



IBM DS8880 (Machine type 283x) high-performance flagship Function Authorizations

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At a glance

New Function Authorizations for IBM^(R) DS8880 (M/T 283x) high-performance flagship are now available as 8xxx feature numbers. IBM DS8000^(R) series Function Authorizations establish the extent of IBM authorization for use of the licensed functions on the IBM DS8880.

Order now

For ordering, contact your IBM representative or an IBM Business Partner. For more information, contact the Americas Call Centers at: 800-IBM-CALL (426-2255).

Reference: YE001

Overview

IBM DS8000 series Function Authorizations are for billing purposes only and establish the extent of IBM authorization for use of the licensed functions on an IBM DS8880 (IBM 2831, 2832, 2833, or 2834).

The following Licensed Functions are being introduced:

- **2836 Model LF8:**
 - Base function license (feature numbers 81xx)
 - Copy Services (CS) license (feature numbers 82xx)
 - z-synergy Services (zsS) License (feature numbers 83xx)
- **2837 Model LF8:**
 - Base function license (feature numbers 81xx)
 - Copy Services (CS) license (feature numbers 82xx)
 - z-synergy Services (zsS) License (feature numbers 83xx)
- **2838 Model LF8:**
 - Base function license (feature numbers 81xx)
 - Copy Services (CS) license (feature numbers 82xx)
 - z-synergy Services (zsS) License (feature numbers 83xx)
- **2839 Model LF8:**
 - Base function license (feature numbers 81xx)

- Copy Services (CS) license (feature numbers 82xx)
- z-synergy Services (zsS) License (feature numbers 83xx)

Machine types 2836, 2837, 2838, and 2839 Model LF8 represent one, two, three, and four years of warranty respectively.

Key prerequisites

All announced features and functions are supported on the IBM DS8000 series and require DS8000 LMC 8.8.00.xx.xx (bundle version 88.0.xxx.xx), or later.

Planned availability date

December 4, 2015

Description

The advanced functions offered on DS8880 systems enable simpler and easier configuration. This offering has three advanced functions bundled as shown below.

1. Base function License
 - Logical Configuration support for FB
 - Operating Environment License
 - Thin Provisioning
 - Easy Tier^(R)
 - I/O Priority Manager
2. Copy Services License
 - FlashCopy^(R)
 - Metro Mirror
 - Global Mirror
 - Metro/Global Mirror
 - z/Global Mirror
 - z/Global Mirror Resync
 - Multi-Target PPRC
3. z-Synergy Service License
 - PAV
 - HyperPAV
 - FICON^(R) attachment
 - High performance FICON
 - IBM z/OS^(R) Distributed Data Backup

This new offering enables customers to order, install, and manage license features in a more efficient manner.

The following licensed functions are available on IBM DS8880 (Machine type 2831, 2832, 2833, and 2834):

Licensed function	Description
Base Function (BF)	IBM DS8000 Base function
Copy Services (CS)	IBM DS8000 Copy Services
z-synergy Services (zsS)	IBM DS8000 z-synergy Services

All DS8880 licensed functions are enabled, authorized, managed, activated, and enforced based upon the physical capacity contained in a 283x system. In the context of licensed functions, these terms are defined as follows:

- "283x system" refers to the 283x base unit and all physically attached 283x expansion units:
 - A 283x base unit refers to the Models 980 and 981
 - A 283x expansion unit refers to the Models 98B and 98E

Enablement refers to the selection of a 283x licensed function indicator feature number to technically activate the associated licensed function.

Authorization refers to the acquisition of a DS8000 series Function Authorization (IBM 283x) feature number to establish the extent of IBM authorization (license size in terms of physical capacity) for use of an associated licensed function. This is also referred to as the *authorization level*.

Management refers to client use of the Disk Storage Feature Activation (DSFA) application to select the license scope, assign the license value, and deactivate a licensed function.

Activation refers to the client retrieval and installation of the feature activation code into the 283x system. The feature activation code is made available by IBM and obtained using the DSFA application.

Enforcement refers to logic and other technology within the Licensed Machine Code of the 283x to maintain compliance with established IBM authorization levels.

Enablement

Each licensed function is enabled for a 283x system through the selection of the appropriate licensed function indicator feature number on the 283x base unit.

Licensed function	Licensed function indicator
Base Function (BF)	283x feature numbers 81xx
Copy Services (CS)	283x feature numbers 82xx
z-synergy Services (zsS)	283x feature numbers 83xx

Each licensed function indicator feature selected on a 283x base unit enables that function at the system level. These features are not selected on any attached 283x expansion units.

Authorization

The extent of IBM authorization for the use of a licensed function on a 283x system is established by acquiring 283x function authorization models and feature numbers for the 283x base unit.

