

IBM DS6800 DASD Subsystem

Basics,
Setup Screens,
And
Maintenance

WAVV Conference
Covington, Kentucky
April 9-13, 2010

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IBM System Storage DS6800

From IBM Web page

<http://www-03.ibm.com/systems/storage/disk/ds6000/index.html>

- Enterprise-class storage in a small, scalable package.
- Designed to offer a highly available, robust storage solution for medium and large enterprises.
- Designed to deliver enterprise-class storage functionality for distributed and mainframe servers in a modular, space-saving, power-efficient, scalable package
- Supports advanced copy services, which are interoperable with IBM System Storage™ DS8000™ series and IBM TotalStorage® Enterprise Storage Server™

IBM System Storage DS6800

Characteristics

Model	Base	1750-522
	Expansion	1750-EX2
Cache/Memory	2 GB cache/memory per controller 4 GB cache/memory per system	
Host interface	FC/FICON	
Host ports	8	
Maximum disk drives supported	128 (with expansion enclosures) 16 disk drives per enclosure, including controller	
Maximum physical storage capacity	57.6 TB (using all FC disk drives)	
RAID levels	5, 10	
Power supplies and fans	2 per enclosure	
Rack support	19" (48.3cm) rack mountable 3U (5.25" (13.3cm) high)	
Mirroring	IBM Metro Mirror, Global Mirror, Global Copy	
Disk drive sizes	73 GB	(15K rpm)
	146 GB	(15K rpm)
	300 GB	(15K rpm)
	450 GB	(15K rpm)
	300 GB	(10K rpm)

Aultman Hospital Configuration

Machine Description	type	Model	Feature
Z890-160 FICON (2 cards)	2086 FICON Express2 SX	A04 2320	4 - 1GB Ports
IBM System Storage™ DS6800 Short Wave SFP Pair	1750	522 1320	2
31M 50 micron LC-LC cable		1355	4
4 drive sets of 146GB 15k RPM drives = 2.336TB raw 1.66TB useable RAID5 (16 physical Drives)			
IBM System Storage™ DS6800 2 drive sets of 300GB 10k RPM drives	1750	EX2	(8 physical Drives)
= 2.4TB raw 1.69TB useable RAID5 (8 physical Drives)			
TOTAL	= 4.736TB raw 3.35TB useable RAID5		
Cache/Memory	4 GB per system	2 GB per controller	

Note: Cache/Memory is shared. 4 GB is the amount of memory. Not all is available as CACHE.

z/VM IOCP

```
*
  CHPID PCHID=130,PATH=30,TYPE=FC,SHARED .FICON DS6800
  CHPID PCHID=131,PATH=31,TYPE=FC,SHARED .FICON DS6800
  CHPID PCHID=140,PATH=40,TYPE=FC,SHARED .FICON DS6800
  CHPID PCHID=141,PATH=41,TYPE=FC,SHARED .FICON DS6800

*****
*  chpids 130/131/140/141 paths 30/31/40/41      *
*  IBM ds6800 system                               *
*****
*
CU0130  CNTLUNIT CUNUMBR=0130,PATH=(30),CUADD=01,      X
        UNITADD=((00,256)),UNIT=2105
CU0140  CNTLUNIT CUNUMBR=0140,PATH=(40),CUADD=01,      X
        UNITADD=((00,256)),UNIT=2105
CU0131  CNTLUNIT CUNUMBR=0131,PATH=(31),CUADD=01,      X
        UNITADD=((00,256)),UNIT=2105
CU0141  CNTLUNIT CUNUMBR=0141,PATH=(41),CUADD=01,      X
        UNITADD=((00,256)),UNIT=2105
CU0230  CNTLUNIT CUNUMBR=0230,PATH=(30),CUADD=02,      X
        UNITADD=((00,256)),UNIT=2105
CU0240  CNTLUNIT CUNUMBR=0240,PATH=(40),CUADD=02,      X
        UNITADD=((00,256)),UNIT=2105
CU0231  CNTLUNIT CUNUMBR=0231,PATH=(31),CUADD=02,      X
        UNITADD=((00,256)),UNIT=2105
CU0241  CNTLUNIT CUNUMBR=0241,PATH=(41),CUADD=02,      X
        UNITADD=((00,256)),UNIT=2105
DV800   IODEVICE ADDRESS=(0800,256),CUNUMBR=(0130,0140,0141,0131), X
        UNIT=3390
DV900   IODEVICE ADDRESS=(0900,256),CUNUMBR=(0241,0231,0230,0240), X
        UNIT=3390
*
```

PATHS

- Q PATH via z/VM

q path 800

Device 0800, Status ONLINE

CHPIDs to Device 0800 (PIM)	:	30	31	40	41
Physically Available (PAM)	:	+	+	+	+
Online (LPM)	:	+	+	+	+
Preferred	:	-	+	+	-

