IBM DS8880 family offers a one-year warranty DS8882F rack-mounted model for IBM Z, IBM LinuxONE, and distributed environments, increased data protection, and enhancements to transparent cloud tiering

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At a glance

IBM(R) DS8880 family has a new all-flash, one-year warranty member, the DS8882F rack-mounted model, designed to deliver important data center power and space savings. DS8882F delivers the same software capabilities and response time as the rest of the DS8880F offerings, except zHyperLink support.

Two additional data security options are now available for the IBM DS8880F family of products:

- Safeguarded Copy provides multiple point-in-time copies of data to protect against user errors, malicious destruction, or ransomware attacks
- Data encryption for transparent cloud tiering to protect data moved to a private or public cloud environment

Transparent cloud tiering support for Global Mirror and Metro Global Mirror is now available on IBM DS8880 and DS8880F family models.

Overview

IBM DS8880 family offers:

- New one-year warranty DS8882F rack-mounted model for IBM Z(R), IBM LinuxONE(TM), and distributed environments
- Safeguarded Copy for logical protection
- Data encryption support for transparent cloud tiering
- Transparent cloud tiering support for Global Mirror and Metro Global Mirror
- Thin provisioning enhancements

Key prerequisites

All announced features and functions that are supported on the IBM DS8000(R) series require DS8000 LMC 8.8.50.xx.xx (bundle version 88.50.xxx.xx), or later.

Planned availability date

- September 7, 2018: All features and functions except Safeguarded Copy
- September 28, 2018: Safeguarded Copy

Description

The IBM DS8880F family now offers a new all-flash array model, DS8882F, to meet the demand for higher speed storage in a smaller footprint. All-flash arrays deliver higher IOPS and bandwidth with lower power consumption to reduce the total cost of ownership as compared to hybrid or HDD-based solutions.

DS8882F is a rack-mounted, all-flash storage system designed for customers with small capacity needs looking to boost performance. DS8882F delivers the following features:

- Six-core processors with options of 64 GB, 128 GB, and 256 GB memory combinations
- Support for up to a maximum of four 4-port host adapters
- A variety of all-flash, high-performance drive sets: 400 GB, 800 GB, 1600 GB, and 3200 GB
- Two all-flash, high-capacity drive set options: 3.84 TB and 7.68 TB
- Support for one high-performance flash enclosure (HPFE) Gen 2 pair that can be populated with either high-performance or high-capacity drive sets, and a maximum raw capacity of 368.64 TB
- Battery backup units that protect the write in-flight in the event of a power loss
- Same advanced functions (except zHyperLink support) as the rest of the DS8880F family members

With 16U height, DS8882F is designed to take advantage of the space available in the IBM Z ZR1 and LinuxONE Rockhopper II system frames, and can be integrated into existing 19-inch form factor racks.

In addition to the new DS8882F, new functionalities are being added to the DS8880 and DS8880F families.

Safeguarded Copy

Human errors and malicious attacks can threaten our customers' business. Corruption of critical data is a risk our customers cannot take. Safeguarded Copy delivers the ability to create and retain hundreds of point-in-time copies online on the DS8880 and DS8880F. Those copies can be used to verify customer data, analyze the nature of the corruption, and restore critical customer data. Safeguarded Copy management is done with Copy Services Manager.

Transparent cloud tiering in transit encryption

Data security within the data center continues to be a paramount concern for clients. In addition to existing data-at-rest encryption on DS8880 and DS8880F systems, transparent cloud tiering now supports client-side data encryption. Data migrated with this feature is encrypted prior to transmission, securing the data in transit as well as when it lands in the object storage.

Transparent cloud tiering support for Global Mirror and Metro Global Mirror

In addition to the existing support for Metro Mirror and FlashCopy$^{(R)}$, transparent cloud tiering now supports the migration and recall of data to and from object storage for volumes participating in either a Global Mirror or Metro Global Mirror relationship.

