier reporting
- Full reporting and monitoring support for FlashCopy, Mirroring, and Mirroring Paths
- Advanced provisioning support for IBM Z and IBM i volume configurations
- Integrated functionality from the DS8000 Service Management Console

DDR4 technology

The DS8880 family is refreshing the current cache options by introducing processor memories with DDR4 technology. DDR4 memories require license machine code release 8.3, or higher, and replace the current DDR3 cache options for initial orders. New orders no longer support DDR3 cache options. Cache upgrades in the field are available if they match the same DDR technology.

RAID-5 RPQ for HDDs below 1 TB capacity

Drive media is rapidly increasing in capacity, and while greater density provides cost advantages, it also requires changes in the types of RAID protection used.

As drive capacities increase, RAID-5 exposes enterprises to increased risks because higher capacity drives are more vulnerable to storage media errors during array rebuild.

To improve data availability, IBM moved protection to the next level by enabling RAID-6 as default for all drive types. The use of RAID-6 instead of RAID-5 can dramatically improve data availability and provide increased protection for workloads where data integrity is critical.

In this release, IBM is removing RAID-5 support for HDD new builds, and limits them to RAID-6 and RAID-10 only.

IBM will continue to offer RAID-5 support for HDD new builds with capacities below 1 TB through RPQ 8S1624.

Since IBM does not recommend the use of RAID-5, the use of this RPQ requires a risk acceptance.

DS8870 to DS8886 GEN 2 model conversion

Machine type model conversion from DS8870 to DS8886 models 985 or 986

Field model conversions from DS8870 to DS8886 models 985 or 986 are available for existing customers. This offering will only be available for DS8870 Enterprise Configurations.

Some restrictions apply for the model conversions. Refer to the [Model conversions](#) section for details.

Accessibility by people with disabilities

A US Section 508 Voluntary Product Accessibility Template (VPAT) containing details on accessibility compliance can be found on the [IBM Accessibility](#) website.

Section 508 of the US Rehabilitation Act

IBM DS8880 storage family is capable as of September 8, 2017, 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 US Section 508 Voluntary Product Accessibility Template (VPAT) can be found on the [IBM Accessibility](#) website.

Statement of general direction

With the release of the 3.8 TB flash drives, IBM is introducing a new family of high-capacity flash drive sets for IBM System Storage[®] DS8880 and DS8880F models. IBM intends to increase the number of high-capacity flash options by delivering 7.6 TB and 15.3 TB flash drives once they complete the qualification and certification processes. These drives should enable customers to manage their business data growth requirements while helping improve the overall total cost of ownership by increasing the flash capacity in the same physical rack space.

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Reference information

For more information about available function authorizations, refer to Hardware Announcement [115-138](#), dated October 20, 2015.

For the IBM statement on compliance with the European Union Directive on Restriction of the use of certain Hazardous Substances in Electrical and Electronic Equipment (2002/95/EC) (RoHS), go to the [IBM and the Environment](#) website.

Product number

Description	Machine type	Models	Feature number
- HD STD enclosure indicator	2831	985, 986, 85E, 86E	1202
- 3.5-inch disk enclosure indicator	2831	985, 986, 85E, 86E	1204
Disk drive set indicators:			
- 300 GB 15K drive set indicator	2831	985, 986, 85E, 86E	5001
- 600 GB 15K drive set indicator	2831	985, 986, 85E, 86E	5002
- 600 GB 10K drive set indicator	2831	985, 986, 85E, 86E	5003
- 1.2 TB 10K drive set indicator	2831	985, 986, 85E, 86E	5004
- 4 TB 7.2K half drive set indicator	2831	985, 986, 85E, 86E	5005
- 1.8 TB 10K drive set indicator	2831	985, 986, 85E, 86E	5006
- 6 TB 7.2K half drive set indicator	2831	985, 986, 85E, 86E	5007
SSD drive set indicators:			
-400 GB SSD drive set indicator	2831	985, 986, 85E, 86E	6002
- 800 GB SSD drive set indicator	2831	985, 986, 85E, 86E	6003
- 1.6 TB SSD drive set indicator	2831	985, 986, 85E, 86E	6004
DS8000 series Function Authorization:			
Base Function (BF) indicator:			
BF - Up to 100 TB capacity indicator	2831	985, 986	8171
BF - 100.1 TB to 250 TB capacity indicator	2831	985, 986	8172
BF - 250.1 TB to 500 TB capacity indicator	2831	985, 986	8173
BF - 500.1 TB to 1250 TB capacity indicator	2831	985, 986	8174
BF - 1250.1 TB to 3000 TB capacity indicator	2831	985, 986	8175
BF - 3000.1 TB to 6000 TB capacity indicator	2831	985, 986	8176
BF - 6000.1 TB to 10000 TB indicator	2831	985, 986	8180

Description	Machine type	Models	Feature number
Copy Services (CS) license indicator:			
CS - Up to 100 TB capacity indicator	2831	985, 986	8271
CS - 100.1 TB to 250 TB capacity indicator	2831	985, 986	8272
CS - 250.1 TB to 500 TB capacity indicator	2831	985, 986	8273
CS - 500.1 TB to 1250 TB capacity indicator	2831	985, 986	8274
CS - 1250.1 TB to 3000 TB capacity indicator	2831	985, 986	8275
CS - 3000.1 TB to 6000 TB capacity indicator	2831	985, 986	8276
CS - 6000.1 TB to 10000 TB indicator	2831	985, 986	8280
z-synergy Services (zsS) license indicator:			
zsS - Up to 100 TB capacity indicator	2831	985, 986	8371
zsS - 100.1 TB to 250 TB capacity indicator	2831	985, 986	8372
zsS - 250.1 TB to 500 TB capacity indicator	2831	985, 986	8373
zsS - 500.1 TB to 1250 TB capacity indicator	2831	985, 986	8374
zsS - 1250.1 TB to 3000 TB capacity indicator	2831	985, 986	8375
zsS - 3000.1 TB to 6000 TB capacity indicator	2831	985, 986	8376
zsS - 6000.1 TB to 10000 TB indicator	2831	985, 986	8380

