IBM DS8888 all-flash storage model with four-year warranty delivers world-class performance and data management in a single solution

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At a glance

An all-flash array storage system and new features and functions have been added to the IBM(R) DS8880 family:

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- DS8888 and DS8886
  - Three-phase power support
- DS8884 and DS8886
  - Small extent volumes as FlashCopy(R) target
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- DS8888, DS8886, and DS8884
  - RAID 10 support for flash cards
  - SuperPAV
  - Security enhancements

Overview

The IBM DS8880 family now offers an all-flash storage array with new models (DS8888 Model 982 with its associated DS8888 Expansion Unit Model 98F) that can be ordered with one, two, three, or four years of support, which covers both the hardware and advanced function features.

These new model systems include a one-year standard warranty and up to three additional years of extended warranty services are available to make these flexible offerings the best option to address business and financial needs. Clients should consult with their financial personnel on the appropriate financial treatment for this offering.

DS8888 delivers world-class performance and data management in a single solution. The DS8888 changes the way companies do their business by accelerating application performance and improving server efficiency, delivering the benefits that make all-flash systems ready for broad enterprise deployment.

IBM DS8888 configuration options

This model delivers up to 2.5 million IOPS random I/O workload environments. DS8888 supports 24- and 48-core processors, with 1 and 2 TB system memory respectively, 128 host adapter ports, and 16 high-performance flash enclosures, up to 480 flash cards.

DS8888 advanced function features can be purchased based on customer usage and not the total physical capacity of the system (excluding base function licenses).

In addition to the all-flash storage arrays, the following capabilities are now offered:

- RAID 10 support for flash
- Three-phase power support
- Small extents for configuration
- Thin provisioning for CKD
- SuperPAV support
- Enhanced security

RAID 10 support for flash

RAID 10 will be supported for flash in addition to the already supported RAID 5. No intermixing is allowed for different capacities or different RAID types within a single flash enclosure. To support RAID 10, the flash enclosure must be fully populated with flash cards.

Three-phase power support

Three-phase power will be available for DS8886 and DS8888. Three-phase power reduces DS8886 individual rack capacity by two drive enclosures, however maximum system capacity remains at 1536 drives.

Small extents for volume allocation

DS8000$^{(R)}$ now supports the ability to configure underlying storage using small extents. Before being allocated to volumes, each RAID rank is divided into equal-sized segments that are known as extents. Current extents use 1113 cylinder/1 GB extent size the DS8000 now supports small extents of 21 cylinders/16 MB in size.

DS8884 and DS8886 support the ability to configure FlashCopy target volumes in small extents for CKD and FB.

Thin provisioning for CKD

Support for the use of thin provisioning with extent space efficient (ESE) volumes is now available for CKD. In combination with the use of small extents, this replaces the previous track space efficient volume function, delivering a higher performance capability for sequential write workloads.

DS8884 and DS8886 support the ability to configure FlashCopy target volumes as thin provisioned.

SuperPAV

SuperPAV extends upon the previous HyperPAV capabilities by enabling alias devices to be used across multiple logical subsystems (LSS). With this release, an alias device can be used for any base device on the same DS8000 server and in the same path group on the server. SuperPAV will enable performance to be sustained with fewer overall alias devices and offer greater parallelism for individual larger volumes, improving scalability and performance.

Security enhancement

The DS8000 audit log can now be stored on a central syslog server for audit purposes using the *rsyslog* protocol.

DS8000 supports customer-signed certificates to control authentication for any GUI connections made through the customer's certificate authority.

Key Management Interoperability Protocol (KMIP) will be supported to offer an alternative encryption key manager.

Key prerequisites

All announced features and functions are supported on the IBM DS8000 series require DS8000 LMC 8.8.10.xx.xx (bundle version 88.10.xxx.xx), or later.

Planned availability date

- June 10, 2016: All features and functions for DS8884 (model 980/98B) and DS8886 (model 981/98E), except in Korea
- June 24, 2016: DS8888 (models 982 and 98F) and all its associated features and functions in the United States, Canada, Japan, Australia, Mexico, Europe, Africa, and the Middle East
- September 9, 2016: Field (MES) availability for the following:
  - Field install Model 98F
  - Field merge of expansion frames
  - Cache and processor options
  - High-performance flash adapter pair II
  - 8/16 Gbps PCIe based host adapters
  - Flash cards
  - High-performance flash enclosure

Description

IBM DS8888, the latest flash array for the DS8880 family has integrated the fastest POWER8$^{(R)}$ processors to handle the magnitude of workload complexity to deliver exceptional performance for mission-critical business environments.

DS8888 offers a dual-socket, 24-core or 48-core POWER8 processor complex per controller with support for up to 2 TB of processor memory. It is delivered in a reduced footprint, a 19-inch rack (600 mm x 1200 mm) with a 40U rack height (1930 mm).

DS8888 uses the same high-performance flash enclosures (HPFE) as the DS8886 and DS8884, supports up to 16 enclosures, and offers enhanced connectivity with the availability of four-port 16 Gb or eight-port 16 Gb and 8 Gb Fibre Channel/FICON host adapters.

Choice of models and features

Offering 24- and 48-core processor complex options, DS8888 Model 982 supports up to 240 flash cards in a single frame for a maximum physical capacity of up to 96 TB. It also supports up to 2 TB of processor memory with up to 64 Fibre Channel/FICON ports. With an optional expansion unit (DS8888 Model 98F), DS8888 Model 982 (24 or 48 core) can be scaled to support up to 128 fibre Channel/FICON ports, and 480 flash cards, providing up to 192 TB of physical capacity with 400 GB flash cards.

To meet performance and configuration needs, the new DS8888 offers a 24- or 48-core processor complex. Refer to the following tables for more information about supported flash and adapter counts with the two available configuration options.

Per frame maximum configuration table:

Model	Core per Processor Complex	Physical capacity	Disk drives	Processor memory	Host adapters	9xE attach	Flash enclosure
DS8888 configuration:							
982	24-core	96 TB	N/A	1 TB	16	0	8
982	48-core	192 TB	N/A	2 TB	32	0 to 1	16

Model	Processor	Physical capacity	Disk drives	Processor memory	Host adapters	9xx attach	Flash enclosures
DS8888 expansion unit configuration:							
98F	N/A	96 TB	N/A	N/A	16	982	8

RAID 10 support for flash

In this release, the HPFE RAID adapters can be configured as RAID 10 arrays in addition to the already available RAID 5 configuration. To support a RAID 10 array configuration, the HPFE must be fully populated with 30 flash cards.

Three-phase power support

The DS8886 and DS8888 three power system provides four second, full-rack battery backup for power line disturbance ride through. Extended power line disturbance ride through feature of 40 seconds is also available. Input voltage is three-phase 200-240 V 30/60 A and 380-415 V 30/40 A service.

Small extents for volume allocation for FlashCopy targets

DS8000 now supports the ability to configure underlying storage using either large or small extents. Before being allocated to volumes, each RAID array is divided into equal-sized segments that are known as extents.

In addition to the previously supported 1113 cylinder/1GB extent size, the DS8000 now supports small extents of 21 cylinders for CKD storage pools and 16MB for FB storage pools.

Volume migration and storage pool merging is only allowed between storage pools of the same sized extents. Rank depopulation can be used to remove ranks from a storage pool, and then the ranks can be reformatted and added to a pool with a different extent size.

Thin provisioning for CKD

In this release, thin provisioning with ESE volumes will support CKD volumes in addition to FB volumes. These volumes feature enabled thin provisioning capabilities that deliver more efficient usage of the storage capacity and reduced storage management requirements.

DS8884 and DS8886 support the ability to configure FlashCopy target volumes as thin provisioned.

If thin-provisoned volumes are used as Global Mirror FlashCopy, space will be released periodically to minimize the capacity usage of these devices. Remote Pair FlashCopy supports both ESE volumes and standard volumes on for both FB and CKD configurations.

Thin provisioning for CKD will be supported by z/OS[(R)] 2.1, or higher, with the appropriate program temporary fixes (PTF).

SuperPAV

SuperPAV extends the previous HyperPAV capability by enabling alias devices to be used across multiple LSSs. With this release, an alias device can be used for any base device on the same DS8000 server and in the same path group on the server. SuperPAV will enable performance to be sustained with fewer overall alias devices and deliver greater parallelism for larger, individual volumes for improved scalability and performance.