Remote pair FlashCopy for extended remote copy (XRC)

Remote Pair FlashCopy capability is now supported where the FlashCopy source and target devices are z/OS[(R)] Global Mirror (XRC) primary volumes. The FlashCopy operation is mirrored to the secondary devices. The capabilities of the previously announced Cascaded FlashCopy enable a FlashCopy relationship to be established between two XRC secondary volumes, even when the target volume is already a FlashCopy source volume.

Thin provisioning enhancements

Space release functionality at the extent level for ECKD[TM] volumes is now supported for Global Copy and Global Mirror primary and secondary volumes. Now, when unallocated space is released on a Global Copy or Global Mirror primary volume, if possible, the corresponding space on the secondary volumes will also be released, including those in cascaded and Multiple Target Peer-to-Peer Remote Copy (PPRC).

IBM Security Key Lifecycle Manager(SKLM) V3.0 support

The DS8000 series now supports SKLM V3.0.

Program number	VRM	Program name
5724-T60	3.0	IBM Security Key Lifecycle Manager (For PPA)
5641-SKL	3.0	IBM Security Key Lifecycle Manager -- 1 year (For AAS)
5641-SKM	3.0	IBM Security Key Lifecycle Manager -- 3 year (For AAS)

For more information about SKLM V3.0, see Software Announcement 217-249, dated October 10, 2017.

IBM Storage Systems remote code load (RCL) for license machine code upgrades

The new DS8882F uses RCL as the default delivery method for code upgrades to our IBM storage clients. Effective December 31, 2018, all DS8880 and DS8880F models will use RCL as the default delivery method for code upgrades. RCL is available on all DS8880 code levels and requires configuring Assist On-Site (AOS) or Remote Support Center (RSC), the same secure connection method used for the DS8000 system autonomic call-home process for service.

Further details are available at IBM System Storage[(R)] DS8000 website.

If you have additional questions about IBM Storage Systems RCL for license machine code upgrades, contact your IBM Storage Systems seller, IBM Business Partner, or your IBM Global Markets Representative.

For those clients interested in IBM on site code load for license machine code upgrades, a separate contract is required. Global Technology Services is able to offer Global Total Microcode Support Services for both IBM Power and Storage systems. Contact your IBM representative or go to the IBM Hardware Maintenance Services - Global Total Microcode Support website.

Advanced function licensing

IBM DS8880F models require a corresponding advanced function license (904x-FF8) for the total physical capacity of the storage system.

DS8882F shares the same license machine code with the rest of the DS8880F models, so that it can use the same advanced functions (except zHyperLink support) the DS8880F family has to offer.

For more information about the function authorizations, see Hardware Announcement 117-007, dated January 10, 2017.

Section 508 of the US Rehabilitation Act

IBM DS8880 storage family is capable as of September 7, 2018, when used in accordance with associated IBM 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 Accessibility Conformance Statement can be requested on the Product accessibility information website.

Reference information

For more information about available function authorizations, see Hardware Announcement 117-007, dated January 10, 2017.

Product number

The following are newly announced models and features on the specified models of the IBM System Storage(R) 2831 and 5331 machine types:

Description	Machine type	Model	Feature
DS8000 LMC R8.5 indicator	2831	84E	1985
DS8000 LMC R8.5 indicator	2831	85E	1985
DS8000 LMC R8.5 indicator	2831	86E	1985
DS8000 LMC R8.5	2831	980	1885
DS8000 LMC R8.5	2831	981	1885
DS8000 LMC R8.5	2831	982	1885
DS8000 LMC R8.5	2831	984	1885
DS8000 LMC R8.5	2831	985	1885
DS8000 LMC R8.5	2831	986	1885
DS8000 LMC R8.5 indicator	2831	98B	1985
DS8000 LMC R8.5 indicator	2831	98E	1985
DS8000 LMC R8.5 indicator	2831	98F	1985
DS8000 LMC R8.5 indicator	5331	85E	1985
DS8000 LMC R8.5 indicator	5331	86E	1985
DS8000 LMC R8.5 indicator	5331	88E	1985
IBM DS8882F	5331	983	
PPA Software Order Indicator	5331	983	0017
DoD Indicator	5331	983	0020
JEMT indicator	5331	983	0021
Encryption not capable	5331	983	0403
Up to 5 TB capacity	5331	983	0795
5.1 TB to 10 TB capacity	5331	983	0796