Licensed function	Function authorization
Base Function (BF)	283x Model LF8 feature number 8151-8160
Copy Services (CS)	283x Model LF8 feature number 8250-8260
z-synergy Services (zsS)	283x Model LF8 feature number 8350-8360

Each function authorization acquired for a 283x base unit establishes the authorization level for the 283x system. For example, a system with Models 980 and 981, and two Models 98B and 98E expansion units requires only one Base Function (BF) (283x Model LF8 feature numbers 8xxx) function authorization. The authorization levels established by acquiring one or more function authorizations for the Models 980 and 981 must also cover the physical capacity of the attached Model 96B and 98E expansion units.

The authorization level provided by each feature number is stated within the feature number description. The unit represents physical capacity, where a terabyte (TB)

equals one trillion bytes. A 283x system's total authorization level for a given licensed function is the sum of the units (TB) associated with all the acquired feature numbers.

The function authorization are based on the capacity range and tier as shown below:

Tier	Min. (TB)	Max. (TB)	Tier TB granularity	Feature Quantity (max.)	Range delta (TB)	Feature number
1	1	100	10	10	100	8x51
2	101	250	15	10	150	8x52
3	251	500	25	10	250	8x53
4	501	1250	75	10	750	8x54
5	1251	3000	175	10	1750	8x55
6	3001	6000	300	10	3000	8x56
7	6001	10000	500	8	4000	8x60

Management

Licensed functions are managed using the DSFA application at

<http://www.ibm.com/storage/dsfa>

To access DSFA, you will be required to enter information about your 283x machine. You can find this information on the Storage Unit General Properties page in the IBM DS8000 Storage Manager application.

Management activities include:

- Selection of a license scope
- Assignment of a license value
- Deactivation of a licensed function

License scope: Licensed functions are activated and enforced within a defined license scope. License scope refers to the type of storage, and therefore the type of servers, that the function can be used with.

- Fixed Block (FB): This function can be used only with data from Fibre Channel-attached servers.
- Count Key Data (CKD): The function can be used only with data from FICON-attached servers.
- Both FB and CKD (ALL): The function can be used with data from all attached servers.

Select licensed functions have multiple license scope options, while other functions have only a single license scope.

Licensed function	License scope options
Base Function (BF)	FB, ALL
Copy Services (CS)	FB, ALL
z-synergy Services (zsS)	CKD

If a licensed function has multiple license scope options, you will be required to select a license scope during the initial retrieval of the feature activation code. This activity is performed using the DSFA application.

The license scope is not selected while ordering function authorization feature numbers. The feature numbers only establish the extent of IBM authorization in terms of physical capacity, regardless of the storage type.

You can also change the license scope using the DSFA application after a licensed function has been activated. A new feature activation code will be generated and when you install it into the machine, the function will be activated and enforced using the newly selected license scope. Only an increase in the license scope (changing FB or CKD to ALL) is a concurrent activity. A lateral change (changing FB

to CKD or changing CKD to FB) or a reduction of the license scope (changing ALL to FB or CKD) is a disruptive activity and requires a machine IML.

License value: Licensed functions are activated and enforced based upon an assigned license value.

License value refers to extent of IBM authorization and is referenced as physical capacity (TB).

On Models 980 and 981, license value assignment is an optional activity that can be performed using the DSFA application.

On these models, the feature activation codes will always be generated using the total license value for each licensed function, unless a license value of zero (0.0 TB) has been assigned.

Deactivation: Assigning a license value of zero (0.0 TB) provides the ability to deactivate (disable) a licensed function. A new feature activation code will be generated and when installed into the machine, the function will be deactivated during the next IML of the machine.

A deactivated licensed function can be reactivated by changing the license value to a non-zero value. A new feature activation code will be generated and when installed into the machine, the function will be activated. Reactivation is a concurrent activity.

When a licensed function is deactivated using the DSFA application, the installed function authorization feature numbers remain on the machine record. The function authorization feature numbers do not need to be reacquired to reactivate the licensed function at a future date.

Activation

Licensed functions are activated by the installation of feature activation codes into the 283x system. The feature activation codes are made available by IBM and are obtained using the DSFA application.

Enforcement

The 283x Licensed Machine Code contains logic and other technology to maintain compliance with established authorization levels. The physical capacity for each storage type can be logically configured up to the given authorization level. If there are multiple licensed functions with the same license scope, the extent of IBM authorization is defined by the licensed function with the lowest license value.

Sub-capacity licensing requires capacity monitoring and remote connection.

Pricing examples

The following examples are provided to illustrate your Copy Services (CS) licensing requirements on FB environment:

Scenario 1

To FlashCopy on the 10 TB source, the purchase of 20 TB of capacity for Copy Services (CS) license is required.

Scenario 2

To Metro Mirror on a source 10 TB and then a single FlashCopy on the target 10 TB, the purchase of 10 TB of CS license on the source and the purchase of 20 TB of CS on the target is required.

Scenario 3

To Global Mirror on a source 10 TB and then a single FlashCopy on the target 10 TB, the purchase of 10 TB of CS license on the source and the purchase of 20 TB of CS on the target is required.

Scenario 4

To Metro Global Mirror on a source 10 TB and then a single FlashCopy on the target 10 TB, the purchase of 10 TB of CS license on the source and secondary, and the purchase of 20 TB of CS on the target is required.