Each LSS must still have at least one base device.

SuperPAV will be supported by z/OS 2.1, and higher, with appropriate PTFs.

Security enhancements

The DS8000 audit log can now be stored on a central syslog server for audit purposes using the *rsyslog* protocol.

DS8000 supports customer-signed certificates to control authentication for any GUI connections made through the customer's certificate authority. A digital certificate can be loaded onto the DS8000 to replace the default certificate or to replace a previously uploaded certificate that is now obsolete.

KMIP will be supported to provide an alternative encryption key manager to IBM Security Key Lifecycle Manager. KMIP will not be supported in China and Russia.

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 June 10, 2016, 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

The current plan and direction of IBM is to provide a DS8000 interface for z/OS$^{(R)}$ environments that will enable any extents on a volume that only contain empty space to be freed on the back-end storage and the space returned to the pool. The plan also includes enabling space release with copy services to allow the use of the space release on replicated devices and to free space where appropriate on the replicated copies.

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remain at our sole discretion.

Reference information

For more information on available function authorizations, refer to the 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	Model	Feature
DS8888	2834	982	
DS8888 Expansion Unit	2834	98F	
Model 9xE merge indicators:			
- 9xE factory merge	2834	982, 98F	0001
- 9xE field merge	2834	98F	0002
- PPA Software Order Indicator	2834	980, 981, 982, 98B, 98E, 98F	0017
- DoD indicator	2834	982, 98F	0020
- JEMT indicator	2834	982, 98F	0021
- Shipping weight reduction	2834	982, 98F	0200
Model 9xF position indicators:			
- 982 - 98F position 1	2834	982, 98F	0381
Encryption not capable	2834	982	0403
Initial system capacity:			
- Up to 5 TB capacity	2834	982, 98F	0795
- 5.1 TB to 10 TB capacity	2834	982, 98F	0796
- 10.1 TB to 25 TB capacity	2834	982, 98F	0797
- 25.1 TB to 50 TB capacity	2834	982, 98F	0798
- 50.1 TB to 75 TB capacity	2834	982, 98F	0799
- 75.1 TB to 100 TB capacity	2834	982, 98F	0801
- 100.1 TB to 250 TB capacity	2834	982, 98F	0803
- 250.1 TB to 500 TB capacity	2834	982, 98F	0804
- 500.1 TB to 1250 TB capacity	2834	982, 98F	0806

Description	Machine type	Model	Feature
- 1250.1 TB to 3000 TB capacity	2834	982, 98F	0807
- 3000.1 TB to 6000 TB capacity	2834	982, 98F	0808
- 6000.1 TB to 10000 TB capacity	2834	982, 98F	0809
Attachment indicators:			
- IBM/Openwave Alliance indicator	2834	982, 98F	0930
- IBM System i[R] indicator	2834	982, 98F	0931
- IBM System p indicator	2834	982, 98F	0932
- IBM System x indicator	2834	982, 98F	0933
- IBM System z[R] indicator	2834	982, 98F	0934
- IBM System z B/C indicator	2834	982, 98F	0935
- IBM System zEnterprise[R] Cloud indicator	2834	982, 98F	0936
- Linux[TM] indicator	2834	982, 98F	0940
- Storage Appliance indicator	2834	982, 98F	0952
- IBM ProtecTIER[R] indicator	2834	982, 98F	0960
- IBM Storwize[R] V7000 indicator	2834	982, 98F	0961
- IBM N series indicator	2834	982, 98F	0962
- IBM SAN Volume Controller indicator	2834	982, 98F	0963
- IBM/EPIC attachment indicator	2834	982, 98F	0964
- VMware VAAI indicator	2834	982, 98F	0965
- OpenStack indicator	2834	982, 98F	0966
- US TAA compliance indicator	2834	982, 98F	0983
Power:			
- Three phase DC-UPS	2834	981, 982, 98E, 98F	1052
- Extended PLD	2834	982, 98F	1055
Three phase line cords:			
- Three phase power cord, 380-415V, 30A, 5 pin connector	2834	981, 982, 98E, 98F	1086
- Three phase power cord, 200-240V, 30A, 4 pin connector	2834	981, 982, 98E, 98F	1087

Description	Machine type	Model	Feature
- Three phase power cord, 380-415V, 40A, no connector	2834	981, 982, 98E, 98F	1088
- Three phase power cord, 200-240V, 60A, 4 pin connector	2834	981, 982, 98E, 98F	1089
Special tool:			
- Overhead ladder - 5ft	2834	982	1101
Management Console:			
- Mgmt console - Primary	2834	982	1140
- Mgmt console - Secondary	2834	982	1150
I/O enclosure pair PCIe 3	2834	982, 98F	1302
Top exit bracket:			
- Top exit bracket for Fibre cable	2834	982, 98F	1400
Fibre Channel/ FICON cables:			
- 50 um Fibre cable (LC)	2834	982, 98F	1410
- 50 um Fibre cable (LC/SC)	2834	982, 98F	1411
- 50 um Fibre cable (Jumper)	2834	982, 98F	1412
- 9 um Fibre cable (LC)	2834	982, 98F	1420
- 9 um Fibre cable (LC/SC)	2834	982, 98F	1421
- 9 um Fibre cable (Jumper)	2834	982, 98F	1422
High-performance flash card sets:			
- High-performance flash enclosure	2834	982, 98F	1500
- 400 GB 1.8-inch flash card set A (R)	2834	982, 98F	1596
- 400 GB 1.8-inch flash card set B (R)	2834	982, 98F	1598
- Flash enclosure filler set	2834	982, 98F	1599
DS8000 Licensed Machine Code:			
- DS8000 LMC R8.1	2834	980, 981, 982	1881
- DS8000 LMC R8.1 indicator	2834	98B, 98E, 98F	1981

Description	Machine type	Model	Feature
Earthquake kit	2834	982, 98F	1906
Hardware installation MES	2834	982, 98F	1999
Device adapters:			
- High-performance flash adapter pair II	2834	982, 98F	3055
Host adapters:			
- 8 Gb 4 port SW FCP/FICON adapter PCIe	2834	982, 98F	3153
- 8 Gb 8 port SW FCP/FICON adapter PCIe	2834	982, 98F	3157
- 8 Gb 4 port LW FCP/FICON adapter PCIe	2834	982, 98F	3253
- 8 Gb 8 port LW FCP/FICON adapter PCIe	2834	982, 98F	3257
- 16 Gb 4 port SW FCP/FICON adapter PCIE	2834	982, 98F	3353
- 16 Gb 4 port LW FCP/FICON adapter PCIE	2834	982, 98F	3453
Processor memory:			
- 1 TB Processor memory (24-core only)	2834	982	4487
- 2 TB Processor memory (48-core only)	2834	982	4488
Processor license indicators:			
- 24-core processor indicator	2834	982	4868
- 48-core processor indicator	2834	982	4888
Function Authorization indicators			
Base Function (BF):			
- BF - Up to 100 TB capacity	2834	982	8151
- BF - 100.1 TB to 250 TB capacity	2834	982	8152
- BF - 250.1 TB to 500 TB capacity	2834	982	8153
- BF - 500.1 TB to 1250 TB capacity	2834	982	8154
- BF - 1250.1 TB to 3000 TB capacity	2834	982	8155