Legend + Yes - No

Ready; T=0.01/0.01 14:00:26

q path 900

Device 0900, Status ONLINE

CHPIDs to Device 0900 (PIM)	:	30	31	40	41
Physically Available (PAM)	:	+	+	+	+
Online (LPM)	:	+	+	+	+
Preferred	:	+	-	-	+

Legend + Yes - No

Ready; T=0.01/0.01 14:00:29

RAID 5 / RAID 10

- **RAID 5** is a method of spreading volume data across multiple disk drives. The DS6000™ series supports **RAID 5** arrays.
- **RAID 5** increases performance by supporting concurrent accesses to the multiple DDMs within each logical volume. Data protection is provided by parity, which is stored throughout the drives in the array. If a drive fails, the data on that drive can be restored using all the other drives in the array along with the parity bits that were created when the data was stored.
- **RAID 10** provides high availability by combining features of RAID 0 and RAID 1. The DS6000™ series supports **RAID 10** arrays.
- **RAID 0** increases performance by striping volume data across multiple disk drives. **RAID 1** provides disk mirroring which duplicates data between two disk drives. By combining the features of RAID 0 and RAID 1, **RAID 10** provides a second optimization for fault tolerance.
- **RAID 10** implementation provides data mirroring from one DDM to another DDM. **RAID 10** stripes data across half of the disk drives in the **RAID 10** configuration. The other half of the array mirrors the first set of disk drives. Access to data is preserved if one disk in each mirrored pair remains available. In some cases, **RAID 10** offers faster data reads and writes than RAID 5 because it does not need to manage parity. However, with half of the DDMs in the group used for data and the other half used to mirror that data, **RAID 10** disk groups have less capacity than **RAID 5** disk groups

DDM / ARRAY / RANK / EXTENT

- **DDM** = Disk drive modules
- **DDMs** are located in rows and columns on the front of the expansion or server enclosure.
- A disk **ARRAY** is a group of disk drive modules (DDMs) that are arranged in a relationship
- One or more arrays are combined to create a logically contiguous storage space called a **RANK**.
- An **Extent Pool** is set of extents of the same type that are associated with a given rank group.



Cache/Memory

- DS6800 has max 4 GB memory.
- Each server processor card contains 2 GB memory.
- The nick name of Server Enclosure Processor Card is Kona card.
- NVS (Nonvolatile storage is 64M per card or 128M = 131,072K and is separate from the 2G (4G total) memory per card.

From the z/VM Q CACHE command

01346464K Bytes configured
00986192K Bytes available

CACHE BUFFER and Cache Management Code.
Available cache. This is the Cache Buffer minus the Cache Management Code.
986192K includes the cache related control structures.

00000000K Bytes offline
00000000K Bytes pinned

01346464K minus 00986192K equals 360272K. **360272K** is the **Cache Management Code** for our configuration.

2G = 2048M = 2097152K minus the 1346464K (above) = **750688K** per card is **Operating System (firmware release dependent) and error logs and traces.**

User and Application Interfaces

- **DS6000™ Interfaces**

- IBM® System Storage™ DS Storage Manager

Manage configuration files, monitor system, manage hardware, configure storage, and manage Copy Services.

(This is the interface that we use.)

- IBM System Storage DS Command-Line Interface

The IBM System Storage DS command-line interface (CLI) enables open systems hosts to invoke and manage FlashCopy® and Metro and Global Mirror functions through batch processes and scripts

- IBM System Storage DS Open Application Programming Interface

Nonproprietary storage management client application that supports routine LUN management activities, such as LUN creation, mapping and masking, and the creation or deletion of RAID 5 and RAID 10 volume spaces.

- IBM TotalStorage® Productivity Center for Disk

Storage management product that is designed for customers who want to reduce the complexities and costs of storage management, including the management of SAN-based storage.

- IBM TotalStorage Productivity Center for Replication

Copy Services functions such as the remote mirror and copy functions (Metro Mirror and Global Mirror) and the point-in-time function (FlashCopy).

Indicator Lights



Power-on A solid green light indicates that power is present on the resource. If the light is not lit, the resource is not receiving any power.



This blue light can be in a solid or blinking state. Press the Identify button on the rear operator panel of a server enclosure to identify connected enclosure enclosures. The location indicator on the server enclosure blinks as the location indicators on the connected enclosure enclosures enter a solid blue state. Once the location indicators on all of the connected enclosure enclosures are lit, the location indicator on the server enclosure becomes a solid blue light.

If the Identify button is pressed when the server enclosure location indicator is a solid blue light, the light blinks as the location indicators on the connected enclosure enclosures are turned off. The location indicator on the server enclosure is turned off after all enclosure indicator lights are turned off.



A solid amber light indicates that a fault is present on the storage unit. Follow the other indicator LEDs to determine the location of the faulty resource. If no other resources have solid amber error LEDs, use the DS Storage Manager to view the current log entries and determine the point of failure.

