

# Command-Line Interface User's Guide



# Command-Line Interface User's Guide

# Note: Before using this information and the product it supports, read the information in the Safety and environmental notices and Notices sections.

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# **About this guide**

This publication introduces the IBM TotalStorage DS Command-Line Interface application and provides instructions for installing it.

This publication provides descriptions of the following components:

- Each command-line interface command.
- Each system message that appears in the command-line interface application.
- Each system message that appears in the management console application.

This publication is for the storage system administrator or the person who is responsible for installing and using the DS Command-Line Interface in your enterprise. It is written for a user who understands the concepts of a command-line interface application and writing scripts and who has a knowledge of the operating systems and the storage systems in your enterprise.

# Safety and environmental notices

This section contains information about safety notices that are used in this guide and environmental notices for this product.

# Safety notices

Use this process to find information about safety notices.

To find the translated text for a danger or caution notice:

 Look for the identification number at the end of each danger notice or each caution notice. In the following examples, the numbers 1000 and 1001 are the identification numbers.

### **DANGER**

A danger notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.

1000

### **CAUTION:**

A caution notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

### 1001

2. Find the number that matches in the *IBM TotalStorage Solutions Safety Notices* for *IBM Versatile Storage Server and IBM TotalStorage Enterprise Storage Server*, GC26-7229.

### **Environmental notices**

This section identifies the environmental guidelines that pertain to this product.

# **Product recycling**

This unit contains recyclable materials.

Recycle these materials at your local recycling sites. Recycle the materials according to local regulations. In some areas, IBM provides a product take-back program that ensures proper handling of the product. Contact your IBM representative for more information.

# **Disposing of products**

This topic contains information about how to dispose of products.

This unit might contain batteries. Remove and discard these batteries, or recycle them, according to local regulations.

# Conventions used in this guide

The following typefaces are used to show emphasis:

### boldface

Text in **boldface** represents menu items and lowercase or mixed-case command names.

Text in italics is used to emphasize a word. In command syntax, it is used for variables for which you supply actual values.

### monospace

Text in monospace identifies the data or commands that you type, samples of command output, or examples of program code or messages from the system.

### **Related information**

The tables in this section list and describe the following publications:

- The publications that make up the IBM<sup>®</sup> TotalStorage<sup>™</sup> DS8000 series library
- Other IBM publications that relate to the DS8000 series
- Non-IBM publications that relate to the DS8000 series

See "Ordering IBM publications" on page xiv for information about how to order publications in the IBM TotalStorage DS8000 series publication library. See "How to send your comments" on page xv for information about how to send comments about the publications.

# DS8000 series library

These customer publications make up the DS8000 series library.

Unless otherwise noted, these publications are available in Adobe portable document format (PDF) on a compact disc (CD) that comes with the storage unit. If you need additional copies of this CD, the order number is SK2T-8803. These publications are also available as PDF files by clicking on the **Documentation link** on the following Web site:

http://www-1.ibm.com/servers/storage/support/disk/ds8100/index.html

See "Ordering IBM publications" on page xiv for information about ordering these and other IBM publications.

Title	Description	Order Number
IBM® TotalStorage® DS: Command-Line Interface User's Guide	This guide describes the commands that you can use from the command-line interface (CLI) for managing your DS8000 configuration and Copy Services relationships. The CLI application provides a set of commands that you can use to write customized scripts for a host system. The scripts initiate predefined tasks in a Copy Services server application. You can use the CLI commands to indirectly control Remote Mirror and Copy and FlashCopy <sup>®</sup> configuration tasks within a Copy Services server group.	SC26-7625 (See Note.)
IBM TotalStorage DS8000: Host Systems Attachment Guide	This guide provides guidelines for attaching the DS8000 to your host system and for migrating to fibre-channel attachment from a small computer system interface.	SC26-7628 (See Note.)
IBM TotalStorage DS8000: Introduction and Planning Guide	This guide introduces the DS8000 product and lists the features you can order. It also provides guidelines for planning the installation and configuration of the storage unit.	GC35-0495

Title	Description	Order Number
IBM TotalStorage Multipath Subsystem Device Driver User's Guide	This publication describes how to use the IBM Subsystem Device Driver (SDD) on open-systems hosts to enhance performance and availability on the DS8000. SDD creates redundant paths for shared logical unit numbers. SDD permits applications to run without interruption when path errors occur. It balances the workload across paths, and it transparently integrates with applications.	SC30-4096
IBM TotalStorage DS8000: User's Guide	This guide provides instructions for setting up and operating the DS8000 and for analyzing problems.	SC26-7623 (See Note.)
IBM TotalStorage DS Application Programming Interface Reference	This publication provides reference information for the IBM TotalStorage DS application programming interface (API) and provides instructions for installing the Common Information Model Agent, which implements the API.	GC35-0493
IBM TotalStorage DS8000 Messages Reference	This publication provides explanations of error, information, and warning messages that are issued from the DS8000 user interfaces.	GC26-7659

**Note:** No hardcopy book is produced for this publication. However, a PDF file is available from the following Web site: http://www-1.ibm.com/servers/storage/support/disk/ds8100/index.html

# Other IBM publications

Other IBM publications contain additional information that is related to the DS product library.

The following list is divided into categories to help you find publications that are related to specific topics. Some of the publications are listed under more than one category. See "Ordering IBM publications" on page xiv for information about ordering these and other IBM publications.

Title	Description	Order Number
	Data-copy services	
z/OS DFSMS Advanced Copy Services	This publication helps you understand and use IBM Advanced Copy Services functions. It describes three dynamic copy functions and several point-in-time copy functions. These functions provide backup and recovery of data if a disaster occurs to your data center. The dynamic copy functions are peer-to-peer remote copy, extended remote copy, and coupled extended remote copy. Collectively, these functions are known as remote copy. FlashCopy, SnapShot, and concurrent copy are the point-in-time copy functions.	SC35-0428
IBM Enterprise Storage Server	This publication, from the IBM International Technical Support Organization, introduces the Enterprise Storage Server and provides an understanding of its benefits. It also describes in detail the architecture, hardware, and functions, including the advanced copy functions, of the Enterprise Storage Server.	SG24-5465
Implementing Copy Services 0n S/390	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on an Enterprise Storage Server that is attached to an S/390 or zSeries host system. Copy Services functions include peer-to-peer remote copy, extended remote copy, FlashCopy <sup>®</sup> , and concurrent copy. This publication describes the functions, prerequisites, and corequisites and describes how to implement each function into your environment.	SG24-5680

Title	Description	Order Number	
IBM TotalStorage ESS Implementing Copy Services in an Open Environment	tells you how to install, customize, and configure Copy Services on UNIX, Windows NT®, Windows 2000, Sun Solaris, HP-UX, Tru64, OpenVMS, and		
	Fibre channel		
Fibre Channel Connection (FICON) I/O Interface: Physical Layer	This publication provides information about the fibre-channel I/O interface.  This book is also available as a PDF file from the following Web site:  http://www.ibm.com/servers/resourcelink/	SA24-7172	
Fibre Transport Services (FTS): Physical and Configuration Planning Guide	This publication provides information about fibre-optic and ESCON-trunking systems.	GA22-7234	
IBM SAN Fibre Channel Switch: 2109 Model S08 Installation and Service Guide	This guide describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S08.	SC26-7350	
IBM SAN Fibre Channel Switch: 2109 Model S08 User's Guide	This guide describes the IBM SAN Fibre Channel Switch and the IBM TotalStorage ESS Specialist. It provides information about the commands and how to manage the switch with Telnet and the Simple Network Management Protocol.	SC26-7349	
IBM SAN Fibre Channel Switch: 2109 Model S16 Installation and Service Guide	This publication describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S16. It is intended for trained service representatives and service providers.	SC26-7352	
IBM SAN Fibre Channel Switch: 2109 Model S16 User's Guide	This guide introduces the IBM SAN Fibre Channel Switch 2109 Model S16 and tells you how to manage and monitor the switch using zoning and how to manage the switch remotely.	SC26-7351	
		SG24-6113	
	Open-systems hosts		
ESS Solutions for Open Systems Storage: Compaq AlphaServer, HP, and Sun	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure the Enterprise Storage Server when you attach Compaq AlphaServer (running Tru64 UNIX), HP, and Sun hosts. This book does not cover Compaq AlphaServer that is running the OpenVMS operating system. This book also focuses on the settings that are required to give optimal performance and on the settings for device driver levels. This book is for the experienced UNIX professional who has a broad understanding of storage concepts.	SG24-6119	

Title	Description	Order Number	
IBM TotalStorage ESS Implementing Copy Services in an Open Environment	This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on UNIX or Windows 2000 host systems. The Copy Services functions that are described include peer-to-peer remote copy and FlashCopy. This publication describes the functions and shows you how to implement them into your environment. It also shows you how to implement these functions in a high-availability cluster multiprocessing environment.		
Implementing Fibre Channel Attachment on the ESS	Channel Attachment on helps you install, tailor, and configure fibre-channel attachment of		
	S/390 and zSeries hosts		
Device Support Facilities: User's Guide and Reference	This publication describes the IBM Device Support Facilities (ICKDSF) product that are used with IBM direct access storage device (DASD) subsystems. ICKDSF is a program that you can use to perform functions that are needed for the installation, the use, and the maintenance of IBM DASD. You can also use it to perform service functions, error detection, and media maintenance.	GC35-0033	
z/OS Advanced Copy Services	This publication helps you understand and use IBM Advanced Copy Services functions. It describes three dynamic copy functions and several point-in-time copy functions. These functions provide backup and recovery of data if a disaster occurs to your data center. The dynamic copy functions are peer-to-peer remote copy, extended remote copy, and coupled extended remote copy. Collectively, these functions are known as remote copy. FlashCopy, SnapShot, and concurrent copy are the point-in-time copy functions.	SC35-0428	
DFSMS/MVS V1: Remote Copy Guide and Reference	This publication provides guidelines for using remote copy functions with S/390 and zSeries hosts.	SC35-0169	
Fibre Transport Services (FTS): Physical and Configuration Planning Guide	This publication provides information about fibre-optic and ESCON-trunking systems.	GA22-7234	
Implementing ESS Copy Services on S/390			
ES/9000, ES/3090: IOCP User Guide Volume A04	This publication describes the Input/Output Configuration Program that supports the Enterprise Systems Connection (ESCON) architecture. It describes how to define, install, and configure the channels or channel paths, control units, and I/O devices on the ES/9000 processors and the IBM ES/3090 Processor Complex.	itecture. It or channel	
IOCP User's Guide, IBM e(logo)server zSeries 800 and 900	This publication describes the Input/Output Configuration Program that supports the zSeries 800 and 900 servers. This publication is available in PDF format by accessing ResourceLink at the following Web site:	SB10-7029	
	www.ibm.com/servers/resourcelink/		

Title	Description	Order Number	
IOCP User's Guide, IBM e(logo)server zSeries	(logo)server zSeries supports the zSeries server. This publication is available in PDF format by accessing ResourceLink at the following Web site:		
	www.ibm.com/servers/resourcelink/		
S/390: Input/Output Configuration Program User's Guide and ESCON Channel-to-Channel Reference	This publication describes the Input/Output Configuration Program that supports ESCON architecture and the ESCON multiple image facility.	GC38-0401	
IBM z/OS Hardware Configuration Definition User's Guide	This guide provides conceptual and procedural information to help you use the z/OS Hardware Configuration Definition (HCD) application. It also explains:  How to migrate existing IOCP/MVSCP definitions How to use HCD to dynamically activate a new configuration How to resolve problems in conjunction with MVS/ESA HCD	SC33-7988	
OS/390: Hardware Configuration Definition User's Guide	This guide provides detailed information about the input/output definition file and about how to configure parallel access volumes. This guide discusses how to use Hardware Configuration Definition for both OS/390® and z/OS V1R1.	SC28-1848	
OS/390 V2R10.0: MVS System Messages Volume 1 (ABA - ASA)	This publication lists OS/390 MVS <sup>™</sup> system messages ABA to ASA.	GC28-1784	
Using IBM 3390 Direct Access Storage in a VM Environment	This publication provides device-specific information for the various models of the 3390 and describes methods you can use to manage storage efficiently using the VM operating system. It provides guidance on managing system performance, availability, and space through effective use of the direct access storage subsystem.	GG26-4575	
Using IBM 3390 Direct Access Storage in a VSE Environment	This publication helps you use the 3390 in a VSE environment. It includes planning information for adding new 3390 units and instructions for installing devices, migrating data, and performing ongoing storage management activities.	GC26-4576	
Using IBM 3390 Direct Access Storage in an MVS Environment	This publication helps you use the 3390 in an MVS environment. It includes device-specific information for the various models of the 3390 and illustrates techniques for more efficient storage management. It also offers guidance on managing system performance, availability, and space utilization through effective use of the direct access storage subsystem.	GC26-4574	
z/Architecture Principles of Operation	This publication provides a detailed definition of the z/Architecture <sup>™</sup> . It is written as a reference for use primarily by assembler language programmers and describes each function at the level of detail needed to prepare an assembler language program that relies on a particular function. However, anyone concerned with the functional details of z/Architecture will find this publication useful.	SA22-7832	
	SAN		

Title	Description	Order Number
IBM OS/390 Hardware Configuration Definition User's Guide	This guide explains how to use the Hardware Configuration Data application to perform the following tasks:  Define new hardware configurations  View and modify existing hardware configurations  Activate configurations  Query supported hardware  Maintain input/output definition files (IODFs)  Compare two IODFs or compare an IODF with an actual configuration  Print reports of configurations  Create graphical reports of a configuration  Migrate existing configuration data  This guide describes how to install and maintain the IBM SAN Fibre	SC28-1848
Switch: 2109 Model S08 Installation and Service Guide	Channel Switch 2109 Model S08.	
IBM SAN Fibre Channel Switch: 2109 Model S08 User's Guide	This guide describes the IBM SAN Fibre Channel Switch and the IBM TotalStorage ESS Specialist. It provides information about the commands and how to manage the switch with Telnet and the Simple Network Management Protocol (SNMP).	SC26-7349
IBM SAN Fibre Channel Switch: 2109 Model S16 Installation and Service Guide	This publication describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S16. It is intended for trained service representatives and service providers.	SC26-7352
IBM SAN Fibre Channel Switch: 2109 Model S16 User's Guide	This guide introduces the IBM SAN Fibre Channel Switch 2109 Model S16 and tells you how to manage and monitor the switch using zoning and how to manage the switch remotely.	SC26-7351
Implementing Fibre Channel Attachment on the ESS	This publication, from the IBM International Technical Support Organization, helps you install, tailor, and configure fibre-channel attachment of open-systems hosts to the Enterprise Storage Server. It provides you with a broad understanding of the procedures that are involved and describes the prerequisites and requirements. It also shows you how to implement fibre-channel attachment.	SG24-6113
	Seascape family	
IBM Enterprise Storage Server	This publication, from the IBM International Technical Support Organization, introduces the Enterprise Storage Server and provides an understanding of its benefits. It also describes in detail the architecture, hardware, and functions, including the advanced copy functions, of the Enterprise Storage Server.	SG24-5465
IBM Enterprise Storage Server Performance Monitoring and Tuning Guide	ance provides guidance on the best way to configure, monitor, and manage your	
IBM Versatile Storage Server: Introduction and Planning Guide	This publication introduces the IBM Versatile Storage Server <sup>™</sup> and lists the features you can order. It also provides planning information for both 2105 Models B09 and 100.	GC26-7223
Implementing the IBM This publication, from the IBM International Technical Support Organization, can help you install, tailor, and configure the Enterprise Storage Server in your environment.		
	Storage management	

Title	Description	Order Number
Device Support Facilities: User's Guide and Reference	This publication describes the IBM Device Support Facilities (ICKDSF) product used with IBM direct access storage device (DASD) subsystems. ICKDSF is a program that you can use to perform functions that are needed for the installation, the use, and the maintenance of IBM DASD. You can also use it to perform service functions, error detection, and media maintenance.	
IBM TotalStorage Solutions Handbook	This handbook, from the IBM International Technical Support Organization, helps you understand what makes up enterprise storage management. The concepts include the key technologies that you must know and the IBM subsystems, software, and solutions that are available today. It also provides guidelines for implementing various enterprise storage administration tasks so that you can establish your own enterprise storage management environment.	SG24-5250

# **Ordering IBM publications**

This section tells you how to order copies of IBM publications and how to set up a profile to receive notifications about new or changed publications.

### IBM publications center

The publications center is a worldwide central repository for IBM product publications and marketing material.

The IBM publications center offers customized search functions to help you find the publications that you need. Some publications are available for you to view or download free of charge. You can also order publications. The publications center displays prices in your local currency. You can access the IBM publications center through the following Web site:

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

### **Publications notification system**

The IBM publications center Web site offers you a notification system for IBM publications.

If you register, you can create your own profile of publications that interest you. The publications notification system sends you a daily e-mail that contains information about new or revised publications that are based on your profile.

If you want to subscribe, you can access the publications notification system from the IBM publications center at the following Web site:

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

### Web sites

The following Web sites provide information about the IBM TotalStorage DS8000 series and other IBM storage products.

Type of Storage Information	Web Site
Concurrent Copy for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/

Type of Storage Information	Web Site		
Copy Services command-line interface (CLI)	http://www-1.ibm.com/servers/storage/support/software/cscli.html		
DS8000 series publications	http://www-1.ibm.com/servers/storage/support/disk/ds8100/index.html		
	Click Documentation.		
FlashCopy for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/		
Host system models, operating	http://www.ibm.com/servers/storage/disk/ds8000/interop.html		
systems, and adapters that the storage unit supports	Click Interoperability matrix.		
IBM Disk Storage Feature Activation (DSFA)	http://www.ibm.com/storage/dsfa		
IBM storage products	http://www.storage.ibm.com/		
IBM TotalStorage DS8000 series	http://www-1.ibm.com/servers/storage/disk/ds8000		
IBM version of the Java (JRE) that is often required for IBM products	http://www-106.ibm.com/developerworks/java/jdk/		
Multiple Device Manager (MDM)	http://www.ibm.com/servers/storage/support/		
	Click Storage Virtualization.		
Remote Mirror and Copy (formerly PPRC) for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/		
SAN fibre channel switches	http://www.ibm.com/storage/fcswitch/		
Storage Area Network Gateway and Router	http://www-1.ibm.com/servers/storage/support/san/index.html		
Subsystem Device Driver (SDD)	http://www-1.ibm.com/servers/storage/support/software/sdd.html		
z/OS Global Mirror (formerly XRC) for S/390 and zSeries host systems	http://www.storage.ibm.com/software/sms/sdm/		

# How to send your comments

Your feedback is important to help us provide the highest quality information. If you have any comments about this information or any other DS8000 series documentation, you can submit them in the following ways:

Submit your comments electronically to the following e-mail address: starpubs@us.ibm.com

Be sure to include the name and order number of the book and, if applicable, the specific location of the text you are commenting on, such as a page number or table number.

Mail

Fill out the Readers' Comments form (RCF) at the back of this book. Return it by mail or give it to an IBM representative. If the RCF has been removed, you can address your comments to:

International Business Machines Corporation RCF Processing Department

Department 61C 9032 South Rita Road TUCSON AZ 85775-4401

# Summary of changes for SC26-7625-04 IBM TotalStorage DS8000 Command-Line Interface User's Guide

This document contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

### **New Information**

The following topics were added to this release:

- iSeries OS/400 v5.2 DS CLI installation instructions
- Added the mkaliasvol command which is used to create zSeries CKD alias volumes (also referred to as parallel access volumes) in a storage image.

### **Changed Information**

Many commands were updated or changed. View the revision symbol in the left margin to view the changes that were made to those commands.

# Chapter 1. Introduction to IBM TotalStorage DS8000 series

IBM TotalStorage DS8000 is a high-performance, high-capacity series of disk storage that is designed to support continuous operations. DS8000 series models (machine type 2107) use the IBM POWER5<sup>™</sup> server technology that is integrated with the IBM Virtualization Engine<sup>™</sup> technology. DS8000 series models consist of a storage unit and one or two management consoles, two being the recommended configuration. The graphical user interface (GUI) or the command-line interface (CLI) allows you to logically partition storage and use the built-in Copy Services functions. For high-availability, hardware components are redundant.

You can read the following information to familiarize yourself with the DS8000 series:

- · DS8000 series models, including a model comparison chart
- DS8000 series performance features
- · DS8000 series interfaces
- · DS8000 series hardware specifics
- Supported systems for open systems, S/390<sup>®</sup>, and zSeries<sup>®</sup> hosts
- · Data management elements
- · Copy Services
- · Data migration

### DS8000 models

The DS8000 series offers various choices of base and expansion models, so you can configure storage units that meet your performance and configuration needs.

### **DS8100**

The DS8100 (Model 921) features a dual two-way processor complex and support for one expansion frame.

### **DS8300**

The DS8300 (Models 922 and 9A2) features a dual four-way processor complex and support for one or two expansion frames. The Model 9A2 supports two IBM TotalStorage System LPARs (Logical Partitions) in one storage unit.

The DS8000 expansion frames (Models 92E and 9AE) expand the capabilities of the base models. You can attach the Model 92E to either the Model 921 or the Model 922 to expand their capabilities. You can attach the Model 9AE to expand the Model 9A2.

Figure 1 on page 2 provides a high-level view at the components for the DS8100 and DS8300 base models (Models 921, 922, and 9A2).

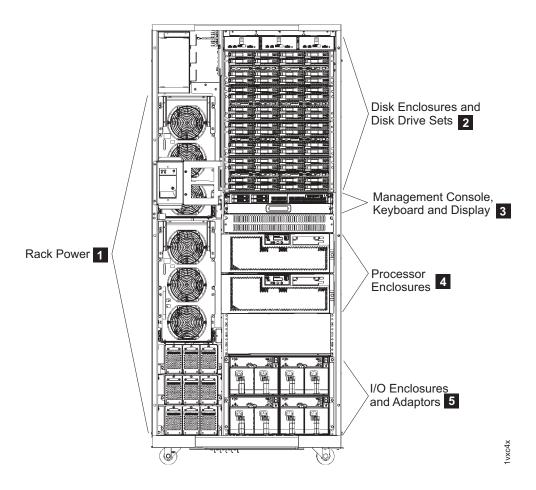


Figure 1. A base model (with front cover off) and its main components

The following notes provide additional information about the labeled components on Figure 1:

- The rack power area of the base models provides redundant power supplies (two primary power supplies), power control cards, and backup battery assemblies to help protect data in the event of a loss of external power. Model 921 contains two batteries. Model 922 and Model 9A2 contain three batteries to support the 4-way processors.
- 2. All base models allow up to eight disk enclosures, which contain the disk drives. In a maximum configuration, each base model can hold up to 128 disk drives.
- 3. All base models contain one management console, a keyboard, and display. The management console is the focal point for configuration, copy services management, and maintenance activities.
- 4. All base models contain two processor enclosures. The processor enclosures contain the computer electronic complex (CEC). The Model 921 processor enclosures have 2-way processors. Processor enclosures on the Model 922 and Model 9A2 have 4-way processors.
- 5. All base models contain I/O enclosures and adapters. The I/O enclosures hold the adapters and provide connectivity between the adapters and the processors. Both device adapters and host adapters are installed in the I/O enclosure.

Figure 2 on page 3 provides a high-level view at the components for the expansion models (Models 92E and 9AE).

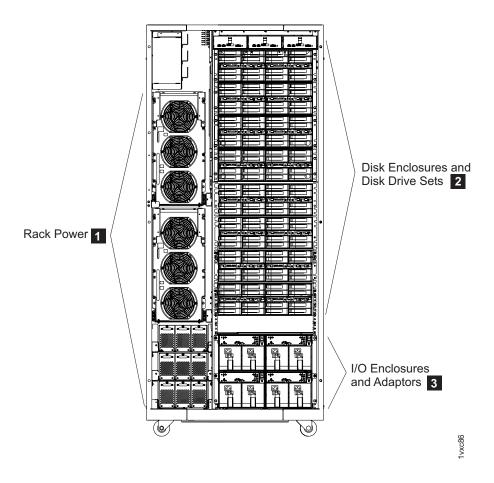


Figure 2. An expansion model (with front cover off) and its main components

The following notes provide additional information about the labeled components on Figure 2:

- The rack power area of each expansion model provides redundant power supplies (two primary power supplies) and power control cards. If the expansion unit contains I/O enclosures or the extended power line disturbance (PLD) feature, three backup battery assemblies are also installed to help protect data in the event of a loss of external power.
- All expansion models allow up to 16 disk enclosures, which contain the disk drives. In a maximum configuration, each expansion model can hold 256 disk drives
- 3. Expansion models can contain I/O enclosures and adapters if they are the first expansion units that are attached to either a Model 922 or a Model 9A2. The second expansion model in a 922 or 9A2 configuration cannot have I/O enclosures and adapters, nor can any expansion unit that is attached to a Model 921. If the expansion unit contains I/O enclosures, the enclosures provide connectivity between the adapters and the processors. The adapters contained in the I/O enclosures can be either device or host adapters.

# **DS8100 (Model 921)**

The IBM TotalStorage DS8100, which is Model 921, offers many features.

These features include:

- · Dual two-way processor complex
- Up to 128 disk drives, for a maximum capacity of 38.4 TB
- Up to 128 GB of processor memory (cache)
- Up to 16 fibre-channel/FICON or ESCON<sup>®</sup> host adapters

The DS8100 model can support one expansion frame. With one expansion frame, you can expand the capacity of the Model 921 as follows:

Up to 384 disk drives, for a maximum capacity of 115.2 TB

**Note:** IBM service representatives can upgrade a Model 921 in the field when you order a model conversion to a Model 922 or Model 9A2.

Figure 3 shows the maximum configuration of a Model 921, which is the 921 base model plus one 92E expansion model.

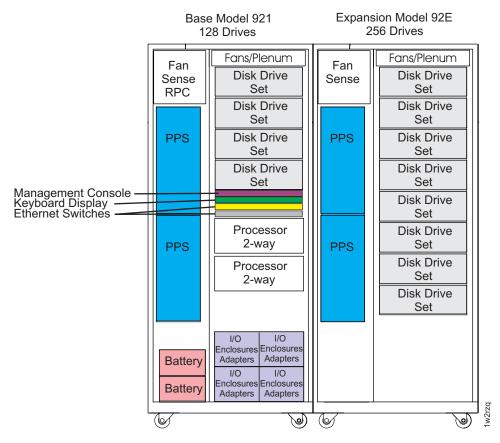


Figure 3. Maximum configuration for Model 921

# **DS8300 (Models 922 and 9A2)**

IBM TotalStorage DS8300 models (Model 922 and Model 9A2) offer higher performance and capacity than the DS8100. The Model 9A2 also enables you to create two storage system LPARs (or images) within the same storage unit.

Both DS8300 models offer the following features:

- Dual four-way processor complex
- · Up to 128 disk drives, for a maximum capacity of 38.4 TB
- Up to 256 GB of processor memory (cache)
- · Up to 16 fibre-channel/FICON or ESCON host adapters

The DS8300 models can support either one or two expansion frames. With expansion frames, you can expand the Model 922 and 9A2 as follows:

- With one expansion frame, you can support the following expanded capacity and number of adapters:
  - Up to 384 disk drives, for a maximum capacity of 115.2 TB
  - Up to 32 fibre-channel/FICON or ESCON host adapters
- · With two expansion frames, you can support the following expanded capacity:
  - Up to 640 disk drives, for a maximum capacity of 192 TB

Figure 4 shows the maximum configuration of a Model 922 and 9A2. Both of these models can attach up to two expansion models. Model 922 uses the 92E expansion model. Model 9A2 uses the 9AE expansion model.