Description	Machine type	Model	Feature
- BF - 3000.1 TB to 6000 TB capacity	2834	982	8156
- BF - 6000.1 TB to 10000 TB	2834	982	8160
Copy Services (CS) license:			
- CS - Inactive	2834	982	8250
- CS - Up to 100 TB capacity	2834	982	8251
- CS - 100.1 TB to 250 TB capacity	2834	982	8252
- CS - 250.1 TB to 500 TB capacity	2834	982	8253
- CS - 500.1 TB to 1250 TB capacity	2834	982	8254
- CS - 1250.1 TB to 3000 TB capacity	2834	982	8255
- CS - 3000.1 TB to 6000 TB capacity	2834	982	8256
- CS - 6000.1 TB to 10000 TB	2834	982	8260
z-synergy Services (zsS) license:			
- zsS - Active	2834	982	8300
- zsS - Inactive	2834	982	8350
- zsS - Up to 100 TB capacity	2834	982	8351
- zsS - 100.1 TB to 250 TB capacity	2834	982	8352
- zsS - 250.1 TB to 500 TB capacity	2834	982	8353
- zsS - 500.1 TB to 1250 TB capacity	2834	982	8354
- zsS - 1250.1 TB to 3000 TB capacity	2834	982	8355
- zsS - 3000.1 TB to 6000 TB capacity	2834	982	8356
- zsS - 6000.1 TB to 10000 TB	2834	982	8360
Copy Services Manager (CSM on HMC) license:			
- CSM on HMC - Inactive	2834	980, 981, 982	8450
- CSM on HMC - Up to 100 TB capacity	2834	980, 981, 982	8451
- CSM on HMC - 100.1 TB to 250 TB capacity	2834	980, 981, 982	8452
- CSM on HMC - 250.1 TB to 500 TB capacity	2834	980, 981, 982	8453

Description	Machine type	Model	Feature
- CSM on HMC - 500.1 TB to 1250 TB capacity	2834	980, 981, 982	8454
- CSM on HMC - 1250.1 TB to 3000 TB capacity	2834	980, 981, 982	8455
- CSM on HMC - 3000.1 TB to 6000 TB capacity	2834	980, 981, 982	8456
- CSM on HMC - 6000.1 TB to 100,000 TB	2834	980, 981, 982	8460
IGF transaction:			
- IGF transaction indicator	2834	982, 98F	8999
Shipping and Handling NC	2834	982, 98F	AG00
Shipping and handling 982	2834	982	AGA8
Shipping and handling 98F	2834	98F	AGA9

Feature conversions

Machine types 242x Models 961 and 96E to Machine type 283x Models 981 and 98E

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts
2421	961	1080	2831	981	1086	Line cord conversion	Yes
2422	961	1080	2831	981	1086	Line cord conversion	Yes
2423	961	1080	2831	981	1086	Line cord conversion	Yes
2424	961	1080	2831	981	1086	Line cord conversion	Yes
2421	96E	1080	2831	98E	1086	Line cord conversion	Yes
2422	96E	1080	2831	98E	1086	Line cord conversion	Yes
2423	96E	1080	2831	98E	1086	Line cord conversion	Yes
2424	96E	1080	2831	98E	1086	Line cord conversion	Yes
2421	961	1081	2831	981	1088	Line cord conversion	Yes
2422	961	1081	2831	981	1088	Line cord conversion	Yes
2423	961	1081	2831	981	1088	Line cord conversion	Yes

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts
2424	961	1081	2831	981	1088	Line cord conversion	Yes
2421	96E	1081	2831	98E	1088	Line cord conversion	Yes
2422	96E	1081	2831	98E	1088	Line cord conversion	Yes
2423	96E	1081	2831	98E	1088	Line cord conversion	Yes
2424	96E	1081	2831	98E	1088	Line cord conversion	Yes
2421	961	1082	2831	981	1089	Line cord conversion	Yes
2422	961	1082	2831	981	1089	Line cord conversion	Yes
2423	961	1082	2831	981	1089	Line cord conversion	Yes
2424	961	1082	2831	981	1089	Line cord conversion	Yes
2421	96E	1082	2831	98E	1089	Line cord conversion	Yes
2422	96E	1082	2831	98E	1089	Line cord conversion	Yes
2423	96E	1082	2831	98E	1089	Line cord conversion	Yes
2424	96E	1082	2831	98E	1089	Line cord conversion	Yes
2421	961	1083	2831	981	1088	Line cord conversion	Yes
2422	961	1083	2831	981	1088	Line cord conversion	Yes
2423	961	1083	2831	981	1088	Line cord conversion	Yes
2424	961	1083	2831	981	1088	Line cord conversion	Yes
2421	96E	1083	2831	98E	1088	Line cord conversion	Yes
2422	96E	1083	2831	98E	1088	Line cord conversion	Yes
2423	96E	1083	2831	98E	1088	Line cord conversion	Yes
2424	96E	1083	2831	98E	1088	Line cord conversion	Yes

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts
2421	961	1084	2831	981	1089	Line cord conversion	Yes
2422	961	1084	2831	981	1089	Line cord conversion	Yes
2423	961	1084	2831	981	1089	Line cord conversion	Yes
2424	961	1084	2831	981	1089	Line cord conversion	Yes
2421	96E	1084	2831	98E	1089	Line cord conversion	Yes
2422	96E	1084	2831	98E	1089	Line cord conversion	Yes
2423	96E	1084	2831	98E	1089	Line cord conversion	Yes
2424	96E	1084	2831	98E	1089	Line cord conversion	Yes
2421	961	1085	2831	981	1086	Line cord conversion	Yes
2422	961	1085	2831	981	1086	Line cord conversion	Yes
2423	961	1085	2831	981	1086	Line cord conversion	Yes
2424	961	1085	2831	981	1086	Line cord conversion	Yes
2421	96E	1085	2831	98E	1086	Line cord conversion	Yes
2422	96E	1085	2831	98E	1086	Line cord conversion	Yes
2423	96E	1085	2831	98E	1086	Line cord conversion	Yes
2424	96E	1085	2831	98E	1086	Line cord conversion	Yes
2422	961	1080	2832	981	1086	Line cord conversion	Yes
2423	961	1080	2832	981	1086	Line cord conversion	Yes
2424	961	1080	2832	981	1086	Line cord conversion	Yes
2422	96E	1080	2832	98E	1086	Line cord conversion	Yes

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts
2423	96E	1080	2832	98E	1086	Line cord conversion	Yes
2424	96E	1080	2832	98E	1086	Line cord conversion	Yes
2422	961	1081	2832	981	1088	Line cord conversion	Yes
2423	961	1081	2832	981	1088	Line cord conversion	Yes
2424	961	1081	2832	981	1088	Line cord conversion	Yes
2422	96E	1081	2832	98E	1088	Line cord conversion	Yes
2423	96E	1081	2832	98E	1088	Line cord conversion	Yes
2424	96E	1081	2832	98E	1088	Line cord conversion	Yes
2422	961	1082	2832	981	1089	Line cord conversion	Yes
2423	961	1082	2832	981	1089	Line cord conversion	Yes
2424	961	1082	2832	981	1089	Line cord conversion	Yes
2422	96E	1082	2832	98E	1089	Line cord conversion	Yes
2423	96E	1082	2832	98E	1089	Line cord conversion	Yes
2424	96E	1082	2832	98E	1089	Line cord conversion	Yes
2422	961	1083	2832	981	1088	Line cord conversion	Yes
2423	961	1083	2832	981	1088	Line cord conversion	Yes
2424	961	1083	2832	981	1088	Line cord conversion	Yes
2422	96E	1083	2832	98E	1088	Line cord conversion	Yes
2423	96E	1083	2832	98E	1088	Line cord conversion	Yes
2424	96E	1083	2832	98E	1088	Line cord conversion	Yes
2422	961	1084	2832	981	1089	Line cord conversion	Yes

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts
2423	961	1084	2832	981	1089	Line cord conversion	Yes
2424	961	1084	2832	981	1089	Line cord conversion	Yes
2422	96E	1084	2832	98E	1089	Line cord conversion	Yes
2423	96E	1084	2832	98E	1089	Line cord conversion	Yes
2424	96E	1084	2832	98E	1089	Line cord conversion	Yes
2422	961	1085	2832	981	1086	Line cord conversion	Yes
2423	961	1085	2832	981	1086	Line cord conversion	Yes
2424	961	1085	2832	981	1086	Line cord conversion	Yes
2422	96E	1085	2832	98E	1086	Line cord conversion	Yes
2423	96E	1085	2832	98E	1086	Line cord conversion	Yes
2424	96E	1085	2832	98E	1086	Line cord conversion	Yes
2423	961	1080	2833	981	1086	Line cord conversion	Yes
2424	961	1080	2833	981	1086	Line cord conversion	Yes
2423	96E	1080	2833	98E	1086	Line cord conversion	Yes
2424	96E	1080	2833	98E	1086	Line cord conversion	Yes
2423	961	1081	2833	981	1088	Line cord conversion	Yes
2424	961	1081	2833	981	1088	Line cord conversion	Yes
2423	96E	1081	2833	98E	1088	Line cord conversion	Yes
2424	96E	1081	2833	98E	1088	Line cord conversion	Yes
2423	961	1082	2833	981	1089	Line cord conversion	Yes