This light remains solid until the required resources have been replaced, the problem log entry has been closed through the DS Storage Manager, or unless you press the Remind button on the rear operator panel. If the Remind button is pressed on the rear operator panel, the system alert LED blinks on every 2 seconds.

More Indicator Lights



A solid amber light indicates that a noncritical event has occurred. View the log in the DS Storage Manager to find more information about the event. The light remains solid until the condition has been corrected or you close the log entry in the DS Storage Manager.

A flashing amber light indicates that the system is initializing and is not yet ready to be accessed by either the management console or host systems. Initialization is complete, and the system is ready for I/O, once the flashing amber light turns off.

This light is lit for minor events. If the system alert indicator is lit at the same time as the information indicator, then two events (one minor and one major) have occurred on the resource.



When this indicator is lit, the fault that is indicated by the system alert light is located on the rear of the enclosure. If this indicator is not lit, the fault that is indicated by the system alert light is located on the front of the enclosure.

Storage Manager

The screenshot shows the IBM System Storage DS6000 Storage Manager web interface. The browser window title is "IBM System Storage DS6000 - Windows Internet Explorer" and the address bar shows "http://localhost:8451/DS6000/Console". The interface has a navigation menu on the left under "My Work" and a main content area on the right.

My Work

- Welcome
- Real-time manager
 - Monitor system
 - System summary
 - Physical summary
 - Properties
 - Error Logs
 - Audit Logs
 - Contact IBM
 - Long running task summary
 - User administration
 - Problem Determination Data
 - Manage hardware
 - Storage complexes
 - Storage units
 - Host systems
 - Configure storage
 - Express configuration wizard
 - Arrays
 - Ranks
 - Extent pools
 - Open systems
 - zSeries
 - LCUs
 - Volumes - zSeries
 - Copy services
 - FlashCopy
 - Paths
 - Metro Mirror/ Global Copy
 - Global Mirror
 - Simulated manager

DS6000 Storage Manager

Version 5.2.200.1733

Getting started

- [Setting up the DS Storage Manager](#)
- [Creating a custom logical storage configuration](#)

Learning and tutorials

- [DS6000 Overview](#)
- [Getting started](#)
- [Configuration](#)
- [Service and support](#)

Additional Resources

- [Using the Information Center](#)
- [IBM System Storage Technical Support Web Site](#)
- [Check for code updates](#)

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Local intranet 100%

Physical Properties

The screenshot displays the IBM System Storage D56000 Storage Manager console in a Windows Internet Explorer browser. The page title is "Physical summary: Real-time". Below the title, there is a paragraph of instructions: "Select a storage complex and storage unit to view the physical summary for the selected storage unit. You must select a component to view the log for that component. Click on the hyperlinked component name to view the general properties of the component. You can also print a report or download a formatted spreadsheet file of the summary table." Below this text are two dropdown menus: "Storage complex" set to "C7591" and "Storage unit" set to "DS6000 Unit". A "Refresh" button is present, with the text "Last refresh: Monday, March 29, 2010 5:03:04 PM EDT".

Below the refresh button is a toolbar with icons for zooming, printing, and downloading, along with a "Select Action" dropdown, "Print report", and "Download spreadsheet" buttons. The main content is a table with the following columns: "Select", "Component", "Battery backup unit", "Disk drive module", "Front display panel", "Power Supply/Fan", "Processor controller card", and "Rear display panel".

Select ^	Component v	Battery backup unit ^	Disk drive module ^	Front display panel ^	Power Supply/Fan ^	Processor controller card ^	Rear display panel ^
<input type="radio"/>	Enclosure 10	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal
<input checked="" type="radio"/>	Enclosure 0	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal	<input type="checkbox"/> Normal

Page 1 of 1 Total: 2 Filtered: 2 Displayed: 2 Selected: 1

Done Local intranet 100%

I/O Ports

The screenshot shows the IBM System Storage DS6000 Storage Manager web interface in a Windows Internet Explorer browser. The browser address bar shows the URL `http://localhost:8451/DS6000/Console`. The page title is "Configure I/O Ports: Real-time". Below the title, there is a navigation bar with tabs for "Welcome", "Arrays: Real-time", "Extent pools: Real-time", "LCUs: Real-time", "Host systems: Real-time", "Storage units: Real-time", and "Configure I/O Ports: Real-time".

The main content area contains the following text:

Use this page to configure I/O ports that are connected to selected host attachments.

[Refresh](#) Last refresh: Friday, April 2, 2010 2:03:52 PM EDT

Below this text is a table with columns: "Select", "Host attachments", "Interface Identifier", "Location", and "Type". The table contains 8 rows of data, all with "0" in the "Host attachments" column and "FICON" in the "Type" column. The "Interface Identifier" values are 0000, 0001, 0002, 0003, 0100, 0101, 0102, and 0103. The "Location" values are R1-I1-C0-T0, R1-I1-C0-T1, R1-I1-C0-T2, R1-I1-C0-T3, R1-I2-C0-T0, R1-I2-C0-T1, R1-I2-C0-T2, and R1-I2-C0-T3.