Description	Machine type	Model	Feature
10.1 TB to 25 TB capacity	5331	983	0797
25.1 TB to 50 TB capacity	5331	983	0798
50.1 TB to 75 TB capacity	5331	983	0799
75.1 TB to 100.0 TB capacity	5331	983	0801
100.1 TB to 250 TB capacity	5331	983	0803
250.1 TB to 500 TB capacity	5331	983	0804
500.1 TB to 1250 TB capacity	5331	983	0806
IBM/Openwave Alliance	5331	983	0930
IBM System i[R] Indicator	5331	983	0931
IBM System p Indicator	5331	983	0932
IBM System x Indicator	5331	983	0933
IBM System z[R] Indicator	5331	983	0934
IBM System zEnterprise[R] Cloud indicator	5331	983	0936
zFlex Frame Field Merge	5331	983	0937
Rockhopper II Field Merge	5331	983	0938
Customer Rack Field Merge	5331	983	0939
Linux[R] Indicator	5331	983	0940
Storage Appliance indicator	5331	983	0952
IBM ProtecTIER[R] indicator	5331	983	0960
IBM Storwize[R] V7000 indicator	5331	983	0961
IBM N series indicator	5331	983	0962
IBM SAN Volume Controller indicator	5331	983	0963
IBM/EPIC attachment indicator	5331	983	0964
VMware VAAI indicator	5331	983	0965
OpenStack indicator	5331	983	0966
US TAA compliance indicator	5331	983	0983
Line cord to NEMA L6-20P (Type 11) 4.3m	5331	983	1021
Line cord to CEE 7 VII 16A (Type 18) 4.3m	5331	983	1022

Description	Machine type	Model	Feature
Line cord to SANS 164 16A (Type 22) 4.3m	5331	983	1023
Line cord to CEI 23-16 (Type 25) 4.3m	5331	983	1024
Line cord to RS 3720DP (Type 35) 4.3m	5331	983	1025
Line cord to IEC309 (P+N+G) 16A (Type 46) 4.3m	5331	983	1026
Line cord to AS/ NZS 3112 15A (Type 54) 4.3m	5331	983	1027
Line cord to JIS C 8303 6-20P 15A (Type 57) 4.3m	5331	983	1028
Line cord C19 to C20 16A, 2.5M	5331	983	1029
Line cord to IRAM 2073 16A (Type 64) 4.3m	5331	983	1030
Line cord to KSC 8305 16A (Type 66) 4.3m	5331	983	1031
Line cord to IS 6538 16A (Type 69) 4.3m	5331	983	1032
Line cord to CH2-16P (Type 72) 4.3m	5331	983	1033
Line cord to NBR 14136 16A (Type 73) 4.3m	5331	983	1034
Line cord to CNS 10917-3 15A (Type 78) 4.3m	5331	983	1035
Line cord to SI 32 16A (Type 79) 4.3m	5331	983	1036
Line cord to SEV 1011 T23 16A (Type 80) 4.3m	5331	983	1037
Battery backup unit	5331	983	1057
Overhead ladder - 5ft	5331	983	1101
Ladder - Top Expansion - 3ft	5331	983	1102
Kick Step	5331	983	1103
Management console - Secondary v2	5331	983	1151
2U IO enclosure pair	5331	983	1305
50 um Fibre cable (LC)	5331	983	1410
50 um Fibre cable (LC/SC)	5331	983	1411
50 um Fibre cable (Jumper)	5331	983	1412