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts
2424	961	1082	2833	981	1089	Line cord conversion	Yes
2423	96E	1082	2833	98E	1089	Line cord conversion	Yes
2424	96E	1082	2833	98E	1089	Line cord conversion	Yes
2423	961	1083	2833	981	1088	Line cord conversion	Yes
2424	961	1083	2833	981	1088	Line cord conversion	Yes
2423	96E	1083	2833	98E	1088	Line cord conversion	Yes
2424	96E	1083	2833	98E	1088	Line cord conversion	Yes
2423	961	1084	2833	981	1089	Line cord conversion	Yes
2424	961	1084	2833	981	1089	Line cord conversion	Yes
2423	96E	1084	2833	98E	1089	Line cord conversion	Yes
2424	96E	1084	2833	98E	1089	Line cord conversion	Yes
2423	961	1085	2833	981	1086	Line cord conversion	Yes
2424	961	1085	2833	981	1086	Line cord conversion	Yes
2423	96E	1085	2833	98E	1086	Line cord conversion	Yes
2424	96E	1085	2833	98E	1086	Line cord conversion	Yes
2424	961	1080	2834	981	1086	Line cord conversion	Yes
2424	96E	1080	2834	98E	1086	Line cord conversion	Yes
2424	961	1081	2834	981	1088	Line cord conversion	Yes
2424	96E	1081	2834	98E	1088	Line cord conversion	Yes
2424	961	1082	2834	981	1089	Line cord conversion	Yes

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts
2424	96E	1082	2834	98E	1089	Line cord conversion	Yes
2424	961	1083	2834	981	1088	Line cord conversion	Yes
2424	96E	1083	2834	98E	1088	Line cord conversion	Yes
2424	961	1084	2834	981	1089	Line cord conversion	Yes
2424	96E	1084	2834	98E	1089	Line cord conversion	Yes
2424	961	1085	2834	981	1086	Line cord conversion	Yes
2424	96E	1085	2834	98E	1086	Line cord conversion	Yes

Machine type 2834 Model 982

From feature	To feature	Returned parts*	Description
Host adapters:			
3153	3157	Yes	Host adapter conversion
3153	3253	Yes	Host adapter conversion
3153	3257	Yes	Host adapter conversion
3157	3153	Yes	Host adapter conversion
3157	3253	Yes	Host adapter conversion
3157	3257	Yes	Host adapter conversion
3253	3153	Yes	Host adapter conversion
3253	3157	Yes	Host adapter conversion
3253	3257	Yes	Host adapter conversion
3257	3153	Yes	Host adapter conversion
3257	3157	Yes	Host adapter conversion
3257	3253	Yes	Host adapter conversion
3353	3453	Yes	Host adapter conversion
3453	3353	Yes	Host adapter conversion
Processor memory:			

From feature	To feature	Returned parts*	Description
4487	4488	No	Processor memory conversion
Processor License feature indicators:			
4868	4888	No	Processor License feature conversion

Machine type 2834 Model 98F

From feature	To feature	Returned parts*	Description
Host adapters:			
3153	3157	Yes	Host adapter conversion
3153	3253	Yes	Host adapter conversion
3153	3257	Yes	Host adapter conversion
3157	3153	Yes	Host adapter conversion
3157	3253	Yes	Host adapter conversion
3157	3257	Yes	Host adapter conversion
3253	3153	Yes	Host adapter conversion
3253	3157	Yes	Host adapter conversion
3253	3257	Yes	Host adapter conversion
3257	3153	Yes	Host adapter conversion
3257	3157	Yes	Host adapter conversion
3257	3253	Yes	Host adapter conversion
3353	3453	Yes	Host adapter conversion
3453	3353	Yes	Host adapter 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 ID and password are required (use IBM ID).

BP Attachment for Announcement Letter 116-047

Publications

The following publication has been updated to reflect this announcement and will be available May 31, 2016.

Title	Order number
IBM DS8880 Introduction and Planning Guide	GC27-8525

The following publications are shipped with the DS8000 series:

Title	Order number
IBM DS8000 Customer Series Publications CDROM	01FT024
IBM DS8000 Series License Documentation CDROM	01FT061

The publications CD contains the following documents:

Title	Order number
License Agreement for Machine Code	SC28-6872
IBM DS8880 Introduction and Planning Guide	GC27-8525
IBM DS8000 Host Systems Attachment Guide	SC27-8527
IBM DS Command-Line Interface User's Guide for DS8000 series	SC27-8526
IBM System Storage$^{(R)}$ Multipath Subsystem Device Driver User's Guide	GC52-1309
IBM DS Open Application Programming Interface Installation and Reference	GC27-4211
IBM DS8000 series Non-IBM_Licenses_and_Notices-Rel 5.x-7.x, 8.0, 8.1	GA32-2204
IBM Warranty Information	GC26-7919
READ ME FIRST for IBM Products	GA32-1061
IBM System Storage Notice Regarding Storage Encryption	45W6389

The license CD contains the following documentation:

Title	Order number
IBM System Storage DS$^{(R)}$ Storage Mgr R8.1 & CIM Agent for DS Open Application Programming Interface 5.8.1	GC27-3907
IBM International License Agreement for Non-Warranted Programs (ILAN)	98Y2827
Global Mirroring Utilities for ICKDSF Users and Open Systems Environments License Information	GC26-7644

DS8000 publications are available at 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

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

Physical specifications
- Width: 606 mm (23.86 in)
- Depth:
  - 1,200 mm (47.25 in) without doors
  - 1,380 mm (54.3 in) with doors
- Height: 40U: 1,924 mm (75.75 in)
- Weight: 40U: 975.7 kg (2,151 lb)

Operating environment

- Temperature: 16°C to 32°C (60°F to 90°F)
- Relative humidity: 20 - 80%
- Wet bulb (caloric value):
  - 27670 BTU for A rack
  - 15013 BTU for B rack
- Electrical power:
  - 7.9 KW for A rack
  - 4.1 KW for B rack
- Capacity of exhaust:
  - 1300 cubic feet/minute for 982
  - 1500 cubic feet/minute for 98F

- Declared operating A-weighted sound power level: 7.9 bels
- Leakage in 3 phase Y: 21.4 mA
- Leakage in 3 phase Delta: 10.5 mA

Power consumption

- Model 982 (24 and 48-core) with 8 HPFE: 7.9 KW

- Model 98F with 8 HPFE: 4.1 KW

DASD Subsystems

- Product Category (2011 law): N
- Maximum physical storage capacity: 192,000 Gigabytes
- Power consumption: 12,000 watts
- DASD Energy Consumption Efficiency: 0.063 watts/Gigabytes

Homologation

This product is not certified for connection to interfaces of public telecommunications networks in the following countries:

- Chad
- Eritrea
- Guinea-Bissau
- Haiti
- Macau (China)
- Moldavia
- Sri Lanka

This product is also restricted for use in the embargoed countries:

- Cuba
- Iran, Islamic Republic of
- North Korea
- Sudan
- Syria (Syrian Arab Republic)

Hardware requirements

Licensed Machine Code

All announced features and functions are supported on the IBM System Storage DS8000 series and require DS8000 LMC 8.8.10.xx.xx (bundle version 88.10.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

- Small extents or thin-provisioned CKD volumes are not available for DS8888 models
- Easy Tier$^{(R)}$ does not currently support storage pools with small extent volumes

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.

- Storage Appliance planning
- Security Key Lifecycle Manager planning
- Encryption activation review planning

Storage Appliance planning

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, enabling 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 Security Key Lifecycle Manager (SKLM), formerly known as IBM Tivoli(R) Key Lifecycle Manager, V2.5, or later, is required.

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

IBM SKLM planning

The DS8000 series supports IBM SKLM versions 2.5 and 1.1.

Program number	VRM	Program name
5724-T60	2.5.0	IBM Security Key Lifecycle Manager
5608-A99	2.5.0	IBM Security Key Lifecycle Manager

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 on the licensing requirements and pricing of the metric, refer to 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 trough 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 a 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.