Scenario 5

To zGM/XRC 10 TB, the purchase of 10 TB and 10 TB of capacity for CS license on source and target respectively is required.

Scenario 6

To perform four site replications, the purchase of the appropriate capacity license requirement for each box is required.

Reference information

For additional information on DS8880 2831, refer to Hardware Announcement [115-139](#), dated October 20, 2015.

For additional information on DS8880 2832, refer to Hardware Announcement [115-142](#), dated October 20, 2015.

For additional information on DS8880 2833, refer to Hardware Announcement [115-140](#), dated October 20, 2015.

For additional information on DS8880 2834, refer to Hardware Announcement [115-141](#), dated October 20, 2015.

Product number

Description	Machine type	Model	Feature
DS8000 series Function Authorization	2836	LF8	
Administrative indicators:			
IBM/Openwave Alliance indicator			0930
IBM System i ^(R) indicator			0931
IBM System p indicator			0932
IBM System x indicator			0933
IBM System z ^(R) indicator			0934
IBM System z business class indicator			0935
Linux TM indicator			0940
IBM ProtecTIER ^(R) indicator			0960
IBM Storwize ^(R) V7000 indicator			0961
IBM N series indicator			0962
IBM SAN Volume Controller indicator			0963

Description	Machine type	Model	Feature
IBM/EPIC indicator			0964
VMware VAAI indicator			0965
Base Function (BF):			
BF - Up to 100 TB capacity			8151
BF - 100.1 TB to 250 TB capacity			8152
BF - 250.1 TB to 500 TB capacity			8153
BF - 500.1 TB to 1250 TB capacity			8154
BF - 1250.1 TB to 3000 TB capacity			8155
BF - 3000.1 TB to 6000 TB capacity			8156
BF - 6000.1 TB to 10000 TB			8160
Copy Services (CS) license:			
CS - Inactive			8250
CS - Up to 100 TB capacity			8251
CS - 100.1 TB to 250 TB capacity			8252
CS - 250.1 TB to 500 TB capacity			8253
CS - 500.1 TB to 1250 TB capacity			8254
CS - 1250.1 TB to 3000 TB capacity			8255
CS - 3000.1 TB to 6000 TB capacity			8256
CS - 6000.1 TB to 10000 TB			8260
z-synergy Services (zsS) license:			
zsS - Active			8300
zsS - Inactive			8350
zsS - Up to 100 TB capacity			8351
zsS - 100.1 TB to 250 TB capacity			8352
zsS - 250.1 TB to 500 TB capacity			8353
zsS - 500.1 TB to 1250 TB capacity			8354
zsS - 1250.1 TB to 3000 TB capacity			8355
zsS - 3000.1 TB to 6000 TB capacity			8356
zsS - 6000.1 TB to 10000 TB			8360
Description	Machine type	Model	Feature
DS8000 series Function Authorization	2837	LF8	

Description	Machine type	Model	Feature
Administrative indicators:			
IBM/Openwave Alliance indicator			0930
IBM System i indicator			0931
IBM System p indicator			0932
IBM System x indicator			0933
IBM System z indicator			0934
IBM System z business class indicator			0935
Linux indicator			0940
IBM ProtecTIER indicator			0960
IBM Storwize V7000 indicator			0961
IBM N series indicator			0962
IBM SAN Volume Controller indicator			0963
IBM/EPIC indicator			0964
VMware VAAI indicator			0965
Base Function (BF):			
BF - Up to 100 TB capacity			8151
BF - 100.1 TB to 250 TB capacity			8152
BF - 250.1 TB to 500 TB capacity			8153
BF - 500.1 TB to 1250 TB capacity			8154
BF - 1250.1 TB to 3000 TB capacity			8155
BF - 3000.1 TB to 6000 TB capacity			8156
BF - 6000.1 TB to 10000 TB			8160
Copy Services (CS) license:			
CS - Inactive			8250
CS - Up to 100 TB capacity			8251
CS - 100.1 TB to 250 TB capacity			8252
CS - 250.1 TB to 500 TB capacity			8253
CS - 500.1 TB to 1250 TB capacity			8254
CS - 1250.1 TB to 3000 TB capacity			8255
CS - 3000.1 TB to 6000 TB capacity			8256

Description	Machine type	Model	Feature
CS - 6000.1 TB to 10000 TB			8260
z-synergy Services (zsS) license:			
zsS - Active			8300
zsS - Inactive			8350
zsS - Up to 100 TB capacity			8351
zsS - 100.1 TB to 250 TB capacity			8352
zsS - 250.1 TB to 500 TB capacity			8353
zsS - 500.1 TB to 1250 TB capacity			8354
zsS - 1250.1 TB to 3000 TB capacity			8355
zsS - 3000.1 TB to 6000 TB capacity			8356
zsS - 6000.1 TB to 10000 TB			8360
Description	Machine type	Model	Feature
DS8000 series Function Authorization	2838	LF8	
Administrative indicators:			
IBM/Openwave Alliance indicator			0930
IBM System i indicator			0931
IBM System p indicator			0932
IBM System x indicator			0933
IBM System z indicator			0934
IBM System z business class indicator			0935
Linux indicator			0940
IBM ProtecTIER indicator			0960
IBM Storwize V7000 indicator			0961
IBM N series indicator			0962
IBM SAN Volume Controller indicator			0963
IBM/EPIC indicator			0964
VMware VAAI indicator			0965
Base Function (BF):			
BF - Up to 100 TB capacity			8151
BF - 100.1 TB to 250 TB capacity			8152
BF - 250.1 TB to 500 TB capacity			8153