Description	Machine types	Models	Feature number
40m zHyperlink cable	2831, 2832, 2833, 2834	985, 986, 85E, 86E	1450
150m zHyperlink cable	2831, 2832, 2833, 2834	985, 986, 85E, 86E	1451
3.8 TB 2.5-inch high capacity flash	2831, 2832, 2833, 2834	984, 985, 986, 84E, 85E, 86E	1623
DS8000 LMC R8.3	2831, 2832, 2833, 2834	984, 985, 986	1883
DS8000 LMC R8.3 indicator	2831, 2832, 2833, 2834	84E, 85E, 86E	1983
zHyperlink adapter	2831, 2832, 2833, 2834	985, 986, 85E, 86E	3500
64 GB processor memory	2831, 2832, 2833, 2834	984	4233
128 GB processor memory	2831, 2832, 2833, 2834	984	4234
256 GB processor memory	2831, 2832, 2833, 2834	984	4235

Description	Machine types	Models	Feature number
128 GB processor memory (8-core only)	2831, 2832, 2833, 2834	985, 986	4334
256 GB processor memory (8-core only or 16-core)	2831, 2832, 2833, 2834	985, 986	4335
512 GB processor memory (16-core only)	2831, 2832, 2833, 2834	985, 986	4336
1,024 GB Processor memory (24-core only)	2831, 2832, 2833, 2834	985, 986	4337
2,048 GB Processor memory (24-core only)	2831, 2832, 2833, 2834	985, 986	4338

Model conversions

From Model	To Model	Description
2421-961	2831-985	DS8886 Model 985
2422-961	2831-985	DS8886 Model 985
2423-961	2831-985	DS8886 Model 985
2424-961	2831-985	DS8886 Model 985
2421-961	2831-986	DS8886 Model 986
2422-961	2831-986	DS8886 Model 986
2423-961	2831-986	DS8886 Model 986
2424-961	2831-986	DS8886 Model 986
2421-96E	2831-85E	DS8886 Model 85E
2422-96E	2831-85E	DS8886 Model 85E
2423-96E	2831-85E	DS8886 Model 85E
2424-96E	2831-85E	DS8886 Model 85E
2421-96E	2831-86E	DS8886 Model 86E
2422-96E	2831-86E	DS8886 Model 86E
2423-96E	2831-86E	DS8886 Model 86E
2424-96E	2831-86E	DS8886 Model 86E

Parts removed as a result of a model conversion become the property of IBM.

Every configuration that needs to perform a model conversion has to be submitted through SCORE process and have the configuration validated before the password is provided to enable the model conversion option on e-config. You can access [SCORE](#) website.

Notes:

- This is a reminder that model conversions are disruptive. Customers are responsible for backing up all data on the DS8870 and restoring it when the DS8886 is ready for production. The approximate duration for the conversion is three days.
- High-Performance Flash Enclosure Gen 1 are not supported on the new models when performing a model conversion.
- Prerequisites for model conversions can be found in the *IBM System Storage DS8880 Introduction and Planning Guide (GC27-8525)*
- .Contact your sales representative for additional information for additional restrictions applicable based on the machine configuration and remaining warranty years.

Feature conversions

For machine types 2421, 2422, 2423, 2424 Models 961/96E to machine type 2831 models 985/85E or 986/86E model conversion

From feature	To feature	Returned parts*	Description
Model 8xE merge indicators:			
0001	0003	No	8xE factory merge
0002	0004	No	8xE field merge
Model 8xE position indicators:			
0361	0241	No	98x - 8xE position1
0362	0242	No	98x - 8xE position2
0363	0243	No	98x - 8xE position3
Initial system capacity:			
0800	0795	No	Up to 5 TB capacity
0802	0795	No	Up to 5 TB capacity
0805	0795	No	Up to 5 TB capacity
0810	0795	No	Up to 5 TB capacity
0815	0795	No	Up to 5 TB capacity
0820	0795	No	Up to 5 TB capacity
0825	0795	No	Up to 5 TB capacity
0800	0796	No	5.1 TB to 10 TB capacity
0802	0796	No	5.1 TB to 10 TB capacity
0805	0796	No	5.1 TB to 10 TB capacity
0810	0796	No	5.1 TB to 10 TB capacity
0815	0796	No	5.1 TB to 10 TB capacity
0820	0796	No	5.1 TB to 10 TB capacity
0825	0796	No	5.1 TB to 10 TB capacity
0800	0797	No	10.1 TB to 25 TB capacity
0802	0797	No	10.1 TB to 25 TB capacity
0805	0797	No	10.1 TB to 25 TB capacity
0810	0797	No	10.1 TB to 25 TB capacity
0815	0797	No	10.1 TB to 25 TB capacity
0820	0797	No	10.1 TB to 25 TB capacity
0825	0797	No	10.1 TB to 25 TB capacity
0800	0798	No	25.1 TB to 50 TB capacity
0802	0798	No	25.1 TB to 50 TB capacity
0805	0798	No	25.1 TB to 50 TB capacity
0810	0798	No	25.1 TB to 50 TB capacity