Description	Machine type	Model	Feature
50 um Fibre cable 3m SW LC	5331	983	1413
9 um Fibre cable (LC)	5331	983	1420
9 um Fibre cable (LC/SC)	5331	983	1421
9 um Fibre cable (Jumper)	5331	983	1422
9 um Fibre cable 3m LW LC	5331	983	1423
High Performance Flash Enclosure Gen 2 pair - Flex	5331	983	1603
400 GB 2.5-inch flash card set	5331	983	1610
800 GB 2.5-inch flash card set	5331	983	1611
1600 GB 2.5-inch flash card set	5331	983	1612
3200 GB 2.5-inch flash card set	5331	983	1613
3.8 TB 2.5-inch high capacity flash	5331	983	1623
7.68 TB 2.5-inch high capacity flash	5331	983	1624
Drive Intermix Indicator	5331	983	1690
Flash enclosure filler set	5331	983	1699
1U Keyboard/ Display	5331	983	1765
DS8000 LMC R8.5	5331	983	1885
Hardware installation MES	5331	983	1999
Base IO expander for HPFE Gen2 and host adapters	5331	983	3065
IO expander for additional host adapters	5331	983	3066
16 Gb Host Adapter 4 port SW	5331	983	3354
16 Gb Host Adapter 4 port LW	5331	983	3454
Transparent cloud tiering 10Gb/1Gb Ethernet pair for 2U controllers	5331	983	3600
64 GB processor Memory	5331	983	4233
128 GB processor Memory	5331	983	4234
256 GB processor Memory	5331	983	4235
6-core processor indicator	5331	983	4421
Node - IO bay connect	5331	983	4501
BF - Up to 100 TB capacity	5331	983	8151
BF - 100.1 TB to 250 TB capacity	5331	983	8152

Description	Machine type	Model	Feature
BF - 250.1 TB to 500 TB capacity	5331	983	8153
BF - 500.1 TB to 1250 TB capacity	5331	983	8154
CS - Inactive	5331	983	8250
CS - Up to 100 TB capacity	5331	983	8251
CS - 100.1 TB to 250 TB capacity	5331	983	8252
CS - 250.1 TB to 500 TB capacity	5331	983	8253
CS - 500.1 TB to 1250 TB capacity	5331	983	8254
zsS - Active	5331	983	8300
zsS - Inactive	5331	983	8350
zsS - Up to 100 TB capacity	5331	983	8351
zsS - 100.1 TB to 250 TB capacity	5331	983	8352
zsS - 250.1 TB to 500 TB capacity	5331	983	8353
zsS - 500.1 TB to 1250 TB capacity	5331	983	8354
CSM on HMC - Active	5331	983	8451
IGF transaction indicator	5331	983	8999
Shipping and Handling NC	5331	983	AG00
Shipping and handling 983	5331	983	AGAI
DS8000 LMC R8.5	5331	984	1885
DS8000 LMC R8.5	5331	985	1885
DS8000 LMC R8.5	5331	986	1885
DS8000 LMC R8.5	5331	988	1885

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 118-065

Publications

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

Physical specifications
- 19-inch EIA rack mount system
  - Requires 16U contiguous vertical rack space (711.2 mm, 28 in.)
  - System consists of eight 2U enclosures
  - Distance between rack front and rear EIA rails: 700 mm - 780 mm (27.6 in. - 30.7 in.)
  - Minimum distance from cabinet rear rail to rear door: 203 mm (8 in.)
- Weight: 242.7 kg (535 lb)

Operating environment

- Temperature: 16°C to 32°C (60°F to 90°F)
- Relative humidity: 20% - 80%
- 8190 BTU
- Electrical power (DS8882F Model 983): 2.4 kW
- Capacity of exhaust: 500 cubic feet/minute estimated
- Declared operating A-weighted sound power level: 8.4 bels estimated
- Leakage current: 15 mA max.