Description	Machine type	Model	Feature
BF - 500.1 TB to 1250 TB capacity			8154
BF - 1250.1 TB to 3000 TB capacity			8155
BF - 3000.1 TB to 6000 TB capacity			8156
BF - 6000.1 TB to 10000 TB			8160
Copy Services (CS) license:			
CS - Inactive			8250
CS - Up to 100 TB capacity			8251
CS - 100.1 TB to 250 TB capacity			8252
CS - 250.1 TB to 500 TB capacity			8253
CS - 500.1 TB to 1250 TB capacity			8254
CS - 1250.1 TB to 3000 TB capacity			8255
CS - 3000.1 TB to 6000 TB capacity			8256
CS - 6000.1 TB to 10000 TB			8260
z-synergy Services (zsS) license:			
zsS - Active			8300
zsS - Inactive			8350
zsS - Up to 100 TB capacity			8351
zsS - 100.1 TB to 250 TB capacity			8352
zsS - 250.1 TB to 500 TB capacity			8353
zsS - 500.1 TB to 1250 TB capacity			8354
zsS - 1250.1 TB to 3000 TB capacity			8355
zsS - 3000.1 TB to 6000 TB capacity			8356
zsS - 6000.1 TB to 10000 TB			8360
Description	Machine type	Model	Feature
DS8000 series Function Authorization	2839	LF8	
Administrative indicators:			
IBM/Openwave Alliance indicator			0930
IBM System i indicator			0931
IBM System p indicator			0932
IBM System x indicator			0933
IBM System z indicator			0934

Description	Machine type	Model	Feature
IBM System z business class indicator			0935
Linux indicator			0940
IBM ProtecTIER indicator			0960
IBM Storwize V7000 indicator			0961
IBM N series indicator			0962
IBM SAN Volume Controller indicator			0963
IBM/EPIC indicator			0964
VMware VAAI indicator			0965
Base Function (BF):			
BF - Up to 100 TB capacity			8151
BF - 100.1 TB to 250 TB capacity			8152
BF - 250.1 TB to 500 TB capacity			8153
BF - 500.1 TB to 1250 TB capacity			8154
BF - 1250.1 TB to 3000 TB capacity			8155
BF - 3000.1 TB to 6000 TB capacity			8156
BF - 6000.1 TB to 10000 TB			8160
Copy Services (CS) license:			
CS - Inactive			8250
CS - Up to 100 TB capacity			8251
CS - 100.1 TB to 250 TB capacity			8252
CS - 250.1 TB to 500 TB capacity			8253
CS - 500.1 TB to 1250 TB capacity			8254
CS - 1250.1 TB to 3000 TB capacity			8255
CS - 3000.1 TB to 6000 TB capacity			8256
CS - 6000.1 TB to 10000 TB			8260
z-synergy Services (zsS) license:			
zsS - Active			8300
zsS - Inactive			8350
zsS - Up to 100 TB capacity			8351
zsS - 100.1 TB to 250 TB capacity			8352
zsS - 250.1 TB to 500 TB capacity			8353

Description	Machine type	Model	Feature
zsS - 500.1 TB to 1250 TB capacity			8354
zsS - 1250.1 TB to 3000 TB capacity			8355
zsS - 3000.1 TB to 6000 TB capacity			8356
zsS - 6000.1 TB to 10000 TB			8360

Model conversions

From Model	To Model	Description
2396-LFA	2836-LF8	DS8000 series Function Authorization Model LF8
2397-LFA	2836-LF8	DS8000 series Function Authorization Model LF8
2398-LFA	2836-LF8	DS8000 series Function Authorization Model LF8
2399-LFA	2836-LF8	DS8000 series Function Authorization Model LF8
2397-LFA	2837-LF8	DS8000 series Function Authorization Model LF8
2398-LFA	2837-LF8	DS8000 series Function Authorization Model LF8
2399-LFA	2837-LF8	DS8000 series Function Authorization Model LF8
2398-LFA	2838-LF8	DS8000 series Function Authorization Model LF8
2399-LFA	2838-LF8	DS8000 series Function Authorization Model LF8
2399-LFA	2839-LF8	DS8000 series Function Authorization Model LF8

Note: The existing advanced functions licenses will be replaced according to the three bundles of advanced functions that are offered on Machine types 2836, 2837, 2838, and 2839 Model LF8. The total capacity of the advanced function licenses available on Model LF8 will be based on the total capacity of customer's current licenses on the DS8870.