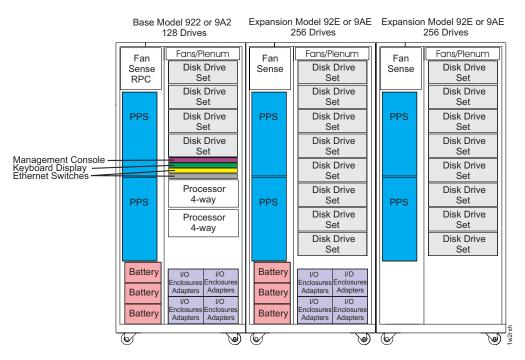


Figure 4. Maximum configuration for Models 922 and 9A2

# Model comparison

DS8000 models vary on the processor types that they use, their disk capacity, and other supported features.

Table 1 compares the various supported features that are available on different DS8000 model configurations.

Table 1. DS8000 model comparison chart

Base model	Images (logical partitions)	Expansion models	Processor type	Disk drives	Processor memory	Host adapters
Model 921	1 image	None	2-way	Up to 128 disks (maximum capacity of 38.4 TB)	Up to 128 GB	Up to 16 host adapters
	1 image	With 1 expansion model (92E)	2-way	Up to 384 disks (maximum capacity of 115.2 TB)	Up to 128 GB	Up to 16 host adapters
Model 922		None	4-way	Up to 128 disks (maximum capacity of 38.4 TB)	Up to 256 GB	Up to 16 host adapters
	1 image	With 1 expansion model (92E)	4-way	Up to 384 disks (maximum capacity of 115.2 TB)	Up to 256 GB	Up to 32 host adapters
		With 2 expansion models (92E)	4-way	Up to 640 disks (maximum capacity of 192 TB)	Up to 256 GB	Up to 32 host adapters
Model 9A2		None	4-way	Up to 128 disks (maximum capacity of 38.4 TB)	Up to 256 GB	Up to 16 host adapters
	2 images	With 1 expansion model (9AE)	4-way	Up to 384 disks (maximum capacity of 115.2 TB)	Up to 256 GB	Up to 32 host adapters
		With 2 expansion models (9AE)	4-way	Up to 640 disks (maximum capacity of 192 TB)	Up to 256 GB	Up to 32 host adapters

**Note:** IBM service representatives can upgrade a Model 921 in the field when you order a model conversion to a Model 922 or a Model 9A2.

# **DS8000** physical footprint

The physical footprint dimensions, caster locations, and cable openings for a DS8000 unit help you plan your installation site.

84.7 (33.3)3 58.9 (23.2)

Figure 5 shows the overall physical footprint of a DS8000 unit.

76.2 (30.0) 3 34.8 (13.7) 45.7 (18.0) Cable Opening 16 (6.3) 9.37 (3.7) 106.7 (42.0) 2 90.0 118.3 8 (46.6) 9 64.5 (25.4) **6** (2x) 5  $\frac{5.1}{(2.0)}$ 85.3 (33.6) 2 121.9 (48.0)

Figure 5. DS8000 physical footprint. Dimensions are in centimeters (inches).

The following dimensions are labeled on Figure 5:

- 1. Front cover width
- 2. Front service clearance
- 3. Back cover widths
- 4. Back service clearance
- 5. Clearance to allow front cover to open
- 6. Distance between casters
- 7. Depth of frame without covers
- 8. Depth of frame with covers
- 9. Minimum dimension between casters and outside edges of frames

# **DS8000** performance features

The DS8000 series is designed to provide you with high-performance, connectivity, and reliability allowing your workload to be easily consolidated into a single storage subsystem.

The following list provides an overview of some of the features that are associated with the DS8000 series:

### POWER5 processor technology

The DS8000 features IBM POWER5 server technology. Depending on workload, the maximum host I/O operations per second of the DS8100 Model 921 is up to three times the maximum operations per second of the ESS Model 800. The maximum host I/O operations per second of the DS8300 Model 922 or 9A2 is up to six times the maximum of the ESS model 800.

### Industry standard fibre channel disk drives

The DS8000 series offers a selection of fibre channel disk drives, including 300 GB drives, allowing a DS8100 to scale up to 115.2 TB of capacity and a DS8300 to scale up to 192 TB of capacity.

### Four-port fibre channel/FICON adapters

These new adapters not only enhance connectivity, but increase configuration flexibility because the individual ports can be configured to support fibre channel or FICON.

### **HOST** attachments

The DS8100 offers up to 16 host adapters (64 FCP/FICON ports) and the DS8300 offers up to 32 host adapters (128 FCP/FICON ports), further increasing your ability to share your disk storage.

### **IBM Standby Capacity on Demand**

The IBM Standby Capacity on Demand (Standby CoD) offering allows the installation of inactive disk drives that can be easily activated as business needs require. With this offering, up to four Standby CoD disk drive sets (64 disk drives) can be factory or field installed into your system. To activate, you logically configure the disk drives for use—a non-disruptive activity that does not require intervention from IBM. Upon activation of any portion of the Standby CoD disk drive set, you must place an order with IBM to initiate billing for the activated set. At that time, you can also order replacement Standby CoD disk drive sets.

### **Online Information Center**

The online Information Center is an information database that provides you the opportunity to quickly familiarize yourself with the major aspects of the DS8000 and to easily recognize the topics for which you might require more information. It provides information regarding user assistance for tasks, concepts, reference, user scenarios, tutorials, and other types of user information. Because the information is all in one place rather than across multiple publications, you can access the information that you need more efficiently and effectively.

### Interfaces of the DS8000

The DS8000 provides management interfaces that contain management tools and utilities to help you increase productivity.

# **IBM TotalStorage DS Storage Manager**

The IBM TotalStorage DS Storage Manager is a program interface that is used to perform logical configurations and Copy Services management functions.

The DS Storage Manager program is installed as a GUI (graphical mode) or as an unattended (silent mode) installation for the supported operating systems. It can be accessed from any location that has network access using a Web browser. It offers you the following choices:

### Simulated configuration

You install this component on your PC or the Master Console which provides the ability to create or modify logical configurations when your storage unit is disconnected from the network. After creating the configuration, you can save it and then apply it to a network attached storage unit at a later time.

### Real-time configuration

This component is preinstalled on your HMC. It provides you the ability to create logical configurations and use Copy Services features when your storage unit is attached to the network. This component provides you with real-time (online) configuration support.

### **DS** command-line interface

The IBM TotalStorage 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.

The command-line interface provides a full-function command set that allows you to check your storage unit configuration and perform specific application functions when necessary.

The following list highlights a few of the specific types of functions that you can perform with the DS command-line interface:

- · Check and verify your storage unit configuration
- · Check the current Copy Services configuration that is used by the storage unit
- Create new logical storage and Copy Services configuration settings
- Modify or delete logical storage and Copy Services configuration settings

Note: You cannot install the DS CLI on a Windows 64-bit operating system.

# DS Open application programming interface

The DS Open application programming interface (API) is a nonproprietary storage management client application that supports routine LUN management activities, such as LUN creation, mapping and masking, and the creation or deletion of RAID5 and RAID10 volume spaces. The DS Open API also enables Copy Services functions such as FlashCopy and Remote Mirror and Copy (formally known as peer-to-peer remote copy).

The IBM TotalStorage DS Open API helps integrate DS configuration management support into storage resource management (SRM) applications, which allow customers to benefit from existing SRM applications and infrastructures. The DS Open API also enables the automation of configuration management through customer-written applications. Either way, the DS Open API presents another option

for managing storage units by complementing the use of the IBM TotalStorage DS Storage Manager web-based interface and the DS command-line interface.

You must implement the DS Open API through the IBM TotalStorage Common Information Model (CIM) agent, a middleware application that provides a CIM-compliant interface. The DS Open API uses the CIM technology to manage proprietary devices as open system devices through storage management applications. The DS Open API allows these storage management applications to communicate with a storage unit.

# **DS8000** hardware specifics

The DS8000 models offer a high degree of availability and performance through the use of redundant components that can be replaced while the system is operating. You can use the DS8000 models with a mix of different operating systems and clustered and nonclustered variants of the same operating systems.

Contributing to the high degree of availability and reliability are the structure of the DS8000 storage unit, the host systems it supports, and its processor memory and processor speeds.

# Storage unit structure

The design of the storage unit, which contains the base model and the expansion models, contributes to the high degree of availability that is associated with the DS8000. The primary components that support high availability within the storage unit are the storage server, the processor complex, and the rack power control card.

The storage unit also has redundant fibre switches, with fibre fabric connections to both processor complexes. The entire power system at all levels is fully redundant. There are redundant private LAN networks between each storage unit and the management consoles (even if there is only one management console).

### Storage unit

A storage unit consists of a storage server and two or more storage (disk) enclosures that are packaged in one or more racks with associated power supplies, batteries, and cooling.

### Storage server

A storage server consists of two processor complexes, two or more I/O enclosures, and a pair of rack power control cards.

### **Processor complex**

A processor complex controls and manages the storage unit to perform the function of the storage server. The two processor complexes form a redundant pair such that if either processor complex fails, the remaining processor complex performs all storage server functions.

### Rack power control card

A redundant pair of rack power control (RPC) cards coordinate the power management within the storage unit. The RPC cards are attached to the service processors in each processor complex, the primary power supplies in each rack, and indirectly to the fan/sense cards and storage enclosures in each rack.

### Multi-path subsystem device driver

The IBM TotalStorage Multi-path subsystem device driver (SDD) provides load balancing and enhanced data availability capability in configurations with more than one I/O path between the host server and the DS8000

series system. Load balancing can help reduce or eliminate I/O bottlenecks that occur when many I/O operations are directed to common devices that are using the same I/O path. The SDD also helps eliminate a potential single point of failure by automatically rerouting I/O operations when a path failure occurs, thereby supporting enhanced data availability capability.

# **IBM TotalStorage Management Console**

The IBM TotalStorage Management Console is the focal point for configuration, copy services management, and maintenance activities.

The Management Console is a dedicated workstation that is physically located (installed) inside your DS8100 and DS8300 and can automatically monitor the state of your system, notifying you and IBM when service is required. The Management Console can also be connected to your network to enable centralized management of your system using the IBM TotalStorage DS Command-Line Interface or the storage management software that uses the IBM TotalStorage DS Open API.

To provide continuous availability of customer access to the management console functions, having a second management console is recommended. This second management console can be provided in two ways:

- External (outside the 2107) This console is generally installed in the customer-provided rack. It uses the same hardware as the internal management console.
- Internal (a second management console that resides within a second 2107) This console can be cabled together with the primary internal management
  console of the first 2107.'

# Host systems that the storage unit supports

The DS8000 storage unit provides a variety of host attachments so that you can consolidate storage capacity and workloads for open-systems hosts, S/390 hosts, and eServer  $^{\text{TM}}$  zSeries hosts.

The DS8100 Model 921 supports a maximum of 16 host adapters and 4 device adapter pairs, and the DS8300 Models 922 and 9A2 supports a maximum of 32 host adapters and 8 device adapter pairs.

You can configure the storage unit for any of the following system adapter types and protocols:

- Fibre-channel adapters, for support of fibre-channel protocol (FCP) and fibre connection (FICON<sup>®</sup>) protocol
- Enterprise Systems Connection Architecture<sup>®</sup> (ESCON) adapters

For fibre-channel attachments, you can establish zones. The zones must contain a single port that is attached to a system adapter with the desired number of ports that are attached to the storage unit. By establishing zones, you reduce the possibility of interactions between system adapters in switched configurations. You can establish the zones by using either of two zoning methods:

- Port number
- Worldwide port name (WWPN)

You can configure switch ports that are attached to the storage unit in more than one zone. This enables multiple system adapters to share access to the storage

unit fibre-channel ports. Shared access to a storage unit fibre-channel port might come from host platforms that support a combination of bus adapter types and the operating systems.

### Attaching a DS8000 series to an open-systems host with fibre channel adapters

You can attach a DS8000 series to an open-systems host with fibre-channel adapters.

Fibre channel is a 1 Gbps or 2 Gbps, full-duplex, serial communications technology to interconnect I/O devices and host systems that are separated by tens of kilometers.

The IBM TotalStorage DS8000 series supports SAN connections at 1 Gbps to 4 Gbps with 2 Gbps host bus adapters. The DS8000 series negotiates automatically and determines whether it is best to run at 1 Gbps link or 2 Gbps link. The IBM TotalStorage DS8000 series detects and operates at the higher link speed.

Fibre channel transfers information between the sources and the users of the information. This information can include commands, controls, files, graphics, video, and sound. Fibre-channel connections are established between fibre-channel ports that reside in I/O devices, host systems, and the network that interconnects them. The network consists of elements like switches, bridges, and repeaters that are used to interconnect the fibre-channel ports.

### Fibre-channel (SCSI-FCP) attached open-systems hosts that the storage unit supports

You can attach the DS8000 storage unit to fibre-channel (SCSI-FCP) attached open-systems hosts.

Each storage unit fibre-channel adapter has four ports. Each port has a unique worldwide port name (WWPN). You can configure the port to operate with the SCSI-FCP upper-layer protocol. Shortwave adapters and longwave adapters are available on the storage unit.

Fibre-channel adapters for SCSI-FCP support provide the following configurations:

- A maximum of 64 host ports for DS8100 Model 921 and a maximum of 128 host ports for DS8300 Models 922 and 9A2
- · A maximum of 509 host logins per fibre-channel port
- A maximum of 2000 N-port logins per storage image
- Access to all 63.7KB LUNs per target (one target per host adapter), depending on host type
- · Either arbitrated loop, switched fabric, or point-to-point topologies

The storage unit supports the following host systems for shortwave fibre-channel attachment and longwave fibre-channel attachment:

- IBM eServer iSeries<sup>™</sup> servers that run an IBM OS/400<sup>®</sup> operating system
- IBM eServer i5 servers that run an IBM i5/OS<sup>™</sup> operating system
- IBM RS/6000<sup>®</sup>, pSeries<sup>®</sup>, eServer p5, RS/6000 SP<sup>™</sup>, and pSeries SP server that run an IBM AIX® operating system
- IBM zSeries servers that run the Linux<sup>™</sup> operating system
- IBM zSeries servers that run the z/VM® operating system
- Apple Macintosh servers

- Fujitsu PRIMEPOWER servers that run the Solaris operating system
- Hewlett-Packard servers that run an HP Tru64 UNIX® operating system
- · Hewlett-Packard servers that run an HP OpenVMS operating system
- · Hewlett-Packard servers that run an HP-UX operating system
- Intel-based servers that run a Microsoft<sup>®</sup> Windows<sup>®</sup> 2000 operating system
- Intel-based servers that run a Microsoft Windows Server 2003 operating system for both 32-bit and 64-bit configurations
- Intel-based servers that run a Novell NetWare operating system
- · IBM servers that run the IBM SAN Volume Controller operating system
- IBM servers that run the IBM SAN File System operating system
- iSCSI Gateway servers that run a Microsoft Windows 2000, Microsoft Windows 2003, or UNIX operating system
- Linux servers that run a Red Hat Linux, Red Flag Linux, Asianux, and SUSE Linux operating system
- · SGI servers that run an IRIX operating system
- · Sun servers that run a Solaris operating system

### See the Interoperability Matrix at

http://www.ibm.com/servers/storage/disk/ds8000/interop.html for details about types, models, adapters, and the operating systems that the storage unit supports.

# ESCON-attached S/390 and zSeries hosts that the storage unit supports

You can attach the DS8000 storage unit to the ESCON-attached S/390 and zSeries hosts.

With ESCON adapters, the storage unit provides the following configurations:

- A maximum of 32 host ports for DS8100 Model 921 and a maximum of 64 host ports for DS8300 Models 922 and 9A2
- A maximum of 64 logical paths per port
- Access to 16 control-unit images (4096 CKD devices) over a single ESCON port on the storage unit
- Zero to 64 ESCON channels; two per ESCON host adapter
- Two ESCON links with each link that supports up to 64 logical paths
   A DS8100 storage unit supports up to 16 host adapters that provide a maximum of 32 ESCON links per machine. A DS8300 storage unit supports up to 32 host adapters that provide a maximum of 64 ESCON links per machine.

**Note:** ESCON host channels limit the number of devices per channel to 1024. To fully access 4096 devices on a storage unit, it is necessary to connect a minimum of four ESCON host channels to the storage unit. You can access the devices through a switch to a single storage unit ESCON port. This method exposes four control-unit images (1024 devices) to each host channel.

The FICON bridge card in ESCON director 9032 Model 5 enables a FICON bridge channel to connect to ESCON host adapters in the storage unit. The FICON bridge architecture supports up to 16 384 devices per channel. This enables you to attach other control units or other storage units to the same host channel up to the limit that the host supports.

The storage unit supports the following operating systems for S/390 and zSeries hosts:

- Transaction Processing Facility (TPF)
- Virtual Storage Extended/Enterprise Storage Architecture (VSE/ESA<sup>TM</sup>)
- z/OS<sup>®</sup>
- z/VM
- Linux

For details about models and the operating system versions and releases that the storage unit supports for these host systems, see the Interoperability Matrix at http://www.ibm.com/servers/storage/disk/ds8000/interop.html.

### FICON-attached S/390 and zSeries hosts that the storage unit supports

You can attach the DS8000 storage unit to FICON-attached S/390 and zSeries hosts.

Each storage unit fibre-channel adapter has four ports. Each port has a unique world wide port name (WWPN). You can configure the port to operate with the FICON upper-layer protocol. When configured for FICON, the fibre-channel port supports connections to a maximum of 128 FICON hosts. On FICON, the fibre-channel adapter can operate with fabric or point-to-point topologies. With fibre-channel adapters that are configured for FICON, the storage unit provides the following configurations:

- · Either fabric or point-to-point topologies
- · A maximum of 64 host ports for DS8100 Model 921 and a maximum of 128 host ports for DS8300 Models 922 and 9A2
- A maximum of 509 channel connections per fibre-channel port
- A maximum of 2048 logical paths on each fibre-channel port
- Access to all 32 control-unit images (8000 CKD devices) over each FICON port

Note: FICON host channels limit the number of devices per channel to 16 384. To fully access 65 280 devices on a storage unit, it is necessary to connect a minimum of four FICON host channels to the storage unit. You can access the devices through a switch to a single storage unit FICON port. This method exposes 64 control-unit images (16 384 devices) to each host channel.

The storage unit supports the following operating systems for S/390 and zSeries hosts:

- Transaction Processing Facility (TPF)
- Virtual Storage Extended/Enterprise Storage Architecture (VSE/ESA)
- z/OS
- z/VM
- Linux

For details about models, versions of operating systems, and releases that the storage unit supports for these host systems, see the Interoperability Matrix at http://www.ibm.com/servers/storage/disk/ds8000/interop.html.

# **Processor memory**

The DS8100 Model 921 offers up to 128 GB of processor memory and the DS8300 Models 922 and 9A2 offer up to 256 GB of processor memory. The Non-Volatile Storage (NVS) scales to the selected processor memory size, which can also help optimize performance.

# **Data management features**

The DS8000 storage unit is designed with the following management features that allow you to securely process and access your data according to your business needs even if it is 24 hours a day and 7 days a week.

### **RAID**

Redundant array of independent disks (RAID) is a method of configuring multiple disk drives in a storage subsystem for high availability and high performance.

The collection of two or more disk drives presents the image of a single disk drive to the system. In the event of a single device failure, data can be read or regenerated from the other disk drives in the array. With RAID implementation, the storage unit offers fault-tolerant data storage. The storage unit supports RAID implementation on the storage unit device adapters. The storage unit supports groups of disk drive modules (DDMs) in both RAID 5 and RAID 10.

### RAID 5

RAID 5 is a method of spreading volume data plus data parity across multiple disk drives. RAID 5 increases performance by supporting concurrent accesses to the multiple DDMs within each logical volume.

### **RAID 10**

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. 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.

# **Arrays across loops**

The arrays across loops helps prevent data loss.

The storage unit provides arrays across loops on open-systems, S/390, and zSeries hosts. For RAID 10, arrays across loops provides mirroring across two loops, which prevents loss of the array during loop failure.

# **Storage System LPARs (logical partitions)**

The DS8300 Model 9A2 exploits LPAR technology, allowing you to run two separate storage server images.

Each Storage System LPAR has access to:

- · 50 percent of the processors
- 50 percent of the processor memory

- Up to 16 host adapters
- Up to 320 disk drives (up to 96 TB of capacity)

With these separate resources, each Storage System LPAR can run the same or different versions of microcode, and can be used for completely separate production, test, or other unique storage environments within this single physical system. This may enable storage consolidations where separate storage subsystems were previously required, helping to increase management efficiency and cost effectiveness.

# Copy Services

Copy Services is a collection of functions that provides disaster recovery, data migration, and data duplication functions. Copy Services runs on the IBM TotalStorage DS8000 storage unit and supports open systems and zSeries environments.

Many design characteristics and advanced functions of the DS8000 contribute to protection of your data. DS8000 has a number of advanced Copy Services functions that are part of the IBM TotalStorage Resiliency family. These functions are supported also on the previous generation of storage systems called the IBM TotalStorage Enterprise Storage Server (ESS).

Copy Services include the following types of functions:

- FlashCopy, which is a point-in-time copy function
- Remote mirror and copy functions (previously known as Peer-to-Peer Remote Copy or PPRC), which includes:
  - IBM TotalStorage Metro Mirror (previously known as Synchronous PPRC)
  - IBM TotalStorage Global Copy (previously known as PPRC Extended Distance)
  - IBM TotalStorage Global Mirror (previously known as Asynchronous PPRC)
- z/OS Global Mirror (previously known as Extended Remote Copy [XRC])

You can manage Copy Services functions through a command-line interface called the IBM TotalStorage DS CLI and a new Web-based interface called the IBM TotalStorage DS Storage Manager. The DS Storage Manager allows you to set up and manage the following types of data-copy functions from any point from which network access is available:

### FlashCopy

The FlashCopy feature enables you to create full volume copies of data.

When you set up a FlashCopy operation, a relationship is established between source and target volumes, and a bitmap of the source volume is created. Once this relationship and a bitmap are created, the target volume can be accessed as though all the data had been physically copied. While a relationship between the source and target volume exists, a background process copies the tracks from the source to the target volume.

FlashCopy is an optional function. To use it, you must purchase the point-in-time 2244 function authorization model, which is 2244 Model PTC.

### **Remote Mirror and Copy**

The remote mirror and copy feature is a flexible data mirroring technology that allows replication between volumes on two or more disk storage systems. You can also use this feature for data backup and disaster recovery.

Remote mirror and copy is an optional function. To use it, you must purchase the remote mirror and copy 2244 function authorization model, which is 2244 Model RMC.

DS8000 storage units can participate in remote mirror and copy solutions with the ESS Model 750, ESS Model 800, and DS6000 storage units.

The remote mirror and copy feature can operate in the following modes:

#### **Metro Mirror**

Provides real-time mirroring of logical volumes between two DS8000s that can be located up to 300 km from each other. It is a synchronous copy solution where write operations are completed on both copies (local and remote site) before they are considered to be completed.

#### **Global Copy**

Copies data nonsynchronously and over longer distances than is possible with Metro Mirror. When operating in Global Copy mode, the source volume sends a periodic, incremental copy of updated tracks to the target volume instead of a constant stream of updates. This causes less impact to application writes for source volumes and less demand for bandwidth resources, while allowing a more flexible use of the available bandwidth.

#### **Global Mirror**

Provides a long-distance remote copy feature across two sites using asynchronous technology. Global Mirror operations provide the following benefits:

- Support for virtually unlimited distance between the local and remote sites, with the distance typically limited only by the capabilities of the network and the channel extension technology. This "unlimited" distance enables you to choose your remote site location based on business needs and enables site separation to add protection from localized disasters.
- A consistent and restartable copy of the data at the remote site, created with minimal impact to applications at the local site.
- Data currency where, for many environments, the remote site lags behind the local site on an average of 3 to 5 seconds, minimizing the amount of data exposure in the event of an unplanned outage. The actual lag in data currency that you experience can depend upon a number of factors, including specific workload characteristics and bandwidth between the local and remote sites.
- Dynamic selection of the desired recovery point objective, based upon business requirements and optimization of available bandwidth.
- Session support whereby data consistency at the remote site is internally managed across up to eight DS8000 machines that are located across the local and remote sites.
- Efficient synchronization of the local and remote sites with support for failover and failback modes, helping to reduce the time that is required to switch back to the local site after a planned or unplanned outage.

#### z/OS Global Mirror

The z/OS Global Mirror function mirrors data on the storage unit to a

remote location for disaster recovery. It protects data consistency across all volumes that you have defined for mirroring. The volumes can reside on several different storage units. The z/OS Global Mirror function can mirror the volumes over several thousand kilometers from the source site to the target recovery site. DS8000 storage complexes support z/OS Global Mirror only on zSeries hosts.

With z/OS Global Mirror, you can suspend or resume service during an outage. You do not have to end your current data-copy session. You can suspend the session, then restart it. Only data that changed during the outage needs to be resynchronized between the copies.

The z/OS Global Mirror function is an optional function. To use it, you must purchase the remote mirror for z/OS 2244 function authorization model, which is 2244 Model RMZ.

#### z/OS Metro/Global Mirror (3-site z/OS Global Mirror and Metro Mirror)

This mirroring capability uses z/OS Global Mirror to mirror primary site data to a location that is a long distance away and also uses Metro Mirror to mirror primary site data to a location within the metropolitan area. This enables a z/OS 3-site high availability and disaster recovery solution for even greater protection from unplanned outages.

The z/OS Metro/Global Mirror function is an optional function. To use it, you must purchase both of the following functions:

- Remote mirror for z/OS (2244 Model RMZ)
- Remote mirror and copy function (2244 Model RMC) for both the primary and secondary storage units

## FlashCopy

The IBM TotalStorage FlashCopy feature provides a point-in-time copy capability for logical volumes. FlashCopy creates a physical point-in-time copy of the data, with minimal interruption to applications, and makes it possible to access immediately both the source and target copies.

The primary objective of FlashCopy is to create a copy of a source volume on the target volume. This copy is called a point-in-time copy. When you initiate a FlashCopy operation, a FlashCopy relationship is created between the source volume and target volume. A FlashCopy relationship is a "mapping" of a FlashCopy source volume and a FlashCopy target volume. This mapping allows a point-in-time copy of the source volume to be copied to the target volume. The FlashCopy relationship exists between the volume pair from the time that you initiate a FlashCopy operation until the DS8000 copies all data from the source volume to the target volume or until you delete the FlashCopy relationship, if it is a persistent FlashCopy.

The point-in-time copy that is created by FlashCopy is typically used when you need a copy of the production data to be produced with minimal application downtime. It can be used for online back up, testing of new applications, or for creating a database for data-mining purposes. The copy looks exactly like the original source volume and is an instantly available, binary copy.

FlashCopy supports the following copy options:

### Data Set FlashCopy

Data Set FlashCopy allows a FlashCopy of a data set in a zSeries environment.

#### Multiple relationship FlashCopy

Multiple relationship FlashCopy allows a source to have FlashCopy relationships with multiple targets simultaneously. This flexibility allows you to establish up to 12 FlashCopy relationships on a given logical unit number (LUN), volume, or data set, without needing to first wait for or cause previous relationships to end.

### Refresh target volume (also known as incremental FlashCopy)

Refresh target volume provides the ability to "refresh" a LUN or volume involved in a FlashCopy relationship. When a subsequent FlashCopy operation is initiated, only data that updates the target and the source to the same point-in-time state is copied. The direction of the "refresh" can also be reversed. The LUN or volume that was defined as the target can now become the source for the LUN or the volume that was defined as the source (now the target).