From feature	To feature	Returned parts*	Description
0815	0798	No	25.1 TB to 50 TB capacity
0820	0798	No	25.1 TB to 50 TB capacity
0825	0798	No	25.1 TB to 50 TB capacity
0800	0799	No	50.1 TB to 75 TB capacity
0802	0799	No	50.1 TB to 75 TB capacity
0805	0799	No	50.1 TB to 75 TB capacity
0810	0799	No	50.1 TB to 75 TB capacity
0815	0799	No	50.1 TB to 75 TB capacity
0820	0799	No	50.1 TB to 75 TB capacity
0825	0799	No	50.1 TB to 75 TB capacity
0800	0801	No	75.1 TB to 100 TB capacity
0802	0801	No	75.1 TB to 100 TB capacity
0805	0801	No	75.1 TB to 100 TB capacity
0810	0801	No	75.1 TB to 100 TB capacity
0815	0801	No	75.1 TB to 100 TB capacity
0820	0801	No	75.1 TB to 100 TB capacity
0825	0801	No	75.1 TB to 100 TB capacity
0830	0803	No	100.1 TB to 250 TB capacity
0835	0803	No	100.1 TB to 250 TB capacity
0840	0803	No	100.1 TB to 250 TB capacity
0845	0804	No	250.1 TB to 500 TB Capacity
0850	0804	No	250.1 TB to 500 TB Capacity
0855	0804	No	250.1 TB to 500 TB Capacity
0860	0804	No	250.1 TB to 500 TB Capacity
0865	0804	No	250.1 TB to 500 TB Capacity
0870	0806	No	500.1 TB to 1250 TB Capacity
0871	0806	No	500.1 TB to 1250 TB Capacity
0872	0806	No	500.1 TB to 1250 TB Capacity
0873	0806	No	500.1 TB to 1250 TB Capacity
0874	0806	No	500.1 TB to 1250 TB Capacity
0875	0806	No	500.1 TB to 1250 TB Capacity

From feature	To feature	Returned parts*	Description
0876	0806	No	500.1 TB to 1250 TB Capacity
0877	0806	No	500.1 TB to 1250 TB Capacity
0878	0806 or 0807	No	500.1 TB to 1250 TB Capacity/1250.1 TB to 3000 TB Capacity
0879	0807	No	1250.1 TB to 3000 TB Capacity
0880	0807	No	1250.1 TB to 3000 TB Capacity
0881	0807	No	1250.1 TB to 3000 TB Capacity
0882	0807	No	1250.1 TB to 3000 TB Capacity
0883	0807	No	1250.1 TB to 3000 TB Capacity
0884	0807	No	1250.1 TB to 3000 TB Capacity
0885	0807	No	1250.1 TB to 3000 TB Capacity
0886	0807	No	1250.1 TB to 3000 TB Capacity
0887	0807	No	1250.1 TB to 3000 TB Capacity
0888	0807	No	1250.1 TB to 3000 TB Capacity
0889	0807	No	1250.1 TB to 3000 TB Capacity
0890	0807	No	1250.1 TB to 3000 TB Capacity
Power:			
1051	1050	Yes	Single phase DC-UPS
1051	1052	Yes	Three phase DC-UPS
Single phase power cords:			
1061	1062	Yes	SPP cord, 200-240V, 60A, 3 pin connector (US, Canada, LA, JP & AP)
1068	1063	Yes	SPP cord, 200-240V, 63A, no connector (EMEA, ME & AP)
1072	1062	Yes	SPP cord, 200-240V, 60A, 3 pin connector (US, Canada, LA, JP & AP)
1073	1063	Yes	SPP cord, 200-240V, 63A, no connector (EMEA, ME & AP)
Line cords:			
1080	1086	Yes	Three phase power cord, 380-415V, 30A, 5 pin connector

From feature	To feature	Returned parts*	Description
1081	1088	Yes	Three phase power cord, 380-415V, 40A, no connector
1082	1089	Yes	Three phase power cord, 200-240V, 60A, 4 pin connector
1083	1088	Yes	Three phase power cord, 380-415V, 40A, no connector
1084	1089	Yes	Three phase power cord, 200-240V, 60A, 4 pin connector
1085	1086	Yes	Three phase power cord, 380-415V, 30A, 5 pin connector
Management console:			
1120	1140	Yes	Mgmt console -- primary
1130	1150	Yes	Mgmt console -- secondary
I/O enclosures:			
1301	1303	Yes	I/O enclosure pair II
Processor memory:			
4313	4324	Yes	128 GB processor memory
4313	4325	Yes	256 GB processor memory
4313	4326	Yes	512 GB processor memory
4313	4327	Yes	1024 GB processor memory
4313	4328	Yes	2048 GB processor memory
4314	4324	Yes	128 GB processor memory
4314	4325	Yes	256 GB processor memory
4314	4326	Yes	512 GB processor memory
4314	4327	Yes	1024 GB processor memory
4314	4328	Yes	2048 GB processor memory
4315	4325	Yes	256 GB processor memory
4315	4326	Yes	512 GB processor memory
4315	4327	Yes	1024 GB processor memory
4315	4328	Yes	2048 GB processor memory
4316	4326	Yes	512 GB processor memory
4316	4327	Yes	1024 GB processor memory
4316	4328	Yes	2048 GB processor memory
4317	4327	Yes	1024 GB processor memory

From feature	To feature	Returned parts*	Description
4317	4328	Yes	2048 GB processor memory
Processor license feature indicators:			
4402	4422	Yes	8 P8 processor indicator
4402	4423	Yes	16 P8 processor indicator
4402	4424	Yes	24 P8 processor indicator
4403	4422	Yes	8 P8 processor indicator
4403	4423	Yes	16 P8 processor indicator
4403	4424	Yes	24 P8 processor indicator
4404	4423	Yes	16 P8 processor indicator
4404	4424	Yes	24 P8 processor indicator
4412	4422	Yes	8 P8 processor indicator
4412	4423	Yes	16 P8 processor indicator
4412	4424	Yes	24 P8 processor indicator
4413	4422	Yes	8 P8 processor indicator
4413	4423	Yes	16 P8 processor indicator
4413	4424	Yes	24 P8 processor indicator
4414	4423	Yes	16 P8 processor indicator
4414	4424	Yes	24 P8 processor indicator
Encryption standby CoD disk drive sets:			
5309	5308	No	300 GB 15K SAS E drive set
5619	5618	No	600 GB 15K SAS E drive set
5709	5708	No	600 GB 10K SAS E drive set
5769	5768	No	1.2TB 10K SAS E drive set
5869	5868	No	4TB 7.2K SAS E drive set

Machine type 283x Model 984

From feature	To feature	Returned parts*	Description
Processor memory:			
4233	4234	No	Processor memory conversion
4233	4235	No	Processor memory conversion
4234	4235	No	Processor memory conversion

Machine type 283x models 985 and 986

From feature	To feature	Returned parts*	Description
Processor memory:			
4334	4335	No	Processor memory conversion
4334	4336	No	Processor memory conversion
4335	4336	No	Processor memory conversion
4335	4337	No	Processor memory conversion
4336	4337	No	Processor memory conversion
4336	4338	No	Processor memory conversion
4337	4338	Yes	Processor memory conversion

*Parts removed as a result of a feature conversion become the property of IBM.