Power consumption

- Model 983 (6-core) with 1 HPFE pair: 2.4 kW

DASD subsystems

- Maximum physical storage capacity: 364,800 Gigabytes with 7.6 TB flash drive sets
- Power consumption: 2, 400 W
- DASD Energy Consumption Efficiency: 0.000065 W/Gigabytes

Hardware requirements

Licensed Machine Code

All announced features and functions are supported on the IBM System Storage DS8000 series and require DS8000 LMC 8.8.50.xx.xx (bundle version 88.50.xxx.xx), or later.

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* (GC27-9259) for Model 983.

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* (GC27-9259) for Model 983.

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

See the *IBM DS8880 Introduction and Planning Guide* (GC27-9259) for Model 983 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 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 that 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[(R)] Key Lifecycle Manager, V2.5, or later, is required.

IBM SKLM planning

The DS8000 series now supports SKLM V3.0.

Program number	VRM	Program name
5724-T60	3.0	IBM Security Key Lifecycle Manager (For PPA)
5641-SKL	3.0	IBM Security Key Lifecycle Manager -- 1 year (For AAS)
5641-SKM	3.0	IBM Security Key Lifecycle Manager -- 3 year (For AAS)

To support enterprise-wide encryption-key management, an updated set of pricing metrics is 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:** See 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 the 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 (singlemode) fiber optic cable terminated with a LC connector. Fibre Channel cables can be purchased using feature numbers 142x for 9 micron cables.

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

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 IBM Global Services 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

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 Service Agent website.

Terms and conditions

Volume orders

Contact your IBM representative.

IBM Global Financing

Yes

Products - terms and conditions

Warranty period

Warranty and additional coverage options	Coverage summary[1]
Warranty period:	1 year
Service level:	IBM On-Site Limited, 24x7 Same Day
Service upgrade options	
Warranty service upgrade	N/A
Maintenance Services (Post-warranty)	IBM On-Site Repair, 24x7 Same Day
IBM Hardware Maintenance Services - committed maintenance[2]	No

1 See complete coverage details below

2 Not offered in the US

One year.

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.

Warranty service

On-site, twenty-four hours a day, seven days a week, same day.

Improved worldwide support processes, including additional response to severity 2 calls, twenty-four 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.

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.

On-site Service

At IBM's discretion, 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

See 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.

The following are newly announced models and features on the specified models of the IBM System Storage 2831 machine type:

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
DS8000 LMC R8.5 indicator	84E	1985	Both	No	No
DS8000 LMC R8.5 indicator	85E	1985	Both	No	No
DS8000 LMC R8.5 indicator	86E	1985	Both	No	No
DS8000 LMC R8.5	980	1885	MES	No	No

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
DS8000 LMC R8.5	981	1885	MES	No	No
DS8000 LMC R8.5	982	1885	MES	No	No
DS8000 LMC R8.5	984	1885	Both	No	No
DS8000 LMC R8.5	985	1885	Both	No	No
DS8000 LMC R8.5	986	1885	Both	No	No
DS8000 LMC R8.5 indicator	98B	1985	Both	No	No
DS8000 LMC R8.5 indicator	98E	1985	Both	No	No
DS8000 LMC R8.5 indicator	98F	1985	Both	No	No

The following are newly announced models and features on the specified models of the IBM System Storage 5331 machine type:

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
DS8882F	983		Both	No	
DS8000 LMC R8.5 indicator	85E	1985	Both	No	No
DS8000 LMC R8.5 indicator	86E	1985	Both	No	No
DS8000 LMC R8.5 indicator	88E	1985	Both	No	No
PPA Software Order Indicator	983	0017	Both	No	No
DoD Indicator	983	0020	Initial	No	No
JEMT indicator	983	0021	Initial	No	No
Encryption not capable	983	0403	Initial	No	No
Up to 5 TB capacity	983	0795	Both	No	No
5.1 TB to 10 TB capacity	983	0796	Both	No	No
10.1 TB to 25 TB capacity	983	0797	Both	No	No
25.1 TB to 50 TB capacity	983	0798	Both	No	No
50.1 TB to 75 TB capacity	983	0799	Both	No	No