Note: For those boxes having different capacity value on the copy services licenses (sub-capacity activated), the new copy services license and z-synergy services license will be converted utilizing the highest capacity value.

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 115-138](#)

Publications

No publications are shipped with the DS8000 series Function Authorizations.

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.

The IBM Publications Center Portal is located at

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

Services

Global Technology Services

IBM services include business consulting, outsourcing, hosting services, applications, and other technology management.

These services help you learn about, plan, install, manage, or optimize your IT infrastructure to be an on-demand business. They can help you integrate your high-speed networks, storage systems, application servers, wireless protocols, and an array of platforms, middleware, and communications software for IBM and many non-IBM offerings. IBM is your one-stop shop for IT support needs.

For details on available services, contact your IBM representative or visit

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

For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

<http://www.ibm.com/services/continuity>

For details on education offerings related to specific products, visit

http://www.ibm.com/services/learning/ites.wss/zz/en?pageType=tp_search_new

Technical information

Specified operating environment

Hardware requirements

Each DS8000 series Function Authorization (IBM 283x) establishes the extent of IBM authorization for one or more licensed functions acquired for an IBM DS8880 (IBM 283x). Each 283x function authorization is applicable only for the specific 283x machine (by serial number) for which it was acquired and is not transferable to another serial numbered 283x machine.

Each 283x function authorization requires a corequisite licensed function indicator feature number on the 283x machine for which it was acquired:

Licensed function	IBM 283x Indicator Feature number	IBM 283x Function Authorization Models and feature numbers
Base Function (BF)	81xx	Model LF8 feature number 8151-8160
Copy Services (CS)	82xx	Model LF8 feature number 8250-8260
z-synergy Services (zsS)	83xx	Model LF8 feature number 8350-8360

Base Function (BF)

A minimum of 10 TB unit Base Function (BF) license is required on every 283x base unit (Model 980 and 981). The extent of IBM authorization acquired through the 283x Model LF8 feature numbers must cover the physical capacity for each acquired drive set of the 283x system, where system is defined as the base unit and all physically attached expansion units.

Feature	Description	Corequisite
8151	BF - Up to 100 TB capacity	Model LF8 feature #8151

Feature	Description	Corequisite
8152	BF - 100.1 TB to 250 TB capacity	Model LF8 feature #8152
8153	BF - 250.1 TB to 500 TB capacity	Model LF8 feature #8153
8154	BF - 500.1 TB to 1250 TB capacity	Model LF8 feature #8154
8155	BF - 1250.1 TB to 3000 TB capacity	Model LF8 feature #8155
8156	BF - 3000.1 TB to 6000 TB capacity	Model LF8 feature #8156
8160	BF - 6000.1 TB to 10000 TB	Model LF8 feature #8160

The physical capacity for base function licenses (Model LF8 feature numbers 8151-8160) are required. This is required for the base function and for a valid system configuration.

The number of TB unit base function license feature activation code can be retrieved and activated by using the DSFA application. The capacity of the storage system for base function licenses are mainly a pricing mechanism, so there will not be any feature activation code to be retrieved and activated by using the DSFA application.

If the base function license has not been acquired and activated on the machine, disk drives installed within the 283x system cannot be logically configured for use. Upon activation of the base function, disk drives can be logically configured up to the extent of IBM authorization.

As additional disk drives are installed, the extent of IBM authorization must be increased by acquiring additional 283x Model LF8 feature numbers. Otherwise, the additional disk drives cannot be logically configured for use.

Limitations

- Conversions between machine types is not supported.
- The intermix of models and features between machine types is not supported. For example, intermixing of machine type 2836 model LF8 and machine type 2838 model LF8 is not supported.
- The amount of physical capacity within a 283x system that can be logically configured for use will be enforced by the 283x Licensed Machine Code to maintain compliance with the extent of IBM authorization established for licensed functions activated on the machine. The 283x Licensed Machine Code will not allow the logical configuration of physical capacity beyond the extent of IBM authorization.
- A lateral change or reduction in the license scope is a disruptive activity and requires a machine IML (Model 980 or 981).
 - A lateral change is defined as changing the license scope from FB to CKD or from CKD to FB.
 - A reduction is defined as changing the license scope from ALL to FB or from ALL to CKD.
 - The deactivation of an activated licensed function occurs at the next machine IML (Model 980 or 981).

Planning information

Customer responsibilities

Determining the required extent of IBM authorization

You are responsible for determining the extent of IBM authorization required for each licensed function. Your disk marketing specialist can help you with this activity. Below are some general guidelines:

- The required authorization level depends upon the license scope:

- If the license scope is FB, the authorization level must be equal to or greater than the total amount of physical capacity within the system that will be logically configured as FB.
- If the license scope is CKD, the authorization level must be equal to or greater than the total amount of physical capacity within the system that will be logically configured as CKD.
- If the license scope is ALL, the authorization level must be equal to or greater than the total system physical capacity.
- The required authorization level stated above could be applicable to the base function license only.
- Refer to *IBM DS8880 Introduction and Planning Guide (GC27-8525)* for physical capacity calculation guidelines.