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^(R) ID and password are required (use IBMid).

[BP Attachment for Announcement Letter 117-062](#)

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DS8000 publications are available at the [IBM Publications Center](#).

You can search, view, and collaborate with documentation using [IBM Knowledge Center](#). IBM Knowledge Center is an IBM-wide view of technical information with multiple sources of offerings in a single location.

IBM Knowledge Center provides a centralized and consolidated way to access the information you need to use IBM products and also provides innovative ways to find information and to create your own set of information to cater to your needs. You will be able to personalize views, build customer documents, and interact with other information.

To access the IBM Publications Center Portal, go to the [IBM Publications Center](#) website.

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided. A large number of publications are available online in various file formats, which can currently be downloaded.

Services

IBM Systems Lab Services

IBM Systems Lab Services offers a wide array of services available for your enterprise. It brings expertise on the latest technologies from the IBM development community and can help with your most difficult technical challenges.

IBM Systems Lab Services exists to help you successfully implement emerging technologies so as to accelerate your return on investment and improve your

satisfaction with your IBM systems and solutions. Services examples include initial implementation, integration, migration, and skills transfer on IBM systems solution capabilities and recommended practices. IBM Systems Lab Services is one of the service organizations of IBM's world-renowned IBM Systems Group development labs.

For details on available services, contact your IBM representative or go to the [Lab Services](#) website.

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 go to the [IBM Global Technology Services^{\(R\)}](#) website.

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or go to the [Resiliency Services](#) website.

Details on education offerings related to specific products can be found on the [IBM authorized training](#) website.

Technical information

Specified operating environment

Hardware requirements

Licensed Machine Code

All announced features and functions are supported on the IBM System Storage DS8000 series and require DS8000 LMC 8.8.30.xx.xx (bundle version 88.30.xxx.xx), or later, except zHyperlink read functionality, which requires DS8000 LMC 8.8.31.xx.xx (bundle version 88.31.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 at the [IBM System Storage Interoperation Center](#).

Limitations

None.

Planning information

Customer responsibilities

Physical configuration planning

Physical configuration planning is a customer responsibility. A marketing specialist can help plan and select the DS8000 series physical configuration and features. Introductory information, including required and optional features, can be found in the *IBM DS8880 Introduction and Planning Guide* (GC27-8525).

Capacity and performance planning assistance is also available. Through the use of Disk Magic, a disk marketing specialist can help 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 a DS8000 series, including equipment, site, and power requirements, can be found in the *IBM DS8880 Introduction and Planning Guide* (GC27-8525).

Logical configuration planning and application

Logical configuration planning is a customer responsibility. Logical configuration refers to the creation of RAID ranks, volumes, and 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, and also the DS8000 GUI.

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

Licensed Machine Code planning and application

IBM may release changes to the DS8000 series Licensed Machine Code. IBM plans to make the most current DS8000 series Licensed Machine Code changes available for download by the DS8000 series system from the IBM System Storage technical support website. Not all Licensed Machine Code changes may be available through the support website. If the machine does not function as warranted and a problem can be resolved through the application of downloadable Licensed Machine Code, the customer is 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. A request can be made for IBM to install downloadable Licensed Machine Code changes, however there may be a charge for that service.

Calculating physical and effective capacity

Refer to the *IBM DS8880 Introduction and Planning Guide* (GC27-8525) 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 the installation considerations.

- IBM Storage Appliance planning
- IBM Security Key Lifecycle Manager (SKLM) planning
- Encryption activation review planning

IBM Storage Appliance planning

IBM Storage Appliance planning is a customer responsibility. Introductory information, including required and optional features, can be found in the *IBM Storage Appliance Guide* (SC27-8520).

According to encryption best practices, DS8880 requires at least two storage appliances and associated software for each site which has one or more encryption-enabled DS8000 system. One server must be isolated and the others can be of any supported appliance configuration. Any site that operates independently of other

sites must have storage appliances for the encryption-enabled DS8000 systems at that site.

It is the customer's responsibility to replicate any key labels and their associated key material across all storage appliances attached to a given encryption-enabled DS8000 before configuring that key label on the DS8000.

Dual storage appliance server planning

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

For customers desiring NIST 800-131a compliance, IBM SKLM, formerly known as IBM Tivoli[®] Key Lifecycle Manager, V2.5, or later, is required.

IBM SKLM planning

The DS8000 series supports IBM SKLM V2.5, or later.

Program number	VRM	Program name
5724-T60	2.5.0	IBM Security Key Lifecycle Manager for Distributed
5641-KL1/3	2.6.0	IBM Security Key Lifecycle Manager for Distributed
5698-B35	1.1.0	IBM Security Key Lifecycle Manager for z/OS [®]
5698-B42	1.1.0	IBM Security Key Lifecycle Manager for Storage

To support enterprise-wide encryption-key management, a new set of pricing metrics is now available. These pricing metrics are simpler and more comprehensive for devices, users, and server capacity.

For self-encrypting disk drives, the metric is per client device with the disk drive feature number.

For more information about the licensing requirements and pricing of the metric, see Software Announcement [213-470](#), dated October 29, 2013.

Isolated key server ordering options

- **Single/dual storage appliance server - Feature numbers 1761 and 1762 are available through Machine type Model 2421-AP1:** New storage appliance server options are available in addition to the existing SKLM isolated key manager (feature number #0204).
- **Customer acquired isolated key server:** Refer to the *IBM Security Key Lifecycle Manager Installation and Configuration Guide (SC27-5335)* for hardware and operating system requirements.