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
75.1 TB to 100.0 TB capacity	983	0801	Both	No	No
100.1 TB to 250 TB capacity	983	0803	Both	No	No
250.1 TB to 500 TB capacity	983	0804	Both	No	No
500.1 TB to 1250 TB capacity	983	0806	Both	No	No
IBM/ Openwave Alliance	983	0930	Both	No	No
IBM System i Indicator	983	0931	Both	No	No
IBM System p Indicator	983	0932	Both	No	No
IBM System x Indicator	983	0933	Both	No	No
IBM System z Indicator	983	0934	Both	No	No
IBM System zEnterprise Cloud indicator	983	0936	Both	No	No
zFlex Frame Field Merge	983	0937	Initial	No	No
Rockhopper II Field Merge	983	0938	Initial	No	No
Customer Rack Field Merge	983	0939	Initial	No	No
Linux Indicator	983	0940	Both	No	No
Storage Appliance indicator	983	0952	Both	No	No
IBM ProtecTIER indicator	983	0960	Both	No	No
IBM Storwize V7000 indicator	983	0961	Both	No	No
IBM N series indicator	983	0962	Both	No	No
IBM SAN Volume Controller indicator	983	0963	Both	No	No

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
IBM/EPIC attachment indicator	983	0964	Both	No	No
VMware VAAI indicator	983	0965	Both	No	No
OpenStack indicator	983	0966	Both	No	No
US TAA compliance indicator	983	0983	Both	No	No
Line cord to NEMA L6-20P (Type 11) 4.3m	983	1021	Both	No	No
Line cord to CEE 7 VII 16A (Type 18) 4.3m	983	1022	Both	No	No
Line cord to SANS 164 16A (Type 22) 4.3m	983	1023	Both	No	No
Line cord to CEI 23-16 (Type 25) 4.3m	983	1024	Both	No	No
Line cord to RS 3720DP (Type 35) 4.3m	983	1025	Both	No	No
Line cord to IEC309 (P+N+G) 16A (Type 46) 4.3m	983	1026	Both	No	No
Line cord to AS/NZS 3112 15A (Type 54) 4.3m	983	1027	Both	No	No
Line cord to JIS C 8303 6-20P 15A (Type 57) 4.3m	983	1028	Both	No	No
Line cord C19 to C20 16A, 2.5M	983	1029	Both	No	No
Line cord to IRAM 2073 16A (Type 64) 4.3m	983	1030	Both	No	No
Line cord to KSC 8305 16A	983	1031	Both	No	No

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
(Type 66) 4.3m					
Line cord to IS 6538 16A (Type 69) 4.3m	983	1032	Both	No	No
Line cord to CH2-16P (Type 72) 4.3m	983	1033	Both	No	No
Line cord to NBR 14136 16A (Type 73) 4.3m	983	1034	Both	No	No
Line cord to CNS 10917-3 15A (Type 78) 4.3m	983	1035	Both	No	No
Line cord to SI 32 16A (Type 79) 4.3m	983	1036	Both	No	No
Line cord to SEV 1011 T23 16A (Type 80) 4.3m	983	1037	Both	No	No
Battery backup unit	983	1057	Initial	No	No
Overhead ladder - 5ft	983	1101	Both	No	No
Ladder - Top Expansion - 3ft	983	1102	Both	No	No
Kick Step	983	1103	Both	No	No
Management console - Secondary v2	983	1151	Initial	No	No
2U IO enclosure pair	983	1305	Initial	No	No
50 um Fibre cable (LC)	983	1410	Both	No	No
50 um Fibre cable (LC/SC)	983	1411	Both	No	No
50 um Fibre cable (Jumper)	983	1412	Both	No	No
50 um Fibre cable 3m SW LC	983	1413	Both	No	No
9 um Fibre cable (LC)	983	1420	Both	No	No