Refer to the following publications:

- *IBM Security Key Lifecycle Manager Quick Start Guide* (GI13-2316)

- *IBM Security Key Lifecycle Manager Installation and Configuration Guide* (SC27-5335)

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 Gb or 16 Gb FCP/FICON 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[R] 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.

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 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

Volume orders

Contact your IBM representative.

IBM Global Financing

Yes

Products - terms and conditions

Warranty period

Four years

This product is provided with one 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.

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.

Premium Support Services

IBM DS8880 models offer enhanced worldwide client care support, including the availability of four years Premium Support Services in a single machine type. Premium Support Services enhance client communications regarding problem status and actions, and will include the following service enhancements:

- Hardware installation and hardware configuration support
- Improved client problem management
- Faster initial response time to prioritize the resolution of high severity problems
- Improved coordination across support teams within IBM; Technical Advisor support is included during the warranty period

Warranty service

CRU and On-site 24x7 Same Day (SD)

Improvement in the worldwide support processes, including addition response to severity 2 calls 24 hours a day, seven days a week.

If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM website. Certain machines contain remote support capabilities for direct problem reporting, remote problem determination, and resolution with IBM. You must follow the problem determination and resolution procedures that IBM specifies. Following problem determination, if IBM determines on-site service is required, scheduling of service will depend upon the time of your call, machine technology and redundancy, and availability of parts. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country-specific and location-specific information.

CRU and On-site Service

At IBM's discretion, you will receive specified CRU service, or IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

Service level is:

- 24 hours per day, 7 days a week, 4 hour average, same day response.

Usage plan machine

No

IBM hourly service rate classification

Three

When a type of service involves the exchange of a machine part, the replacement may not be new, but will be in good working order.

General terms and conditions

Field-installable features

Yes

Model conversions

No

Machine installation

Installation is performed by IBM. IBM will install the machine in accordance with the IBM installation procedures for the machine. In the United States, contact IBM at 1-800-IBM-SERV (426-7378). In other countries, contact the local IBM office.

The following activities are a customer responsibility:

- Installation planning
- Retrieval and installation of feature activation codes
- Encryption planning

Refer to the Customer responsibilities section for more information.

Customer requests for installation of items not covered in the installation guide may be performed at IBM's hourly service rate designated for the machine.

Graduated program license charges apply

No

Licensed Machine Code

IBM Machine Code is licensed for use by a customer on the IBM machine for which it was provided by IBM under the terms and conditions of the IBM License Agreement for Machine Code, to enable the machine to function in accordance with its specifications, and only for the capacity authorized by IBM and acquired by the customer. You can obtain the agreement from the License Agreement for Machine Code and Licensed Internal Code website.

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

You may also obtain updated code by contacting your IBM representative.

If the machine does not function as warranted and your problem can be resolved through your application of downloadable Machine Code, you are responsible for downloading and installing these designated Machine Code changes as IBM specifies. If you would prefer, you may request IBM to install downloadable Machine Code changes; however, you may be charged for that service.

Educational allowance

A reduced charge is available to qualified education customers. The educational allowance may not be added to any other discount or allowance.

The educational allowance is 15% for the products in this announcement.

Prices

For additional information and current prices, contact your local IBM representative.

Description	Machine type	Model	Feature
DS8888	2834	982	
DS8888 Expansion Unit	2834	98F	
Model 9xE merge indicators:			
- 9xE factory merge	2834	982, 98F	0001
- 9xE field merge	2834	98F	0002
- PPA Software Order Indicator	2834	980, 981, 982, 98B, 98E, 98F	0017
- DoD indicator	2834	982, 98F	0020
- JEMT indicator	2834	982, 98F	0021
- Shipping weight reduction	2834	982, 98F	0200
Model 9xF position indicators:			
- 982 - 98F position 1	2834	982, 98F	0381
Encryption not capable	2834	982	0403
Initial system capacity:			
- Up to 5 TB capacity	2834	982, 98F	0795
- 5.1 TB to 10 TB capacity	2834	982, 98F	0796
- 10.1 TB to 25 TB capacity	2834	982, 98F	0797
- 25.1 TB to 50 TB capacity	2834	982, 98F	0798
- 50.1 TB to 75 TB capacity	2834	982, 98F	0799
- 75.1 TB to 100 TB capacity	2834	982, 98F	0801
- 100.1 TB to 250 TB capacity	2834	982, 98F	0803
- 250.1 TB to 500 TB capacity	2834	982, 98F	0804
- INIT SYS CAPACITY 500.1TB	2834	982, 98F	0806
- INIT SYS CAPACITY 1250.1TB	2834	982, 98F	0807
- INIT SYS CAPACITY 3000.1TB	2834	982, 98F	0808
- INIT SYS CAPACITY 6000.1TB	2834	982, 98F	0809

Description	Machine type	Model	Feature
Attachment indicators:			
- ATTACHM INDIC OPENWAVE ALL	2834	982, 98F	0930
- IBM System i(R) indicator	2834	982, 98F	0931
- IBM System p indicator	2834	982, 98F	0932
- IBM System x indicator	2834	982, 98F	0933
- IBM System z(R) indicator	2834	982, 98F	0934
- IBM System z B/C indicator	2834	982, 98F	0935
- ATTACHM INDIC SYSTEM ZENTE	2834	982, 98F	0936
- Linux(TM) indicator	2834	982, 98F	0940
- Storage Appliance indicator	2834	982, 98F	0952
- IBM ProtecTIER(R) indicator	2834	982, 98F	0960
- IBM Storwize(R) V7000 indicator	2834	982, 98F	0961
- IBM N series indicator	2834	982, 98F	0962
- ATTACHM INDIC SAN VOLUME C	2834	982, 98F	0963
- EPIC ATTACHMENT INDICATOR	2834	982, 98F	0964
- VMware VAAI indicator	2834	982, 98F	0965
- OpenStack indicator	2834	982, 98F	0966
- US TAA compliance indicator	2834	982, 98F	0983
Power:			
- Three phase DC-UPS	2834	981, 982, 98E, 98F	1052
- Extended PLD	2834	982, 98F	1055
Three phase line cords:			
- 3PHS 380-415V 30A 5 PIN	2834	981, 982, 98E, 98F	1086
- 3PHS 200-240V 30A 4 PIN	2834	981, 982, 98E, 98F	1087
- 3PHS 380-415V 40A No CON	2834	981, 982, 98E, 98F	1088
- 3PHS 200-240V 60A 4 PIN	2834	981, 982, 98E, 98F	1089
Special tool:			
- Overhead ladder - 5ft	2834	982	1101
Management Console:			

Description	Machine type	Model	Feature
- Mgmt console - Primary	2834	982	1140
- Mgmt console - Secondary	2834	982	1150
I/O enclosure pair PCIe 3	2834	982, 98F	1302
Top exit bracket:			
- TOP EXIT BRACKET FOR FIBRE	2834	982, 98F	1400
Fibre Channel/ FICON cables:			
- 50 um Fibre cable (LC)	2834	982, 98F	1410
- 50 um Fibre cable (LC/SC)	2834	982, 98F	1411
- 50 um Fibre cable (Jumper)	2834	982, 98F	1412
- 9 um Fibre cable (LC)	2834	982, 98F	1420
- 9 um Fibre cable (LC/SC)	2834	982, 98F	1421
- 9 um Fibre cable (Jumper)	2834	982, 98F	1422
High-performance flash card sets:			
- HIGH PERFORMANCE FLASH ENC	2834	982, 98F	1500
- 400GB 1.8INCH FLSH CRD SET	2834	982, 98F	1596
- 400GB 1.8INCH FLSH CRD SET	2834	982, 98F	1598
- Flash enclosure filler set	2834	982, 98F	1599
DS8000 Licensed Machine Code:			
- DS8000 LMC R8.1	2834	980, 981, 982	1881
- DS8000 LMC R8.1 indicator	2834	98B, 98E, 98F	1981
Earthquake kit	2834	982, 98F	1906
Hardware installation MES	2834	982, 98F	1999
Device adapters:			
- HPFE DEVICE ADAPTER II	2834	982, 98F	3055
Host adapters:			
- 8GB 4PORT SW FCP FICON ADA	2834	982, 98F	3153
- 8GB 8PORT SW FCP FICON ADA	2834	982, 98F	3157