Licensed function management and activation

Licensed function management and activation activities responsibilities:

- Management refers to use of the DSFA application to select the license scope and assign the license value.
- Activation refers to the retrieval and installation of the feature activation code into the 283x system. The feature activation code is made available by IBM and obtained using the DSFA application.

These activities are your responsibility during the initial activation of a licensed function and when you increase the extent of IBM authorization.

DSFA application

To access DSFA, you will be required to enter information about your 283x machine. You can find this information on the Storage Unit General Properties page in the IBM DS8000 Storage Manager application.

The DSFA application is available at

<http://www.ibm.com/storage/dsfa>

You are responsible for downloading or obtaining from IBM, and installing designated Machine Code (microcode, basic input/output system code (called BIOS), utility programs, device drivers, and diagnostics delivered with an IBM machine) and other software updates in a timely manner from an IBM Internet website or from other electronic media, and following the instructions that IBM provides. You may request IBM to install Machine Code changes; however, you may be charged for that service.

Cable orders

No cables required.

Direct customer support

Direct customer support for the DS8000 Function Authorization is provided by IBM Operational Support Services - Support Line. This fee service can enhance your productivity by providing voice and electronic access into the IBM support organization. IBM Operational Support Services - Support Line will help answer questions pertaining to product and feature usage (how to), configuration and product compatibility for eligible products. For a list of the products supported through Support Line, visit

<http://www.ibm.com/services/sl/products/>

For more information on services, call 800-IBM-4YOU (426-4968).

Security, auditability, and control

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

IBM Electronic Services

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

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

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

To learn how Electronic Services can work for you, visit

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

Terms and conditions

Volume orders

Contact your IBM representative.

IBM Global Financing

Yes

Products - terms and conditions

Warranty period

- Machine Type 2836, 1 year (tied to Machine Type 2831)
- Machine Type 2837, 2 years (tied to Machine Type 2832)
- Machine Type 2838, 3 years (tied to Machine Type 2833)
- Machine Type 2839, 4 years (tied to Machine Type 2834)

Warranty for a DS8000 series licensed function is entitled as a feature of the 283x machine for which the licensed function is authorized, under the terms and conditions associated with that machine.

Advanced functions license is applicable to original owner of the machine with specific machine type and serial number and is not transferable.

Warranty service for a DS8000 series licensed function is provided on the 238x machine for which the licensed function is authorized, under the terms and conditions associated with that machine, and is available until the expiration of that machine's warranty period.

Usage plan machine

No

IBM hourly service rate classification

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

Yes

Machine installation

Customer setup. Customers are responsible for installation according to the instructions IBM provides with 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 at

http://www.ibm.com/servers/eserver/support/machine_warranties/machine_code.html

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.

Machine Code License Acceptance Requirement

Acceptance-By-Use Machine: Yes, acceptance of the Machine Code license terms is conveyed through the user's initial use of the Machine.

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 number
DS8000 series Function Authorization	2836	LF8	
Administrative indicators:			
IBM/Openwave Alliance indicator			0930
IBM System i ^(R) indicator			0931
IBM System p indicator			0932
IBM System x indicator			0933
IBM System z ^(R) indicator			0934
IBM System z business class indicator			0935
Linux TM indicator			0940
IBM ProtecTIER ^(R) indicator			0960
IBM Storwize ^(R) V7000 indicator			0961
IBM N series indicator			0962
IBM SAN Volume Controller indicator			0963
IBM/EPIC indicator			0964
VMware VAAI indicator			0965
Base Function (BF)			
BF - Up to 100 TB capacity			8151
BF - 100.1 TB to 250 TB capacity			8152
BF - 250.1 TB to 500 TB capacity			8153
BF - 500.1 TB to 1250 TB capacity			8154
BF - 1250.1 TB to 3000 TB capacity			8155

Description	Machine type	Model	Feature number
BF - 3000.1 TB to 6000 TB capacity			8156
BF - 6000.1 TB to 10000 TB			8160
Copy Services (CS) license			
CS - Inactive			8250
CS - Up to 100 TB capacity			8251
CS - 100.1 TB to 250 TB capacity			8252
CS - 250.1 TB to 500 TB capacity			8253
CS - 500.1 TB to 1250 TB capacity			8254
CS - 1250.1 TB to 3000 TB capacity			8255
CS - 3000.1 TB to 6000 TB capacity			8256
CS - 6000.1 TB to 10000 TB			8260
z-synergy Services (zsS) license			
zsS - Active			8300
zsS - Inactive			8350
zsS - Up to 100 TB capacity			8351
zsS - 100.1 TB to 250 TB capacity			8352
zsS - 250.1 TB to 500 TB capacity			8353
zsS - 500.1 TB to 1250 TB capacity			8354
zsS - 1250.1 TB to 3000 TB capacity			8355
zsS - 3000.1 TB to 6000 TB capacity			8356
zsS - 6000.1 TB to 10000 TB			8360
DS8000 series Function Authorization			
Administrative indicators:	2837	LF8	
IBM/Openwave Alliance indicator			0930
IBM System i indicator			0931
IBM System p indicator			0932
IBM System x indicator			0933
IBM System z indicator			0934
IBM System z business class indicator			0935
Linux indicator			0940