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
9 um Fibre cable (LC/ SC)	983	1421	Both	No	No
9 um Fibre cable (Jumper)	983	1422	Both	No	No
9 um Fibre cable 3m LW LC	983	1423	Both	No	No
High Performance Flash Enclosure Gen 2 pair - Flex	983	1603	Initial	No	No
400 GB 2.5-inch flash card set	983	1610	Both	No	No
800 GB 2.5-inch flash card set	983	1611	Both	No	No
1600 GB 2.5-inch flash card set	983	1612	Both	No	No
3200 GB 2.5-inch flash card set	983	1613	Both	No	No
3.8 TB 2.5-inch high capacity flash	983	1623	Both	No	No
7.68 TB 2.5-inch high capacity flash	983	1624	Both	No	No
Drive Intermix Indicator	983	1690	Initial	No	No
Flash enclosure filler set	983	1699	Both	No	No
1U Keyboard/ Display	983	1765	Both	No	No
DS8000 LMC R8.5	983	1885	Both	No	No
Hardware installation MES	983	1999	MES	No	No
Base IO expander for HPFE Gen2 and host adapters	983	3065	Initial	No	No
IO expander for	983	3066	Both	No	No

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
additional host adapters					
16 Gb Host Adapter 4 port SW	983	3354	Both	No	No
16 Gb Host Adapter 4 port LW	983	3454	Both	No	No
Transparent cloud tiering 10Gb/1Gb Ethernet pair for 2U controllers	983	3600	Both	No	No
64 GB processor Memory	983	4233	Both	No	No
128 GB processor Memory	983	4234	Both	No	No
256 GB processor Memory	983	4235	Both	No	No
6-core processor indicator	983	4421	Initial	No	No
Node - IO bay connect	983	4501	Initial	No	No
BF - Up to 100 TB capacity	983	8151	Both	No	No
BF - 100.1 TB to 250 TB capacity	983	8152	Both	No	No
BF - 250.1 TB to 500 TB capacity	983	8153	Both	No	No
BF - 500.1 TB to 1250 TB capacity	983	8154	Both	No	No
CS - Inactive	983	8250	Both	No	No
CS - Up to 100 TB capacity	983	8251	Both	No	No
CS - 100.1 TB to 250 TB capacity	983	8252	Both	No	No
CS - 250.1 TB to 500 TB capacity	983	8253	Both	No	No
CS - 500.1 TB to	983	8254	Both	No	No

Description	Model number	Feature numbers	Initial / MES / Both / Support	CSU	RP MES
1250 TB capacity					
zsS - Active	983	8300	Both	No	No
zsS - Inactive	983	8350	Both	No	No
zsS - Up to 100 TB capacity	983	8351	Both	No	No
zsS - 100.1 TB to 250 TB capacity	983	8352	Both	No	No
zsS - 250.1 TB to 500 TB capacity	983	8353	Both	No	No
zsS - 500.1 TB to 1250 TB capacity	983	8354	Both	No	No
CSM on HMC - Active	983	8451	Both	No	No
IGF transaction indicator	983	8999	MES	No	No
Shipping and Handling NC	983	AG00	Initial	No	No
Shipping and handling 983	983	AGAI	Initial	No	No
DS8000 LMC R8.5	984	1885	Both	No	No
DS8000 LMC R8.5	985	1885	Both	No	No
DS8000 LMC R8.5	986	1885	Both	No	No
DS8000 LMC R8.5	988	1885	Both	No	No

CSU = Customer setup

RP MES = Returnable parts MES

ServiceElect (ESA) charges

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

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Corrections

(Corrected on September 4, 2018)

The remote code load information in the Description section has been updated.