Description	Machine type	Model	Feature
- 8GB 4PORT LW FCP FICON ADA	2834	982, 98F	3253
- 8GB 8PORT LW FCP FICON ADA	2834	982, 98F	3257
- 16GB 4PORT SW FCP FICON AD	2834	982, 98F	3353
- 16GB 4PORT LW FCP FICON AD	2834	982, 98F	3453
Processor memory:			
- 1TB PROCESSOR MEMORY 24COR	2834	982	4487
- 2TB PROCESSOR MEMORY 48COR	2834	982	4488
Processor license indicators:			
- 24-core processor indicator	2834	982	4868
- 48-core processor indicator	2834	982	4888
Function Authorization indicators			
Base Function (BF):			
- BF - Up to 100 TB capacity	2834	982	8151
- BF 100.1TB TO 250TB CAPACI	2834	982	8152
- BF 250.1TB TO 500TB CAPACI	2834	982	8153
- BF 500.1TB TO 1250TB CAPAC	2834	982	8154
- BF 1250.1TB TO 3000TB CAPA	2834	982	8155
- BF 3000.1TB TO 6000TB CAPA	2834	982	8156
- BF - 6000.1 TB to 10000 TB	2834	982	8160
Copy Services (CS) license:			
- CS - Inactive	2834	982	8250
- CS - Up to 100 TB capacity	2834	982	8251
- CS 100.1TB TO 250TB CAPACI	2834	982	8252
- CS 250.1TB TO 500TB CAPACI	2834	982	8253
- CS 500.1TB TO 1250TB CAPAC	2834	982	8254
- CS 1250.1TB TO 3000TB CAPA	2834	982	8255
- CS 3000.1TB TO 6000TB CAPA	2834	982	8256
- CS - 6000.1 TB to 10000 TB	2834	982	8260

Description	Machine type	Model	Feature
z-synergy Services (zsS) license:			
- zsS - Active	2834	982	8300
- zsS - Inactive	2834	982	8350
- zsS - Up to 100 TB capacity	2834	982	8351
- ZSS 100.1TB TO 250TB CAPAC	2834	982	8352
- ZSS 250.1TB TO 500TB CAPAC	2834	982	8353
- ZSS 500.1TB TO 1250TB CAPA	2834	982	8354
- ZSS 1250.1TB TO 3000TB CAP	2834	982	8355
- ZSS 3000.1TB TO 6000TB CAP	2834	982	8356
- ZSS 6000.1TB TO 10000TB	2834	982	8360
Copy Services Manager (CSM on HMC) license:			
- CSM on HMC - Inactive	2834	980, 981, 982	8450
- CSM UP TO 100 TB CAP	2834	980, 981, 982	8451
- CSM 100.1 TB TO 250 TB CAP	2834	980, 981, 982	8452
- CSM 250.1 TB TO 500 TB CAP	2834	980, 981, 982	8453
- CSM 500.1 TB TO 1250 TB CA	2834	980, 981, 982	8454
- CSM 1250.1 TB TO 3000 TB C	2834	980, 981, 982	8455
- CSM 3000.1 TB TO 6000 TB C	2834	980, 981, 982	8456
- CSM 6000.1 TB TO 100000 TB	2834	980, 981, 982	8460
IGF transaction:			
- IGF transaction indicator	2834	982, 98F	8999
Shipping and Handling NC	2834	982, 98F	AG00
Shipping and handling 982	2834	982	AGA8
Shipping and handling 98F	2834	98F	AGA9

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
Model 9xE merge indicators:						
- 9xE factory merge	0001	Plant only	No	No	No	N/A
- 9xE field merge	0002	Plant only	No	No	No	N/A

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
- PPA Software Order Indicator	0017	Plant only	No	No	No	N/A
- DoD indicator	0020	Plant only	No	No	No	N/A
- JEMT indicator	0021	Plant only	No	No	No	N/A
- Shipping weight reduction	0200	Plant only	No	No	No	N/A
Model 9xF position indicators:						
- 982 - 98F position 1	0381	Both	No	No	Yes	N/A
Encryption not capable	0403	Plant only	No	No	No	N/A
Initial system capacity:						
- Up to 5 TB capacity	0795	Plant only	No	No	Yes	N/A
- 5.1 TB to 10 TB capacity	0796	Plant only	No	No	Yes	N/A
- 10.1 TB to 25 TB capacity	0797	Plant only	No	No	Yes	N/A
- 25.1 TB to 50 TB capacity	0798	Plant only	No	No	Yes	N/A
- 50.1 TB to 75 TB capacity	0799	Plant only	No	No	Yes	N/A
- 75.1 TB to 100 TB capacity	0801	Plant only	No	No	Yes	N/A
- 100.1 TB to 250 TB capacity	0803	Plant only	No	No	Yes	N/A
- 250.1 TB to 500 TB capacity	0804	Plant only	No	No	Yes	N/A
- INIT SYS	0806	Plant only	No	No	Yes	N/A

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
CAPACITY 500.1TB						
- INIT SYS CAPACITY 1250.1TB	0807	Plant only	No	No	Yes	N/A
- INIT SYS CAPACITY 3000.1TB	0808	Plant only	No	No	Yes	N/A
- INIT SYS CAPACITY 6000.1TB	0809	Plant only	No	No	Yes	N/A
Attachment indicators:						
- ATTACHM INDIC OPENWAVE ALL	0930	Both	No	No	No	N/A
- IBM System i indicator	0931	Both	No	No	No	N/A
- IBM System p indicator	0932	Both	No	No	No	N/A
- IBM System x indicator	0933	Both	No	No	No	N/A
- IBM System z indicator	0934	Both	No	No	No	N/A
- IBM System z B/C indicator	0935	Both	No	No	No	N/A
- ATTACHM INDIC SYSTEM ZENTE	0936	Both	No	No	No	N/A
- Linux indicator	0940	Both	No	No	No	N/A
- Storage Appliance indicator	0952	Both	No	No	No	N/A
- IBM ProtecTIER indicator	0960	Both	No	No	No	N/A
- IBM Storwize V7000 indicator	0961	Both	No	No	No	N/A
- IBM N series indicator	0962	Both	No	No	No	N/A
- ATTACHM INDIC SAN	0963	Both	No	No	No	N/A

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
VOLUME C						
- EPIC ATTACHMENT INDICATOR	0964	Both	No	No	No	N/A
- VMware VAAI indicator	0965	Both	No	No	No	N/A
- OpenStack indicator	0966	Both	No	No	No	N/A
- US TAA compliance indicator	0983	Plant only	No	No	No	N/A
Power:						
- Three phase DC-UPS	1052	Plant only	No	No	No	No
- Extended PLD	1055	Both	No	No	No	No
Three phase line cords:						
- 3PHS 380-415V 30A 5 PIN	1086	Both	No	No	No	No
- 3PHS 200-240V 30A 4 PIN	1087	Both	No	No	No	No
- 3PHS 380-415V 40A No CON	1088	Both	No	No	No	No
- 3PHS 200-240V 60A 4 PIN	1089	Both	No	No	No	No
Special tool:						
- Overhead ladder - 5ft	1101	Both	No	No	No	No
Management Console:						
- Mgmt console - Primary	1140	Plant only	No	No	No	No
- Mgmt console - Secondary	1150	Both	No	No	No	No

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
I/O enclosure pair PCIe 3	1302	Both	No	No	No	No
Top exit bracket:						
- TOP EXIT BRACKET FOR FIBRE	1400	Both	No	No	No	No
Fibre Channel/ FICON cables:						
- 50 um Fibre cable (LC)	1410	Both	No	No	No	No
- 50 um Fibre cable (LC/SC)	1411	Both	No	No	No	No
- 50 um Fibre cable (Jumper)	1412	Both	No	No	No	No
- 9 um Fibre cable (LC)	1420	Both	No	No	No	No
- 9 um Fibre cable (LC/SC)	1421	Both	No	No	No	No
- 9 um Fibre cable (Jumper)	1422	Both	No	No	No	No
High-performance flash card sets:						
- HIGH PERFORMANCE FLASH ENC	1500	Both	No	No	No	No
- 400GB 1.8INCH FLSH CRD SET	1596	Both	No	No	No	No
- 400GB 1.8INCH FLSH CRD SET	1598	Both	No	No	No	No
- Flash enclosure filler set	1599	Both	No	No	No	No
DS8000 Licensed						