At the bottom of the table, there is a summary row: "Page 1 of 1", "Total: 8", "Filtered: 8", "Displayed: 8", "Selected: 0".

The browser status bar at the bottom shows "Done" and "Local intranet".

Select	Host attachments	Interface Identifier	Location	Type
<input type="checkbox"/>	0	0000	R1-I1-C0-T0	FICON
<input type="checkbox"/>	0	0001	R1-I1-C0-T1	FICON
<input type="checkbox"/>	0	0002	R1-I1-C0-T2	FICON
<input type="checkbox"/>	0	0003	R1-I1-C0-T3	FICON
<input type="checkbox"/>	0	0100	R1-I2-C0-T0	FICON
<input type="checkbox"/>	0	0101	R1-I2-C0-T1	FICON
<input type="checkbox"/>	0	0102	R1-I2-C0-T2	FICON
<input type="checkbox"/>	0	0103	R1-I2-C0-T3	FICON

LCU - zSeries logical control unit

The screenshot shows the IBM System Storage DS6000 Storage Manager console in a Windows Internet Explorer browser. The browser address bar shows `http://localhost:8451/DS6000/Console`. The console interface includes a navigation menu with options like 'Welcome', 'Arrays: Real-time', 'Extent pools: Real-time', and 'LCUs: Real-time'. The 'LCUs: Real-time' section is active, displaying a table of Logical Control Units (LCUs) for the selected storage unit 'DS6000 Unit'. The table has columns for 'Select', 'LCU ID', 'SSID', 'LCU Type', 'Volumes', and 'Addresses Used'. Two LCUs are listed: LCU 01 (SSID 0001, 3990 Mod 6) with 163 volumes and LCU 02 (SSID 0002, 3990 Mod 6) with 176 volumes. The console also shows a 'Refresh' button and a 'Last refresh' timestamp of 'Friday, April 2, 2010 2:01:41 PM EDT'. The status bar at the bottom indicates 'Local intranet' and '100%' zoom.

IBM System Storage™ DS6000 Storage Manager

LCUs: Real-time

Select storage unit
DS6000 Unit

Refresh Last refresh: Friday, April 2, 2010 2:01:41 PM EDT

Select	LCU ID	SSID	LCU Type	Volumes	Addresses Used
<input type="checkbox"/>	01	0001	3990 Mod 6		163
<input type="checkbox"/>	02	0002	3990 Mod 6		176

Page 1 of 1 Total: 2 Filtered: 2 Displayed: 2 Selected: 0

Arrays

The screenshot shows the IBM System Storage DS6000 Storage Manager console in a Windows Internet Explorer browser. The browser address bar shows the URL `http://localhost:8451/DS6000/Console`. The console interface includes a navigation menu with 'Welcome' and 'Arrays: Real-time' tabs. The 'Arrays: Real-time' tab is active, displaying a table of storage arrays. Above the table, there is a 'Select storage unit' dropdown menu set to 'DS6000 Unit' and a 'Refresh' button. The table has columns for 'Select', 'Number', 'Data State', 'RAID', 'Status', 'Rank', 'DA Pair', 'DDM GB', 'DDM RPM (K)', and 'DDM Class'. The table contains six rows of data, all with a 'Normal' data state and 'Assigned' status. Below the table, a summary bar indicates 'Page 1 of 1', 'Total: 6', 'Filtered: 6', 'Displayed: 6', and 'Selected: 0'. The browser's status bar at the bottom shows 'Local intranet' and a zoom level of 100%.

Select storage unit
DS6000 Unit

Refresh Last refresh: Friday, April 2, 2010 1:14:03 PM EDT

Select ^	Number ^	Data State ^	RAID ^	Status ^	Rank ^	DA Pair ^	DDM GB ^	DDM RPM (K) ^	DDM Class ^
<input type="checkbox"/>	A0	Normal	RAID 5 (3+P)	Assigned	R0	0	146	15	Enterprise
<input type="checkbox"/>	A1	Normal	RAID 5 (2+P+S)	Assigned	R1	0	146	15	Enterprise
<input type="checkbox"/>	A2	Normal	RAID 5 (2+P+S)	Assigned	R2	0	146	15	Enterprise
<input type="checkbox"/>	A3	Normal	RAID 5 (3+P)	Assigned	R3	0	146	15	Enterprise
<input type="checkbox"/>	A4	Normal	RAID 5 (2+P+S)	Assigned	R4	0	300	10	Enterprise
<input type="checkbox"/>	A5	Normal	RAID 5 (3+P)	Assigned	R5	0	300	10	Enterprise