Description	Machine type	Model	Feature number
IBM ProtecTIER indicator			0960
IBM Storwize V7000 indicator			0961
IBM N series indicator			0962
IBM SAN Volume Controller indicator			0963
IBM/EPIC indicator			0964
VMware VAAI indicator			0965
Base Function (BF)			
BF - Up to 100 TB capacity			8151
BF - 100.1 TB to 250 TB capacity			8152
BF - 250.1 TB to 500 TB capacity			8153
BF - 500.1 TB to 1250 TB capacity			8154
BF - 1250.1 TB to 3000 TB capacity			8155
BF - 3000.1 TB to 6000 TB capacity			8156
BF - 6000.1 TB to 10000 TB			8160
Copy Services (CS) license			
CS - Inactive			8250
CS - Up to 100 TB capacity			8251
CS - 100.1 TB to 250 TB capacity			8252
CS - 250.1 TB to 500 TB capacity			8253
CS - 500.1 TB to 1250 TB capacity			8254
CS - 1250.1 TB to 3000 TB capacity			8255
CS - 3000.1 TB to 6000 TB capacity			8256
CS - 6000.1 TB to 10000 TB			8260
z-synergy Services (zsS) license			
zsS - Active			8300
zsS - Inactive			8350
zsS - Up to 100 TB capacity			8351
zsS - 100.1 TB to 250 TB capacity			8352
zsS - 250.1 TB to 500 TB capacity			8353
zsS - 500.1 TB to 1250 TB capacity			8354
zsS - 1250.1 TB to 3000 TB capacity			8355

Description	Machine type	Model	Feature number
zsS - 3000.1 TB to 6000 TB capacity			8356
zsS - 6000.1 TB to 10000 TB			8360
Description	Machine type	Model	Feature number
DS8000 series Function Authorization	2838	LF8	
Administrative indicators:			
IBM/Openwave Alliance indicator			0930
IBM System i indicator			0931
IBM System p indicator			0932
IBM System x indicator			0933
IBM System z indicator			0934
IBM System z business class indicator			0935
Linux indicator			0940
IBM ProtecTIER indicator			0960
IBM Storwize V7000 indicator			0961
IBM N series indicator			0962
IBM SAN Volume Controller indicator			0963
IBM/EPIC indicator			0964
VMware VAAI indicator			0965
Base Function (BF)			
BF - Up to 100 TB capacity			8151
BF - 100.1 TB to 250 TB capacity			8152
BF - 250.1 TB to 500 TB capacity			8153
BF - 500.1 TB to 1250 TB capacity			8154
BF - 1250.1 TB to 3000 TB capacity			8155
BF - 3000.1 TB to 6000 TB capacity			8156
BF - 6000.1 TB to 10000 TB			8160
Copy Services (CS) license			
CS - Inactive			8250
CS - Up to 100 TB capacity			8251
CS - 100.1 TB to 250 TB capacity			8252
CS - 250.1 TB to 500 TB capacity			8253

Description	Machine type	Model	Feature number
CS - 500.1 TB to 1250 TB capacity			8254
CS - 1250.1 TB to 3000 TB capacity			8255
CS - 3000.1 TB to 6000 TB capacity			8256
CS - 6000.1 TB to 10000 TB			8260
z-synergy Services (zsS) license			
zsS - Active			8300
zsS - Inactive			8350
zsS - Up to 100 TB capacity			8351
zsS - 100.1 TB to 250 TB capacity			8352
zsS - 250.1 TB to 500 TB capacity			8353
zsS - 500.1 TB to 1250 TB capacity			8354
zsS - 1250.1 TB to 3000 TB capacity			8355
zsS - 3000.1 TB to 6000 TB capacity			8356
zsS - 6000.1 TB to 10000 TB			8360
Description	Machine type	Model	Feature number
DS8000 series Function Authorization	2839	LF8	
Administrative indicators:			
IBM/Openwave Alliance indicator			0930
IBM System i indicator			0931
IBM System p indicator			0932
IBM System x indicator			0933
IBM System z indicator			0934
IBM System z business class indicator			0935
Linux indicator			0940
IBM ProtecTIER indicator			0960
IBM Storwize V7000 indicator			0961
IBM N series indicator			0962
IBM SAN Volume Controller indicator			0963
IBM/EPIC indicator			0964
VMware VAAI indicator			0965
Base Function (BF)			