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
Machine Code:						
- DS8000 LMC R8.1	1881	Both	No	No	Yes	No
- DS8000 LMC R8.1 indicator	1981	Both	No	No	Yes	N/A
Earthquake kit	1906	Both	No	No	Yes	No
Hardware installation MES	1999	Field only	No	No	No	No
Device adapters:						
- HPFE DEVICE ADAPTER II	3055	Both	No	No	No	No
Host adapters:						
- 8GB 4PORT SW FCP FICON ADA	3153	Both	Yes	No	No	No
- 8GB 8PORT SW FCP FICON ADA	3157	Both	Yes	No	No	No
- 8GB 4PORT LW FCP FICON ADA	3253	Both	Yes	No	No	No
- 8GB 8PORT LW FCP FICON ADA	3257	Both	Yes	No	No	No
- 16GB 4PORT SW FCP FICON AD	3353	Both	Yes	No	Yes	No
- 16GB 4PORT LW FCP FICON AD	3453	Both	Yes	No	Yes	No
Processor memory:						
- 1TB PROCESSOR MEMORY 24COR	4487	Both	Yes	No	No	No

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
- 2TB PROCESSOR MEMORY 48COR	4488	Both	Yes	No	No	No
Processor license indicators:						
- 24-core processor indicator	4868	Both	No	No	Yes	No
- 48-core processor indicator	4888	Both	No	No	Yes	No
Function Authorization indicators						
Base Function (BF):						
- BF - Up to 100 TB capacity	8151	Both	No	No	Yes	N/A
- BF 100.1TB TO 250TB CAPACI	8152	Both	No	No	Yes	N/A
- BF 250.1TB TO 500TB CAPACI	8153	Both	No	No	Yes	N/A
- BF 500.1TB TO 1250TB CAPAC	8154	Both	No	No	Yes	N/A
- BF 1250.1TB TO 3000TB CAPA	8155	Both	No	No	Yes	N/A
- BF 3000.1TB TO 6000TB CAPA	8156	Both	No	No	Yes	N/A
- BF - 6000.1 TB to 10000 TB	8160	Both	No	No	Yes	N/A
Copy Services (CS) license:						
- CS - Inactive	8250	Both	No	No	Yes	N/A

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
- CS - Up to 100 TB capacity	8251	Both	No	No	Yes	N/A
- CS 100.1TB TO 250TB CAPACI	8252	Both	No	No	Yes	N/A
- CS 250.1TB TO 500TB CAPACI	8253	Both	No	No	Yes	N/A
- CS 500.1TB TO 1250TB CAPAC	8254	Both	No	No	Yes	N/A
- CS 1250.1TB TO 3000TB CAPA	8255	Both	No	No	Yes	N/A
- CS 3000.1TB TO 6000TB CAPA	8256	Both	No	No	Yes	N/A
- CS - 6000.1 TB to 10000 TB	8260	Both	No	No	Yes	N/A
z-synergy Services (zsS) license:						
- zsS - Active	8300	Both	No	No	Yes	N/A
- zsS - Inactive	8350	Both	No	No	Yes	N/A
- zsS - Up to 100 TB capacity	8351	Both	No	No	Yes	N/A
- ZSS 100.1TB TO 250TB CAPAC	8352	Both	No	No	Yes	N/A
- ZSS 250.1TB TO 500TB CAPAC	8353	Both	No	No	Yes	N/A
- ZSS 500.1TB TO 1250TB CAPA	8354	Both	No	No	Yes	N/A
- ZSS 1250.1TB TO	8355	Both	No	No	Yes	N/A

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
3000TB CAP						
- ZSS 3000.1TB TO 6000TB CAP	8356	Both	No	No	Yes	N/A
- ZSS 6000.1TB TO 10000TB	8360	Both	No	No	Yes	N/A
Copy Services Manager (CSM on HMC) license:						
- CSM on HMC - Inactive	8450	Both	No	No	Yes	N/A
- CSM UP TO 100 TB CAP	8451	Both	No	No	Yes	N/A
- CSM 100.1 TB TO 250 TB CAP	8452	Both	No	No	Yes	N/A
- CSM 250.1 TB TO 500 TB CAP	8453	Both	No	No	Yes	N/A
- CSM 500.1 TB TO 1250 TB CA	8454	Both	No	No	Yes	N/A
- CSM 1250.1 TB TO 3000 TB C	8455	Both	No	No	Yes	N/A
- CSM 3000.1 TB TO 6000 TB C	8456	Both	No	No	Yes	N/A
- CSM 6000.1 TB TO 100000 TB	8460	Both	No	No	Yes	N/A
IGF transaction						
- IGF transaction indicator	8999	Field only	No	No	Yes	N/A
Shipping and	AG00	Plant only	No	No	No	N/A

Description	Feature	Install type	Feature conversion	Feature exchange	Feature remove	CSU
Handling NC						
Shipping and handling 982	AGA8	Plant only	No	No	No	N/A
Shipping and handling 98F	AGA9	Plant only	No	No	No	N/A

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.

ServiceElect (ESA) charges

For ServiceElect (ESA) maintenance service charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

Feature conversion purchase price

Machine types 242x Models 961 and 96E to Machine type 283x Models 981 and 98E

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts	Continuous maintenance
2421	961	1080	2831	981	1086	Line cord convers on	Yes	No
2422	961	1080	2831	981	1086	Line cord convers on	Yes	No
2423	961	1080	2831	981	1086	Line cord convers on	Yes	No
2424	961	1080	2831	981	1086	Line cord convers on	Yes	No
2421	96E	1080	2831	98E	1086	Line cord convers on	Yes	No
2422	96E	1080	2831	98E	1086	Line cord convers on	Yes	No
2423	96E	1080	2831	98E	1086	Line cord convers on	Yes	No
2424	96E	1080	2831	98E	1086	Line cord convers on	Yes	No
2421	961	1081	2831	981	1088	Line cord convers on	Yes	No

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts	Continuous maintenance
2422	961	1081	2831	981	1088	Line cord convers on	Yes	No
2423	961	1081	2831	981	1088	Line cord convers on	Yes	No
2424	961	1081	2831	981	1088	Line cord convers on	Yes	No
2421	96E	1081	2831	98E	1088	Line cord convers on	Yes	No
2422	96E	1081	2831	98E	1088	Line cord convers on	Yes	No
2423	96E	1081	2831	98E	1088	Line cord convers on	Yes	No
2424	96E	1081	2831	98E	1088	Line cord convers on	Yes	No
2421	961	1082	2831	981	1089	Line cord convers on	Yes	No
2422	961	1082	2831	981	1089	Line cord convers on	Yes	No
2423	961	1082	2831	981	1089	Line cord convers on	Yes	No
2424	961	1082	2831	981	1089	Line cord convers on	Yes	No
2421	96E	1082	2831	98E	1089	Line cord convers on	Yes	No
2422	96E	1082	2831	98E	1089	Line cord convers on	Yes	No
2423	96E	1082	2831	98E	1089	Line cord convers on	Yes	No
2424	96E	1082	2831	98E	1089	Line cord convers on	Yes	No
2421	961	1083	2831	981	1088	Line cord convers on	Yes	No
2422	961	1083	2831	981	1088	Line cord convers on	Yes	No
2423	961	1083	2831	981	1088	Line cord convers on	Yes	No
2424	961	1083	2831	981	1088	Line cord convers on	Yes	No
2421	96E	1083	2831	98E	1088	Line cord convers on	Yes	No
2422	96E	1083	2831	98E	1088	Line cord convers on	Yes	No