### Persistent FlashCopy

Persistent FlashCopy allows the FlashCopy relationship to remain even after the FlashCopy operation completes. You must explicitly delete the relationship.

### Establish FlashCopy on existing Remote Mirror and Copy source

The establish FlashCopy on an existing Remote Mirror and Copy source volume option allows you to establish a FlashCopy relationship where the target volume is also the source of an existing remote mirror and copy source volume. This enables you to create full or incremental point-in-time copies at a local site and then use remote mirroring commands to copy the data to the remote site.

This feature is represented by the **Establish target on existing Metro Mirror source** selection in the GUI.

### **Consistency group commands**

Consistency group commands allow the DS8000 to freeze I/O activity to a LUN or volume until you issue the FlashCopy consistency group command. Consistency groups help create a consistent point-in-time copy across multiple LUNs or volumes, and even across multiple DS8000 systems. This function is available through the use of command-line interface commands.

### Inband commands over remote mirror link

In a remote mirror environment, inband commands are issued to a source volume of a remote mirror and copy volume pair on a local storage unit and sent across paths (acting as a conduit) to a remote storage unit to enable a FlashCopy pair to be established at the remote site. This eliminates the need for a network connection to the remote site solely for the management of FlashCopy. This function is available through the use of command-line interface commands.

# **Disaster recovery using Copy Services**

One of the main reasons for using Copy Services functions is in preparation for a possible disaster by backing up, copying, and mirroring your data at the production and recovery sites.

You can create a disaster recovery solution using any of the following functions. These functions help improve a disaster recovery process by allowing a much shorter recovery time with little or no data loss.

Note: In a remote mirror and copy environment, when two storage units are set up in two geographically distinct locations, we refer to the sites as Site A (the production site) and Site B (the recovery site).

### Failover and failback operations

A failover is the process of temporarily switching production to a backup facility (normally your recovery site) following a planned outage, such as a scheduled maintenance period or an unplanned outage, such as a disaster. A failback operation is the process of returning production to its original location. These operations use remote mirror and copy functions to help reduce the time that is required to synchronize volumes after sites are switched during planned or unplanned outages.

#### **Global Mirror**

The Global Mirror function provides a two-site extended distance remote copy option for disaster recovery and backup solution for the zSeries and open systems environments. This solution is based on existing Global Copy and FlashCopy functions. With Global Mirror, the data that the host writes to the storage unit at the production site is asynchronously shadowed to the storage unit at the recovery site. Global Mirror operates over high-speed, Fibre Channel communication links and is designed to maintain a consistent and restartable copy of data at a recovery site that can be located at virtually unlimited distance from the production site.

# **Comparison of licensed functions**

A key decision that you must make in planning for a disaster is deciding which licensed functions to use to best suit your environment.

Table 2 provides a brief summary of the characteristics of the Copy Services features that are available for the storage unit.

Table 2. Comparison of licensed functions

Licensed function	Description	Advantages	Considerations
Metro Mirror	Synchronous data copy at a distance	No data loss, rapid recovery time for distances up to 300 km.	Slight performance impact.
Global Copy	Continuous copy without data consistency	Nearly unlimited distance, suitable for data migration, only limited by network and channel extenders capabilities.	Copy is normally fuzzy but can be made consistent through synchronization.
Global Mirror	Asynchronous copy	Nearly unlimited distance, scalable, and low recovery point objective (RPO). The RPO is the time needed to recover from a disaster; that is, the total system downtime.	RPO might grow when link bandwidth capability is exceeded.

Table 2. Comparison of licensed functions (continued)

Licensed function	Description	Advantages	Considerations
z/OS Global Mirror	Asynchronous copy controlled by z/OS host software	Nearly unlimited distance, highly scalable, and very low RPO.	Additional host server hardware and software is required. The RPO might grow if bandwidth capability is exceeded or host performance might be impacted.

## **Parallel Access Volumes**

The use of parallel access volumes (PAVs) enables a single zSeries server to simultaneously process multiple I/O operations to the same logical volume, which can help to significantly reduce device queue delays. This is achieved by defining multiple addresses per volume.

With dynamic parallel access volumes, the assignment of addresses to volumes is automatically managed to help the workload meet its performance objectives and minimize overall queuing.

You must configure both your storage unit and operating system to use PAVs. You can use the logical configuration definition to define PAV-bases, PAV-aliases, and their relationship in the storage unit hardware. This unit address relationship creates a single logical volume, allowing concurrent I/O operations.

The storage unit supports concurrent or parallel data transfer operations to or from the same volume from the same system or system image for S/390 or zSeries hosts. An S/390 with PAV software support enables multiple users and jobs to simultaneously access a logical volume. Read and write operations can be accessed simultaneously to different domains. (The domain of an I/O operation is the specified extents to which the I/O operation applies.)

### **DS8000 limitations**

The following list describes known limitations for the DS8000.

- The 65,520 cylinder 3390 volume is not supported with z/OS Global Mirror and z/OS Metro/Global Mirror.
- The amount of physical capacity within a 2107 system that can be logically configured for use will be enforced by the 2107 licensed machine code (LMC) to maintain compliance with the extent of IBM authorization established for licensed functions activated on the machine. The 2107 LMC will not allow the logical configuration of physical capacity beyond the extent of IBM authorization (except when activating Standby CoD capacity).
- The deactivation of an activated licensed function, or a lateral change or reduction in the license scope, is a disruptive activity and requires a machine IML (Model 921 and Model 922) or reboot of the affected image (Model 9A2). A lateral change is defined as changing the license scope from fixed block (FB) to count key data (CKD) or from CKD to FB. A reduction is defined as changing the license scope from all physical capacity (ALL) to only FB or only CKD capacity.
- · The following activities are disruptive:

- Model conversions. In addition, data may not be preserved during the model conversion.
- Field attachment of the first Model 92E expansion unit to a Model 922.
- Field attachment of the first Model 9AE expansion unit to a Model 9A2.
- Removal of an expansion unit model from the base unit model. Data may not be preserved during this activity.
- Some DS8000 functions are not available or supported in all environments. You can find current information about supported environments, prerequisites, and minimum operating systems levels at the following IBM Web site: http://www.ibm.com/servers/storage/disk/ds8000/interop.html

# Planning data migration

The planning and methods of data migration for the DS8000 vary by environment. The DS8000 supports over 90 operating systems. You can migrate data to a storage unit from these host and operating system environments.

When you plan for data migration, consider the following factors:

Note: The following lists do not cover every possibility. They provide a high-level view of some of the tools and factors that you can consider when moving data.

- · The system:
  - Is it UNIX based? You will probably use some variation of a logical volume manager.
  - Is it a zSeries or S/390? You will probably use IBM® TotalStorage® Global Mirror, Remote Mirror and Copy (when available).
  - Is it z/OS? You will probably use DFDSS, though there are many choices.
  - Is it VM? You might use DASD Dump Restore or PTAPE.
  - Is it VSE? You might use the VSE fastcopy or ditto commands.

Your system administrator selects the data migration method that is the best compromise between efficiency and impact on the users of the system.

- The storage unit:
  - Are the storage units involved the same with the same level of licensed management code?
  - Are the storage units different? In which case you want to ensure that the new configuration is large enough to accommodate the existing data. You also want to ensure that the virtual disks are similar in configuration to the disk drives that they are replacing.
- · Time and complexity involved:
  - Typically data migration requires that updates or changes cease while the movement occurs. Also, depending on the amount of data that you are moving and your migrating method, data could be unavailable for an extended period of time, perhaps several hours.
  - Could the complexity and time involved require the services of IBM through International Global Services? Contact your IBM representative for more information.

# How to select a data migration method

Your system administrator selects the data migration method that is the best compromise between efficiency and impact on the users of the system.

Most methods of data migration affect the everyday operation of a computer system. When data is moved, the data must be in a certain state, typically requiring that updates or changes cease while the movement occurs. Depending on the amount of data that you are moving and your migrating method, data could be unavailable for an extended period of time, perhaps several hours. The following factors might contribute to the migration time:

- Creating new logical volumes or file systems
- · Modifying configuration files
- · Receiving integrity checks

The following items are more than likely among the topics considered by your system administrator to determine the best method to use to migrate your data:

- Management software provides simple robust methods that you can generally use during production without disturbing users.
- The AIX logical volume manager (LVM) provides methods that you can use at any time without disrupting user access to the data. You might notice a small performance degradation, but this is preferable to shutting down databases or requiring users to log off the system.

#### Notes:

- AIX and HP-UX 11.xx ship with logical volume management (LVM) software as part of the base operating system. LVM provides complete control over all disks and file systems that exist on an AIX system. HP-UX has similar volume management software.
- Sun Microsystems has a basic volume management product called Solstice, which is available for the Solaris systems.
- Linux systems also use the LVM.
- Methods that use backup and restore procedures generally have the most impact on the system usage. They require that databases and file systems be in quiescent states to ensure a valid snapshot of the data.

# Chapter 2. Installing and removing the CLI

On most systems you can install and remove the DS command-line interface (CLI) using silent mode, console mode, or by using a GUI application.

## Supported operating systems for the DS command-line interface

The DS command-line interface (CLI) can be installed on these operating systems.

- AIX 5.1, 5.2, 5.3
- HP-UX 11i v1. v2
- HP Tru64 version 5.1, 5.1A
- Linux (RedHat 3.0 Advanced Server (AS) and Enterprise Server (ES)
- SUSE Linux SLES 8, SLES 9, SUSE 8, SUSE 9
- Novell Netware 6.5
- OpenVMS 7.3-1, 7.3-2
- Sun Solaris 7, 8, 9
- · Windows 2000, Windows Datacenter, Windows 2003, and Windows XP

Note: The DS CLI cannot be installed on a Windows 64-bit operating system.

## **DS CLI operational limitations**

There are operational limitations associated with the use of the DS CLI.

These are described as follows:

 Volumes in the same volume space, logical subsystem (LSS), logical control unit (LCU), or address group cannot be of mixed type. They must be either fixed block or count key data (CKD).

**Note:** The volume space is called an extent pool. An extent pool contains one or more ranks of a common storage type (fixed block or CKD).

 Logical subsystems cannot be created using the DS CLI. A fixed block LSS is automatically created when your first fixed block volume is assigned to the LSS address space. A fixed block LSS is automatically deleted when the last fixed block volume is removed from an LSS address space.

**Note:** You can use DS CLI commands to create, modify, and delete logical control units (LCUs), which are the CKD volume equivalent of a fixed block LSS.

A maximum of 256 volumes for each logical subsystem can be defined.

# Preparing for the IBM TotalStorage DS CLI installation

The IBM TotalStorage DS CLI program enables open systems hosts to invoke and manage FlashCopy and Metro and Global Mirror functions through batch processes and scripts. You can choose to install the DS CLI interface using the silent mode, console mode, or graphic mode. The mode of installation that you choose is often dependent on system configuration.

Before you install the DS CLI, be aware of the following requirements:

· The DS CLI can be installed on only one of the following supported operating systems:

Supported Host Systems	Installation File Name
IBM AIX (5.1, 5.2, 5.3)	setupaix.bin
Hewlett-Packard-UX (11.0, 11i, v1, v2)	setuphp1020.bin or setuphp11x.bin
Linux (Red Hat 3.0 Advanced Server (AS) and Enterprise Server (ES) )	setuplinux.bin
SUSE Linux SLES 8, SLES 9, SUSE 8, SUSE 9	setuplinux.bin
Sun Solaris (7, 8, 9)	setupsolarisSparc.bin
HP Tru64 (5.1, 5.1A)	setupgenericunix.sh
Novell Netware 6.5	setupwin32.exe
iSeries OS/400 5.2	Add -os400 at a command line after the name of the installation file. For example, setupaix.bin -os400
Windows 2000, Windows Datacenter, Windows 2003, and Windows XP	setupwin32.exe
UNIX users that do not have an X display	setupos.bin -console
<b>Note:</b> Use the same installation file name for your host operating system as shown in the rows above, but add the -console parameter after the installation file name. For example:	<b>Note:</b> Where <i>os</i> represents the name of your operating system as shown in the rows above.
setupaix.bin -console	
setuplinux.bin -console	

- The DS CLI cannot be installed on a Windows 64-bit system.
- You must have Java 1.4.1 or later installed on your machine. The installation program checks for this requirement during installation and does not install the DS CLI if you do not have Java 1.4.1 or later.

Note: The DS CLI installation CD-ROM contains Java 1.4.1, which you can install if your system is not equipped with this version of Java.

- OS/400 installation tips:
  - Ensure that the machine that you use to install DS CLI onto a machine that is running OS/400 is network-attached to the OS/400 machine and is a supported platform for DS CLI. It is not possible to install the DS CLI program directly onto a machine that is running OS/400.
  - Provide the machine name, username, and password when prompted.
- · You must use the ksh (Korn shell) or bash (Bourne again shell) shell if you are installing on a HP Tru64. Installshield does not support the sh shell. You must perform all HP Tru64 installations using the setupgenericunix.sh file that is located on the installation compact disc.
- The installation process installs the DS CLI in the following default directory:

AIX /opt/ibm/dscli HPUX /opt/ibm/dscli Linux /opt/ibm/dscli

#### Sun Solaris

/opt/ibm/dscli

#### **Windows**

C:\Program Files\IBM\dscli

#### HP Tru64

/opt/ibm/dscli

#### **Novell Netware**

SYS:\dscli

Perform the following steps in preparation for the DS CLI installation:

- 1. Log on to your host system as a root user or administrator.
- 2. Insert the DS CLI product CD into the CD drive. If a window opens for the CD drive, close the window.
- 3. Mount the CD drive using the **mount** command according to your system. You can mount your CD drive using the following examples:
  - AIX Create a directory for the CD-ROM by issuing the following command:

```
mkdir /cdrom -p
```

Create a file system for the CD-ROM by issuing the following command:

```
crfs -v cdrfs -p ro -d cd0 -m /cdrom
```

where cd0 is represents the CD-ROM drive.

Mount the CD-ROM file system by issuing the following command:

mount /cdrom

**HPUX** Mount the CD-ROM file system using the path name for your environment by issuing the following commands:

```
ioscan -funC disk | more
mount /dev/dsk/c?t?d? /<cdrom>
```

**Linux** Issue the following command on Red Hat systems:

mount /dev/cdrom

#### **Sun Solaris**

Issue the following command:

```
mkdir /mnt
mount -F hsfs -r /dev/dsk/c0t6d0s2 /mnt
```

**Note:** The device name /dev/dsk/c0t6d0s2 is the default name for Sun Solaris. The device name might be different on your system depending on your hardware configuration.

#### Windows

You are not required to mount the CD if you are using this operating system.

## HP Tru64

Issue the following command:

```
mount -t cdfs -o noversion /dev/rznn /mnt
```

where nn represents the number of CD-ROM drives.

#### **Novell Netware**

You are not required to mount the CD if you are using this operating

4. Navigate to your CD drive and proceed with either the silent, console, or graphic installation.

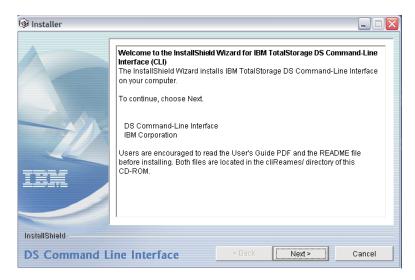
## Installing the IBM TotalStorage DS CLI using graphical mode

Users of Windows, Novell, or UNIX systems can use the DS CLI graphical mode to install the DS CLI.

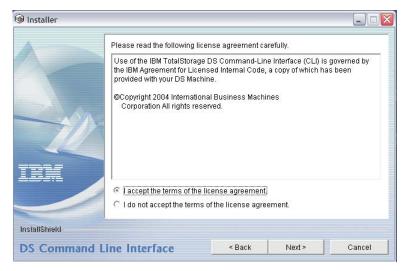
You can install the IBM TotalStorage DS CLI using the graphical mode with the help of an installation wizard. Ensure that your system has the correct version of Java (Java 1.4.1) or higher and perform the following steps to install the DS CLI using the graphical mode.

#### Note:

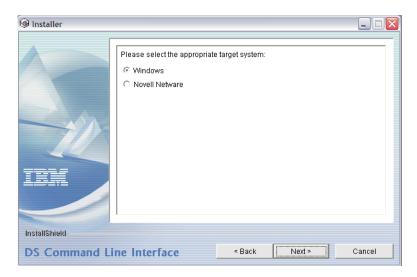
- The installation process stops if the correct version of Java is not found. However, the DS CLI installation CD contains the Java 1.4.1 version. You can install this version on your system and continue with the installation of the DS CLI.
- · If you are installing on a Novell system, you are directed to provide information about where your Windows drive is mapped and where the JAVA HOME location is located.
- You cannot install the DS CLI on a Windows 64-bit operating system.
- If you are installing onto an OS/400 system, ensure that the machine that you are installing from is network-attached to the OS/400 machine.
- Ensure that your Internet browser has animations turned on if you want to observe the installation progress bars that are associated with the installation of the DS CLI. Use the following instructions for your specific browser:
  - Internet Explorer
    - 1. From the **Tools** menu, select **Internet Options**.
    - 2. Select the Advanced tab and scroll down to the Multimedia section.
    - 3. Check Play animation in web pages.
  - Netscape
    - 1. From the **Edit** menu, select **Preferences**.
    - 2. Double-click on Privacy and Security.
    - 3. Select Images and select as many times as the image specifies in the **Animated image should loop** section.
- 1. Start the setup file that is appropriate for your operating system. If you are ultimately installing onto an OS/400 system, add -os400 to your command that includes the setup file. For example, setupwin32.exe -os400
- 2. The Welcome window is displayed. Click Next to continue or Cancel to exit the installation.



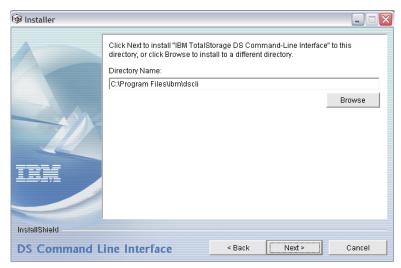
3. The License Agreement window is displayed. Select "I accept the terms of this license agreement" to continue. Click "I do not accept the terms of this license agreement" or Cancel to exit the installation.



4. The User's window is displayed. Select the appropriate target system where you want the DS CLI installed, and then click **Next** to continue or **Cancel** to exit the installation.

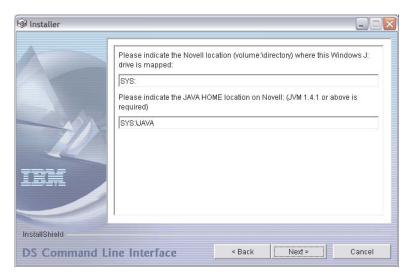


5. The Installation Location window (Windows has been selected as your system) is displayed. If you selected Novell, go to the next step. If you are satisfied with the default directory, click Next. If not, type the directory path where you want to install the DS CLI and click Next. Try to avoid using white spaces in the installation path. Click Cancel if you want to exit the installation.

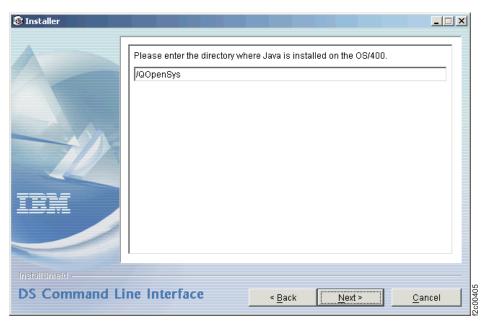


**Note:** If you are installing onto an OS/400 system, a window asking for the directory where Java is installed on the OS/400 is displayed when you click **Next**. Go to Step 7 on page 31.

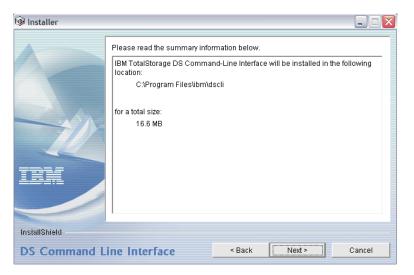
6. The Novell Location window is displayed. Complete the information for where the Windows drive is installed and where JAVA HOME is located. Click **Cancel** if you want to exit the installation.



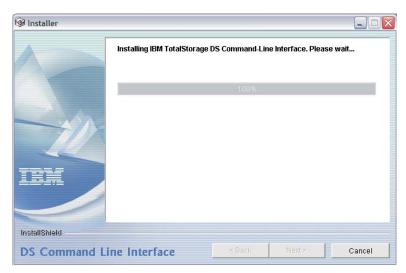
7. The Java directory window for OS/400 is displayed. Insert the directory information. Click **Next** to continue or **Cancel** to exit the installation.



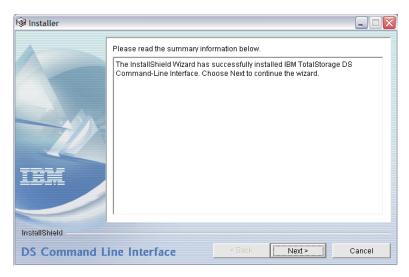
8. The Installation Preview window is displayed. This window displays where the command-line interface will be installed and how much space it will occupy on your drive. Click **Next** to continue or **Cancel** to exit the installation. You can change the installation directory by clicking **Back**.



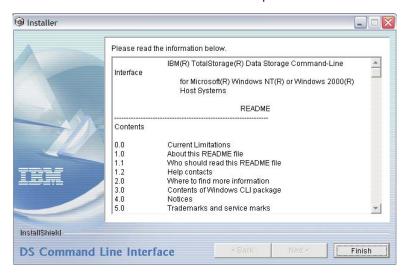
9. The Installation Progress window is displayed. This window displays the progress of the command line interface installation. Click Next to continue or Cancel to exit the installation.



10. The Installation Summary window is displayed. This window displays the installation summary information. Click Next to continue or Cancel to exit the installation.



11. The Installation Complete window is displayed. A reminder is provided in text to read the Readme file. Click **Finish** to complete the installation.



You can verify that the command line interface has installed correctly by reviewing the CLI.CFG file in the lib/ directory.

# Installing the IBM TotalStorage DS CLI using silent mode

The DS CLI can be installed silently (without prompts or feedback) from the command line. You must create an options/response file and use a text editor to change the default selections to a selection of your choosing. Perform these steps to install the DS CLI in silent mode.

**Note:** When you are installing on a Novell system, run the windows installer on a Windows system, select the Novell install option, and then select the destination where the Novell drive is mapped.

- 1. Log on to your system as an administrator.
- 2. Insert the DS CLI installation CD into the CD-ROM drive. If the Installshield starts, click the **Exit** selection to exit.
- 3. Generate the template response file. A response file is provided in the cliReadmes directory of the CD. You can copy it to a directory of your choosing.

The following is an example of an response or options file.

#### Note:

- The response file that you want to edit is included on the DS CLI CD. Open the file with a text editor and modify the default options with the values that you want. If you are installing on a Novell system, you must indicate where the Java code is installed. The Java code must be JVM 1.4.1 or later.
- If your system does not have Java 1.4.1 or later, the installation fails. However, Java 1.4.1 is contained on the DS CLI CD and can be installed on your system. After installation of this Java version, you can continue with the installation of the DS CLI.
- If you are installing on an OS/400 system, the installer prompts you to provide the machine name, user name, and password for the OS/400 machine.

#### Example response file

```
InstallShield Options File Template
# Wizard name: Install
# Wizard source: setup.jar
# Created on: Mon May 09 16:35:04 MST 2005
# Created by: InstallShield Options File Generator
# This file can be used to create an options file (i.e., response file) for the
# wizard "Install". Options files are used with "-options" on the command-line
# to modify wizard settings.
# The settings that can be specified for the wizard are listed below. To use
# this template, follow these steps:
    1. Enable a setting below by removing leading '###' characters from the
    line (search for '###' to find settings you can change).
    2. Specify a value for a setting by replacing the characters '<value>'.
    Read each setting's documentation for information on how to specify its
    value.
    3. Save the changes to the file.
    4. To use the options file with the wizard, specify -options <file name>
    as a command-line argument to the wizard, where <file name> is the name
    of this options file.
# License Agreement State
# The initial state of the License Agreement panel. Legal values are:
    0 - Nothing will be selected
    1 - "I accept the terms of the license agreement." will be selected
    2 - "I do not accept the terms of the license agreement." will be
       selected
# For example, to configure the panel to initially display "I accept the
# terms of the license agreement.", use
# -W license.selection=2
-W license.selection=1
# User Input Field - Win_Novell_select
# This field only has meaning if you are running the installer on Windows.
# You must choose whether it should install the Windows CLI or the Novell
# CLI.
# If you choose Novell, then make sure that the installLocation (see below)
# is on a Novell drive.
    1 - Novell Netware
    2 - Windows
-W win user input.Win Novell select="2"
```

The following is a continuation of the response file found on the installation CD.

```
IBM TotalStorage DS command-line Interface Install Location
# The install location of the product. Specify a valid directory into which the
# product should be installed. If the directory contains spaces, enclose it in
# double-quotes. For example, to install the product to C:\Program Files\My
# Product, use
     -P installLocation="C:\Program Files\My Product"
-P installLocation="C:\Program Files\IBM\dscli"
User Input Field - os400_java_location
# This is only used on OS/400 installations.
### -W os400 java location panel.os400 java location="<value>"
# User Input Field - novell location mapped
# This is only used on Novell installations.
### -W novell user input.novell location mapped="<value>"
# User Input Field - novel_java_location
# This is only used on Novell installations.
### -W novell user input.novel java location="<value>"
```

- 4. Save the modifications to the response file.
- 5. Type the following command for all systems but the OS/400 at the command prompt and press the **Enter** key on your keyboard to start the installation process in silent mode: setup<platform>. <exelbinlsh> -silent -options options.txt
- 6. Type the following command if you are installing onto an OS/400 system and press the **Enter** key on your keyboard to start the installation process in silent mode: setup<platform>. <exelbin|sh> -os400 -silent -options options.txt

You can verify that the command line interface has installed correctly by reviewing the CLI.CFG file in the lib/ subdirectory of the install directory.

# Installing the IBM TotalStorage DS CLI using console mode

UNIX users who do not have an X display primarily use the console mode of installation to install the DS CLI. However, users can also run the installer from a command prompt on a Windows system.

The console mode installer displays its various screens as text. The screens have exactly the same options and information as the GUI installer. Perform the following steps to install the DS CLI using the console mode.

Note:

- The DS CLI install CD-ROM contains the Java 1.4.1 version. You can install this version from the CD and continue with the installation of DS CLI.
- If you are ultimately installing onto an OS/400 system, ensure that the machine that you are installing from is network-attached to the OS/400 machine.
- Ensure that your Internet browser has animations turned on if you want to observe the installation progress bars that are associated with the installation of the DS CLI. Use the following instructions for your specific browser:
  - Internet Explorer
    - 1. From the **Tools** menu, select **Internet Options**.
    - 2. Select the **Advanced** tab and scroll down to the **Multimedia** section.
    - 3. Check Play animation in web pages.
  - Netscape

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- 1. From the Edit menu, select Preferences.
- 2. Double-click on Privacy and Security.
- 3. Select Images and select as many times as the image specifies in the Animated image should loop section.