Description	Machine type	Model	Feature number
BF - Up to 100 TB capacity			8151
BF - 100.1 TB to 250 TB capacity			8152
BF - 250.1 TB to 500 TB capacity			8153
BF - 500.1 TB to 1250 TB capacity			8154
BF - 1250.1 TB to 3000 TB capacity			8155
BF - 3000.1 TB to 6000 TB capacity			8156
BF - 6000.1 TB to 10000 TB			8160
Copy Services (CS) license			
CS - Inactive			8250
CS - Up to 100 TB capacity			8251
CS - 100.1 TB to 250 TB capacity			8252
CS - 250.1 TB to 500 TB capacity			8253
CS - 500.1 TB to 1250 TB capacity			8254
CS - 1250.1 TB to 3000 TB capacity			8255
CS - 3000.1 TB to 6000 TB capacity			8256
CS - 6000.1 TB to 10000 TB			8260
z-synergy Services (zsS) license			
zsS - Active			8300
zsS - Inactive			8350
zsS - Up to 100 TB capacity			8351
zsS - 100.1 TB to 250 TB capacity			8352
zsS - 250.1 TB to 500 TB capacity			8353
zsS - 500.1 TB to 1250 TB capacity			8354
zsS - 1250.1 TB to 3000 TB capacity			8355
zsS - 3000.1 TB to 6000 TB capacity			8356
zsS - 6000.1 TB to 10000 TB			8360

Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
Administrative indicators:						
IBM/ Openwave Alliance indicator	0930	Both	No	No	No	N/A
IBM System i indicator	0931	Both	No	No	No	N/A

Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
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 business class indicator	0935	Both	No	No	No	N/A
Linux indicator	0940	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
IBM SAN Volume Controller indicator	0963	Both	No	No	No	N/A
IBM/EPIC indicator	0964	Both	No	No	No	N/A
VMware VAAI indicator	0965	Both	No	No	No	N/A
<hr/>						
Base Function (BF)						
BF - Up to 100 TB capacity	8151	Both	No	No	No	Yes
BF - 100.1 TB to 250 TB capacity	8152	Both	No	No	No	Yes
BF - 250.1 TB to 500 TB capacity	8153	Both	No	No	No	Yes
BF - 500.1 TB to 1250 TB capacity	8154	Both	No	No	No	Yes
BF - 1250.1 TB to	8155	Both	No	No	No	Yes

Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
3000 TB capacity						
BF - 3000.1 TB to 6000 TB capacity	8156	Both	No	No	No	Yes
BF - 6000.1 TB to 10000 TB	8160	Both	No	No	No	Yes
Copy Services (CS) license						
CS - Inactive	8250	Both	No	No	No	Yes
CS - Up to 100 TB capacity	8251	Both	No	No	No	Yes
CS - 100.1 TB to 250 TB capacity	8252	Both	No	No	No	Yes
CS - 250.1 TB to 500 TB capacity	8253	Both	No	No	No	Yes
CS - 500.1 TB to 1250 TB capacity	8254	Both	No	No	No	Yes
CS - 1250.1 TB to 3000 TB capacity	8255	Both	No	No	No	Yes
CS - 3000.1 TB to 6000 TB capacity	8256	Both	No	No	No	Yes
CS - 6000.1 TB to 10000 TB	8260	Both	No	No	No	Yes
z-synergy Services (zsS) license						
zsS - Active	8300	Both	No	No	No	Yes
zsS - Inactive	8350	Both	No	No	No	Yes
zsS - Up to	8351	Both	No	No	No	Yes

Description	Feature number	Install type	Feature conversion	Feature exchange	Feature remove	CSU
100 TB capacity						
zsS - 100.1 TB to 250 TB capacity	8352	Both	No	No	No	Yes
zsS - 250.1 TB to 500 TB capacity	8353	Both	No	No	No	Yes
zsS - 500.1 TB to 1250 TB capacity	8354	Both	No	No	No	Yes
zsS - 1250.1 TB to 3000 TB capacity	8355	Both	No	No	No	Yes
zsS - 3000.1 TB to 6000 TB capacity	8356	Both	No	No	No	Yes
zsS - 6000.1 TB to 10000 TB	8360	Both	No	No	No	Yes

CSU = Customer setup

N/A = Not applicable

ServiceElect (ESA) charges

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

Model conversion purchase price

From Model	To Model	Description	Continuous maintenance
2396-LFA	2836-LF8	DS8000 series Function Authorization Model LF8	Yes
2397-LFA	2836-LF8	DS8000 series Function Authorization Model LF8	Yes
2398-LFA	2836-LF8	DS8000 series Function Authorization Model LF8	Yes
2399-LFA	2836-LF8	DS8000 series Function Authorization Model LF8	Yes
2397-LFA	2837-LF8	DS8000 series Function	Yes

From Model	To Model	Description	Continuous maintenance
		Authorization Model LF8	
2398-LFA	2837-LF8	DS8000 series Function Authorization Model LF8	Yes
2399-LFA	2837-LF8	DS8000 series Function Authorization Model LF8	Yes
2398-LFA	2838-LF8	DS8000 series Function Authorization Model LF8	Yes
2399-LFA	2838-LF8	DS8000 series Function Authorization Model LF8	Yes
2399-LFA	2839-LF8	DS8000 series Function Authorization Model LF8	Yes

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