Note: Regardless of the ordering method, customers will need to acquire an SKLM license for use of the SKLM software ordered separately from the stand-alone server hardware.

Note: The licensing for SKLM includes both an install license for the SKLM management software and a license for the encrypting drives.

IBM Security Key Lifecycle Manager, V2.6 English publications may be viewed online on the electronic availability date in [IBM Knowledge Center](#).

To access the IBM Publications Center portal, go to [IBM Publications Center](#) website.

Encryption activation review planning

Encryption activation is a customer responsibility. IBM 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

Go to the [Storage Services](#) website and click on **Contact now** to submit your inquiry or request.

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 Gbps or 16 Gbps FCP/FICON^(R) host adapter 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, are 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 a 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 a 9 micron (single-mode) fiber optic cable terminated with a LC connector. Fibre Channel cables can be purchased using feature numbers 142x for 9 micron cables.

Cables are required to connect a zHyperlink adapter port from a DS8880 to a server or port of the zHyperLink Express^(R) feature in a IBM z14.

These are single 24-fiber cables with MTP connectors. Internally, a single cable houses 12 fibers for transmit and 12 fibers for receive.

Two fiber distances are available as DS8880 feature codes for the zHyperLink Express:

- Feature #1450 - 150 m zHyperlink cable: OM4 50/125 micrometer multimode fiber optic cable with a fiber bandwidth at wavelength: 4.7 GHz-km at 850 nm
- Feature #1451 - 40 m zHyperlink cable: OM4 50/125 micrometer multimode fiber optic cable with a fiber bandwidth at wavelength: 2.0 GHz-km at 850 nm

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 supported products, go to the [Support Line](#) website.

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 Systems Lab Services

IBM Systems Lab Services offers a wide array of services available for your enterprise. It brings expertise on the latest technologies from the IBM development community and can help with your most difficult technical challenges.

IBM Systems Lab Services exists to help you successfully implement emerging technologies so as to accelerate your return on investment and improve your satisfaction with your IBM systems and solutions. Services examples include initial implementation, integration, migration, and skills transfer on IBM systems solution capabilities and recommended practices. IBM Systems Lab Services is one of the service organizations of IBM's world-renowned IBM Systems Group development labs.

For details on available services, contact your IBM representative or go to the [Lab Services](#) website.

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, go to the [IBM Electronic Support](#) website.

Terms and conditions

MES discount applicable

No

Field installable feature

Yes

Warranty period

Machine type 2831: One year

Machine type 2832: Two years

Machine type 2833: Three years

Machine type 2834: Four years

To obtain copies of the IBM Statement of Limited Warranty, contact your reseller or IBM. An IBM part or feature installed during the initial installation of an IBM machine is subject to the full warranty period specified by IBM. An IBM part or feature that replaces a previously installed part or feature assumes the remainder of the warranty period for the replaced part or feature. An IBM part or feature added to a machine without replacing a previously installed part or feature is subject to a full warranty. Unless specified otherwise, the warranty period, type of warranty service, and service level of a part or feature are the same as those for the machine in which it is installed.

Customer setup

No

Machine code

Same license terms and conditions as base machine

Prices

Description	Machine type	Models	Feature number
Disk drive enclosures indicator:			
- HD STD enclosure indicator	2831	985, 986, 85E, 86E	1202
- 3.5INCH DISK ENCLOSURE IND	2831	985, 986, 85E, 86E	1204
Disk drive set indicators:			
- 300 GB 15K DRIVE SET IND	2831	985, 986, 85E, 86E	5001
- 600 GB 15K DRIVE SET IND	2831	985, 986, 85E, 86E	5002
- 600 GB 10K DRIVE SET IND	2831	985, 986, 85E, 86E	5003
- 1.2 TB 10K DRIVE SET IND	2831	985, 986, 85E, 86E	5004
- 4 TB 7.2K HALF DRIVE SET I	2831	985, 986, 85E, 86E	5005
- 1.8 TB 10K DRIVE SET IND	2831	985, 986, 85E, 86E	5006
- 6 TB 7.2K HALF DRIVE SET I	2831	985, 986, 85E, 86E	5007
SSD drive set indicators:			
-400 GB SSD DRIVE SET IND	2831	985, 986, 85E, 86E	6002
- 800 GB SSD DRIVE SET IND	2831	985, 986, 85E, 86E	6003
- 1.6 TB SSD DRIVE SET IND	2831	985, 986, 85E, 86E	6004

Description	Machine type	Models	Feature number
Base Function (BF) indicator:			
BF UP TO 100 TB CAPACITY I	2831	985, 986	8171
BF 100.1 TB TO 250 TB CAP	2831	985, 986	8172
BF 250.1 TB TO 500 TB CAP	2831	985, 986	8173
BF 500.1 TB TO 1250 TB CAP	2831	985, 986	8174
BF 1250.1 TB TO 3000 TB CA	2831	985, 986	8175
BF 3000.1 TB TO 6000 TB CA	2831	985, 986	8176
BF 6000.1 TB TO 10000 TB I	2831	985, 986	8180
Copy Services (CS) license indicator:			
CS UP TO 100 TB CAPACITY I	2831	985, 986	8271
CS 100.1 TB TO 250 TB CAP	2831	985, 986	8272
CS 250.1 TB TO 500 TB CAP	2831	985, 986	8273
CS 500.1 TB TO 1250 TB CAP	2831	985, 986	8274
CS 1250.1 TB TO 3000 TB CA	2831	985, 986	8275
CS 3000.1 TB TO 6000 TB CA	2831	985, 986	8276
CS 6000.1 TB TO 10000 TB I	2831	985, 986	8280
z-synergy Services (zsS) license indicator:			
ZSS UP TO 100 TB CAPACITY	2831	985, 986	8371
ZSS 100.1 TB TO 250 TB CAP	2831	985, 986	8372
ZSS 250.1 TB TO 500 TB CAP	2831	985, 986	8373
ZSS 500.1 TB TO 1250 TB CA	2831	985, 986	8374
ZSS 1250.1 TB TO 3000 TB	2831	985, 986	8375
ZSS 3000.1 TB TO 6000 TB	2831	985, 986	8376
ZSS 6000.1 TB TO 10000 TB	2831	985, 986	8380

Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
Disk drive enclosures indicator:						
- HD STD enclosure indicator	1202	Field Install	No	No	No	N/A
- 3.5INCH DISK	1204	Field Install	No	No	No	N/A

Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
ENCLOSURE IND						
Disk drive set indicators:						
- 300 GB 15K DRIVE SET IND	5001	Field Install	No	No	No	N/A
- 600 GB 15K DRIVE SET IND	5002	Field Install	No	No	No	N/A
- 600 GB 10K DRIVE SET IND	5003	Field Install	No	No	No	N/A
- 1.2 TB 10K DRIVE SET IND	5004	Field Install	No	No	No	N/A
- 4 TB 7.2K HALF DRIVE SET I	5005	Field Install	No	No	No	N/A
- 1.8 TB 10K DRIVE SET IND	5006	Field Install	No	No	No	N/A
- 6 TB 7.2K HALF DRIVE SET I	5007	Field Install	No	No	No	N/A
SSD drive set indicators:						
-400 GB SSD DRIVE SET IND	6002	Field Install	No	No	No	N/A
- 800 GB SSD DRIVE SET IND	6003	Field Install	No	No	No	N/A
- 1.6 TB SSD DRIVE SET IND	6004	Field Install	No	No	No	N/A
Base Function (BF) indicator:						
BF UP TO 100 TB CAPACITY I	8171	Field Install	No	No	No	N/A
BF 100.1 TB TO 250 TB CAP	8172	Field Install	No	No	No	N/A
BF 250.1	8173	Field Install	No	No	No	N/A

Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
TB TO 500 TB CAP						
BF 500.1 TB TO 1250 TB CAP	8174	Field Install	No	No	No	N/A
BF 1250.1 TB TO 3000 TB CA	8175	Field Install	No	No	No	N/A
BF 3000.1 TB TO 6000 TB CA	8176	Field Install	No	No	No	N/A
BF 6000.1 TB TO 10000 TB I	8180	Field Install	No	No	No	N/A
Copy Services (CS) license indicator:						
CS UP TO 100 TB CAPACITY I	8271	Field Install	No	No	No	N/A
CS 100.1 TB TO 250 TB CAP	8272	Field Install	No	No	No	N/A
CS 250.1 TB TO 500 TB CAP	8273	Field Install	No	No	No	N/A
CS 500.1 TB TO 1250 TB CAP	8274	Field Install	No	No	No	N/A
CS 1250.1 TB TO 3000 TB CA	8275	Field Install	No	No	No	N/A
CS 3000.1 TB TO 6000 TB CA	8276	Field Install	No	No	No	N/A
CS 6000.1 TB TO 10000 TB I	8280	Field Install	No	No	No	N/A
z- synergy Services (zsS)						

Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
license indicator:						
ZSS UP TO 100 TB CAPACITY	8371	Field Install	No	No	No	N/A
ZSS 100.1 TB TO 250 TB CAP	8372	Field Install	No	No	No	N/A
ZSS 250.1 TB TO 500 TB CAP	8373	Field Install	No	No	No	N/A
ZSS 500.1 TB TO 1250 TB CA	8374	Field Install	No	No	No	N/A
ZSS 1250.1 TB TO 3000 TB	8375	Field Install	No	No	No	N/A
ZSS 3000.1 TB TO 6000 TB	8376	Field Install	No	No	No	N/A
ZSS 6000.1 TB TO 10000 TB	8380	Field Install	No	No	No	N/A

Description	Machine types	Models	Feature number
40m zHyperlink cable	2831, 2832, 2833, 2834	985, 986, 85E, 86E	1450
150m zHyperlink cable	2831, 2832, 2833, 2834	985, 986, 85E, 86E	1451
3.8 TB High cap flash	2831, 2832, 2833, 2834	984, 985, 986, 84E, 85E, 86E	1623
DS8000 LMC R8.3	2831, 2832, 2833, 2834	984, 985, 986	1883
DS8000 LMC R8.3 indicator	2831, 2832, 2833, 2834	84E, 85E, 86E	1983
zHyperlink adapter	2831, 2832, 2833, 2834	985, 986, 85E, 86E	3500
64 GB processor memory	2831, 2832, 2833, 2834	984	4233
128 GB processor memory	2831, 2832, 2833, 2834	984	4234
256 GB processor memory	2831, 2832, 2833, 2834	984	4235
128GB PROCESSOR MEMORY 8CO	2831, 2832, 2833, 2834	985, 986	4334
256GB PROCESSOR MEMORY 8CO	2831, 2832, 2833, 2834	985, 986	4335
512GB PROCESSOR MEMORY 16C	2831, 2832, 2833, 2834	985, 986	4336
1TB PROCESSOR MEMORY 24COR	2831, 2832, 2833, 2834	985, 986	4337

Description		Machine types	Models	Feature number		
2TB PROCESSOR MEMORY 24COR		2831, 2832, 2833, 2834	985, 986	4338		
Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
40m zHyperlink cable	1450	Both	No	No	No	No
150m zHyperlink cable	1451	Both	No	No	No	No
3.8 TB High cap flash	1623	Both	Yes	No	Yes	No
DS8000 LMC R8.3	1883	Both	No	No	Yes	No
DS8000 LMC R8.3 indicator	1983	Both	No	No	Yes	N/A
zHyperlink adapter	3500	Both	No	No	No	No
64 GB processor memory	4233	Both	Yes	No	No	No
128 GB processor memory	4234	Both	Yes	No	No	No
256 GB processor memory	4235	Both	Yes	No	No	No
128GB PROCESSOR MEMORY 8CO	4334	Both	Yes	No	No	No
256GB PROCESSOR MEMORY 8CO	4335	Both	Yes	No	No	No
512GB PROCESSOR MEMORY 16C	4336	Both	Yes	No	No	No
1TB PROCESSOR MEMORY 24COR	4337	Both	Yes	No	No	No
2TB PROCESSOR MEMORY 24COR	4338	Both	Yes	No	No	No

CSU = Customer setup

N/A = Not applicable

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.