Page 1 of 1 Total: 6 Filtered: 6 Displayed: 6 Selected: 0

RANKS

The screenshot shows the IBM System Storage DS6000 Storage Manager console in a Windows Internet Explorer browser. The browser address bar shows the URL `http://localhost:8451/DS6000/Console`. The console interface includes a navigation menu with 'Welcome', 'Arrays: Real-time', and 'Ranks: Real-time'. The 'Ranks: Real-time' section is active, displaying a table of storage ranks. Above the table, there is a 'Select storage unit' dropdown menu set to 'DS6000 Unit' and a 'Refresh' button with the text 'Last refresh: Friday, April 2, 2010 1:22:25 PM EDT'. The table has columns for 'Select', 'Number', 'Data State', 'Storage Type', 'RAID', 'Array', 'Extent Pool', 'Total GB', and 'Used GB'. The table contains six rows of data for ranks R0 through R5. Below the table, there is a summary bar showing 'Page 1 of 1', 'Total: 6', 'Filtered: 6', 'Displayed: 6', and 'Selected: 0'. The browser status bar at the bottom shows 'Done', 'Local intranet', and '100%' zoom.

Select storage unit
DS6000 Unit

Refresh Last refresh: Friday, April 2, 2010 1:22:25 PM EDT

Select ^	Number ^	Data State ^	Storage Type ^	RAID ^	Array ^	Extent Pool ^	Total GB ^	Used GB ^
<input type="checkbox"/>	R0	Normal	CKD	RAID 5	A0	Extent Pool 1	381	375
<input type="checkbox"/>	R1	Normal	CKD	RAID 5	A1	Extent Pool 2	253	248
<input type="checkbox"/>	R2	Normal	CKD	RAID 5	A2	Extent Pool 3	253	248
<input type="checkbox"/>	R3	Normal	CKD	RAID 5	A3	Extent Pool 4	381	375
<input type="checkbox"/>	R4	Normal	CKD	RAID 5	A4	Extent Pool 5	517	516
<input type="checkbox"/>	R5	Normal	CKD	RAID 5	A5	Extent Pool 5	776	776

Page 1 of 1 Total: 6 Filtered: 6 Displayed: 6 Selected: 0

Extents

IBM System Storage DS6000 - Windows Internet Explorer
http://localhost:8451/DS6000/Console

IBM System Storage™ DS6000 Storage Manager
Extent pools: Real-time

Select storage unit
DS6000 Unit

Refresh Last refresh: Friday, April 2, 2010 1:32:47 PM EDT

Select	Nickname	Number	Storage Type	RAID	Primary Server	Ranks	Total GB	Reserved %	Available GB	Threshold Exceeded
<input type="checkbox"/>	Extent Pool 1	P0	CKD	RAID 5	0	1	381	0	5	No
<input type="checkbox"/>	Extent Pool 2	P2	CKD	RAID 5	0	1	253	0	4	No
<input type="checkbox"/>	Extent Pool 3	P4	CKD	RAID 5	0	1	253	0	4	No
<input type="checkbox"/>	Extent Pool 4	P6	CKD	RAID 5	0	1	381	0	5	No
<input type="checkbox"/>	Extent Pool 5	P1	CKD	RAID 5	1	2	1,293	0	1	Yes

Page 1 of 1 Total: 5 Filtered: 5 Displayed: 5 Selected: 0

Local intranet 100%

Error Logs

IBM System Storage™ DS6000 Storage Manager

Welcome Error Logs: Real-time

Error Logs

Error Logs: Real-time

Select a storage complex and a storage unit to view the associated informational and problem log entries. You can choose to view an unfiltered display of all log entries or you can specify start and end dates and times to filter the display. Before using this page, check to make sure the storage unit date and time are set correctly. If this information is not set correctly, the time and date on the error logs for the storage unit will be incorrect.

Storage complex: All Storage unit: All
 Severity: All Status: All

All log entries
 Range of log entries

From this date: 3/25/10 time: 5:11:39 PM
 To this date: 3/26/10 time: 6:11:39 PM

Refresh

Last refresh: Friday, March 26, 2010 6:15:57 PM EDT

Log Entries

Use this table to review informational and problem log entries. Select a log entry to close the entry. Click on the hyperlinked message ID to view additional details about the entry. You can also create a test connectivity problem, print a report, or download a formatted spreadsheet file for the data displayed in the table.