Use the following steps to install the DS CLI using the console mode:

- 1. Open a command prompt and locate the setupwin32console.exe or, setuplinux.bin file on the DS CLI CD.
- 2. Type the following command on the command line (unless you are installing onto an OS/400 system): setup *platform*<.exe | .bin | .sh> -console

For example, for Windows, type: setupwin32console.exe or, for Linux, type: setuplinux.bin -console

For an installation onto an OS/400 system from a Windows system, type: setupwin32console.exe -os400

#### Note:

- When you issue the setupwin32console.exe command on a Windows system, you do not need to include the -console argument as part of your command.
- If you are installing onto an OS/400 system, you are prompted to provide the OS/400 machine name, user name, and password.
- 3. The Welcome screen is displayed. Press 1 for Next, 3 to Cancel, or 4 to Redisplay.

```
Initializing InstallShield Wizard...
Searching for Java(tm) Virtual Machine...
Searching for Java 1.4.1 by IBM Corporation
Verifying Java 1.4.1 by IBM Corporation
Welcome to the InstallShield Wizard for IBM TotalStorage DS Command-Line
Interface (CLI)
The InstallShield Wizard installs IBM TotalStorage DS Command-Line Interface
on your computer.
To continue, choose Next.
    DS Command-Line Interface
    IBM Corporation
Users are encouraged to read the User's Guide PDF and the README file before
installing. Both files are located in the cliReames/ directory of this
CD-ROM.
Press 1 for Next, 3 to Cancel or 4 to Redisplay [1]
```

4. The License Agreement screen is displayed. Press 1 to accept the terms of the license agreement, and then press 0 to notify the installer that you are finished with this section. Press 1 to continue. The following screen is displayed.

```
Please read the following license agreement carefully.
Use of the IBM TotalStorage DS Command-Line Interface (CLI) is governed by the
IBM Agreement for Licensed Internal Code, a copy of which has been provided
with your DS Machine.
 (C) Copyright 2004, 2005 International Business Machines
     Corporation All rights reserved.
Please choose from the following options:
 ] 1 - I accept the terms of the license agreement.
[ ] 2 - I do not accept the terms of the license agreement.
To select an item enter its number, or 0 when you are finished: [0] 1
[X] 1 - I accept the terms of the license agreement.
[ ] 2 - I do not accept the terms of the license agreement.
To select an item enter its number, or 0 when you are finished: [0]
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

5. The Windows User's screen is displayed if you are installing on a Windows system or are pointing to a Novell system. If you want Windows, press 1. If you want the Novell system, press 2. If you choose 1 or 2, the screen is updated with an X next to the system that you selected. Press 0 to notify the installer that you are finished with this section, and then press 1 to continue.

```
Please select the appropriate target system:
[X] 1 - Windows
[ ] 2 - Novell Netware
To select an item enter its number, or 0 when you are finished: [0]
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

6. The Installation Location screen (Windows was selected) is displayed. (If you selected Novell, go to the next step). If you are satisfied with the directory shown in brackets, press 1 to continue. If you are not satisfied, enter the directory where you want to install the CLI, and press 1 to continue. Avoid using blank spaces in the path.

```
IBM TotalStorage DS Command-Line Interface Install Location

Please specify a directory or press Enter to accept the default directory.

Directory Name: [C:\Program Files\ibm\dscli]

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

7. If you selected Novell, the following screen is displayed.

#### Note:

- SYS represents where the Windows drive is mapped in a Novell system. However, this could also be SYS:\DS\CLI or a volume other than SYS:
- · J: (could be any drive letter)

```
IBM TotalStorage DS Command-Line Interface Install Location

Please indicate the Novell location (volume:\directory) where this window J:
drive is mapped:

Enter a value: [SYS:]

Please indicate the JAVA HOME location on Novell: (JVM 1.4.1 or above is required)

Enter a value: [SYS:\JAVA]

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

8. If you selected Windows and are installing onto an OS/400, the following screen is displayed:

```
Please indicate the directory where Java is installed on the OS/400

Enter a value: [/QOpenSys]

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

9. The Installation Preview screen is displayed. Depending on your system's current configuration, the total size of the installation can vary. Press 1 to continue.

```
IBM TotalStorage DS Command-Line Interface will be installed in the following location:

C:\Program Files\ibm\dscli

for a total size:

16.6 MB
Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

10. The Installation Progress screen is displayed. Press 1 to continue after the installation completes.

```
Installing command-line Interface. Please wait...
Installing IBM TotalStorage DS Command-Line Interface. Please wait...
Creating uninstaller...
```

11. The Installation Completed screen is displayed. If you are satisfied with the installation, press 1 to continue.

```
The InstallShield Wizard has successfully installed IBM TotalStorage DS
Command-Line Interface. Choose Next to continue the wizard.
Press 1 for Next, 3 to Cancel or 4 to Redisplay [1]
```

12. The Readme screen displays. It contains specific information about the DS CLI for your operating system. Press Enter to read the readme information or press 3 to finish the installation process. If you press Enter, you must press q to guit the readme and then press 3 to finish the installation process.

Note: If you are installing on a Windows system, you might have to restart your system. If this is the case, the following window is displayed and you must complete the next step.

```
To complete the installation you must restart your computer.
      [X] 1 - Yes, restart my computer.
     [] 2 - No, I will restart my computer at a later time.
To select an item enter its number, or 0 when you are finished:
```

13. Select the item you want and press 3 to finish the installation process. Use of the DS CLI application becomes effective with a reboot of your system.

You can verify that the command-line interface has installed correctly by reviewing the CLI.CFG file in the lib subdirectory of the install directory that you defined in Step 6.

# Installing DS CLI on an OpenVMS system

The DS Command-Line Interface (CLI) provides a full function command set that allows you to check your storage unit configuration and perform specific application functions when necessary. It also enables open systems hosts to invoke and manage FlashCopy, Metro and Global Mirror functions through batch processes and scripts.

This topic describes how to install the DS CLI on an OpenVMS system. Additionally, it provides hints for integrating the DS CLI into the operating system environment.

## Preparing to install the DS CLI on an OpenVMS System

The IBM TotalStorage DS CLI program enables open systems hosts to invoke and manage FlashCopy and Metro and Global Mirror functions through batch processes and scripts. The DS CLI is installed on an OpenVMS system by using the Polycenter Software Installation utility.

Be aware of the following requirements before you begin the installation of the DS CLI:

- The installation process places all command-line interface files in the [IBMDSCLI...] directory tree as a subdirectory of the Polycenter destination directory. You can specify this directory by using the PRODUCT INSTALL command with the /DESTINATION=devicename:[directoryname] qualifier. If you omit the device name, the Polycenter installation utility uses your current default device. If you omit the directory name, the Polycenter Software Installation utility uses the [VMS\$COMMON] directory as the default destination directory. If you do not use the /DESTINATION qualifier at all, the utility installs the software in the location that is defined by logical name PCSI\$DESTINATION. If this logical name is not defined, the utility installs the software in SYS\$SYSDEVICE:[VMS\$COMMON].
- Extract and check the Release Notes file from the DS CLI installation package in the root directory of the installation CD.
- Install the required prerequisite patches operating system patches (ECOs) on your OpenVMS host system.
  - The command-line interface installation process automatically installs Java<sup>™</sup> Runtime Environment (JRE) 1.4.2-4 on your host system. The JRE requires several ECOs. For detailed patch information, see the Java SDK v1.4.2 patch installation page at:
  - http://h18012.www1.hp.com/java/download/ovms/1.4.2/sdk1.4.2\_patches.html To download these ECOs, use the HP IT Resource Center (ITRC) database to perform a search for the patches from which you can select. These download steps are described at the Java SDK v1.4.2 patch installation page.
- Ensure that you have at least 140000 blocks (approximately 70 MB) of free space on the installation disk.

# Installing the DS CLI on your OpenVMS system

Use the following steps to install the DS CLI application in your OpenVMS environment.

Before you install the DS CLI application, verify that the prerequisite software and hardware are installed on your system. The installation program checks for prerequisites and stops if any prerequisites are missing.

- 1. Log on to your host system as a user with SYSLCK, SYSNAM, SYSPRV, (or a system UIC), TMPMBX, and CMKRNL privileges.
- 2. Insert the DS CLI product CD-ROM into the CD drive.
- 3. Mount the CD drive. For example, for an IDE CD device DQA0, type the following command: MOUNT /NOASSIST /OVERRIDE=IDENTIFICATION /MEDIA\_FORMAT=CDROM\_DQA0: A message similar to the following is displayed:

```
%MOUNT-I-WRITELOCK,volume is write locked %MOUNT-I-CDROM ISO, : (1 of 1) , mounted on VMS1$DQA0:
```

For a SCSI CD device DKAnnn, type the following command: MOUNT /NOASSIST /OVERRIDE=IDENTIFICATION /MEDIA FORMAT=CDROM DKAnnn: where nnn represents the number that is assigned by the OpenVMS system to your CD device.

4. Type the following command and press Enter to access the command-line interface installation package in the root directory of the CD: DIRECTORY /FULL DQA0: [000000] IBM-AXPVMS-DSCLI-\*.PCSI. Output similar to the following is displayed:

```
Directory DQA0: [000000]
IBM-AXPVMS-DSCLI-V0500-01F96-1.PCSI;1
                                                  File ID: (4,7,0)
Size:
            55.79MB/55.80MB
                                 Owner:
                                           [0,0]
Created:
            9-MAR-2005 04:07:22.25
Revised: 9-MAR-2005 04:09:43.98 (1)
Expires:
           None specified
            No Backup record
Backup:
Effective: None specified
Recording: None specified
Accessed:
            None specified
Attributes: None specified
Modified: None specified
Linkcount: 1
File organization: Sequential
Shelved state:
                   Online
Caching attribute: Writethrough
                   Allocation: 114282, Extend: 0, Global buffer count: 0
File attributes:
                   Version limit: 0, Backups disabled
Record format:
                   Undefined, maximum 0 bytes, longest 0 bytes
Record attributes: None
RMS attributes:
                   None
Journaling enabled: None
File protection:
                   System: RWED, Owner: RWED, Group: RWED, World: RWED
Access Cntrl List: None
Client attributes: None
Total of 1 file, 55.79MB/55.80MB
```

5. Type the following command and press Enter to extract the command-line interface for OpenVMS release notes: PRODUCT EXTRACT RELEASE NOTES DSCLI /SOURCE=DQA:[000000] /FILE=filespec

Note: If you do not use the /FILE qualifier, the release notes are written to the DEFAULT.PCSI\$RELEASE NOTES file in your current default directory. Read the release notes before continuing to ensure that you are equipped with the information that you need to complete your installation successfully.

6. Type the following command and press Enter to invoke the command-line interface installation process: PRODUCT INSTALL DSCLI /SOURCE=DQAO: [000000] /DESTINATION=devicename:[directoryname] /RECOVERY MODE.

After typing this command, a message similar to the following is displayed:

```
The following product has been selected:
  IBM AXPVMS DSCLI V5.0-1F96 Layered Product
 Do you want to continue? [YES]
```

The /DESTINATION qualifier can be omitted from the command. However, IBM recommends that you use the optional /RECOVERY\_MODE qualifier. For a detailed description of all PRODUCT INSTALL command qualifiers and parameters, see the HP OpenVMS System Management Utilities Reference Manual or the OpenVMS online help.

7. Press Enter to continue the installation process. The following configuration options message is displayed:

```
Configuration phase starting ...

You will be asked to choose options, if any, for each selected product and for any products that may be installed to satisfy software dependency requirements.

IBM AXPVMS DSCLI V5.0-1F96: IBM DS Command Line Interface (DS CLI)

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International Business Machines Corporation (IBM)

No PAK

Do you want the defaults for all options? []
```

8. Type No and press Enter to review the installation options.

**Note:** You can type Yes if you have decided to install with the default options. The following CLI license message is displayed after typing Yes or No:

```
License Agreement IBM TotalStorage DS Command-line Interface

Copyright 2005 International Business Machines Corporation
All rights reserved.

Use of the IBM TotalStorage DS Command-line Interface (DS CLI) is governed by the IBM Agreement for Licensed Internal Code, a copy of which has been provided with your DS Machine.

Answer "Yes" to install the DS CLI code. By installing this code, you are certifying that you have read and accept the IBM DS CLI License agreement.

Answer "No" to terminate and exit the IBM DS CLI installation.

Do you want to continue? [YES]
```

**Note:** You can answer Yes if you are using the default options for your installation process.

9. Press Enter to accept the DS CLI license agreement. The following Java license message is displayed:

```
License Agreement HP Java Run-Time Environment for OpenVMS

The IBM DS CLI requires the Java 1.4.2 Java Runtime Environment (JRE). Installing the DS CLI program automatically installs the required JRE. The installed JRE is the intellectual property of and licensed by Hewlett-Packard Company.

You can view the license agreement on the World Wide Web at:

http://h18012.www1.hp.com/java/download/ovms/1.4.2/
rte1.4.2_license.html

Answer "Yes" to install the Java code. By installing this code, you are certifying that you have read and accepted the HP Java License agreement.

Answer "No" to terminate and exit the IBM DS CLI installation.

Do you want to continue? [YES]
```

10. Press Enter to accept the Java license agreement. The command-line interface requires Java 1.4.2 on an OpenVMS Alpha host system. If you answer No, the installation process automatically ends and exits. The following library update warning message is displayed:

```
WARNING: By default the system Help and Message libraries will be updated.

The IBM DS CLI program provides local Help and Help Message library files. By default, the CLI instalation integrates these local libraries into the OpenVMS system Help and Help Message libraries.

To prevent the system libraries from being modified chose to review the installation options and answer "No" when prompted to update the libraries.

Do you want to continue? [YES]
```

11. Press Enter to continue the installation process. The following configuration question is displayed:

```
Would you like the local IBM DS CLI Help and Help Message libraries to be integrated into the OpenVMS system libraries?

If you answer "Yes", the following OpenVMS libraries will be updated:

SYS$COMMON:[SYSHLP]HELPLIB.HLB
SYS$COMMON:[SYSHLP]MSGHLP$LIBRARY.MSGHLP$DATA

If you answer "No", OpenVMS system libraries will not be modified.

In every case, local libraries are available under:

IBMDSCLI$HELP:IBMDSCLI_OVR.HLB
IBMDSCLI$HELP:IBMDSCLI_MESSAGES.MSGHLP$DATA

Modify the system Help and Help Message libraries? [YES]
```

12. Press Enter to confirm the library update option (or type No and press Enter to deny the library update option). The following confirmation message is displayed:

```
Do you want to review the options? [NO]
```

13. Press Enter to confirm and accept all selections. The following installation message with completion status is displayed:

```
Execution phase starting ...

The following product will be installed to destination:
    IBM AXPVMS DSCLI V5.0-1F96
    DISK$V732_ALPHA:[VMS$COMMON.]

Portion done: 0%...10%...20%...30%...60%...70%...80%...90%...100%

The following product has been installed:
    IBM AXPVMS DSCLI V5.0-1F96 Layered Product
```

14. Review the Installation Verification Procedure (IVP) report, which is similar to the following output and check for possible errors:

```
%PCSI-I-IVPEXECUTE, executing test procedure for IBM AXPVMS DSCLI V5.0-1F96 ... dscli -ver IBM DSCLI Version: 5.0.1.96 %PCSI-I-IVPSUCCESS, test procedure completed successfully
```

15. Ensure that the installation completes. When the Polycenter Software Installation utility finishes the command-line interface installation process, you will see a message similar to the following:

```
IBM AXPVMS DSCLI V5.0-1F96: IBM DS Command Line Interface (DS CLI)

Insert the following lines in SYS$MANAGER:SYSTARTUP_VMS.COM:
    @PCSI$DESTINATION:[IBMDSCLI.MGR]IBMDSCLI$STARTUP.COM
    Insert the following lines in SYS$MANAGER:SYSHUTDWN.COM:
    @IBMDSCLI$MANAGER:IBMDSCLI$SHUTDOWN.COM

Users of this product require the following lines in their login command procedure:
    @IBMDSCLI$MANAGER:IBMDSCLI$LOGIN.COM

Release notes for IBM DS CLI available in IBMDSCLI$HELP
```

16. Unmount the CD drive and remove the CD-ROM.

The command-line interface provides program startup, login, and shutdown procedures in the [destinationdir.IBMDSCLI.MGR] directory. The installation process runs the startup and login procedures immediately before invoking the IVP procedure. But for persistent setup, you must integrate the startup, login, and shutdown procedures.

# Using the DS CLI on an OpenVMS system

To use the DS CLI on an OpenVMS system, you must integrate the required IBMDSCLI\$STARTUP.COM and IBMDSCLI\$LOGIN.COM procedures. You can also integrate the optional IBMDSCLI\$SHUTDOWN.COM procedure. This integration is accomplished when you use the OpenVMS persistent setup procedure.

You must add the required IBMDSCLI\$STARTUP.COM procedure to your system startup processes. The IBMDSCLI\$STARTUP.COM procedure defines the logical names that are required for the command-line interface in your system logical name table and installs some images with enhanced privileges. This procedure is intended to be invoked during the system startup.

You also must add the required IBMDSCLI\$LOGIN.COM procedure to your system login processes. The IBMDSCLI\$LOGIN.COM procedure sets up the JRE that is required by the command-line interface and defines the DSCLI command as a foreign DCL command symbol. It is intended to be invoked during the system-wide SYS\$MANAGER:SYLOGIN.COM or user-specific SYS\$LOGIN:LOGIN.COM procedure.

In order to use the DS CLI interface from start to finish in your OpenVMS system, you can add the optional IBMDSCLI\$SHUTDOWN.COM procedure to your system shutdown processes. The IBMDSCLI\$SHUTDOWN.COM procedure performs the removal operations for privileged images and undefines system-wide logical names that are associated with the DS CLI. It is intended to be invoked during the system shutdown process.

 Integrate the IBMDSCLI\$STARTUP.COM procedure into your system startup by adding the following line to the SYS\$MANAGER:SYSTARTUP\_VMS.COM script: \$ @destinationdev:[destinationdir.IBMDSCLI.MGR] IBMDSCLI\$STARTUP

#### destinationdev

Specifies the name of the device that contains the command-line interface installation directory

destinationdir

Specifies the name of the directory where you just installed the command-line interface.

Note: You can alternatively add the IBMDSCLI\$STARTUP.COM procedure to the SYSMAN startup database.

2. Integrate the IBMDSCLI\$LOGIN.COM procedure into the system-wide or user-specific login by adding the following line:

**\$@IBMDSCLI\$MANAGER:IBMDSCLI\$LOGIN.COM** 

Note: Run the IBMDSCLI\$LOGIN.COM procedure only after you have successfully run the IBMDSCLI\$STARTUP.COM procedure.

3. Integrate the IBMDSCLI\$SHUTDOWN.COM procedure by adding the following line to the SYS\$MANAGER:SYSHUTDOWN.COM script:

**\$@IBMDSCLI\$MANAGER:IBMDSCLI\$SHUTDOWN** 

Note: This step is optional. However, processing this step allows your system to make the full use of the DS CLI application.

# Removing the DS CLI from an OpenVMS system

The removal of the DS CLI application from an OpenVMS system requires not only a removal from your main system but also a removal from your startup, login, and shutdown processes.

Perform the following steps to remove the CLI from your OpenVMS system:

- Log on to your host system as a user with SYSLCK, SYSNAM, SYSPRV (or a system group UIC), TMPMBX, and CMKRNL privileges.
- 2. Type the following command at the command prompt to start the uninstallation process: PRODUCT REMOVE IBMDSCLI.

A message similar to the following is displayed:

```
The following product has been selected:
   IBM AXPVMS DSCLI V5.0-1F96
                                           Layered Product
Do you want to continue? [YES]
```

3. Press Enter to confirm the uninstallation. The following uninstallation confirmation message with completion status is displayed:

```
The following product will be removed from destination:
   IBM AXPVMS DSCLI V5.0-1F96
                                          DISK$V732 ALPHA: [VMS$COMMON.]
Portion done: 0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
```

4. When the uninstallation process ends, a message similar to the following is displayed:

```
The following product has been removed:
   IBM AXPVMS DSCLI V5.0-1F96
                                       Layered Product
```

4. 5. Remove the command-line interface startup, login, and shutdown functions from your system startup, login, and shutdown processes.

# **Completing DS CLI postinstallation**

Perform these tasks to set up the DS CLI application so that you can use the DS CLI to configure your DS8000.

You must install the DS CLI before you complete these postinstallation tasks.

After you install the DS CLI application, how do you log into the application? After the initial login, what are some of the first tasks you must accomplish before you can get the full benefit of the DS CLI application? The instructions in this section answer these questions, as well as, describe how to configure your volumes and how to manage potential problems.

- 1. Initiate the DS CLI to begin using it in either single-shot, script, or interactive command mode.
- 2. Set up your required user accounts and passwords.
- 3. Set your DS CLI default configuration settings.
- 4. Activate your machine and feature license codes.
- 5. Enable the remote support and call home functions. You must provide customer contact and network information to enable these functions.
- 6. Register for the My Support service.
- 7. Configure new fixed block storage. Use the DS CLI to create and modify fixed block extent pools, arrays, volumes, and volume groups. You can also configure host ports and connections.

## Using the DS CLI application

Your DS8000 model is ready for you to begin using the DS CLI application after it is installed. There are three command modes available to you.

You must log into the DS CLI application to use the command modes. There are three command modes for the DS CLI:

- Single-shot
- · Interactive
- Script

### Logging into the DS CLI application

You must log into the DS CLI application to use any of the command modes.

You must ensure that you are in the directory where you installed the DS CLI application. The following list provides a reminder of the supported operating systems default directories where the DS CLI is installed if the directory designation is not changed:

AIX /opt/ibm/dscli

HPUX /opt/ibm/dscli

Sun Solaris

/opt/ibm/dscli

Windows

C:\Program Files\IBM\dscli

HP Tru64

/opt/ibm/dscli

#### **Novell Netware**

SYS:\dscli

When you log into the DS CLI application (type dscli at the command prompt), you must provide the following information:

HMC1 - Specify the primary management console.

Note: If you are using 2105 models as part of your network and are going to use the Copy Services functions, you must specify the IP address of the domain control server where you have installed the DS CLI application.

- · User Name Specify the name of the user account. The default account for the first login is admin.
- Password Specify the user password. The default password for the admin account is admin. However, this password is only good for your first login.

Note: Because the password for the admin account is expired when you log in for the first time, you must change the password before you can perform any other DS CLI command function. Use the chuser command to change your password.

The first time that you log in to the DS CLI, you can specify this information using either of the following two methods:

- Ensure you are in the directory where you installed the DS CLI application and type the dscli command at the command prompt. Supply all the log in information with the command. For example: dscli -hmc1 mtc032h.storage.tucson.ibm.com -user admin -passwd topn0t. Use this command when you use the single-shot mode for the first time and when the DS CLI application is not active on your system. In addition, when you use the single-shot mode, you must include the command that you want to process. For example, if you want to process the Issi command, if you have not activated the DS CLI application, and if you are using the single-shot mode type: dscli -hmc1 mtc032h.storage.tucson.ibm.com -user admin -passwd topn0t lssi.
- Supply the log in information in a profile configuration file (for additional information, see the topic "Default configuration setup with a profile file"). When you log into the DS CLI application (from the directory where you installed the DS CLI application) by typing dscli, you are prompted to supply the information for HMC1, user name, and password.

### Using the DS CLI single-shot command mode

Use the DS CLI single-shot command mode if you want to issue an occasional command but do not want to keep a history of the commands that you have issued.

You must supply the login information and issue the command that you want to process at the same time. Use the following example to use the single-shot mode:

- 1. Enter dscli -hmc1 mtc032h.storage.tucson.ibm.com -user admin -passwd topnOt lssi
- 2. Wait for the command to process and display the end results.

### Using the DS CLI script command mode

Use the DS CLI script command mode if you want to issue a sequence of DS CLI commands. Administrators can use this mode to create automated processes; for example, establishing remote mirror and copy relationships for volume pairs.

- The DS CLI script can contain only DS CLI commands. Use of shell commands results in a process failure.
- You can add comments to the scripts. Comments must be prefixed by the number sign (#); for example, # This script contains PPRC Path establish procedures.

**Note:** It is not the intent of this instruction to tell you how to write a script. An example script is displayed for your use as a guide.

You can issue the DS CLI script from the command prompt at the same time that you provide your login information.

- Type the script name at the command prompt using the following format: dscli
   -hmc1 mtc032h.storage.tucson.ibm.com -user admin -passwd tucs0n -script
   ~/bin/mkpprcpairs
- 2. Wait for the script to process and provide a report regarding the success or failure of the process.

Here is an example script that could be used to establish remote mirror and copy relationships for volume pairs.

```
mkpprc -dev IBM.2107-1303561 -remotedev IBM.2107-7504491 -type mmir 1000-103F: 2300-233F
mkpprc -dev IBM.2107-1303561 -remotedev IBM.2107-7504491 -type gcp 1100-113F: 2340-237F
mkpprc -dev IBM.2107-1303561 -remotedev IBM.2107-7504491 -type mmir 1800-187F: 2800-287F
mkpprc -dev IBM.2107-1303561 -remotedev IBM.2107-7504491 -type gcp 1200-127F: 2500-257F
mkpprc -dev IBM.2107-1303561 -remotedev IBM.2107-7504491 -type mmir 1040-1054: 2700-2714
mkpprc -dev IBM.2107-1303561 -remotedev IBM.2107-7504491 -type gcp 1055-107F: 2400-242A
mkpprc -dev IBM.2107-1303561 -remotedev IBM.2107-7504491 -type mmir 1140-117F: 2600-263F
```

### Using the DS CLI interactive command mode

Use the DS CLI interactive command mode when you have multiple transactions to process that cannot be incorporated into a script. The interactive command mode provides a history function that makes repeating or checking prior command usage easy to do.

In addition to being able to enter DS CLI commands at the DS CLI command prompt, a history function provides a view of the last four DS CLI commands that you have used. It also allows you to repeat any of the last four commands more quickly than having to type out the entire command. The example at the end of this process shows how the history function works.

1. Log on to the DS CLI application at the directory where it is installed.

**Note:** If you should make a mistake and type the wrong user name or password, do not try to correct this within the current session. Exit the DS CLI session you are in and log in to a new DS CLI session.

2. Provide the information that is requested by the information prompts. The information prompts might not appear if you have provided this information in your profile file. The command prompt switches to a **dscli** command prompt.

3. Begin using the DS CLI commands and parameters. You are not required to begin each command with dscli because this prefix is provided by the dscli command prompt.

To use the DS CLI history function that is associated with the interactive command mode, perform the following steps:

- 1. Issue an exclamation mark (!) to display CLI commands that you have used in the current session. For example: dscli>! a list of commands is displayed such as the following:
  - [4] lsarraysite -dev IBM.2107-1300771
  - [3] lsarray -dev IBM.2107-1300771
  - [2] lsextpool -dev IBM.2107-1300771
  - [1] lsextpool -dev IBM.2107-1300771
- 2. Issue dscli>!1 to retry the last command. Or, issue dscli>!3 to retry the third last command.

## Setting up user accounts

This scenario describes how to set up a user account. You must have administrator authority to enable this function.

The admin account is set up automatically at the time of installation. It is accessed using the user name admin and the default password admin. This password is temporary and expires after its initial use. You must change the password before you can use any of the other functions. There are 7 groups the administrator can assign to a user. The groups and the associated functions allowed by the assignment are as follows:

#### admin

All users that you assign to the administrator user group allows access to all management console server service methods and all storage image resources.

#### op volume

The volume operator user group allows access to service methods and resources that relate to logical volumes, hosts, host ports, logical subsystems, logical volumes, and volume groups, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

#### op storage

The storage operator user group allows access to physical configuration service methods and resources, including storage complex, storage image, array, rank, and extent pool objects. This user group inherits all the authority of the op\_copy\_services and monitor user groups, excluding security methods.