Model conversion purchase price

From Model	To Model	Description
2421-961	2831-985	DS8886 Model 985
2422-961	2831-985	DS8886 Model 985
2423-961	2831-985	DS8886 Model 985
2424-961	2831-985	DS8886 Model 985
2421-961	2831-986	DS8886 Model 986
2422-961	2831-986	DS8886 Model 986
2423-961	2831-986	DS8886 Model 986
2424-961	2831-986	DS8886 Model 986
2421-96E	2831-85E	DS8886 Model 85E
2422-96E	2831-85E	DS8886 Model 85E
2423-96E	2831-85E	DS8886 Model 85E
2424-96E	2831-85E	DS8886 Model 85E
2421-96E	2831-86E	DS8886 Model 86E
2422-96E	2831-86E	DS8886 Model 86E
2423-96E	2831-86E	DS8886 Model 86E
2424-96E	2831-86E	DS8886 Model 86E

Feature conversion purchase price**For MTs 2421, 2422, 2423, 2424 Models 961/96E to MT 2831 Models 985/85E or 986/86E model conversion**

From feature	To feature	Description	Returned parts*	Continuous maintenance
Model 8xE merge indicators:				
0001	0003	8xE factory merge	N/A	No
0002	0004	8xE field merge	N/A	No
Model 8xE position indicators:				
0361	0241	98x - 8xE position1	N/A	No
0362	0242	98x -- 8xE position 2	N/A	No
0363	0243	98x -- 8xE position 3	N/A	No
Initial system capacity:				
0800	0795	Up to 5 TB capacity	N/A	No
0802	0795	Up to 5 TB capacity	N/A	No
0805	0795	Up to 5 TB capacity	N/A	No
0810	0795	Up to 5 TB capacity	N/A	No
0815	0795	Up to 5 TB capacity	N/A	No
0820	0795	Up to 5 TB capacity	N/A	No
0825	0795	Up to 5 TB capacity	N/A	No
0800	0796	5.1 TB to 10 TB capacity	N/A	No
0802	0796	5.1 TB to 10 TB capacity	N/A	No
0805	0796	5.1 TB to 10 TB capacity	N/A	No
0810	0796	5.1 TB to 10 TB capacity	N/A	No

From feature	To feature	Description	Returned parts*	Continuous maintenance
0815	0796	5.1 TB to 10 TB capacity	N/A	No
0820	0796	5.1 TB to 10 TB capacity	N/A	No
0825	0796	5.1 TB to 10 TB capacity	N/A	No
0800	0797	10.1 TB to 25 TB capacity	N/A	No
0802	0797	10.1 TB to 25 TB capacity	N/A	No
0805	0797	10.1 TB to 25 TB capacity	N/A	No
0810	0797	10.1 TB to 25 TB capacity	N/A	No
0815	0797	10.1 TB to 25 TB capacity	N/A	No
0820	0797	10.1 TB to 25 TB capacity	N/A	No
0825	0797	10.1 TB to 25 TB capacity	N/A	No
0800	0798	25.1 TB to 50 TB capacity	N/A	No
0802	0798	25.1 TB to 50 TB capacity	N/A	No
0805	0798	25.1 TB to 50 TB capacity	N/A	No
0810	0798	25.1 TB to 50 TB capacity	N/A	No
0815	0798	25.1 TB to 50 TB capacity	N/A	No
0820	0798	25.1 TB to 50 TB capacity	N/A	No
0825	0798	25.1 TB to 50 TB capacity	N/A	No
0800	0799	50.1 TB to 75 TB capacity	N/A	No
0802	0799	50.1 TB to 75 TB capacity	N/A	No
0805	0799	50.1 TB to 75 TB capacity	N/A	No
0810	0799	50.1 TB to 75 TB capacity	N/A	No
0815	0799	50.1 TB to 75 TB capacity	N/A	No
0820	0799	50.1 TB to 75 TB capacity	N/A	No
0825	0799	50.1 TB to 75 TB capacity	N/A	No
0800	0801	75.1 TB to 100 TB capacity	N/A	No
0802	0801	75.1 TB to 100 TB capacity	N/A	No
0805	0801	75.1 TB to 100 TB capacity	N/A	No
0810	0801	75.1 TB to 100 TB capacity	N/A	No

From feature	To feature	Description	Returned parts*	Continuous maintenance
0815	0801	75.1 TB to 100 TB capacity	N/A	No
0820	0801	75.1 TB to 100 TB capacity	N/A	No
0825	0801	75.1 TB to 100 TB capacity	N/A	No
0830	0803	100.1 TB to 250 TB capacity	N/A	No
0835	0803	100.1 TB to 250 TB capacity	N/A	No
0840	0803	100.1 TB to 250 TB capacity	N/A	No
0845	0804	250.1 TB to 500 TB capacity	N/A	No
0850	0804	250.1 TB to 500 TB capacity	N/A	No
0855	0804	250.1 TB to 500 TB capacity	N/A	No
0860	0804	250.1 TB to 500 TB capacity	N/A	No
0865	0804	250.1 TB to 500 TB capacity	N/A	No
0870	0806	500.1 TB to 1250 TB capacity	N/A	No
0871	0806	500.1 TB to 1250 TB capacity	N/A	No
0872	0806	500.1 TB to 1250 TB capacity	N/A	No
0873	0806	500.1 TB to 1250 TB capacity	N/A	No
0874	0806	500.1 TB to 1250 TB capacity	N/A	No
0875	0806	500.1 TB to 1250 TB capacity	N/A	No
0876	0806	500.1 TB to 1250 TB capacity	N/A	No
0877	0806	500.1 TB to 1250 TB capacity	N/A	No
0878	0806 or 0807	500.1 TB to 1250 TB capacity or 1250.1 TB to 3000 TB capacity	N/A	No