Select	Message ID	Date	Type	Severity	Status	Error code	Storage unit	Message
<input checked="" type="radio"/>	2008-01-03-17.52.38.716645	Thursday, January 3, 2008 12:52:42 PM EST	Software	Attention	Closed	BE860100	DS6000 Unit	The storage unit has encountered an internal e...
<input checked="" type="radio"/>	2008-01-03-17.52.43.149313	Thursday, January 10, 2008 3:33:28 PM EST	Software	Attention	Closed	BE860101	DS6000 Unit	The SMTP server that is provided for Call Home...
<input type="radio"/>	2008-01-10-20.42.18.035180	Thursday, January 10, 2008 3:42:18 PM EST	Test	Test	Closed	BE810081	DS6000 Unit	A Test Problem log has been created per your r...
<input type="radio"/>	2008-01-10-20.42.18.855956	Thursday, January 10, 2008 3:42:18 PM EST	Software	Attention	Closed	BE860104	DS6000 Unit	The storage unit is unable to communicate with...
<input type="radio"/>	2008-01-03-17.55.42.137216	Thursday, January 17, 2008 1:10:14 PM EST	Heartbeat	Heartbeat	Closed	BE8FFFFF	DS6000 Unit	A heartbeat record was generated. Heartbeat re...
<input type="radio"/>	2008-01-23-20.11.00.087670	Wednesday, January 23, 2008 3:11:00 PM EST	Test	Test	Closed	BE810081	DS6000 Unit	A Test Problem log has been created per your r...
<input type="radio"/>	2008-01-23-20.35.41.076210	Wednesday, January 23, 2008 3:35:41 PM EST	Test	Test	Closed	BE810081	DS6000 Unit	A Test Problem log has been created per your r...
<input type="radio"/>	2008-01-17-18.10.16.638949	Wednesday, January 23, 2008 3:35:41 PM EST	Software	Attention	Closed	BE860107	DS6000 Unit	Call Home notifications cannot be sent due to ...
<input type="radio"/>	2008-01-23-21.11.53.243608	Wednesday, January 23, 2008 4:11:53 PM EST	Test	Test	Closed	BE810081	DS6000 Unit	A Test Problem log has been created per your r...
<input type="radio"/>	2008-01-23-21.11.54.116694	Wednesday, January 23, 2008 4:11:54 PM EST	Software	Attention	Closed	BE860107	DS6000 Unit	Call Home notifications cannot be sent due to ...

Page 1 of 3 1 Go Total: 30 Filtered: 30 Displayed: 10 Selected: 1

Error Log Heat Issue

The screenshot shows the IBM System Storage DS6000 Storage Manager console in a Windows Internet Explorer browser. The address bar shows the URL `http://localhost:8451/DS6000/Console`. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The console interface has a navigation bar with 'Welcome', 'Error Logs: Real-time', and 'Log Details: Real-time'. The 'Log Details: Real-time' tab is active, displaying the following information:

Use this page to view detailed information about the log entry you selected on the main Logs page. Select a component and then an action to request a replacement part, view maintenance instructions, or service effects, take a component offline, or bring a component online. You can also print a report or download a formatted spreadsheet file of the data in the table.

Message ID: 2008-01-03-17.52.38.716645
Message: The storage unit has encountered an internal error.
Recommended Action: Collect the PE package and contact IBM support for further assistance. Navigate to the Contact IBM page or call the next level of support.

Type: Software **Error code:** BE860100
Severity: Attention **Status:** Closed
First occurrence: Thursday, January 3, 2008 12:52:38 PM EST **Number of occurrences:** 3
Last occurrence: Thursday, January 3, 2008 12:52:42 PM EST **Storage unit:** DS6000 Unit
Machine type - Model: 1750 - 522 **Storage complex:** C7591

Buttons:

Select	Component	Serial number	Part number	Enclosure	Location code	State
Total: 0 Displayed: 0 Selected: 0						

Maintenance

Firmware Updates

Interface Updates

- Storage Manager level is found on the Welcome page.
- Firmware level is found on the Apply Firmware Update page.
 - Select via
 - Manage Software
 - Storage Units
 - Apply Firmware Update
 - Points toward IBM Web page
 - <http://www-1.ibm.com/servers/storage/support/disk/ds6800/downloading.html>
- Or go to WWW.IBM.COM ,
 - Select on Products
 - Select Storage
 - Select Disk Systems
 - DS6000 Series
- Allows for
 - Checking for Firmware Updates
 - Firmware Application Methods
 - » Concurrent
 - » Non Concurrent

Apply Firmware Update Selection

The screenshot shows the IBM System Storage DS6000 Storage Manager console in a Windows Internet Explorer browser. The address bar shows the URL `http://localhost:8451/DS6000/Console`. The browser's menu bar includes File, Edit, View, Favorites, Tools, and Help. The console interface has a navigation tree on the left with the following items:

- Welcome
- Real-time manager
 - Monitor system
 - Manage hardware
 - Storage complexes
 - Storage units
 - Host systems
 - Configure storage
 - Copy services
 - Simulated manager

The main content area is titled "Apply Firmware Update: Real-time" and contains the following text:

Select a firmware application method and the update file in order to transfer onto the storage unit and activate the firmware level transferred to the processor cards.

Current firmware level for selected Storage unit:

Attribute	Value
Storage unit nickname	DS6000 Unit
Storage unit Machine-Type-Model-Serial Number	IBM.1750.522.6814714
Current firmware level	5.2.2.514
Firmware level transferred to the processor cards	
Uploaded firmware level from the selected file	5.2.2.514

Below the table is a "Check for firmware update" button. Underneath, there is a section for selecting a firmware application method, with a dropdown menu set to "Concurrent". Below that is a "Selected file:" label, a text input field containing "SEA.jar", and a "Select a file" button. At the bottom of the form are three buttons: "Transfer file", "Activate", and "Reset".