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts	Continuous maintenance
2423	96E	1083	2831	98E	1088	Line cord convers on	Yes	No
2424	96E	1083	2831	98E	1088	Line cord convers on	Yes	No
2421	961	1084	2831	981	1089	Line cord convers on	Yes	No
2422	961	1084	2831	981	1089	Line cord convers on	Yes	No
2423	961	1084	2831	981	1089	Line cord convers on	Yes	No
2424	961	1084	2831	981	1089	Line cord convers on	Yes	No
2421	96E	1084	2831	98E	1089	Line cord convers on	Yes	No
2422	96E	1084	2831	98E	1089	Line cord convers on	Yes	No
2423	96E	1084	2831	98E	1089	Line cord convers on	Yes	No
2424	96E	1084	2831	98E	1089	Line cord convers on	Yes	No
2421	961	1085	2831	981	1086	Line cord convers on	Yes	No
2422	961	1085	2831	981	1086	Line cord convers on	Yes	No
2423	961	1085	2831	981	1086	Line cord convers on	Yes	No
2424	961	1085	2831	981	1086	Line cord convers on	Yes	No
2421	96E	1085	2831	98E	1086	Line cord convers on	Yes	No
2422	96E	1085	2831	98E	1086	Line cord convers on	Yes	No
2423	96E	1085	2831	98E	1086	Line cord convers on	Yes	No
2424	96E	1085	2831	98E	1086	Line cord convers on	Yes	No
2422	961	1080	2832	981	1086	Line cord convers on	Yes	No
2423	961	1080	2832	981	1086	Line cord convers on	Yes	No

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts	Continuous maintenance
2424	961	1080	2832	981	1086	Line cord convers on	Yes	No
2422	96E	1080	2832	98E	1086	Line cord convers on	Yes	No
2423	96E	1080	2832	98E	1086	Line cord convers on	Yes	No
2424	96E	1080	2832	98E	1086	Line cord convers on	Yes	No
2422	961	1081	2832	981	1088	Line cord convers on	Yes	No
2423	961	1081	2832	981	1088	Line cord convers on	Yes	No
2424	961	1081	2832	981	1088	Line cord convers on	Yes	No
2422	96E	1081	2832	98E	1088	Line cord convers on	Yes	No
2423	96E	1081	2832	98E	1088	Line cord convers on	Yes	No
2424	96E	1081	2832	98E	1088	Line cord convers on	Yes	No
2422	961	1082	2832	981	1089	Line cord convers on	Yes	No
2423	961	1082	2832	981	1089	Line cord convers on	Yes	No
2424	961	1082	2832	981	1089	Line cord convers on	Yes	No
2422	96E	1082	2832	98E	1089	Line cord convers on	Yes	No
2423	96E	1082	2832	98E	1089	Line cord convers on	Yes	No
2424	96E	1082	2832	98E	1089	Line cord convers on	Yes	No
2422	961	1083	2832	981	1088	Line cord convers on	Yes	No
2423	961	1083	2832	981	1088	Line cord convers on	Yes	No
2424	961	1083	2832	981	1088	Line cord convers on	Yes	No
2422	96E	1083	2832	98E	1088	Line cord convers on	Yes	No
2423	96E	1083	2832	98E	1088	Line cord convers on	Yes	No

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts	Continuous maintenance
2424	96E	1083	2832	98E	1088	Line cord convers on	Yes	No
2422	961	1084	2832	981	1089	Line cord convers on	Yes	No
2423	961	1084	2832	981	1089	Line cord convers on	Yes	No
2424	961	1084	2832	981	1089	Line cord convers on	Yes	No
2422	96E	1084	2832	98E	1089	Line cord convers on	Yes	No
2423	96E	1084	2832	98E	1089	Line cord convers on	Yes	No
2424	96E	1084	2832	98E	1089	Line cord convers on	Yes	No
2422	961	1085	2832	981	1086	Line cord convers on	Yes	No
2423	961	1085	2832	981	1086	Line cord convers on	Yes	No
2424	961	1085	2832	981	1086	Line cord convers on	Yes	No
2422	96E	1085	2832	98E	1086	Line cord convers on	Yes	No
2423	96E	1085	2832	98E	1086	Line cord convers on	Yes	No
2424	96E	1085	2832	98E	1086	Line cord convers on	Yes	No
2423	961	1080	2833	981	1086	Line cord convers on	Yes	No
2424	961	1080	2833	981	1086	Line cord convers on	Yes	No
2423	96E	1080	2833	98E	1086	Line cord convers on	Yes	No
2424	96E	1080	2833	98E	1086	Line cord convers on	Yes	No
2423	961	1081	2833	981	1088	Line cord convers on	Yes	No
2424	961	1081	2833	981	1088	Line cord convers on	Yes	No
2423	96E	1081	2833	98E	1088	Line cord convers on	Yes	No

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts	Continuous maintenance
2424	96E	1081	2833	98E	1088	Line cord convers on	Yes	No
2423	961	1082	2833	981	1089	Line cord convers on	Yes	No
2424	961	1082	2833	981	1089	Line cord convers on	Yes	No
2423	96E	1082	2833	98E	1089	Line cord convers on	Yes	No
2424	96E	1082	2833	98E	1089	Line cord convers on	Yes	No
2423	961	1083	2833	981	1088	Line cord convers on	Yes	No
2424	961	1083	2833	981	1088	Line cord convers on	Yes	No
2423	96E	1083	2833	98E	1088	Line cord convers on	Yes	No
2424	96E	1083	2833	98E	1088	Line cord convers on	Yes	No
2423	961	1084	2833	981	1089	Line cord convers on	Yes	No
2424	961	1084	2833	981	1089	Line cord convers on	Yes	No
2423	96E	1084	2833	98E	1089	Line cord convers on	Yes	No
2424	96E	1084	2833	98E	1089	Line cord convers on	Yes	No
2423	961	1085	2833	981	1086	Line cord convers on	Yes	No
2424	961	1085	2833	981	1086	Line cord convers on	Yes	No
2423	96E	1085	2833	98E	1086	Line cord convers on	Yes	No
2424	96E	1085	2833	98E	1086	Line cord convers on	Yes	No
2424	961	1080	2834	981	1086	Line cord convers on	Yes	No
2424	96E	1080	2834	98E	1086	Line cord convers on	Yes	No
2424	961	1081	2834	981	1088	Line cord convers on	Yes	No

From Machine type	Model	Feature	To Machine type	Model	Feature	Description	Returned parts	Continuous maintenance
2424	96E	1081	2834	98E	1088	Line cord convers on	Yes	No
2424	961	1082	2834	981	1089	Line cord convers on	Yes	No
2424	96E	1082	2834	98E	1089	Line cord convers on	Yes	No
2424	961	1083	2834	981	1088	Line cord convers on	Yes	No
2424	96E	1083	2834	98E	1088	Line cord convers on	Yes	No
2424	961	1084	2834	981	1089	Line cord convers on	Yes	No
2424	96E	1084	2834	98E	1089	Line cord convers on	Yes	No
2424	961	1085	2834	981	1086	Line cord convers on	Yes	No
2424	96E	1085	2834	98E	1086	Line cord convers on	Yes	No

Machine type 2834 for Models 982 and 98F

From feature	To feature	Returned parts*	Description	Continuous maintenance
Host adapters:				
3153	3157	Yes	Host adapter conversion	Yes
3153	3253	Yes	Host adapter conversion	Yes
3153	3257	Yes	Host adapter conversion	Yes
3157	3153	Yes	Host adapter conversion	Yes
3157	3253	Yes	Host adapter conversion	Yes
3157	3257	Yes	Host adapter conversion	Yes
3253	3153	Yes	Host adapter conversion	Yes
3253	3157	Yes	Host adapter conversion	Yes
3253	3257	Yes	Host adapter conversion	Yes
3257	3153	Yes	Host adapter conversion	Yes
3257	3157	Yes	Host adapter conversion	Yes
3257	3253	Yes	Host adapter conversion	Yes

From feature	To feature	Returned parts*	Description	Continuous maintenance
3353	3453	Yes	Host adapter conversion	Yes
3453	3353	Yes	Host adapter conversion	Yes

Machine type 2834 for Model 982

From feature	To feature	Returned parts*	Description	Continuous maintenance
Processor memory:				
4487	4488	No	Processor memory conversion	Yes
Processor License feature indicators:				
4868	4888	No	Processor License feature conversion	Yes

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

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Corrections

(Corrected on June 14, 2016)
The Overview and Description sections have been updated for DS8000 connection support.