### op\_copy\_services

The copy services operator user group allows access to all Copy Services service methods and resources, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

#### service

The service user group includes monitor authority, plus access to all management console server service methods and resources, such as performing code loads and retrieving problem logs.

#### monitor

The monitor user group allows access to list and show commands. It provides access to all read-only, nonsecurity management console server service methods and resources.

#### no access

The no access user group does not allow access to any service methods or storage image resources. By default, this user group is assigned to any user account in the security repository that is not associated with any other user group.

**Note:** A user can be assigned to more than one user group.

In addition to assigning users to one or more user groups, you also must assign a default password to each user. When you notify users of their group assignment and default password, indicate that the default password is only good for the initial log on. Users must change the password at the time of their initial log on. Also, remind all users to record their password in a safe place, because there is no way that the administrator or the application can retrieve a password.

**Note:** You must change the default password for an account, including the **admin** account, to be able to use any CLI command other than the one to change the password. See the chuser command for more information.

Use the mkuser DS CLI command to create new user accounts with specific roles (user group or groups) and an initial password. If you assign multiple roles to an account, ensure that you separate the different roles by using a comma for example, op\_volume, op\_storage. See the mkuser command description for more details.

- 1. Log into the DS CLI application in interactive command mode.
- 2. Issue the following command from the dscli command prompt to assign a user to an account with a default password: dscli>mkuser -pw AB9cdefg -group service,op\_copy\_services testuser
- 3. Press Enter and observe the processing result. A successful process returns the following display:

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
Version 5.0.0.0 DS: IBM.2107-75FA120
User Name testuser successfully created.
```

# Default configuration setup with a profile file

You can create default settings for the command-line interface by defining one or more profiles on the system. For example, you can specify the management console (MC) for the session, specify the output format for list commands, specify the number of rows per page in the command-line output, and specify that a banner is included with the command-line output.

If a user enters a value with a command that is different from a value in the profile, the command overrides the profile.

You have several options for using profile files:

- You can modify the default profile. The default profile, dscli.profile, is installed in the profile directory with the software. For example, c:\Program Files\IBM\DSCLI\profile\dscli.profile for the Windows platform and /opt/ibm/dscli/profile/dscli.profile for UNIX and Linux platforms.
- You can make a personal default profile by making a copy of the system default profile as <user\_home>/dscli/profile/dscli.profile. The home directory,
   <user\_home> is designated as follows:
  - Windows system: C:\Documents and Settings\<user\_name>
  - Unix/Linux system: /home/<user\_name>

- · You can create a profile for the storage unit operations. Save the profile in the user profile directory. For example:
  - c:\Program Files\IBM\DSCLI\profile\operation\_name1
  - c:\Program Files\IBM\DSCLI\profile\operation\_name2

These profile files can be specified using the DS CLI command parameter -cfg profile\_name>. If the -cfg file is not specified, the user's default profile is used. If a user's profile does not exist, the system default profile is used.

Note: A password file, generated using the managepwfile command, is located at the following directory: <user\_home>/dscli/security/security.dat.

When you install the command-line interface software, the default profile is installed in the profile directory with the software. The file name is dscli.profile. For example. c:\Program Files\IBM\DSCLI\profile\dscli.profile.

The profile is a text file. Table 3 provides the list of profile variables that can be used to create the profile.

Table 3. Profile variables

Variable	Description	
banner: onloff	Enables or disables the banner that appears before the command output. This variable is equivalent to the command option -bnr.  The command option -bnr overrides this default value.	
delim	Specifies a delimiter character for the format: delim variable. The default character is a comma. This variable is equivalent to the command option -delim. The command option -delim overrides this default value.	
devid	Specifies the storage image ID that is the target for the command. This value is equivalent to the command option -dev. The command option -dev overrides this default value.	
format	Specifies the output format for list commands.	
	Specify one of the following formats:	
	default: Specifies default output.	
	xml: Specifies XML format.	
	<ul> <li>delim: Specifies columnar format. Columns are delimited with the character that you must specify with the delim variable.</li> </ul>	
	stanza: Specifies a horizontal table.	
	This variable is equivalent to command option -fmt. The command option -fmt overrides this default value.	
fullid	Specifies that IDs display in fully qualified format, which includes the storage image ID.	
header: onloff	Enables or disables the headers that display with the columns of data in the list commands. This variable is equivalent to the command option -hdr. The command option -hdr overrides this default value.	
hmc1	Specifies the primary Storage Manager IP address. This variable is equivalent to the command option -hmc1. The command option -hmc1 overrides this default value.	
hmc2	Specifies the secondary Storage Manager IP address. This variable is equivalent to the command option -hmc2. The command option -hmc2 overrides this default value.	

Table 3. Profile variables (continued)

Variable	Description
locale	Specifies the language for the output on the local computer.
	ar: Arabic
	be: Byelorussian
	bg: Bulgarian
	ca: Catalan
	cs: Czech
	• da: Danish
	• de: German
	el: Greek
	en: English
	es: Spanish
	et: Estonian
	fi: Finnish
	fr: French
	gu: Gujarati
	hi: Hindi
	hr: Croatian
	hu: Hungarian
	in: Indonesian
	is: Icelandic
	it: Italian
	iw: Hebrew
	• ja: Japanese
	<ul> <li>kk: Kazakh</li> </ul>
	kn: Kannada
	ko: Korean
	It: Lithuanian
	<ul> <li>lv: Latvian (Lettish)</li> </ul>
	mk: Macedonian
	mr: Marathi
	ms: Malay

Table 3. Profile variables (continued)

Variable	Description
locale, continued	nl: Dutch
	no: Norwegian
	• pa: Punjabi
	• pl: Polish
	pt: Portuguese
	ro: Romanian
	ru: Russian
	sa: Sanskrit
	sh: Serbo-Croatian
	sk: Slovak
	sl: Slovenian
	• sq: Albanian
	sr: Serbian
	sv: Swedish
	• ta: Tamil
	• te: Telugu
	• th: Thai
	tr: Turkish
	uk: Ukrainian
	vi: Vietnamese
	zh: Chinese
paging: onloff	Controls the display of output. If paging is enabled, a limited number of lines of output displays when a command is issued. The lines do not scroll. You must set the number of lines per page with the rows variable. This variable is equivalent to command option -p. The command option -p overrides this default value.
timeout	Set timeout value of client/server synchronous communication.  The unit of the value is second. The default value is 420 seconds. You can set this timeout if the processing of a command ends by timeout due to network or client/server performance issue.
	<b>Note:</b> The command timeout value can be longer than this value because one command can consist of multiple client/server requests.
remotedevid	Specifies the remote storage image ID. This variable is equivalent to the command option -remotedev. The command option -remotedev overrides this default value.
rows	Specifies the number of rows per page of output if the paging variable is enabled. This variable is equivalent to command option -r. The command option -r overrides this default value.
verbose: onloff	Enables or disables verbose output. This variable is equivalent to the command option -v. The command option -v overrides this default value.

# Example

```
#
# DS CLI Profile
#
```

```
# Management Console/Node IP Address(es)
# hmc1 and hmc2 are equivalent to -hmc1 and -hmc2 command options.
#hmc1: 127.0.0.1
#hmc2: 127.0.0.1
# Password filename
   The password file can be generated using mkuser command.
#pwfile: ibmadmin
# Default target Storage Image ID
     "devid" and "remotedevid" are equivalent to
     "-dev storage image ID" and "-remotedev storeage image ID" command options,
     respectively.
#devid: IBM.2107-AZ12341
#remotedevid: IBM.2107-AZ12341
# locale
    Default locale is based on user environment.
#locale: en
# Timeout value of client/server synchronous communication in second.
     DSCLI command timeout value may be longer than client/server communication
     timeout value since multiple requests may be made by one DSCLI command
     The number of the requests made to server depends on DSCLI commands.
    The default timeout value is 420 seconds.
#timeout 420
# Output settings
# ID format of objects:
   on: fully qualified format
   off: short format
fullid: off
# Paging and Rows per page.
# paging enables/disables paging the output per line numbers specified by "rows".
# "paging" is equivalent to "-p on off" option.
# on : Stop scrolling per output lines defined by "rows".
  off: No paging. (default)
\mbox{\# "rows"} is equivalent to "-r\mbox{\#"} option. paging: off
#rows: 24
# Output format type for ls commands, which can take one of the following values:
# default: Default output
        : XML format
   delim : delimit columns using a character specified by "delim"
   stanza : Horizontal table format
# "format" is equivalent to option "-fmt default|xml|delim|stanza".
#format: default
# delimitter character for 1s commands.
#delim:
# Display banner message. "banner" is equivalent to option "-bnr on|off".
# on : Banner messages are displayed. (default)
# off : No Banner messages are displayed.
banner: on
# Display table header for ls commands. "header" is equivalent
```

```
# to option "-hdr on off".
  on : Table headers are displayed. (default)
 off: No table headers are displayed.
header: on
# Display verbose information. "verbose" is equivalent to option "-v on off".
   on : Display verbose information.
   off: No verbose information.
verbose: off
# End of Profile
```

# Activating your machine and feature licenses

Use this scenario to activate your license activation codes. These codes must be activated before any configuration can be applied to your DS8000 network.

The following licenses can be activated depending on your purchase:

- Operating environment license for each storage unit that you own. (This license must be activated.)
- Copy Services, which can consist of the following features:
  - Point-in-time
  - Remote mirror and copy

There are multiple codes associated with these features. To obtain the information that you need to activate these licenses and features in your storage unit, go to the IBM Disk Storage Feature Activation (DSFA) Web site at http://www.ibm.com/storage/dsfa. Download your codes onto a diskette in XML format. You can then import the codes from the XML file when you process the DS CLI applykey command.

Note: In most situations, the DSFA application can locate your 2244 license authorization record when you enter the DS8000 (2107) serial number and signature. However, if the 2244 license authorization record is not attached to the 2107 record, you must assign it to the 2107 record in the DSFA application. In this situation, you need the 2244 serial number (which you can find on the License Function Authorization document).

Use the applykey DS CLI command to activate the licenses for your storage unit. Use the **Iskey** DS CLI command to verify which type of licensed features are activated for your storage unit.

- 1. Log into the DS CLI application in interactive command mode (if you are not already logged in).
- 2. Issue the DS CLI applykey command at the dscli command prompt as follows (this example presumes that your XML file is named "keys" and it resides on a diskette in your A: drive): dscli> applykey -file a:\keys.xml IBM.2107-75FA120
- 3. Press Enter. When the process has completed, the following message is displayed:

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
Version 5.0.0.0 DS: IBM.2107-75FA120
Licensed Machine Code key xxxx, key xxxx successfully applied.
```

- 4. Verify that the keys have been activated for your storage unit by issuing the DS CLI **Iskey** command as follows: 1skey IBM.2107-75FA120
- 5. Press Enter and the following type of report is displayed:

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI
```

Activation Key	Capacity (TB)	Storage Type	Storage Facility Image
Operating Environment	45	All	IBM.2107-75FA120
FlashCopy	23	FB	IBM.2107-75FA120

# Configuring new fixed block storage using the command-line interface

This section describes how you can configure new fixed block storage within a storage image by using the command-line interface.

Before you begin, you must be logged into the DS CLI application in interactive command mode. You must also be connected to a storage image that is used for open systems host system storage.

This section describes the creation of the fixed block storage configuration and then describes the configuration of the storage image SCSI host ports to enable access to fixed block storage. You can run these two basic steps in the reverse order, but it is better to create storage configurations first, thereby creating the media to back up configuration data that is not related to the storage configuration.

Configuring new fixed block storage involves the following processes:

- · Creating fixed block extent pools
- · Creating arrays
- · Creating ranks
- · Associating ranks with extent pools
- Creating fixed block volumes
- Configuring fibre-channel I/O ports
- Creating SCSI host port connections
- · Creating fixed block volume groups

### Creating fixed block extent pools

Creating the fixed block extent pools is the first step in configuring new fixed block storage.

Creating the extent pools before the arrays and ranks saves a processing step. When you create the new ranks, you can assign them to existing extent pools. Otherwise, you must modify each rank object to complete the extent pool ID assignment after the extent pools have been defined.

Each extent pool is defined with the rank group of 0 or 1 and storage type of fb. The minimum requirement if for you to define one extent pool for each rank group and storage type combination. This means that you must make a minimum of two extent pools for a storage unit that contains fixed block storage: one fixed block extent pool per rank group.

Extent pools that are defined for rank group 0 or 1 are assigned an even- or odd-numbered extent pool ID, respectively. Even-numbered extent pools are managed by storage server ID 0. Odd-numbered extent pools are managed by storage server ID 1. Each rank is assigned to one extent pool, therefore, storage server workload is affected by the rank assignments to even- and odd-numbered extent pool IDs. It is better to evenly distribute rank and extent pool allocations in order to keep the storage server workloads balanced.

You can create more than the minimum number of extent pools. For example, you can define unique extent pools for each RAID type (5 or 10) that is configured in a storage image. Or, you can define and name extent pools according to the host system attachments that access the volumes that are created from extent pool extents. You can have the same number of extent pools as ranks.

Use the Isextpool and mkextpool commands to create the fixed block extent pools. You must be logged into the DS CLI application and connected to the storage unit that will be used for open systems host system storage. See the command descriptions for **Isextpool** and **mkextpool** if you need additional information about the commands.

1. Issue the mkextpool the following command to create the fixed block extent pool for rank group 0:

```
dscli> mkextpool -dev IBM.2107-75FA120 -rankgrp 0 -stgtype fb p0000
```

Note: You must change the -dev value to match your the serial number of your system.

2. Press Enter. A successful process displays the following message:

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
```

```
Extent pool P1 successfully created.
```

- Repeat step 1 for rank group 1, if needed.
- 4. Continue to repeat the mkextpool command in step 1 for each extent pool that you want to create. Try to evenly distribute rank and extent pool allocations in order to keep the storage server workloads balanced.
- 5. Verify the extent pool assignments by issuing the Isextpool command when you are done making the extent pools. Use the -I parameter to display a full report for the extent pools that are assigned to the storage unit.

```
dscli> 1sextpool -1
```

# Creating arrays

The creation of arrays is based on the array sites that are associated with the storage unit.

The machine type 2107 storage image storage devices (DDMs) are packaged into storage enclosure pairs. The machine type 2107 contains at least one storage enclosure pair, with a minimum of 16 DDMs. All DDMs that are installed in a storage enclosure pair have identical capacity, rpm (revolutions per minute), and interface characteristics.

The DDMs of a storage enclosure are partitioned into array sites. A machine type 2107 array site consists of eight DDMs, four from each storage enclosure of a storage enclosure pair, two-or-four (eight DDM) array sites per storage enclosure pair. All array sites of a storage enclosure pair have identical capacity, rpm, and interface characteristics, and interface to a common DA pair.

Use the **Isarraysite** and **mkarray** commands to create the arrays. You must be logged into the DS CLI application and connected to the storage unit that will be used for open systems host system storage. See the command descriptions in Chapter 3 of this guide if you need additional information about the Isarraysite and mkarray commands.

- Create a list of array site IDs for all installed array sites with the status "unassigned" by issuing the following Isarraysite command: dscli> lsarraysite -dev IBM.2107-75FA120 -state unassigned
- 2. Press Enter. A report of unassigned array sites is displayed. Use the list to identify unassigned array site capacity, rpm, and device adapter (DA) pair attributes. Record the RAID type for each array site.
- Create an array from each site with the status "unassigned" by issuing the following mkarray command:
   dscli> mkarray -dev IBM.2107-75FA120 -raidtype 10 -arsite \$10
   Repeat this command until all "unassigned" array sites have been assigned to

#### Note:

an array.

- You can specify one or two array sites for Raid types 5 and 10. If there are two array sites, both must be associated with a common DA pair ID. Two array sites must be separated by commas with no blank space in between. Example: S10,S11.
- The new array site inherits the capacity, rpm, interface, and DA pair characteristics of its parent array site. The status of the array is "unassigned" until it is assigned to a rank.

# Creating fixed block volumes

To create fixed block volume groups, you must have the command-line interface prompt, and you must be connected to a storage image that will be used for open systems host system storage.

A storage image contains 64,000 possible logical volumes. The quantity of logical volumes that you can create in a storage image is dependent on the machine type and model, installed raw storage capacity, the configured storage RAID type, and the size or capacity of each volume that is created.

A logical volume consists of one or more data extents that are allocated from a single extent pool. The data type of a volume is inherited from the extent pool extent storage type (fixed block or CKD) characteristic. When a fixed block volume is created, volume attributes are further defined as a standard storage image, OS400-protected, or OS400-unprotected volume type and volume capacity in bytes (512-byte logical blocks). These volume attributes characterize the volume to the host system that will access the volume. Each volume is assigned a volume ID, which is the volume address within the storage image 64 KB address space. Host access to a volume is enabled when the volume ID is assigned to a volume group object.

Use these steps to create fixed block volumes:

- Create a list of fixed block extent pool IDs using the following command. dscli> lsextpool -dev ID -stgtype fb
- 2. Determine which extent pool IDs will be used as the source for the fixed block logical volumes to be created. Extent pool attributes determine the size and quantity of volumes that can be created. The extent pool ID (even/odd) indicates the storage server (0l1) affinity, which dictates that the LSS ID component of the volume ID must be an even or an odd number.
- 3. Create a list of unassigned address groups using the following command. dscli> lsaddressgrp -dev ID

Take the following notes into consideration:

- Determine the defined address group objects (0 F). If the returned list is empty, then all address group objects are available to be defined (0 - 3).
- · Address groups with storage type CKD are not available for the definition of fixed block volumes. Address groups with storage type "FB" and number of defined LSSs less than 16 are available for new fixed block volume ID definition.
- If an undefined address group will be used when creating new fixed block volumes, select the lowest numbered address group that is not defined.
- If you are adding new fixed block volumes to an existing fixed block address group, use the Islss command to identify LSSs that are already defined in the target address group.
- 4. Create 256 fixed block volumes for the specified LSS using the following command. Specify a volume ID that has not been previously defined as a fixed block or CKD volume. Repeat this step for all of the required logical volumes for each LSS.

dscli> mkfbvol -dev ID -extpool ID -cap 8.6 -name DS 1 vol#h -volgrp volume group ID 1000-10FF

Take the following notes into consideration:

- All volumes will have the same type and capacity attributes.
- · -extpool identifies a fixed block extent pool containing available data extents.
- -cap (capacity) is 8.6 GB.
- -name assigns a unique name to the volume. The volume name parameter can include a wild card (#d or #h) that inserts a decimal/hexadecimal volume ID value into a volume name, thereby making volume names unique when multiple volumes are created by one command execution.
- -volgrp (Optional) The use of this parameter is optional at this point in the configuration process. The use of this parameter requires that a volume group ID already exist. It is possible that you have not yet created your volume group IDs. However, if you have created the IDs, you can use the -volgrp parameter to assign the new fixed block volumes to the existing volume group IDs.
- Volume ID 1000-10FF 256 volumes, starting at a fixed address group (1), LSS ID (10), and volume number (00). A volume ID is four hexadecimal characters in the format "llxx", where II specifies an LSS ID (00 - FE) and xx specifies an LSS volume number (00 - FF). A volume ID must be compatible with the extent pool ID that is the specified source for volume data extents. That is, if an extent pool ID is associated with rank group 0/1, then the volume LCU ID must be an even/odd numbered value, respectively.

### Creating fixed block volume groups

To create fixed block volume groups, you must have the command-line interface prompt, and you must be connected to a storage image that will be used for open systems host system storage.

A volume group identifies the set of fixed block logical volumes that are accessible by one or more SCSI host system ports. If you make volume groups prior to making fixed block volumes, then the mkfbvol command -volgrp parameter can be used to assign new fixed block volumes to a target volume group ID. Otherwise, if you make fixed block volumes prior to making volume groups, then use the mkvolgrp

command and the -volume parameter to assign volumes to a new volume group ID, or use the chvolgrp command and the -volume parameter to assign volumes to an existing volume group ID.

SCSI host system access is constrained to the "identified" access mode. For "identified" access mode, a volume group ID is assigned to a SCSI host port. Only those SCSI host ports that are "registered" to a volume group ID are allowed to access the set of logical volumes contained by the volume group.

Logical volumes can be assigned to a volume group when the volume group is created, or the logical volumes can be added (or removed) at a later time. The volume group type determines the maximum number of volumes that can be assigned to a volume group, either a maximum of 256 volumes or a maximum of 64 K volumes. The volume group type must be selected according to the addressing capability of the SCSI host system that will use the volume group.

Create and view fixed block volume groups using the following steps:

- 1. Create a fixed block volume group using the following command. Repeat this command for each volume group that you want to create..
  - dscli> mkvolgrp -dev ID -volume ID1, ID2,... volume group name
  - Use the -type scsi256 flag if the volume group is constrained to 256 volume IDs. Otherwise, a volume group may contain up to 64 K volumes. Use the -type 0s400mask flag if the volume group is constrained to fixed block volume types OS400-protected or OS400-unprotected. Otherwise, the volume group is constrained to the fixed block volume type 2107.
  - The volume group name should describe the SCSI host system ports that will access volumes using this volume group ID. A SCSI host port can access one and only one volume group ID. Multiple SCSI host ports can register to access the same volume group ID. In this case, all host ports have shared access to the set of volumes contained by the volume group ID.
- 2. Create a list of the assigned volume group IDs using the following command. dscli> lsvolgrp -dev ID

If the SCSI host ports have not yet been configured, save the volume group ID for use when you create the SCSI host port. If the fixed block volumes have not yet been defined, save the volume group ID for use when you create fixed block volumes. If the SCSI host ports were configured prior to the volume groups, use the chhostconnect command to modify each SCSI host port that is configured for SCSI host system access. Add the volume group ID to enable host system access to storage image fixed block volumes.

# Configuring fibre-channel I/O ports

Before you begin, you must have the command-line interface prompt, and you must be connected to a storage image that will be used for open systems host system storage.

The storage image supports the fibre-channel host bus adapter (HBA) card type. For machine type 2107, HBA cards are installed in I/O enclosures, each containing up to four HBA cards. Each fibre-channel HBA card contains four I/O ports. The storage image microcode automatically creates one I/O port object to represent each HBA card I/O port. The default fibre-channel I/O port object settings enable SCSI-FCP "identified" access to fixed block volumes. You might have to modify the I/O port object settings to enable SCSI FC-AL access to FB volumes.

Use these steps to configure fibre-channel I/O ports:

- 1. Create a list of fibre-channel port IDs using the following command: dscli> 1sioport -dev ID -type fc
- 2. Identify which I/O port IDs you want to access the fixed block volumes. Configure a minimum of four storage image I/O ports for SCSI host I/O operations. Select ports with physical locations on different host bus adapter (HBA) cards. If possible, locate the HBA cards in different I/O enclosures. Identify the port IDs that you want to configure for SCSI host access.
- 3. Set the specified I/O ports to enable the FCAL topology using the following command. I/O ports are automatically set offline and returned to the online state after configuration changes are applied

```
dscli> setioport -dev ID -topology fc-al port_ID1 ID2...IDn
```

# Creating SCSI host port connections

Before you begin, you must have the command-line interface prompt, and you must be connected to a storage image that will be used for open systems host system storage.

The 2107 supports the "identified" access mode for SCSI host attachments, which requires that all SCSI host ports be identified to a storage image. This is accomplished by creating a SCSI host port object for each SCSI host port that will access storage image fixed block volumes. A SCSI host port object contains attributes that identify the SCSI host system type, the port profile, the port WWPN, the volume group ID that the port will access, and an array of storage image I/O port IDs that the host port will log into for volume access, or an attribute to indicate that all I/O ports can be used for volume access. Object attributes also include a host port description and port nickname. Create one SCSI host port for each port that will access storage image volumes.

Create SCSI host ports using the following command:

```
dscli> mkhostconnect -dev ID -wwname wwpn -profile # -volgrp ID -ioport
ID, ID, ID, ID host name
```

The command specifies the worldwide port name, the fibre-channel communication profile, the volume group ID that this host port is allowed to access, the storage image I/O ports that this port can log in to, and your name for the SCSI host system.

#### Note:

- You can obtain a profile value from the Isportprof command for the host type.
- You do not need to list the volume group.
- Use the chhostconnect command to map volumes to volume groups

### Modifying fixed block volume groups

This scenario describes how to modify fixed block storage within a storage image.

To modify fixed block volume groups, you must have the command-line interface prompt, and you must be connected to a storage image that will be used for open systems host system storage.

Adding volumes to a volume group and removing volumes from a volume group are typical storage management tasks. The volumes that are added to a volume group can be "unassigned" to a volume group, or they can be volumes that are assigned to a volume group but you want to move them to a different volume group. In either case, you are responsible for managing how the volumes are allocated to volume groups and how the volumes are reserved for future allocation. It is better that you maintain "unassigned" volumes in a volume group that is not accessible by any host system, thereby controlling the accessibility of volumes that are reserved for future allocation.

You can assign a fixed block volume to multiple volume groups. This might be necessary for some host system applications. However, damage to volume data can occur if a volume is accessed by different host systems using different file management systems. To assign a fixed block volume to multiple volume groups, perform the following steps:

- 1. Find the fixed block volumes that are to be assigned to a volume group using the following command.
  - dscli> lsfbvol -dev ID -type 2107 | os400-protected | os400-unprotected -extpool ID
  - The command creates a list of all volumes of the specified volume type within the specified extent pool. It includes only the volumes that are contained by the specified storage image.
- 2. Retrieve the current volume group volume map using the following command. dscli> showvolgrp -dev ID volume\_group\_ID
  - The command creates a list of volumes that are assigned to the target volume group.
- 3. Modify the volume group using the following command.

```
dscli> chvolgrp -dev ID -action add | remove | replace -volume
ID, ID, ..., ID volume_group_ID
```

You can add or remove volume IDs to the list in order to add or remove volumes. This command applies the updated volume ID list.

### **DS Command Line Interface**

You can remove the DS CLI using the same modes that are allowed by the operating systems during the installation process. For example, you can use the graphical mode, silent mode, or console mode to install this interface. Conversely, you can remove this interface using the graphical mode, silent mode, or console mode.

The following topics describe the steps required to successfully remove this interface.

# Removing IBM TotalStorage DS CLI from your system using graphical mode

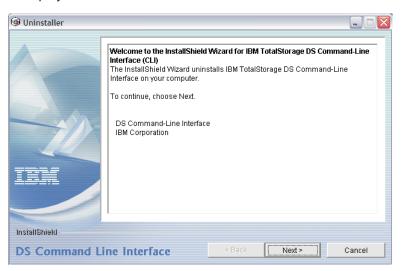
Use the graphical mode to remove the DS CLI from your system when DS CLI is installed on a Windows, Novell, or UNIX system.

**Note:** The following procedure applies only to the removal of the DS CLI application. This procedure cannot be used to remove other versions of CLI.

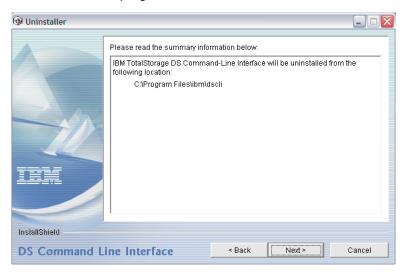
You use the Add/Remove Programs facility of the Windows operating system to remove the DS CLI from your system. When you have processed the uninstall

steps, you need to restart your system to complete the uninstall. Perform the following steps to remove the DS CLI using the graphical mode.