Recommended Code Levels for DS6000

(copied from IBM Web page as of 29 March 2010)

- **Minimum Level for New Installs:** [Bundle 6.2.2.114](#) (DS6000 Microcode 5.2.2.514, DS6000 Storage Manager 5.2.200.1733 and DSCLI 5.2.2.514)
Anytime a new DS6000 is installed and is at a level lower than this, please upgrade the machine at install time before configuring or using the machine.

For Customers Wishing to Upgrade Code: [Bundle 6.2.2.114](#) (DS6000 Microcode 5.2.2.514, DS6000 Storage Manager 5.2.200.1733 and DSCLI 5.2.2.514)
Customers who wish to upgrade code and are at any level lower than this should load this code.

Minimum Level Recommended for all Customers: [Bundle 6.2.2.108](#) (DS6000 Microcode 5.2.2.497, DS6000 Storage Manager 5.2.200.1724 and DSCLI 5.2.2.497)

This level provides the most critical fixes and updates that all customers need to ensure good system stability. IBM Recommends that all customers below this level upgrade at their earliest convenience.

How to Determine your Microcode Level

DSCLI Level: The DSCLI code level is displayed in the header that appears at the top of the output of any DSCLI command that you issue.

DS6000 Storage Manager Level: Is displayed on the "Welcome" screen which appears directly after entering your username and password.

DS6000 Microcode Level: Can be obtained from the DSCLI using the `ver -l` command, or from the from the DS6000 Storage Manager by choosing Real Time Manager -> Properties, and selecting your storage unit, enclosure 0, Processor Controller Cards Resource, then viewing the attributes tab. The code level will be in the right most column in the table.

Bundles

- Unzip to system that you will be using for the upgrade.
- Read the RELNOTES.TXT
 - basic installation notes from IBM.
- FIRMWARE must be updated first.
 - took 1 hour and 15 minutes concurrent install.
 - Very low I/O activity.
 - Aultman was done during Fall time change.
- There is no backup if you fail. Just a restart. You must upgrade.
 - Most problems are during upload to the DS6800.
 - You can upload to DS6800 (transfer) and let it sit until you are ready.
 - Make sure that the client controlling the update is on a UPS.
- Contact IBM hardware support.
 - Let them know you are doing a Firmware update.
 - IBM can remote in (with your permission) and review your system for issues before you start.
- Update the Storage Manager and DSCLI after Firmware is complete.
 - Normal client software update.

Bundle Notes from RELNOTES.TXT

- - zSeries MCL requirements
 - Driver 55 MCL's J13479.011 and J13480.014 are required to be installed for the attachment of the DS6000/DS8000 DASD to the 2084/2086 systems. Those MCL's fix a problem during FICON channel error recovery where a customer could lose a Logical Path to the Device.
- zSeries (S/390):
 - The paths to controller 0 (top) will be taken offline twice. The paths to controller 1 (bottom) will be taken offline once.

Disaster Recovery Backups

- IBM FlashCopy®

- Point-in-time copies of data that allow users to have nearly instantaneous access to information on both the source and target volumes.
- Aultman uses with IDCAMS SNAP on the z/VSE system.
- z/VM uses the FLASHCOPY command.
- FlashCopy has some functions that I am attempting to explore.
 - **FlashCopy SE** - only the capacity needed for pre-change of the source data is allocated in the target.
 - **FlashCopy NOCOPY** -the only data copied to the target is that which is about to be changed or overlaid.
 - **Data Set FlashCopy** –
 - **Multiple Relationship FlashCopy** -

- Global Mirror, Metro Mirror and Metro/Global Mirror

- generate and maintain data-consistent copies of data on separate storage systems.
- Requires separate duplicate storage at remote site and bandwidth to transfer data.
- **Metro Mirror (Synchronous)** is remote data-mirroring. Maintains a constantly updated copy of application data remotely within an area (up to 300 km/180 miles away).
- **Global Copy** is non-synchronous, remote copy function. Unlimited distance but write to secondary is done after the primary write is done. Great for constant off-site backups
- **Global Mirror (Asynchronous)** a two-site remote data mirroring function with a two to three second lag time.
- Combinations of the above three.