From feature	To feature	Description	Returned parts*	Continuous maintenance
0879	0807	1250.1 TB to 3000 TB capacity	N/A	No
0880	0807	1250.1 TB to 3000 TB capacity	N/A	No
0881	0807	1250.1 TB to 3000 TB capacity	N/A	No
0882	0807	1250.1 TB to 3000 TB capacity	N/A	No
0883	0807	1250.1 TB to 3000 TB capacity	N/A	No
0884	0807	1250.1 TB to 3000 TB capacity	N/A	No
0885	0807	1250.1 TB to 3000 TB capacity	N/A	No
0886	0807	1250.1 TB to 3000 TB capacity	N/A	No
0887	0807	1250.1 TB to 3000 TB capacity	N/A	No
0888	0807	1250.1 TB to 3000 TB capacity	N/A	No
0889	0807	1250.1 TB to 3000 TB capacity	N/A	No
0890	0807	1250.1 TB to 3000 TB capacity	N/A	No
Power:				
1051	1050	Single phase DC-UPS	Yes	No
1051	1052	Three phase DC-UPS	Yes	No
Single phase power cords:				
1061	1062	SPP cord, 200-240V, 60A, 3 pin connector (US, Canada, LA, JP & AP)	Yes	No
1068	1063	SPP cord, 200-240V, 63A, no connector (EMEA, ME & AP)	Yes	No
1072	1062	SPP cord, 200-240V, 60A, 3 pin connector (US, Canada, LA, JP & AP)	Yes	No
1073	1063	SPP cord, 200-240V, 63A, no connector	Yes	No

From feature	To feature	Description	Returned parts*	Continuous maintenance
		(EMEA, ME & AP)		
Line cords:				
1080	1086	Three phase power cord, 380-415V, 30A, 5 pin connector	Yes	No
1081	1088	Three phase power cord, 380-415V, 40A, no connector	Yes	No
1082	1089	Three phase power cord, 200-240V, 60A, 4 pin connector	Yes	No
1083	1088	Three phase power cord, 380-415V, 40A, no connector	Yes	No
1084	1089	Three phase power cord, 200-240V, 60A, 4 pin connector	Yes	No
1085	1086	Three phase power cord, 380-415V, 30A, 5 pin connector	Yes	No
Management console:				
1120	1140	Management console - primary	Yes	Yes
1130	1150	Management console - secondary	Yes	Yes
I/O enclosures:				
1301	1303	I/O enclosure pair PCIE G3	Yes	Yes
Processor memory:				
4313	4324	128 GB processor memory	Yes	Yes
4313	4325	256 GB processor memory	Yes	Yes
4313	4326	512 GB processor memory	Yes	Yes
4313	4327	1024 GB processor memory	Yes	Yes
4313	4328	2048 GB processor memory	Yes	Yes
4314	4324	128 GB processor memory	Yes	Yes

From feature	To feature	Description	Returned parts*	Continuous maintenance
4314	4325	256 GB processor memory	Yes	Yes
4314	4326	512 GB processor memory	Yes	Yes
4314	4327	1024 GB processor memory	Yes	Yes
4314	4328	2048 GB processor memory	Yes	Yes
4315	4325	256 GB processor memory	Yes	Yes
4315	4326	512 GB processor memory	Yes	Yes
4315	4327	1024 GB processor memory	Yes	Yes
4315	4328	2048 GB processor memory	Yes	Yes
4316	4326	512 GB processor memory	Yes	Yes
4316	4327	1024 GB processor memory	Yes	Yes
4316	4328	2048 GB processor memory	Yes	Yes
4317	4327	1024 GB processor memory	Yes	Yes
4317	4328	2048 GB processor memory	Yes	Yes
Processor license feature indicators:				
4402	4422	8 P8 processor indicator	Yes	Yes
4402	4423	16 P8 processor indicator	Yes	Yes
4402	4424	24 P8 processor indicator	Yes	Yes
4403	4422	8 P8 processor indicator	Yes	Yes
4403	4423	16 P8 processor indicator	Yes	Yes
4403	4424	24 P8 processor indicator	Yes	Yes
4404	4423	16 P8 processor indicator	Yes	Yes
4404	4424	24 P8 processor indicator	Yes	Yes

From feature	To feature	Description	Returned parts*	Continuous maintenance
4412	4422	8 P8 processor indicator	Yes	Yes
4412	4423	16 P8 processor indicator	Yes	Yes
4412	4424	24 P8 processor indicator	Yes	Yes
4413	4422	8 P8 processor indicator	Yes	Yes
4413	4423	16 P8 processor indicator	Yes	Yes
4413	4424	24 P8 processor indicator	Yes	Yes
4414	4423	16 P8 processor indicator	Yes	Yes
4414	4424	24 P8 processor indicator	Yes	Yes
Encryption standby CoD disk drive sets:				
5309	5308	300 GB 15K SAS E drive set	No	Yes
5619	5618	600 GB 15K SAS E drive set	No	Yes
5709	5708	600 GB 10K SAS E drive set	No	Yes
5769	5768	1.2 TB 10K SAS E drive set	No	Yes
5869	5868	4 TB 7.2K SAS E drive set	No	Yes

Machine type 283x Model 984

From feature	To feature	Description	Returned parts*	Continuous maintenance
Processor memory:				
4233	4234	Processor memory conversion	No	Yes
4233	4235	Processor memory conversion	No	Yes
4234	4235	Processor memory conversion	No	Yes

Machine type 283x Models 985 and 986

From feature	To feature	Description	Returned parts*	Continuous maintenance
Processor memory:				

From feature	To feature	Description	Returned parts*	Continuous maintenance
4334	4335	Processor memory conversion	No	Yes
4334	4336	Processor memory conversion	No	Yes
4335	4336	Processor memory conversion	No	Yes
4335	4337	Processor memory conversion	No	Yes
4336	4337	Processor memory conversion	No	Yes
4336	4338	Processor memory conversion	No	Yes
4337	4338	Processor memory conversion	Yes	Yes

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