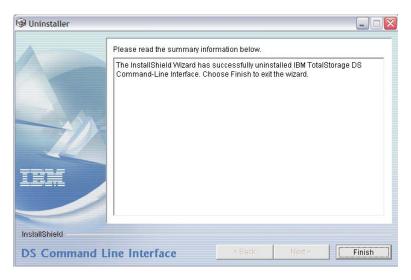
- 1. Navigate to your Control Panel and open the Add/Remove program facility.
- 2. Scroll the list of currently installed programs and click the listing for DS CLI.
- 3. Click the **Change/Remove** button and the Welcome window for the Uninstaller is displayed.



Click Next to continue or click Cancel to exit the removal process. When you click Next, the Confirmation window is displayed showing the directory from which the DS CLI program is removed.



5. Click **Remove** to continue or **Cancel** to stop the removal and exit the uninstall process. Click **Back** to return to the previous window. When you click **Remove**, the Uninstallation Progress window is displayed. When the uninstall process is finished, the Finish window is displayed, which contains a statement about the success or failure of the uninstall process.



If the uninstall program does not remove some information from your system, the Restart window is displayed. You must restart so that previously locked files are released and automatically deleted.

- 6. Close the Add/Remove Programs window.
- 7. Restart your system (now or later) to complete the removal process.

# Removing the IBM TotalStorage DS CLI using silent mode

Use the silent mode to remove the DS CLI through the command-line if the DS CLI is installed on a UNIX system or a variant of UNIX (for example, Linux, HPUX, Sun, or AIX).

Perform the following steps to successfully uninstall the DS CLI.

#### Note:

- If you are using Windows or Novell you will use the Add/Remove Programs feature to uninstall the DS CLI.
- This uninstall process only works with DS CLI. No other versions of CLI can be removed with this process.
- Locate the uninstaller file in the /\_uninst folder. If you selected the default directory, you can find the \_uninst folder using the /opt/ibm/dscli path. The uninstaller file name is uninstaller.xxx, with xxx depending on the operating system. If you have a Linux, Hewlett Packard, Sun, or AIX system, then the file name is uninstaller.bin. For all other operating systems the file name is uninstaller.sh.
- 2. Type the following command at the command prompt: <install directory>/\_uninst/uninstaller.<exelshlbin> -silent
- 3. Press the **Enter** key. All the associated CLI files are uninstalled.

# Removing the IBM TotalStorage DS CLI using the console mode

Use the console mode to remove the DS CLI when the DS CLI is installed on a UNIX system that does not the have use of an X display.

Perform the following steps to remove the DS CLI using the console mode:

**Note:** Do not use the console method to uninstall DS CLI on a Windows system. Instead, follow the steps in this guide for removing the DS CLI using graphical mode.

- 1. Type the following command at a command prompt: <install directory>/\_uninst/uninstaller.<sh | bin> -console
- 2. The Welcome screen displays. Press 1 and Enter to continue, or 3 to Cancel the removal process.

```
Welcome to the InstallShield Wizard for IBM TotalStorage DS Command-Line Interface (CLI)
The InstallShield Wizard uninstalls IBM TotalStorage DS Command-Line Interface on your computer.

To continue, choose Next.

DS Command-Line Interface IBM Corporation

Press 1 for Next, 3 to Cancel or 4 to Redisplay [1]
```

3. The Uninstallation Location screen is displayed. Press 1 and Enter to continue, or 3 and Cancel to exit the removal process.

```
IBM TotalStorage DS Command-Line Interface will be uninstalled from the following location:

C:\Program Files\ibm\dscli

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
```

4. The Uninstallation progress screen is displayed while the command-line interface is being removed.

```
Uninstalling IBM TotalStorage DS Command-Line Interface...
```

5. The Uninstallation Finish screen is displayed. Press 3 to finish the removal.

```
The InstallShield Wizard has successfully uninstalled IBM TotalStorage DS Command-Line Interface. Choose Finish to exit the wizard.

Press 3 to Finish or 4 to Redisplay [3]
```

# Upgrading your system to use DS CLI

You can upgrade your system to use DS CLI by following the remove and install procedures put in place for DS CLI. However, there are some things that you need to consider before making this upgrade.

The DS CLI is designed to support the following features that exist on the IBM TotalStorage Enterprise Storage Server<sup>®</sup> (ESS) Models 750 and 800:

- A Copy Services domain, configured as part of the IBM TotalStorage Enterprise Storage Server (ESS) Models 750 and 800.
- FlashCopy Version 2 and PPRC Version 2 licenses that are available on the ESS.

However, the DS CLI is not designed to support the CLI scripts that you have written for these features without modification.

As part of your upgrade preparation, ask yourself the following questions:

- Do you plan to add the DS8000 to your network? If you do, you must install the DS CLI application. This application is used for the configuration, performance, and Copy Services functions. Also, only the DS CLI can be used to perform Copy Services functions between the ESS and the DS models.
- Do you plan to keep the DS8000 separate from your network? If you do, you can not communicate with the ESSs in your network, even for Copy Services functions. You can install the DS CLI on your server and it supports the DS8000, but new scripts must be written that support the DS8000.

# **OpenVMS** system integration

You can adjust your OpenVMS system to obtain greater benefits from the use of the DS CLI application. The hints and tips that are provided in this section show how to obtain these benefits through the optimal integration of the DS CLI into your OpenVMS system.

The following list provides the areas that you might consider for optimizing the use of the DS CLI in your OpenVMS system:

- Command Console LUN (CCL)
- · OpenVMS system messages
- Message help
- Java Run Time Environment (JRE)
- · Quota recommendations

# Enhancing the command console LUN for DS CLI use

The OpenVMS operating system considers a fibre-channel device with LUN ID 0 as Command Console LUN (CCL). These devices do not normally display when you issue the DS CLI Ishostvol command. However, with adjustments, these devices can be displayed when you issue the Ishostvol command. The following description provides the information that you need to make this enhancement work on your OpenVMS system.

Fibre-channel CCL devices have the OpenVMS device type GG, which result in OpenVMS device names in the form \$1\$GGAn. In contrast, fibre-channel disk devices have the OpenVMS device type DG, which result in device names in the form \$1\$DGAn. Therefore, LUN 0 devices on OpenVMS are a special device type, different from disk devices.

The DS CLI Ishostvol command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs. That implies that all host devices belonging to 2105/2107/1750 volumes are displayed. Therefore, CCL devices \$1\$GGAn are included in the Ishostvol output for multiplatform consistency and to match the output of other DS CLI commands.

However, the inclusion of CCL devices can be confusing for users who expect that the Ishostvol command displays only the disk devices. You can use the OpenVMS logical name IBMDSCLI\$SHOW\_GG\_DEVICES to modify the DS CLI behavior: If this logical name translates to an expression which evaluates as True in OpenVMS conventions (1, Y, YES, T, or TRUE), then the \$1\$GGAn CCL devices are shown in the command output. Otherwise, the \$1\$GGAn CCL devices are not shown.

The startup procedure IBMDSCLI\$STARTUP.COM defines the logical name IBMDSCLI\$SHOW GG DEVICES as Y. If you want to suppress \$1\$GGAn CCL devices in the Ishostvol command output, you can redefine the logical name after the startup procedure has been processed.

# Enhancing the OpenVMS system messages

When you use the DS CLI, the application provides messages regarding the application processes, status, and errors. You also receive the OpenVMS system messages but they are displayed in a different format. You can make this situation less confusing by making the following adjustments.

The DS CLI messages are presented in an operating-system independent format. In contrast, native OpenVMS programs provide messages using the system message facility as displayed in the following format: %facility-level-identification, text.

To ensure that the OpenVMS command SET MESSAGE and customer-written tools that scan for such messages work correctly, the DS CLI provides each message using OpenVMS system services in addition to the operating system independent output. After displaying the OpenVMS message, the normal DS CLI message is provided unchanged. This ensures that the DS CLI messages are identical across platforms and that you can work with the DS CLI documentation.

However, these redundant messages can be confusing for users who are not familiar with OpenVMS. You can use the OpenVMS logical name IBMDSCLI\$OPENVMS\_MESSAGES to modify the DS CLI behavior: If this logical name translates to an expression which evaluates as True in OpenVMS conventions (1, Y, YES, T, or TRUE), then the additional OpenVMS-formatted messages are presented. Otherwise, only the operating system independent DS CLI messages are shown.

The startup procedure IBMDSCLI\$STARTUP.COM defines the logical name IBMDSCLI\$OPENVMS\_MESSAGES as Y. If you want to suppress the OpenVMS-formatted messages, you can redefine the logical name after the startup procedure has been processed.

# **Enabling OpenVMS to use the DS CLI help**

The DS CLI installation process offers the option to add modules to the system help library. If you enable OpenVMS with this option, you can use the DS CLI help.

The DS CLI installation process offers the option to add modules to the system help library SYS\$COMMON:[SYSHLP]HELPLIB.HLB and the system messages database SYS\$COMMON:[SYSHLP]MSGHLP\$LIBRARY.MSGHLP\$DATA. If you choose this option, the module IBMDSCLI is added as the top-level key to the help library, and the DS CLI status messages can be accessed using the HELP/MESSAGE/FACILITY=IBMDSCLI command. Additionally, the login procedure IBMDSCLI\$MANAGER:IBMDSCLI\$LOGIN.COM activates the message section file IBMDSCLI\$SYSTEM:IBMDSCLI\_Messages\_Shr.exe for the current process.

In every case, the installation process provides the following files in the directory which is referred by the logical name IBMDSCLI\$HELP:

### IBMDSCLI Ovr.hlp

A help library containing one module with the top-level key IBMDSCLI. You can add this library to the search list for help libraries in your OpenVMS

system by defining appropriate logical names **HLP\$LIBRARY**, HLP\$LIBRARY 1, HLP\$LIBRARY 2, and so forth.

### IBMDSCLI\_Messages.msghlp\$data

A message help data file with messages for facility IBMDSCLI. You can add this data file to the searchlist for message help files in your OpenVMS system by defining the logical name MSGHLP\$LIBRARY accordingly.

If you do not want the installation process to modify the OpenVMS system libraries, you can use these OpenVMS default logical names to integrate the DS CLI help information manually.

### Java Runtime Environment considerations

The DS CLI login procedure IBMDSCLI\$MANAGER:IBMDSCLI\$LOGIN.COM defines JAVA\$CLASSPATH in the OpenVMS process logical name table and it overrides any existing Java classpath definition. If you want to use other Java-based software in the same process, you must redefine JAVA\$CLASSPATH so that it provides the classpath as a JAVA command parameter.

The following information provides an overview of how the installation of the DS CLI affects the Java environment of your OpenVMS system.

Because the DS CLI relies on Java Run Time Environment (JRE) V1.4.2. mandatory JRE files are installed in the directory tree that is referenced by the logical name IBMDSCLI\$JRE. This setup is according to HP guidelines. The login procedure IBMDSCLI\$MANAGER:IBMDSCLI\$LOGIN.COM calls the JRE setup procedure which defines several logical names and DCL symbols for usage by the Fast Virtual Machine.

If your OpenVMS host system uses other software that requires JRE but cannot run with the same JRE version as the DS CLI, users of that software can switch between different Java versions. To use different JRE versions, you must run a command procedure to set up the Java environment definitions for the version that you want to use in the given process (see the OpenVMS Java documentation at http://h18012.www1.hp.com/java/documentation/index.html).

The DS CLI application-specific Java classes are bundled in Java Archive (.JAR) files in the directory referenced by logical name IBMDSCLI\$LIBRARY. These files must be included in the Java classpath. On OpenVMS, two logical names define the classpath:

#### **CLASSPATH**

For UNIX-style names. You can use a string inside single quotation marks that consists of colon-separated path names.

### JAVA\$CLASSPATH

For OpenVMS specification syntax. You can specify multiple paths with a comma-separated expression (not enclosed in single quotation marks) as OpenVMS logical name search list. JAVA\$CLASSPATH overrides CLASSPATH, if JAVA\$CLASSPATH is defined.

Because of this override process, you might have to redefine the **JAVA\$CLASSPATH** to provide the class path as a JAVA command parameter. However, this JAVA command parameter is only required if you want to use other Java-based software in the same process.

# **Quota considerations**

The JRE was designed to perform optimally on UNIX systems, where each process is given large quotas by default. On OpenVMS, the default behavior gives each process lower quotas so that many processes can co-exist on a system.

To get the best Java performance on OpenVMS, HP recommends that you set process quotas to match a typical UNIX system. HP also recommends these as minimum quota settings (except where noted). See these recommendations at

http://h18012.www1.hp.com/java/documentation/1.4.2/ovms/docs/ user\_guide.html#processquotas.

To check if your current process quotas fulfill the recommendations, you can run the following process: IBMDSCLI\$JRE:[LIB]Java\$Check\_Environment.com.

# Chapter 3. CLI commands

This section describes the command-line interface (CLI) commands that you can use to perform configuration and storage management tasks.

### **About CLI commands**

This is a description of the components and structure of a command-line interface command.

A command-line interface command consists of one to four types of components, arranged in the following order:

- 1. The command name.
- 2. One or more flags, each followed by any flag parameters it might require.
- 3. The command parameter.

The **command name** specifies the task that the command-line interface is to perform. For example, *Isarraysite* tells the command-line interface to list array sites, and *mklcu* tells the command-line interface to create a logical control unit.

**Flags** modify the command. They provide additional information that directs the command-line interface to perform the command task in a specific way. For example, the -v flag tells the command-line interface to display the command results in verbose mode. Some flags may be used with every command-line interface command. Others are specific to a command and are invalid when used with other commands. Flags are preceded by a hyphen (-), and may be followed immediately by space and a flag parameter.

**Flag parameters** provide information that is required to implement the command modification that is specified by a flag. For example, the *-user* flag requires a *user\_name* parameter, and the *-passwd* flag requires a *password* parameter. Flag parameters are variables. This means that their value changes to meet your needs. Every user will have a different user name and password. Not all flags require parameters. In this case, the flag itself provides all the information that is necessary. Some flag parameters are optional and might allow the use of multiple values. These values must be separated with a comma and no white space between the values. If you do not provide a parameter, then a default value is assumed. For example, you can specify *-v on*, or *-v off* to turn verbose mode on or off; but if you specify *-v* only, then the flag parameter is assumed to be on.

The **command parameter** provides basic information that is necessary to perform the command task. When a command parameter is required, it is always the last component of the command; and it is not preceded by a flag. Some commands permit multiple command parameters with each parameter separated by a white space and not a comma (unlike flag parameters that allow multiple values). Some commands, like *Isuser*, do not require a command parameter, because a default value of *all* is always assumed. For some commands, like *Isarraysite*, the command parameter is optional. If no value is provided, then a default value of *all* is assumed. If a value is provided, then the command-line interface lists information only about the array site or sites provided in the command parameter string.

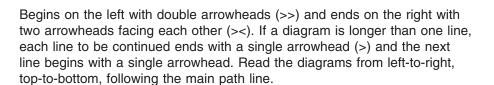
In the following example, *Isrank* is the command name. *-fullid -dev* and *-l* are flags. *IBM.2107–75FA120* is the flag parameter for the *-dev* flag, and *R1*, *R2*, and *R3* are a list of command parameters.

# Understanding the syntax diagrams

A syntax diagram uses symbols to represent the elements of a command and to specify the rules for using these elements.

# Syntax diagrams

#### Main path line

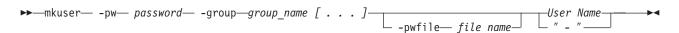


#### **Keyword**



Represents the name of a command, flag, parameter, or argument. A keyword is not in italics. Spell a keyword exactly as it is shown in the syntax diagram.

### Required keywords



Indicate the parameters or arguments you must specify for the command. Required keywords appear on the main path line. Mutually exclusive required keywords are stacked vertically.

### **Optional keywords**



Indicate the parameters or arguments you can choose to specify for the command. Optional keywords appear below the main path line. Mutually exclusive optional keywords are stacked vertically.

#### **Variable**



Represents the value you need to supply for a parameter or argument, such as a file name, user name, or password. Variables are in italics.

### Special characters

- (minus) or / (slash) sign

Flags are prefixed with a - (minus) sign. Flags define the action of a

command or modify the operation of a command. You can use multiple flags, followed by parameters, when you issue a command.

### [ ] square brackets

Optional values are enclosed in square brackets.

#### { } braces

Required or expected values are enclosed in braces.

### I vertical bar

A vertical bar indicates that you have a choice between two or more options or arguments.

For example, [ a | b ] indicates that you can choose a, b, or nothing. Similarly, { a | b } indicates that you must choose either a or b.

#### ... ellipsis

An ellipsis signifies the values that can be repeated on the command line or multiple values or arguments.

#### - dash

A dash indicates that, as an alternative to entering the parameter, a value or values are supplied from stdin. stdin varies depending on your settings and is available when you are using single-shot or script mode. This option is not available when using interactive mode.

# List of commands

This is a complete list of the command-line interface commands, alphabetized by command name.

Command	Туре	Description
applykey	application key and version	The applykey command applies the licensed machine code (LMC) activation keys for a storage server. You can enter the LMC keys manually, or you can import the keys from an XML file. The file that contains the LMC keys must be downloaded from an IBM Web site.
chckdvol	storage configuration	The chckdvol command changes the name of a count key data (CKD) base volume.
chextpool	storage configuration	The chextpool command modifies an extent pool name.
chfbvol	storage configuration	The chfbvol command changes the name or data type of a fixed block volume.
chhostconnect	I/O port and host connect configuration	The chhostconnect command modifies a SCSI host port configuration.
chlcu	storage configuration	The chlcu command modifies a logical control unit.
chlss	storage configuration	The chlss command modifies a logical subsystem.

Command	Туре	Description
chpass	user account and security	The chpass command changes the password expiration time and the number of login attempts for a storage complex.
chrank	storage configuration	The chrank command assigns an unassigned rank to a extent pool, or removes an assigned rank from a extent pool. This action can change an assigned rank to an unassigned rank.
chsession	Copy Services	The chsession command allows you to modify a Global Mirror session.
chsi	storage image configuration	The chsi command modifies a storage image. You can use it to set characteristics such as online or offline state, name, and description.
chsp	storage complex configuration	The chsp command modifies a storage complex for items such as notification of the Simple Network Management Protocol (SNMP) traps and e-mail problem notification lists in a storage complex.
chsu	storage unit configuration	The chsu command modifies a storage unit. You can use this command to power-on and power-off a storage unit.
chuser	user account and security	The chuser command is used to modify and lock or unlock a DS CLI or a DS Storage Manager user account. A CLI user with administrative authority uses this command to update a user account password, modify user group authority, or to lock or unlock a user account. Users that do not have administrator authority, use this command to change an expired password and create a password that is not known to the administrator who created their account.
chvolgrp	storage configuration	The chvolgrp command modifies a volume group name and volume members.
clearvol	storage configuration	The clearvol command clears Copy Services relationships for a base logical volume.

Command	Туре	Description
commitflash	Copy Services	The commitflash command commits data to a target volume to form a consistency between the source and target. Before you use this command, you must first issue the mkflash command with the -record and -persist flags. After the pair is established, you must then issue the setflashrevertible command against the pair.
commitremoteflash	Copy Services	The commitremoteflash command commits data to a target volume to form a consistency between the remote source and target FlashCopy pair. Before you use this command, you must first issue either the command mkflash or mkremoteflash with the -record and -persist flags. After the pair is established, you must then issue either the setflashrevertible or setremoteflashrevertible command against the pair.
dscli	framework	The dscli command starts the command-line interface (CLI) program. Use this command to run CLI commands in interactive mode, to run a single command, or to run a set of commands from a script. For more information about how to use this command, see "Completing DS CLI postinstallation."
failbackpprc	Copy Services	the failbackpprc command against any remote mirror and copy volume that is in a primary suspended state. The command copies the required data from the source volume to the target volume in order to resume mirroring. The command is usually used after a failoverpprc command has been issued to restart mirroring either in the reverse direction (recovery site to production site) or original direction (production site to recovery site). However, this command also works if the target volume has been made simplex or is a secondary volume. The command performs a full or partial copy, as required.

Command	Туре	Description
failoverpprc	Copy Services	The failoverpprc command changes a secondary device into a primary suspended device while leaving the primary device in its current state. This command succeeds even if the paths are down and the volume at the production site is unavailable or nonexistent. See "Using the failoverpprc and failbackpprc commands" scenario for further information.
freezepprc	Copy Services	The freezepprc command creates a new remote mirror and copy consistency group. It places the source logical subsystem (LSS) in the long busy state so that no I/Os can be directed to it. It also removes remote mirror and copy paths between the source LSS and target LSS and sets the queue full condition for the primary volume. This causes the host to queue writes to the primary volume until the queue full condition is reset. During the queue full condition, the primary volume reports long busy status.
Isaddressgrp	storage configuration	The Isaddressgrp command displays a list of address groups for a storage image and status information for each address group in the list.
Isarray	storage configuration	The Isarray command displays a list of arrays in a storage image and status information for each array in the list.
Isarraysite	storage configuration	The Isarraysite command displays a list of array sites and status information for each array site in the list.
Isavailpprcport	Copy Services	The Isavailpprcport command displays a list of ESCON or fibre channel I/O ports that can be defined as remote mirror and copy (formerly PPRC) paths. The DS8000 supports only fibre channel ports. The Enterprise Storage Server (2105 machine type) supports ESCON ports.
Isckdvol	storage configuration	The Isckdvol command displays a list of count key data (CKD) base and alias volumes in a storage image and status information for each volume in the list.

Command	Туре	Description
Isda	field-replaceable unit information	The Isda command displays a list of device adapter (DA) field replaceable units (FRUs) for each storage image. You can use this command to look at the status of each device adapter FRU in the list.
Isddm	field-replaceable unit information	The Isddm command displays a list of device drive modules (DDMs) and status information for each DDM in the list.
Ishba	field-replaceable unit information	The Ishba command displays a list of storage image host bus adapter (HBA) field replaceable units (FRUs) and status information for each FRU in the list.
Isextpool	storage configuration	The Isextpool command displays a list of extent pools in a storage image and status information on each extent pool in the list.
Isfbvol	storage configuration	The Isfbvol command displays a list of fixed block volumes in a storage image and status information for each volume in the list.
Isflash	Copy Services	The Isflash command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list.
Isframe	physical enclosure information	The Isframe command displays a list of frame enclosures for a storage image.
Ishostconnect	I/O port and host connect configuration	The Ishostconnect command displays a list of host connections for a storage image and the status information for each host connection in the list.
Ishosttype	I/O port and host connect configuration	The Ishosttype command displays a list of known hosts, their associated port profiles, address discovery, and logical block size values. Use this command to get the available host types for the mkhostconnect command.
Ishostvol	I/O port and host connect configuration	The Ishostvol command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs.
Isioport	I/O port and host connect configuration	The Isioport command displays a list of I/O ports (both ESCON and fibre channel) on a specified storage image and optionally provides performance metrics for each I/O port listed.

Command	Туре	Description
Iskey	application key and version	The Iskey command displays the type of licensed machine code (LMC) activation keys that are installed and available for use by the storage image. For instance, the following list represents the type of LMC activation keys: Operating Environment, FlashCopy, Remote Mirror and Copy, Parallel Access Volumes, Remote Mirror for z/OS.
Islcu	storage configuration	The Islcu command displays a list of logical control units (LCUs) for a storage image and status information for each logical control unit in the list.
Islss	storage configuration	The Islss command displays a list of logical subsystems (LSSs) for a storage image and status information for each logical subsystem in the list.
Isportprof	I/O port and host connect configuration	The Isportprof command displays a list of port profiles that are supported on a storage image and their recommended address discovery and logical block size values.
Ispprc	Copy Services	The Ispprc command displays a list of remote mirror and copy (formerly PPRC) volume relationships for a storage image, and status information for each remote mirror and copy volume relationship in the list.
Ispprcpath	Copy Services	The Ispprcpath command displays a list of existing remote mirror and copy (formerly PPRC) path definitions.
Isrank	storage configuration	The Isrank command displays a list of defined ranks in a storage image and status information for each rank.
Isremoteflash	Copy Services	The Isremoteflash command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list.
Isserver	storage image configuration	The Isserver command displays all servers in a storage complex or a list of specified servers, and displays status information for each server in the list.

Command	Туре	Description
Issession	Copy Services	The Issession command displays a list of Global Mirror sessions for a logical subsystem (LSS) and information regarding the volumes of each session in the list.
Issi	storage image configuration	The Issi command displays a list of storage images in a storage complex. You can use this command to look at the status of each storage image in the list. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN when using the Isavailpprcport and mkpprcpath commands.
Isstgencl	physical enclosure information	The Isstgencl command displays a list of storage enclosures and status information for each enclosure in the list.
Issu	storage unit configuration	The Issu command displays a list of storage units in a storage complex. You can use this command to look at the status and other properties of each storage unit in the list.
Isuser	user account and security	The Isuser command returns a list of storage image user account names and access authority levels.
Isvolgrp	storage configuration	The Isvolgrp command displays a list of volume groups in a storage image and status information for each volume group in the list.
managehostconnect	I/O port and host connect configuration	The managehostconnect command modifies the volume group assignment for a SCSI host port.
mkaliasvol	storage configuration	The mkaliasvol command creates zSeries CKD alias volumes (generally referred to as parallel access volumes or PAVs) in a storage image.
mkarray	storage configuration	The mkarray command creates arrays.
mkckdvol	storage configuration	The mkckdvol command creates zSeries count key data (CKD) base or CKD alias volumes in a storage image.

Command	Туре	Description
mkesconpprcpath	Copy Services	The mkesconpprcpath command creates a remote mirror and copy (formerly PPRC) path between source and target logical subsystems over an ESCON connection. The command allows you to specify ESCON direct and ESCON switch connections. Use this command only with IBM TotalStorage Enterprise Storage Servers (2105, Model 800 and Model 750).
mkextpool	storage configuration	The mkextpool command creates a fixed block or count key data (CKD) storage type extent pool.
mkfbvol	storage configuration	The mkfbvol command creates open systems fixed block (FB) volumes in a storage image.
mkflash	Copy Services	The mkflash command initiates a point-in-time copy from source volumes to target volumes.
mkgmir	Copy Services	The mkgmir command starts Global Mirror for a session.
mkhostconnect	I/O port and host connect configuration	The mkhostconnect command configures open systems hosts port attachments to fibre channel ports that are configured for FC-AL or SCSI-FCP topology. Open systems hosts port attachments to fibre channel ports are configured for identified access mode and SCSI protocol.
mklcu	storage configuration	The mklcu command creates a logical control unit (LCU) in a storage image.
mkpprc	Copy Services	The mkpprc command establishes a remote mirror and copy (formerly PPRC) relationship for a volume pair.
mkpprcpath	Copy Services	The mkpprcpath command establishes or replaces a remote mirror and copy (formerly PPRC) path between source and target logical subsystems (LSSs) over a fibre channel connection. This is the only supported connectivity for machine types 2107 and 1750. Paths can be established between the following machine types: 2105:2105, 2107:2107, 2107:1750, 2107:2105, 1750:1750, 1750:2105.