FlashCopy and IXFP/SnapShot z/VSE

- Introduced in VSE/ESA 2.5
- Updated VSE/ESA 2.6, 2.7.3
 - Check the VSE/ESA Release Guide Version 2 Release 7 Modification Level 3 SC33-6718-09
- VSE/FastCopy supports Full Volume Disk to disk but not files or extents
- IXFP **SNAP** (AR Format) copies data from a source device to a target device.
- IXFP Status (AR Format) current status and progress of ongoing or persisting FlashCopy relations.
 - IXFP STATUS XCM EDMA
 - AR 0015 IXFP70I NO FLASH-COPY FUNCTION ESTABLISHED OR PENDING
 - AR 0015 1I40I READY

IDCAMS SNAP

- ```
// EXEC IDCAMS,SIZE=AUTO
/* FIRST DO THE SNAPSHOT */
 SNAP
 SOURCEVOLUMES(
 DS6914 DS6915 DS6916
 DS6941 DS6942 DS6943
 DS6988 DS6989 DS698A
 DS6948
)
 TARGETVOLUMES(
 DS6927 DS6928 DS6929
 DS692A DS692B DS692C
 DS692D DS692E DS692F
 DS6931
)
```
- ```
F5 0028 IXFP22I SNAP TO CUU= 927 STARTED AT 04:03:05 GMT 03/20/2010 03/20/10 00.03.05
F5 0028 IXFP20I SNAP FUNCTION COMPLETED AT 04:03:05 GMT 03/20/2010 03/20/10 00.03.05
```
- But behind on the DS6800 function is still happening.
- ```
AR 0028 1H09I OPER INFO SYSXXX=931 03/20/10 00.03.10
AR 0028 SUBSYSTEM STATUS CHANGE: FL-COPY RELATION ESTABLISHED 03/20/10 00.03.10
```
- ```
AR 0028 1H09I OPER INFO SYSXXX=931 03/20/10 00.51.13
AR 0028 SUBSYSTEM STATUS CHANGE: FL-COPY RELATION TERMINATED 03/20/10 00.51.13
```
- Our Operators did notice a short time difference in duration on jobs running during the SNAP

FlashCopy z/VM

- z/VM 5.2 introduced native support for 1750 via APAR VM63952
- Supports Preferred paths on DS6800.
 - I/O redriven on non-preferred paths only if no preferred path is available.
 - **Q PATH will show status**
 - Device 0900, Status ONLINE
 - CHPIDs to Device 0900 (PIM) : 30 31 40 41
 - Physically Available (PAM) : + + + +
 - Online (LPM) : + + + +
 - Preferred : + - - +
 - Legend + Yes - No
 - Ready; T=0.01/0.01 13:34:09
- I have used but not a lot.
- Note that when using MDC buffers must be flushed.
- z/VM APAR VM61486.

IBM United States Withdrawal Announcement 910-032, dated February 23, 2010

Effective June 11, 2010, IBM® will withdraw from marketing the following products. On or after the effective date of withdrawal, you can no longer order these products directly from IBM.

For new orders, the customer requested arrival date (CRAD) can be no later than June 18, 2010. You can obtain the product on an as-available basis through IBM Business Partners.

Machine			
Description	type	Model	Feature
IBM System Storage™ DS6800	1750	522	
Dial-up Modem:			
	- Modem Country Group M01		1211
	- Modem Country Group M02		1212
	- Modem Country Group M03		1213
	- Modem Country Group M04		1214
	- Modem Country Group M05		1215
9 micron LC-LC Fibre Optical Host cables:			
	- 2M 9 micron LC-LC cable		1363
	1750	EX1	
50 micron LC-LC Fibre Optical Host cables:			
	- 2M 50 micron LC-LC cable		1380
	- 7M 50 micron LC-LC cable		1381
50 micron LC-LC Fibre Optical Host cables:			
	- 2M 50 micron LC-LC cable		1383

* Note the full PDF is available in the VSE-L archives, from Ed Martin, or from IBM directly.

Links to Information

- <http://www-03.ibm.com/systems/storage/disk/ds6000/index.html>
Index for information on the DS6800.
Link to Product support page.
- <http://www-03.ibm.com/systems/storage/disk/ds6000/media.html>
Configuration Demo and Visual Tour.
- http://www-03.ibm.com/systems/resources/systems_storage_disk_ds6000_pdf_interop.pdf
Interoperability Matrix
- http://publib.boulder.ibm.com/infocenter/dsichelp/ds6000ic/index.jsp?topic=/com.ibm.storage.smric.help.doc/f2c_ichome_23bc5o.html
IBM System Storage DS6000 Information Center
- <http://www-1.ibm.com/servers/storage/support/disk/ds6800/downloading.html>
Download area information
- <http://www.vm.ibm.com/devpages/farman/CAVDS6K.PDF>
Eric Farman – Introduction to the IBM System Storage DS6000
Presented at CAVMEN October 18 , 2007

Source References

- IBM System Storage Web Pages
- Introduction to the IBM System Storage DS6000 from WAVV 2007 author Steve Wilkins
- IBM System Storage DS6000 Information Center
- Help Screens on the DS6800 Storage Manager.
- 1-800-IBM-SERV Hardware support
- hw_support@ecurep.ibm.com with the IBM reference number in the subject line.
- IBM Product Field Engineer Bob
 - Bob L Xiao
 - xiaoling@cn.ibm.com
 - Referred to by some of the support group as ‘the developer’