Command	Туре	Description
managepwfile	user account and security	The managepwfile command creates a password file for an existing ESS user account. This command processes the password requirements for 2105, 2107, and 1750 systems.
mkrank	storage configuration	The mkrank command creates one fixed block or count key data (CKD) rank from one array.
mkremoteflash	Copy Services	The mkremoteflash command initiates a remote copy from source volumes to target volumes through a remote mirror and copy (formerly PPRC) relationship.
mksession	Copy Services	The mksession command opens a Global Mirror session.
mkuser	user account and security	The mkuser command creates a DS CLI or a DS Storage Manager user account. A CLI user with administrative authority uses this command to create a user account with a password and user group authority.
mkvolgrp	storage configuration	The mkvolgrp command creates a volume group in a storage image.
pausegmir	Copy Services	The pausegmir command pauses Global Mirror for a session.
pausepprc	Copy Services	The pausepprc command pauses an existing remote mirror and copy volume pair relationship. Or, this command can be used to pause a single volume ID. To use with a single volume you must specify either the -at <i>src</i> parameter option or the -at <i>tgt</i> parameter option. If neither of these options are specified in the command, single volumes are not valid.
restorevolaccess	storage configuration	The restorevolaccess command resets the fenced access state for a volume when the volume is in a fenced access state.
resumegmir	Copy Services	The resumegmir command resumes Global Mirror processing for a session.
resumepprc	Copy Services	The resumepprc command resumes a remote mirror and copy (formerly PPRC) relationship for a volume pair.

Command	Туре	Description
resyncflash	Copy Services	The resyncflash command (formerly called incflash for an incremental FlashCopy process) increments an existing FlashCopy pair that has been established with the -record and -persist flags. When a pair is established with the -record and -persist flags, the pair initially synchronizes and then a record of all host writes to the source is maintained in the source volumes. When the resyncflash command is issued on the pair, the new writes to the source are copied to the target. The flags specified in this command will replace the flags in the existing relationship. In order to keep the initial -record and -persist flags, they must be specified in the resyncflash command.
resyncremoteflash	Copy Services	The resyncremoteflash command (formerly called the incremoteflash command and associated with the incremental FlashCopy process) increments an existing remote FlashCopy pair that has been established with the -record and -persist flags. When a pair is established with the -record and -persist flags, the pair initially synchronizes and then a record of all host writes to the source is maintained in the source volumes. When the resyncremoteflash command is issued on that pair, the new writes to the source are copied to the target. The specified flags in this command replace the flags in the existing relationship. In order to keep the initial -record and -persist flags, they must be specified using the resyncremoteflash command.

Command	Туре	Description
reverseflash	Copy Services	The direction of a FlashCopy relationship can be reversed, where the volume that was previously defined as the target becomes the source for the volume that was previously defined as the source (and is now the target). The data that has changed is copied to the volume that was previously defined as the source. For example, suppose you create a FlashCopy relationship between source volume A and target volume B. Data loss occurs on source volume A. To keep applications running, you can reverse the FlashCopy relationship so that volume B is copied to volume A.
reverseremoteflash	Copy Services	The reverseremoteflash command restores an existing remote FlashCopy pair that was previously established with the -record and -persist flags. When a pair is established with the -record and -persist flags, the pair will initially synchronize and then a record will be kept of all host writes to the source. When this command is issued on that pair, the new data on the source will be overwritten with the previously saved data on the target. The pair will be permanently reversed, meaning the source is now the target and the target now the source. The flags specified in this command will replace the flags in the existing relationship. In order to keep the pair with the -record and -persist flags, they must be specified.
revertflash	Copy Services	The revertflash command overwrites new data with data saved at the last consistency formation. To use this command, you must first issue the mkflash command with the -record and -persist flags. You must then issue the setflashrevertible command against the pair.

Command	Туре	Description
revertremoteflash	Copy Services	The revertremoteflash command overwrites new data with data saved at the last consistency formation. To use this command, you must first issue the mkremoteflash command with the -record and -persist flags. You must then issue the setremoteflashrevertible command against the pair.
rmarray	storage configuration	The rmarray command deletes arrays.
rmckdvol	storage configuration	The rmckdvol command deletes count key data (CKD) base or alias volumes from a storage image.
rmextpool	storage configuration	The rmextpool command deletes extent pools from a storage image.
rmfbvol	storage configuration	The rmfbvol command deletes fixed block volumes from a storage image.
rmflash	Copy Services	The rmflash command removes a relationship between FlashCopy volume pairs.
rmgmir	Copy Services	The rmgmir command removes Global Mirror for the specified session. All of the volumes are removed from the session and the instance of the session no longer exists.
rmhostconnect	I/O port and host connect configuration	The rmhostconnect command removes a SCSI host port connection from a storage image.
rmlcu	storage configuration	The rmlcu command deletes existing logical control units.
rmpprc	Copy Services	The rmpprc command removes a remote mirror and copy (formerly PPRC) volume pair relationship. Or, this command can be used to remove a single volume ID (which might be useful when a disaster occurs and you want to specify only the available volume and not both the primary and secondary). To use with a single volume you must specify either the -at <i>src</i> parameter option or the -at <i>tgt</i> parameter option. If neither of these options are specified in the command, single volumes are not valid. The -uncondtional parameter must be specified when designating a single volume otherwise an error occurs and the command process fails.

Command	Туре	Description
rmpprcpath	Copy Services	The rmpprcpath deletes a remote mirror and copy (formerly PPRC) path.
rmrank	storage configuration	The rmrank command deletes ranks from a storage image.
rmremoteflash	Copy Services	The rmremoteflash command removes a relationship between remote FlashCopy volume pairs. <b>Note</b> :
rmsession	Copy Services	The rmsession command closes an existing Global Mirror session.
rmuser	user account and security	The rmuser command removes a storage image user account. CLI users with administrative authority use this command to delete a user account file. Administrators use their passwords in the required field.
rmvolgrp	storage configuration	The rmvolgrp command deletes existing volume groups from a storage image.
setflashrevertible	Copy Services	The setflashrevertible command modifies a FlashCopy volume pair that is part of a Global Mirror relationship to revertible. This command must be run before the FlashCopy pair can be committed or reverted. Once a pair is revertible, the data can be committed to the target to form a new consistency, or reverted back to the last consistency.
setioport	I/O port and host connect configuration	The setioport command configures one or more I/O ports for open systems or zSeries host system connections. This command cannot be used for ESCON ports.
setremoteflashrevertible	Copy Services	The setremoteflashrevertible command modifies a remote FlashCopy volume pair that is part of a Global Mirror relationship to revertible. This command must be run before the FlashCopy pair can be committed or reverted. Once a pair is revertible, the data can be committed to the target to form a new consistency, or reverted back to the last consistency.
showarray	storage configuration	The showarray command displays detailed properties of a specific array.
showarraysite	storage configuration	The showarraysite command displays detailed properties of a specific storage image array site.

Command	Туре	Description
showckdvol	storage configuration	The showckdvol command displays detailed properties of an individual count key data volume. This command can also be used to display the performance metrics for an individual volume ID.
showextpool	storage configuration	The showextpool command displays detailed properties or performance metrics of an extent pool.
showfbvol	storage configuration	The showfbvol command displays detailed properties for an individual volume. This command can also be used to display the performance metrics of a fixed block volume.
showgmir	Copy Services	The showgmir command displays detailed properties and performance metrics for a Global Mirror.
showhostconnect	I/O port and host connect configuration	The showhostconnect command displays detailed properties of a storage image host connection.
showioport	I/O port and host connect configuration	The showioport command displays properties of an ESCON or fibre channel I/O port. It optionally displays the performance metrics for an I/O port.
showlcu	storage configuration	The showlcu command displays the detailed properties of an individual logical control unit (LCU).
showlss	storage configuration	The showlss command displays detailed properties of a logical subsystem (LSS).
showpass	user account and security	The showpass command lists the properties of passwords.
showrank	storage configuration	The showrank command displays detailed properties or performance metrics of a rank.
showsi	storage image configuration	The showsi command displays detailed properties of a storage image. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN when using the Isavailpprcport and mkpprcpath commands.
showsp	storage complex configuration	The showsp command displays detailed properties of a storage complex. Detailed properties include your names, descriptions, and customer account names for the storage complex.

Command	Туре	Description
showsu	storage unit configuration	The showsu command displays detailed properties of an individual storage unit.
showuser	user account and security	The showuser command displays storage image user account details. A CLI user with administrative authority uses this command to display the properties (group assignment, user account status and number of failed logins) that is associated with a current user account name.
showvolgrp	storage configuration	The showvolgrp command displays detailed properties of a volume group.
unfreezeflash	Copy Services	The unfreezeflash command resets a FlashCopy consistency group that was previously established with the -freeze flag when the mkflash or resyncflash commands were issued.
unfreezepprc	Copy Services	The unfreezepprc command thaws an existing remote mirror and copy (formerly PPRC) consistency group. The command resets the queue full condition for the primary volume. All queued writes to the source volume are written.
ver	application key and version	The ver command displays the versions of the command-line interface, Storage Manager, and licensed machine code.

# **Command flags**

You can use these flags with any command-line interface command.

Flag	Parameters	Description
-p	on I off	Turns paging on or off. Displays 24 rows at a time unless used with the -r flag. The default is off in single-shot mode and on in interactive mode. You can page by pressing any key.  Note: This flag can be used only with the Is type (for example, Isuser, Iskey, Isserver) commands and the help (setoutput) command.

Flag	Parameters	Description
-r	number	Specifies the number of rows (1 - 100) per page. This flag is valid only when the -p flag is set to on. The default value is 24 rows.  Note: This flag can be used only with the ls type (for example, Isuser, Iskey, Isserver) commands and the help (setoutput) command.
-fmt	xml	Sets the output format to XML.
	stanza	Sets the output format to stanza.
	delim	Sets the output format to a table. You must set the column delimiter to a single character with the -delim flag.
	default	Sets the output to a space-separated plain text table.
-delim	char	Sets the output to delimited output and the delimiter to the single character <i>char</i> . You must enclose <i>char</i> in single or double quotation marks if the character is a shell metacharacter (such as * or \t). If <i>char</i> is not specified, the CLI program returns a syntax error. A blank space, even when it is enclosed within quotation marks, is not a valid character as a delimiter.
-hdr	on I off	Turns the header on or off. The default is on.
-bnr	on I off	Turns the banner on or off. The default is on.
-v	[ on l off ]	Turns verbose mode on or off. The default is off. If you specify the -v flag and do not specify on or off, then verbose mode defaults to on.
-fullid	Provides fully qualified IDs, which include the storage image ID, for every ID that is displayed in the command output.  Note: This command flag can only be used with list (for example, Isioport, Iskey) and show (for example, showsu, showlss) commands.	

# Default configuration setup with a profile file

You can create default settings for the command-line interface by defining one or more profiles on the system. For example, you can specify the management console (MC) for the session, specify the output format for list commands, specify the number of rows per page in the command-line output, and specify that a banner is included with the command-line output.

If a user enters a value with a command that is different from a value in the profile, the command overrides the profile.

You have several options for using profile files:

- You can modify the default profile. The default profile, dscli.profile, is installed in the profile directory with the software. For example, c:\Program Files\IBM\DSCLI\profile\dscli.profile for the Windows platform and /opt/ibm/dscli/profile/dscli.profile for UNIX and Linux platforms.
- You can make a personal default profile by making a copy of the system default profile as <user\_home>/dscli/profile/dscli.profile. The home directory,
   <user home> is designated as follows:
  - Windows system: C:\Documents and Settings\<user\_name>
  - Unix/Linux system: /home/<user\_name>
- You can create a profile for the storage unit operations. Save the profile in the user profile directory. For example:
  - c:\Program Files\IBM\DSCLI\profile\operation\_name1
  - c:\Program Files\IBM\DSCLI\profile\operation\_name2

These profile files can be specified using the DS CLI command parameter **-cfg profile\_name>**. If the -cfg file is not specified, the user's default profile is used.
If a user's profile does not exist, the system default profile is used.

**Note:** A password file, generated using the **managepwfile** command, is located at the following directory: <user\_home>/dscli/security/security.dat.

When you install the command-line interface software, the default profile is installed in the profile directory with the software. The file name is dscli.profile. For example. c:\Program Files\IBM\DSCLI\profile\dscli.profile.

The profile is a text file. Table 3 on page 52 provides the list of profile variables that can be used to create the profile.

Table 4. Profile variables

Variable	Description	
banner: onloff	Enables or disables the banner that appears before the command output. This variable is equivalent to the command option -bnr. The command option -bnr overrides this default value.	
delim	Specifies a delimiter character for the format: delim variable. The default character is a comma. This variable is equivalent to the command option -delim. The command option -delim overrides this default value.	
devid	Specifies the storage image ID that is the target for the command. This value is equivalent to the command option -dev. The command option -dev overrides this default value.	

Table 4. Profile variables (continued)

Variable	Description
format	Specifies the output format for list commands.
	Specify one of the following formats:
	default: Specifies default output.
	xml: Specifies XML format.
	<ul> <li>delim: Specifies columnar format. Columns are delimited with</li> </ul>
	the character that you must specify with the delim variable.
	stanza: Specifies a horizontal table.
	This variable is equivalent to command option -fmt. The command option -fmt overrides this default value.
fullid	Specifies that IDs display in fully qualified format, which includes the storage image ID.
header: onloff	Enables or disables the headers that display with the columns of data in the list commands. This variable is equivalent to the command option -hdr. The command option -hdr overrides this default value.
hmc1	Specifies the primary Storage Manager IP address. This variable is equivalent to the command option -hmc1. The command option -hmc1 overrides this default value.
hmc2	Specifies the secondary Storage Manager IP address. This variable is equivalent to the command option -hmc2. The command option -hmc2 overrides this default value.
locale	Specifies the language for the output on the local computer.  ar: Arabic  be: Byelorussian  bg: Bulgarian  ca: Catalan  cs: Czech  da: Danish  de: German  el: Greek  en: English  es: Spanish  et: Estonian  fi: Finnish  fr: French  gu: Gujarati  hi: Hindi  hr: Croatian  hu: Hungarian  in: Indonesian  is: Icelandic  it: Italian  iw: Hebrew  ja: Japanese  kk: Kazakh  kn: Kannada  ko: Korean  It: Lithuanian  Iv: Latvian (Lettish)  mk: Macedonian  mr: Marathi  ms: Malay

Table 4. Profile variables (continued)

Variable	Description
locale, continued	<ul><li>nl: Dutch</li><li>no: Norwegian</li></ul>
	• pa: Punjabi
	• pl: Polish
	pt: Portuguese
	• ro: Romanian
	ru: Russian
	sa: Sanskrit
	sh: Serbo-Croatian
	• sk: Slovak
	sl: Slovenian
	• sq: Albanian
	sr: Serbian
	sv: Swedish
	• ta: Tamil
	• te: Telugu
	• th: Thai
	tr: Turkish
	uk: Ukrainian
	vi: Vietnamese
	• zh: Chinese
paging: onloff	Controls the display of output. If paging is enabled, a limited number of lines of output displays when a command is issued. The lines do not scroll. You must set the number of lines per page with the rows variable. This variable is equivalent to command option -p. The command option -p overrides this default value.
timeout	Set timeout value of client/server synchronous communication. The unit of the value is second. The default value is 420 seconds. You can set this timeout if the processing of a command ends by timeout due to network or client/server performance issue.  Note: The command timeout value can be longer than this value because one command can consist of multiple client/server requests.
remotedevid	Specifies the remote storage image ID. This variable is equivalent to the command option -remotedev. The command option -remotedev overrides this default value.
rows	Specifies the number of rows per page of output if the paging variable is enabled. This variable is equivalent to command option -r. The command option -r overrides this default value.
verbose: onloff	Enables or disables verbose output. This variable is equivalent to the command option -v. The command option -v overrides this default value.

# Example

```
#
# DS CLI Profile
#
```

```
# Management Console/Node IP Address(es)
# hmc1 and hmc2 are equivalent to -hmc1 and -hmc2 command options.
#hmc1: 127.0.0.1
#hmc2: 127.0.0.1
# Password filename
   The password file can be generated using mkuser command.
#pwfile: ibmadmin
# Default target Storage Image ID
     "devid" and "remotedevid" are equivalent to
     "-dev storage image ID" and "-remotedev storeage image ID" command options,
     respectively.
#devid: IBM.2107-AZ12341
#remotedevid: IBM.2107-AZ12341
# locale
    Default locale is based on user environment.
#locale: en
# Timeout value of client/server synchronous communication in second.
     DSCLI command timeout value may be longer than client/server communication
     timeout value since multiple requests may be made by one DSCLI command
     The number of the requests made to server depends on DSCLI commands.
    The default timeout value is 420 seconds.
#timeout 420
# Output settings
# ID format of objects:
   on: fully qualified format
   off: short format
fullid: off
# Paging and Rows per page.
# paging enables/disables paging the output per line numbers specified by "rows".
# "paging" is equivalent to "-p on off" option.
# on : Stop scrolling per output lines defined by "rows".
  off: No paging. (default)
\mbox{\# "rows"} is equivalent to "-r\mbox{\#"} option. paging: off
#rows: 24
# Output format type for ls commands, which can take one of the following values:
   default: Default output
   xml : XML format
   delim : delimit columns using a character specified by "delim"
   stanza : Horizontal table format
# "format" is equivalent to option "-fmt default|xml|delim|stanza".
#format: default
# delimitter character for 1s commands.
# Display banner message. "banner" is equivalent to option "-bnr on|off".
# on : Banner messages are displayed. (default)
# off : No Banner messages are displayed.
banner: on
# Display table header for ls commands. "header" is equivalent
```

```
# to option "-hdr on|off".
# on : Table headers are displayed. (default)
# off : No table headers are displayed.
header: on

#
# Display verbose information. "verbose" is equivalent to option "-v on|off".
# on : Display verbose information.
# off : No verbose information.
verbose: off
# End of Profile
```

# **Command equivalents**

Use this list to correlate commands that are supported on the Enterprise Storage Server machine type 2105 to equivalent commands on the DS8000 machine type 2107.

Enterprise Storage Server machine type 2105 command	DS8000 machine type 2107 command	Description
list server	Isserver	Like the 2105, a 2107 storage image contains one pair of servers. A 2107 storage image can contain two storage images.
list volumespace	Isextpool, showextpool, Isrank, showrank, Isarray, showarray, showarraysite	See Note 1.
create volumespace	mkextpool, mkarray, mkrank	
delete volumespace	rmrank, rmarray, rmextpool	
list diskgroup	Isarraysite, showarraysite	Like the 2105 disk group, a 2107 array site consists of eight storage devices that are made into a RAID array. The 2107 does not support the JBOD array configuration.

Enterprise Storage Server machine type 2105 command	DS8000 machine type 2107 command	Description
list port	Isioport, showioport	Like 2105, the 2107 supports fibre-channel and ESCON ports. The 2107 does not support parallel SCSI ports.
		The maximum quantity of host device adapter cards and I/O ports is dependent on 2107 model number and on the quantity of installed I/O enclosure features.
		The 2107 CLI Isioport and showioport commands include the -metrics parameter that returns the performance counter values for the respective I/O port IDs. The -metrics parameter provides the means to monitor I/O port performance statistics.
		For 2107, a I/O adapter card is assigned to a storage image.
set port	setioport	See Note 2.
list volume	Isfbvol, Isckdvol	See Note 3.
create volume	mkfbvol, mkckdvol	
set volume	chfbvol, chckdvol	
list pav	Isckdvol, showckdvol	
create pav	mkckdvol	
delete pav	rmckdvol	
list volumeaccess	Isvolgrp, showvolgrp	See Note 4.
create volumeaccess	mkvolgrp, chvolgrp	
delete volumeacess	rmvolgrp	
list hostconnection	Ishostconnect, showhostconnect	The 2105 and 2107 CLI commands are essentially the same, except that the 2107 commands include the volume
create hostconnection	mkhostconnect	group ID parameter.
delete hostconnection	rmhostconnect	For 2107, the hostconnect commands concern SCSI-FCP host port
set hostconnection	chhostconnect, managehostconnect	connections to ESS I/O ports that are configured for SCSI-FCP and "identified" access mode.
list log	Not applicable.	
list featurecode	Isuser, mkuser, rmuser, chuser, Isrpc, Isstgencl	The 2107 CLI commands can display feature codes when the appropriate parameters are used with the commands.
list webuseraccount	Not applicable.	
create webuseraccount	Not applicable.	
set webuseraccount	Not applicable.	
delete webuseraccount	Not applicable.	

Enterprise Storage Server machine type 2105 command	DS8000 machine type 2107 command	Description
list perfstats	Isioport, showioport, showrank, showextpool, showfbvol, showckdvol	The 2105 CLI list perfstats commands concern the Specialist facility that streams performance counter device adapter to the ESS Expert at predefined intervals. This facility does not exist for 2107. Use the 2107 CLI commands with the -metrics parameter to obtain current performance counter values.
create perfstats	Not applicable.	
delete perfstats	Not applicable.	
show remotesupport	showsp	The 2105 Specialist remote
set remotesupport	chsp	communication functions are implemented in the 2107 as attributes of
show email	showsp	the storage complex object. The 2107
create email	chsp	CLI chsp and showsp commands provide methods to view, set, and
delete email	chsp	modify the remote communication
set email	chsp	attributes. The 2107 does not support the pager remote communication
show pager	Not applicable.	function.
create pager	Not applicable.	
delete pager	Not applicable.	
set pager	Not applicable.	
show snmp	showsp	
create snmp	chsp	
set snmp	chsp	
delete snmp	chsp	
list problem	Not applicable.	
show problem	Not applicable.	
delete problem	Not applicable.	
list task	Not applicable.	
show task	Not applicable.	
list pprcpaths	Isflash, Isremoteflash, Ispprcpath, Ispprc, Ispprcavailpprcport, showgmir	Unlike the 2105, the 2107 CLI Copy Services functions are not task-oriented. The 2107 CLI provides a complete set of FlashCopy and remote mirror and copy (formerly PPRC) make, change, remove, list, and show commands.
rsExecuteTask	Copy Services commands	The 2107 CLI provides a complete set of FlashCopy, remote mirror and copy (formerly PPRC) commands that can be used in the coding of scripts that emulate 2105 Copy Services tasks.
rsList2105s	Ishostvol	The Ishostvol command displays the mapping of host device or volume names to 2107 and 2105 and volume IDs.
rsPrimeServer	Not applicable.	

Enterprise Storage Server machine type 2105 command	DS8000 machine type 2107 command	Description
rsQuery, rsQueryComplete, rsFlashCopyQuery	Isflash, Ispprc	These 2107 Copy Services CLI commands are equivalent to the respective 2105 CLI commands.  The 2107 mkflashcopy and mkpprc commands provide a -wait flag that delays command response until copy complete status is achieved.
rsTestConnection	ver	

#### Note 1

Volume space configuration is a primary difference between 2105 and 2107. For 2105, one command configures an array site into a RAID array and rank. For 2107, one command configures an array site into an array, and a second command configures an array into a rank. For 2105, a rank is configured as fixed block or CKD, and a CKD rank can contain "interleave" CKD volumes. For 2107, a rank is assigned to a user-defined extent pool object, which the user defines as either the fixed block or CKD storage type. The "interleave" volume construct does not exist for 2107. For 2105, a volume is configured from a specific rank, and cannot span rank boundaries. For 2107, a volume is configured from an extent pool. An extent pool can contain multiple ranks. A 2107 volume consists of one or more extents that can be allocated from one or more ranks. A fixed block extent is 1 GB (128 logical blocks). Each block contains 512 bytes of usable data space. A CKD extent is 0.94 GB or 1113 CKD cylinders.

For 2105, a rank is either assigned to server 0 or server 1, dependent on array site location. A 2105 rank is assigned to one of four possible LSS IDs, dependent on device adapter pair location and storage type configuration.

For 2107, an extent pool is assigned to server 0 or server 1. A rank that is configured from any array site can be assigned to a server 0 or 1 extent pool. Array site position and device adapter pairs are not factors for the rank-to-extent-pool assignment. A volume that is created from a server 0 extent pool is assigned to an even-numbered LSS ID. A volume created from a server 1 extent pool is assigned to odd-numbered LSS ID. A user must define at least two extent pools (0 and 1) but can define as many extent pools as there are ranks. For 2105, a user can delete a rank but cannot delete a volume. For 2107, a user can delete a single volume, rank, or extent pool. The 2107 CLI showrank and showextpool commands include a -metrics parameter that returns the performance counter values for a specified rank or extent pool ID. The -metrics parameter provides the means to monitor rank and extent pool performance statistics.

Enterprise Storage Server machine type	DS8000 machine type 2107 command	Description
2105 command		

#### Note 2

A 2107 ESCON I/O port is used for zSeries host attachment but cannot be configured as a remote mirror and copy path. Each ESCON I/O port must be assigned to only one address group. An address group is a set of 16 LSS IDs that are configured as CKD LCUs; for example, 0x00 to 0x0F. ESCON I/O port access to 2107 CKD volumes is constrained to the address group LCU volumes, up to 4096 volumes.

A 2107 fibre-channel port is configured for either SCSI-FCP or FICON protocol. Like 2105, a FICON port is restricted to the point-to-point/switched fabric topology setting. A FICON I/O port is used for zSeries host attachment, but cannot be configured as a remote mirror and copy path. A FICON port must be configured for "anonymous" access mode, meaning that any zSeries host system port (WWNN or WWPN) has unrestricted access to all CKD volumes, up to 64 KB volumes.

Like 2105, a 2107 fibre-channel SCSI-FCP I/O port can be configured for either the point-to-point/switched fabric or FC-AL connection topologies. A port that uses the point-to-point/switched fabric topology can be simultaneously used for OS host system I/O and for remote mirror and copy path configurations. Like 2105, a 2107 fibre-channel SCSI-FCP I/O port allows only "identified" host system ports to access volumes. A host system port WWPN must be identified (registered) to each I/O port through which volume access is intended. For 2107, this configuration constraint is defined as I/O port "identified" access mode. Host system port WWPN identification is accomplished by the CLI mkhostconnect command.

#### Note 3

A 2107 storage image can contain up to 32 000 volumes, whereas a 2105 unit can contain up to 8 000 volumes. Otherwise, the 2105 and 2107 volume definitions and characteristics are essentially identical.

For 2107 CKD PAV volumes, the CLI list and show commands identify both the original base and current base volume assignments. The original and current base concept exists for 2105, but specific relationships are not identified in the output.

The 2107 CLI provides a specific set of volume commands for each storage type (fixed block or CKD) as a means to clarify input parameter and output device adapter definitions.

The 2107 CLI showfbvol and showckdvol commands include a -metrics parameter that returns the performance counter values for a specified volume ID. The -metrics parameter provides the means to monitor volume performance statistics.

Enterprise Storage Server machine type 2105 command	DS8000 machine type 2107 command	Description
---	-------------------------------------	-------------

## Note 4

The 2105 volume access commands concern volume ID assignment to a SCSI-FCP host port initiator or WWPN. For 2107, volume IDs are assigned to a user-defined volume group ID (mkvolgrp and chvolgrp). A volume group ID is then assigned to one or more host system ports (mkhostconnect and chhostconnect) as a means to complete the volume access configuration.

The volume group construct also exists in the 2105 internal code, but the construct is not externalized by the 2105 Specialist or CLI commands.

For 2107, a user must create a FICON/ESCON-all type volume group. This volume group ID is assigned to each ESCON I/O port and to each FICON I/O port. The volume group ID enables FICON access all storage image CKD volumes, up to 64 KB volumes. The volume group ID enables an ESCON I/O port to access to the storage image CKD Address Group volumes, up to 4 KB volumes.

For 2107 fixed block volumes, a volume group must be configured as either "SCSI-mask" or "SCSI-map-256", depending whether the volume group is accessed by a SCSI-FCP host port that uses the report LUNs or poll LUNs access method protocol.

# **Output field descriptions**

This list describes the output field names, abbreviations, and field descriptions.

Output field name	Abbreviation	Description
Access	access	Access state.
		The term "access" is used throughout the CLI in different contexts.
Access state	accstate	The accessibility state of an object, online or offline.
Account	acct	Customer account name for a storage complex.
Active copy	actcpy	The FlashCopy background copy process is active.
Addr group	addrgrp	A set of 16 contiguous logical subsystems (LSSs) or logical control units (LCUs), starting at ID X0. Address group identifier that is assigned to this ESCON I/O port.
Address group	addrgrp	A set of 16 contiguous logical subsystems (LSSs) or logical control units (LCUs), starting at ID X0. Address group identifier that is assigned to this ESCON I/O port.
Array	array	An array of device drive modules (DDMs).
Array ID	arrayID	Array identifier that is assigned to a rank.

Output field name	Abbreviation	Description
Array site	arsite	Storage unit identifier followed by an array site identifier. Array site ID does not indicate physical location.
Attaching topology	atchtopo	Ports to which the host can attach.
Available storage	availstor	Storage that is available for a segment pool, in GB.
Background copy	bkgrndcopy	FlashCopy process that copies data from a source volume to a target volume.
Base Vol #	basevolnum	Lowest number of logical volumes in the address group.
Bypass cache	bypasscach	Count of bypass cache I/O requests.
Bytes read	byteread	Count of bytes that are transferred by SCSI read I/O operations, in 128 KB.
Bytes written	bytewrit	Count of bytes that are transferred by SCSI write I/O operations, in 128 KB.
Cache fast-write hits	cachfwhits	Count of cache fast-write write I/O operations where data did not move to or from a storage device.
Cache fast-write read hits	cachfwrhits	Count of cache fast-write read I/O operations where data was not moved to or from a storage device.
Cache fast-write read requests	cachfwrreqs	Count of cache fast-write read I/O operations issued by a host to a volume.
Cache fast-write requests	cachfwreqs	Count of cache fast-write write I/O operations issued by a host to a volume.
Cache space delay	cachspdelay	Count of delayed I/O operations from a host to a volume because of insufficient cache space.
Capacity	сар	Quantity of volume logical blocks or cylinders that are available for access by a host system.
CG attempts	CGattem	Number of attempts to form a consistency group.
CG drain	CGdrain	The maximum time that writes are inhibited to the remote site before stopping the current consistency group.
CG interval	CGinterval	The interval time between attempts to form a consistency group.
CG success	CGsuccess	The percentage of successful attempts to form consistency groups.
CG time	CGtime	The time when the last successful consistency group was formed.

Output field name	Abbreviation	Description
CKD irregular track accesses	CKDirtrkac	Count of I/O operations from a host to a CKD volume that has accessed at least one logical track not described by a regular track format descriptor.
CKD irregular track hits	CKDirtrkhits	Count of irregular track I/O operations where data did not move to or from a storage device.
CKD write promote hits	CKDwrtprohits	Count of write I/O operations to a volume, where track format descriptor data in cache has promoted at least one track to cache with requiring access to a storage device.
Config Vols	confgvol	Number of logical volumes configured on an address group.
Configuration	config	Storage unit internal I/O interface configuration: model and feature code dependent.
Configured volumes	confgvols	Number of configured volumes.
Contaminating writes	contamwrts	Count of side file additions to a volume from an update to a concurrent copy protected track or an update to an XRC monitored track.
Control ops received	conopsrcd	Count of remote mirror and copy SCSI control I/O operations that are received from a SCSI source.
Control ops sent	conopssent	Count of remote mirror and copy SCSI control I/O operations that are sent to a SCSI target.
Control unit base type	conbasetype	Default or user-assigned logical control unit type.
Copy state	cpystate	Global Mirror copy state.
CopyIndicator	CopyIndicator	Indicates Yes if the CopyIndicator is set for this FlashCopy relationship.
Created	created	Date of creation.
Crit mode	critmode	Status of critical heavy mode, either enabled or disabled.
Critical heavy mode	crithvmode	Status of critical heavy mode for remote mirror and copy (formerly PPRC) copy operations, either enabled or disabled.
Current base vol	curbasevol	Base and alias volume number.
Current FICON logins	curflogs	Current number of FICON N-port worldwide node name (WWNN) identifiers that are logged in to this I/O port.
Current SCSI logins	currentlogs	Current number of N-ports that are logged in to this I/O port.

Output field name	Abbreviation	Description
Current time	currtime	Current date, time, local time zone, and Daylight Savings Time.
DA pair	DA pair	Identifier of the device adapter pair that the DDM is associated with. The DA pair indicates I/O enclosure location.
DASD cache transfers	DASDtrans	Count of logical tracks for a volume that were promoted to cache in full or partial track mode (excluding sequential pre-state).
Data	data	Status of the array data access: normal, degraded, read only, failed, repairing, or inaccessible.
Data state	datastate	Status of data access: normal, degraded, read only, failed, repairing, or inaccessible.
Date	date	Date and time, including time zones and Daylight Savings Time.
Date (85)	date	Current clock setting of date.
DDM capacity (GB)	DDMcap	Minimum disk capacity of DDMs, in GBs.
DDM RPM (revolutions per minute)	DDMRPM	Minimum rate of disk revolutions per minute of the DDMs in an array.
Description	desc	User-defined description.
Disk capacity (GB)	dkcap	Capacity of the DDM, in GBs.
Disk interface	dkinf	Interface type of DDM.
Disk rate (Gb/Sec)	dkrate	Interface rate of DDM, in GBs per second.
Disk RPM	diskrpm	DDM revolutions per minute.
Disk usage	dkuse	DDM usage in an array site.
Dynamic relocation source	dyrelocsource	Counting number of extents that were source of a dynamic relocation.
Dynamic relocation target	dyreloctarget	Counting number of extents that were target of a dynamic relocation.
EC level	ECIVI	Engineering change level of the listed enclosure.
E-mail addresses	emailaddr	One or more e-mail addresses that receive service notification.
Enclosure #	enclnum	Identifier for an I/O enclosure within a storage unit frame.
Ending track	endtrk	Ending track address or number.
ESS IO ports	ESSIOport	The set of Enterprise Storage Server I/O ports to which a SCSI host port can log in.
ESSNet	ESSnet	Status of storage complex ESSNet user interface, either enabled or disabled.

Output field name	Abbreviation	Description
Extended long busy active	xtndlbzactive	Default or user-assigned extended long busy setting, enabled or disabled.
Extended long busy timeout (secs)	xtndlbztimout	Default or user-assigned extended long busy timeout value.
Extent limit	extlim	Maximum number of possible extents.
Extent number	extentnum	LSS persistent cache extent number.
Extent pool	extpool	Extent pool.
Extent pool ID	extpoolID	Identifier for the extent pool of the assigned rank.
Extent pool name	extpoolnam	Name of the extent pool of the assigned rank.
Extent size	extsize	Number of logical tracks in an extent.
Extent threshold	extthresh	Extent allocation threshold setting that triggers notification.
Extents	exts	Number of extents in the rank.
Extents used	extused	Number of extents used by this volume ID.
Fan speed	fanspeed	Current speed of a fan.
Fatal reason	fatalrsn	Reason code for a fatal error.
Feature code	FC	Identifier code that is used to order the PC enclosure.
FICON	FICON	FICON I/O operations that are enabled for this port.
FICON enabled	fenabled	FICON status, enabled or disabled.
Firmware level	firmwarelevel	Identifier for the firmware level that is installed in the hardware management console (HMC) enclosure.
Frame	frame	Identifier of storage unit frame that contains this I/O enclosure. Frame identifier format is six hexadecimal characters.
Frame ID	frameID	Identifier of storage unit frame that contains this I/O enclosure. Frame identifier format is six hexadecimal characters.
Frame #	frm#	Frame number of a listed enclosure.
Group	group	
Host ID	hostID	SCSI host identifier for an Open Systems host that is associated with this host port.
ID	ID	Storage image ID in the following format: manufacturer.type.serial number.

Output field name	Abbreviation	Description
ľmACopy	imacpy	Indicates Yes if the I'mAcopyBit is set for this FlashCopy relationship.
Inhibit cache loading	inhcachload	Count of inhibit cache loading I/O requests.
Interface address	interadd	FlashCopy arbitrated-loop base address of the storage image enclosure.
Interface IDs	interfID	Identifies four interface IDs that are associated with I/O ports on the HBA.
Interface rate	interrate	Minimum disk interface rate of the disk in an array, in GBs per second.
Interface type	interface type	Host attachment interface type (FC-AL, SCSI-FCP, or FICON).
Interfaces	interfs	Identifier of three interface ports for the HMC enclosure consisting of four hexadecimal characters.
Location	loc	Location of enclosure. Location format is <i>Utttt.mmm.ppsssss</i> .
Logical block	logblk	Logical block (512 bytes or 520 bytes).
Logical block size	logblksz	Logical block size.
Logical vols	logvols	Identifier of logical volumes.
Login limit	loglim	Maximum number of N-ports that can log in to this I/O port.
LSSs	LSSs	Number of logical subsystems in an address group.
LUN access	LUNacc	Quantity of LUNs that are accessible by this host attachment (256 LUNs or 64K LUNs).
LUN capacity	LUNcap	Quantity of LUNs that are accessible by this host attachment (256 LUNs or 64K LUNs).
Name	name	User-defined name.
NVS space allocations	NVSspallo	Count of I/O operations that cause nonvolatile storage (NVS) space allocation.
NVS space delay	NVSspadel	Count of I/O operations from a host to a volume.
Master count	mastcount	Quantity of master LSS IDs on this storage image ID.
Master ID	mastID	Master storage image ID.
Master session ID	mastsessID	Global Mirror session ID.
Master SSID	mastSSID	LSS subsystem identifier.
Memory	mem	Amount of processor memory in this PC enclosure, in MB.
Migration disk SN	migradiskSN	Migration disk serial number.

to report machine-reported product data (MRPD). This interval can be a Manufacturer, machine type, and sequence number.  Narrow arrays nararrays Number of narrow arrays in a rank. Normal read hits normrdhits Number of normal read operations where data did not move to or from a storage device.  Normal read requests normrdrqts Number of normal read operations issued by a host to a volume.  Normal write hits normwritehits Number of normal write operations where data did not move to or from a storage device.  Normal write operations normwriteops Number of normal write operations where data did not move to or from a storage device.  Normal write requests normwritereq Number of command sequences with at least one write command.  Normal write requests normwritereq Number of normal write operations issued by a host to a volume.  NVS memory NVSmem Amount of nonvolatile storage (NVS memory that is assigned to this server, in MB.  Number of logical vols numlogins Current number of valid N-ports that are logged in to this I/O port.  Number of logical vols numlous Number of logical volumes configured from an extent pool.  Number of extents numents Number of extents.  Number of ranks numranks Number of ranks configured in an extent pool.  Original base vol orgbvols Original base volume CKD volume identifier.  OS memory OSmem Amount of operating system memory that is assigned to the server, in MB.  Out-of-sync tracks outsynctrks The number of tracks that are not synchronized for this FlashCopy either enabled or disabled.  Persistent cache (MB) pcache Amount of persistent Cache memor	Output field name	Abbreviation	Description
Narrow arrays  Narrow arrays  Number of narrow arrays in a rank.  Normal read hits  normrdhits  Number of normal read operations where data did not move to or from a storage device.  Normal write hits  normwritehits  Number of normal read operations where data did not move to or from a storage device.  Normal write operations  Normal write operations  normwriteops  Number of normal write operations where data did not move to or from a storage device.  Normal write requests  normwritereq  Number of command sequences with at least one write command.  Normal write requests  NVSmem  NVSmem  Amount of norwolatile storage (NVSmemy that is assigned to this server, in MB.  Number of logical volume.  Number of logical volume numlyols  Number of logical volume numlyols  Number of logical volume on a steril pool.  Number of extents  Number of ranks  Number of ranks  Number of ranks configured in an extent pool.  Original base vol  Out-of-sync tracks  Outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB)  Physical bytes read  phbyteread  Number of physical bytes written  Number of physical storage write operations.	MRPD interval	MRPDintvl	Number of days between dial home to report machine-reported product data (MRPD). This interval can be 0.
Normal read hits    Number of normal read operations where data did not move to or from a storage device.   Normal read requests   Number of normal read operations issued by a host to a volume.   Normal write hits   Number of normal write operations where data did not move to or from a storage device.   Normal write operations   Number of normal write operations where data did not move to or from a storage device.   Normal write operations   Number of command sequences with at least one write command.   Normal write requests   Number of normal write operations issued by a host to a volume.   NVS memory   NVSmem   Amount of nonvolatile storage (NVSmemory that is assigned to this server, in MB.   Number of logins   numlogins   Current number of valid N-ports the are logged in to this I/O port.   Number of logical vols   numlvols   Number of logical volumes configured from an extent pool.   Number of extents   numexts   Number of extents.   Number of extents   Number of extents.   Number of extents   Number of extents.   Number of ranks   Original base volume CKD volume identifier.   OS memory   OSmem   Amount of operating system memory that is assigned to the server, in MB.   Out-of-sync tracks   outsynctrks   The number of tracks that are not synchronized for this FlashCopy relationship.   Persistent   persistent   Status of persistent FlashCopy, either enabled or disabled.   Persistent cache (MB)   pcache   Amount of persistent cache memor that is assigned to a server, in MB.   Physical bytes read   phbyteread   Number of physical bytes written.   Physical read   Physical storage read operations.   Physical write   Phwrite   Number of physical storage write operations.	MTS	MTS	
where data did not move 'to or from a storage device.  Normal read requests  normrdrqts  Number of normal read operations issued by a host to a volume.  Normal write hits  normwritehits  Number of normal write operations where data did not move to or from a storage device.  Normal write operations  normwriteops  Number of command sequences with at least one write command.  Normal write requests  NVS memory  NVS memory  NVS memory  NVSmem  Amount of nonvolatile storage (NVSmemory that is assigned to this server, in MB.  Number of logical vols  numlogins  Current number of valid N-ports the are logged in to this I/O port.  Number of logical vols  numlvols  Number of extents  Number of extents  Number of extents.  Number of ranks  numranks  Number of ranks configured in an extent pool.  Original base vol  Original base vol  Orginal	Narrow arrays	nararrays	Number of narrow arrays in a rank.
Normal write hits    Normal write hits	Normal read hits	normrdhits	where data did not move to or from
where data did not move to or from a storage device.  Normal write operations  normwriteops  Number of command sequences with at least one write command.  Normal write requests  normwritereq  Number of normal write operations issued by a host to a volume.  NVS memory  NVS memory  NVS memory  NVSmem  Amount of nonvolatile storage (NVS memory that is assigned to this server, in MB.  Number of logins  numlogins  Current number of valid N-ports that are logged in to this I/O port.  Number of logical vols  numlvols  Number of logical volumes configured from an extent pool.  Number of extents  Number of extents.  Number of ranks  numranks  Number of ranks configured in an extent pool.  Original base vol  orgbvols  Original base volume CKD volume identifier.  OS memory  OSmem  Amount of operating system memory that is assigned to the server, in MB.  Out-of-sync tracks  outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB)  Physical bytes read  phbyteread  Number of physical bytes read.  Physical bytes written  physical bytes written  Physical read  phread  Number of physical storage write operations.	Normal read requests	normrdrqts	
Normal write requests    Number of normal write operations issued by a host to a volume.	Normal write hits	normwritehits	where data did not move to or from
issued by a host to a volume.  NVS memory  NVSmem  Amount of nonvolatile storage (NVS memory that is assigned to this server, in MB.  Number of logins  numlogins  Current number of valid N-ports the are logged in to this I/O port.  Number of logical vols  numlvols  Number of logical volumes configured from an extent pool.  Number of extents  numexts  Number of ranks configured in an extent pool.  Original base vol  Original base vol  Original base volume CKD volume identifier.  OS memory  OSmem  Amount of operating system memory that is assigned to the server, in MB.  Out-of-sync tracks  Outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB)  Physical bytes read  phbyteread  Number of physical bytes read.  Physical bytes written  Physical read  Physical storage read operations.  Number of physical storage write operations.	Normal write operations	normwriteops	
memory that is assigned to this server, in MB.  Number of logins  numlogins  Current number of valid N-ports that are logged in to this I/O port.  Number of logical vols  numlvols  Number of logical volumes configured from an extent pool.  Number of extents  numexts  Number of ranks configured in an extent pool.  Original base vol  Original base vol  Original base volume CKD volume identifier.  OS memory  OSmem  Amount of operating system memory that is assigned to the server, in MB.  Out-of-sync tracks  outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Physical bytes read  phbyteread  Number of physical bytes read.  Physical read  phread  Number of physical storage read operations.  Number of physical storage write operations.	Normal write requests	normwritereq	
are logged in to this I/O port.  Number of logical vols  numlvols  Number of logical volumes configured from an extent pool.  Number of extents  numexts  Number of extents.  Number of ranks configured in an extent pool.  Original base vol  Original base vol  OSmem  OSmem  OSmem  Out-of-sync tracks  Outsynctrks  Outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  Persistent cache (MB)  Physical bytes read  Physical bytes written  Physical read  Physical write  Phyrical write  Phyrical write  Phyrical write  Phyrical write  Phyrical write  Phyrical storage write  Number of physical storage write	NVS memory	NVSmem	
Configured from an extent pool.  Number of extents  Number of ranks  numranks  numranks  Number of ranks configured in an extent pool.  Original base vol  orgbvols  Original base volume CKD volume identifier.  OS memory  OSmem  Amount of operating system memory that is assigned to the server, in MB.  Out-of-sync tracks  outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB)  pcache  Amount of persistent cache memor that is assigned to a server, in MB.  Physical bytes read  phbyteread  Number of physical bytes read.  Physical bytes written  Physical read  phread  Number of physical storage read operations.	Number of logins	numlogins	Current number of valid N-ports that are logged in to this I/O port.
Number of ranks  numranks  numranks  Number of ranks configured in an extent pool.  Original base vol  orgbvols  Original base volume CKD volume identifier.  OS memory  OSmem  Amount of operating system memory that is assigned to the server, in MB.  Out-of-sync tracks  outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB)  pcache  Amount of persistent cache memor that is assigned to a server, in MB.  Physical bytes read  phbyteread  Number of physical bytes read.  Physical bytes written  Physical read  Number of physical storage read operations.  Physical write  Number of physical storage write operations.	Number of logical vols	numivols	
extent pool.  Original base vol  orgbvols  Original base volume CKD volume identifier.  OS memory  OSmem  Amount of operating system memory that is assigned to the server, in MB.  Out-of-sync tracks  outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB)  pcache  Amount of persistent cache memor that is assigned to a server, in MB.  Physical bytes read  phbyteread  Number of physical bytes read.  Physical bytes written  Physical read  phread  Number of physical storage read operations.  Physical write  Number of physical storage write operations.	Number of extents	numexts	Number of extents.
identifier.  OS memory  OSmem  Amount of operating system memory that is assigned to the server, in MB.  Out-of-sync tracks  outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB)  pcache  Amount of persistent cache memor that is assigned to a server, in MB.  Physical bytes read  phbyteread  Number of physical bytes read.  Physical bytes written  Physical read  phread  Number of physical storage read operations.  Physical write  Physical storage write operations.	Number of ranks	numranks	
memory that is assigned to the server, in MB.  Out-of-sync tracks  outsynctrks  The number of tracks that are not synchronized for this FlashCopy relationship.  Persistent  persistent  Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB)  pcache  Amount of persistent cache memor that is assigned to a server, in MB.  Physical bytes read  phbyteread  Number of physical bytes read.  Physical bytes written  Physical read  phread  Number of physical storage read operations.  Physical write  phwrite  Number of physical storage write operations.	Original base vol	orgbvols	
synchronized for this FlashCopy relationship.  Persistent persistent Status of persistent FlashCopy, either enabled or disabled.  Persistent cache (MB) pcache Amount of persistent cache memor that is assigned to a server, in MB.  Physical bytes read phbyteread Number of physical bytes read.  Physical bytes written phbytewrit Number of physical bytes written.  Physical read phread Number of physical storage read operations.  Physical write phwrite Number of physical storage write operations.	OS memory	OSmem	memory that is assigned to the
either enabled or disabled.  Persistent cache (MB)  pcache  Amount of persistent cache memor that is assigned to a server, in MB.  Physical bytes read  phbyteread  Number of physical bytes read.  Physical bytes written  Physical read  phread  Number of physical bytes written.  Number of physical storage read operations.  Physical write  phwrite  Number of physical storage write operations.	Out-of-sync tracks	outsynctrks	synchronized for this FlashCopy
that is assigned to a server, in MB.  Physical bytes read phbyteread Number of physical bytes read.  Physical bytes written phbytewrit Number of physical bytes written.  Physical read phread Number of physical storage read operations.  Physical write phwrite Number of physical storage write operations.	Persistent	persistent	
Physical bytes written phbytewrit Number of physical bytes written.  Physical read phread Number of physical storage read operations.  Physical write phwrite Number of physical storage write operations.	Persistent cache (MB)	pcache	Amount of persistent cache memory that is assigned to a server, in MB.
Physical read phread Number of physical storage read operations.  Physical write phwrite Number of physical storage write operations.	Physical bytes read	phbyteread	Number of physical bytes read.
Physical write phwrite phwrite physical storage write operations.	Physical bytes written	phbytewrit	Number of physical bytes written.
operations.	Physical read	phread	
Port port I/O port.	Physical write	phwrite	
	Port	port	I/O port.
Port group portgrp Group identifier for host port.	Port group	portgrp	Group identifier for host port.

Output field name	Abbreviation	Description
Port profile	portpro	Port behavior identification for this SCSI host ID.
Position	pos	Position of DDM in an array configuration of DDMs.
Power mode	pw mode	Current storage unit power control mode.
Power state	pw state	Current storage unit power status.
PPRC control operations received	PPRCcntrloprec	Remote mirror and copy (formerly PPRC) I/O control operations.
PPRC control operations sent	PPRCcntrlopsent	Remote mirror and copy (formerly PPRC) I/O control operations.
PPRC source	PPRCsce	Remote mirror and copy (formerly PPRC) source I/O operations that are enabled for this port.
PPRC target	PPRCtgt	Remote mirror and copy (formerly PPRC) target I/O operations that are enabled for this port.
PPRC tracks	PPRCtrks	Count of logical tracks for a remote mirror and copy (formerly PPRC) primary volume that were transferred to a remote mirror and copy secondary volume.
Processor complex	procplex	Identifier of processor complex with which the central electronic complex enclosure is associated.
Processor qty	procqty	Number of processors in the PC enclosure.
Processors assigned	procassd	Number of processors that are assigned to the server.
Profile	profile	Host port profile.
Quick write promotes	qwriteprots	Count of logical tracks for a volume that have been destaged from cache to storage devices.
RAID type	RAIDtype	Type and configuration of RAID array.
Rank	rank	Identifier that the array is assigned to. Rank number consists of storage unit ID and a rank number.
Rank group	rnkgrp	Identifier of rank group where segment pool is configured.
Rank position	rankpos	Array position within the assigned rank.
Read operations	readops	Count of I/O command sequences in one read or search command (but no write commands).
Reads	reads	Count of read I/O operations.
Real allocated extents	realallocext	Count of real allocated extents.
Real extent conversion	realextconv	Count of real extent conversion.

Output field name	Abbreviation	Description
Real extent pool capacity	relextcap	Number of gigabytes of real extent pool capacity.
Real extents	realext	Count of real extents.
Reason	reason	The reason a condition exists.
Record cache misses	reccachemis	Number of normal record mode read operations where data moved to or from a storage device.
Record mode reads	recmoreads	Number of normal record mode read operations issued by a host to a volume.
Recording	rec	FlashCopy - record changed tracks.
Requested capacity	reqcap	Number of volume cylinders that are available for host system access.
Requested power mode	reqpm	Power control mode when the local/remote switch is set to remote.
Requested state	reqstate	Desired state of storage unit: online or offline.
Reserved extents	resvdexts	Extents that are reserved in an extent pool.
Reserved storage (GB)	resvdstor	Reserved storage in an extent pool, in GB.
Revertable	revertable	Revertable to previous Global Mirror state.
SCSI host port users	SCSIhostportusr	SCSI host port users of this volume group.
SCSI TGT	SCSItgt	SCSI target I/O operations that are enabled for this port.
Scheduled on	schl-on	User-defined time that the storage unit powers on.
Scheduled off	schl-off	User-defined time that the storage unit powers off.
Sequential DASD cache transfers	seqDASDtrans	Count of logical tracks for a volume that were promoted to cache because data was moved by sequential pre-stage and required movement from a storage device.
Sequential read hits	seqreadhits	Number of sequential read operations where data did not move to or from a storage device.
Sequential read requests	seqreadreqs	Number of sequential read operations issued by a host to a volume.
Sequential write hits	seqwritehits	Number of sequential write operations that did not require movement of data to or from a storage device before the completion of the operation.
Sequential write operations	seqwriteops	Number of command sequences that contain at least one sequential write command.

Output field name	Abbreviation	Description
Sequential write requests	seqwritereq	Number of sequential write operations issued by a host to a volume.
Serial number	SN	Internal identifier for the data space of an array.
Server	server	Server or DA group to which the DA is assigned.
SN	SN	Unique serial number.
SNMP addresses	SNMPaddr	One or two IP addresses where the storage complex sends SNMP error messages.
Source write enabled	sourcewrite	Host writes to the source volume are allowed.
Speed	speed	The current speed of this fan tray.
SRC cascade	SRCcascade	Source volume is enabled to be in a cascading remote mirror and copy (formerly PPRC) relationship.
SRC vol LSS	SRCvolLSS	Source volume LSS.
SS	SS	Subsystem.
Starting track	starttrk	The starting track address for the volume pinned data.
State	state	Storage unit functional status: online, offline, resuming, quiescing, quiesce exception, forced quiescing, or fenced.
State (FRU)	statefru	Current state of the disk drive module.
Storage devices	stordev	Number of storage devices in an enclosure.
Storage slots	storslot	Number of slots for storage devices in an enclosure.
Storage type	stortype	Extent pool type of the assigned rank.
Storage unit	su	One storage device.
Strip size	strpsize	Number of logical tracks in a strip.
Stripe size	strpesize	Number of logical tracks in a stripe.
Subordinate count	subcount	Count of subordinate associations.
Subordinate ID	subID	Subordinate storage unit ID.
Subordinate SSID	subSSID	Subordinate subsystem identifier.
Subsystem	subsys	User-assigned or default subsystem identifier.
Suspended	suspended	The relationship is suspended.
Synced	synced	Date the FlashCopy was synchronized.
Target write enabled	tgtwrite	Host write I/O operations to a target volume are allowed.

Output field name	Abbreviation	Description
Tgt cascade	tgtcascade	Target volume is enabled to be configured in a cascading remote mirror and copy relationship.
Tgt read enabled	tgtread	Host read I/O operations to a target volume are allowed.
Time	time	Current clock setting of time.
Time lower interface activity	timelowifact	Accumulated time of lower interface I/O activity for the volume.
Time on-channel	timeonchan	Amount of I/O port time for SCSI I/O operations, in seconds.
Time physical storage read	timephread	Accumulated time for physical storage read operations.
Time physical storage write	timephwrite	Accumulated time for physical storage write operations.
Time read	timeread	Accumulated time for all read operations.
Time write	timewrite	Accumulated time for all write operations.
Time zone	timez	Current clock settings of time zone and Daylight Savings Time.
Timout active copy recording	timoutactcpyrec	
Total storage (GB)	totlstor	Amount of storage in an extent pool, in GB.
Topology	topo	Port topology.
Track size	trksize	Size of the track if the volume is CKD or fixed block.
Туре	type	Type of storage unit enclosure.
Unknown SCSI IDs	unkSCSIlog	List of unknown SCSI N-port WWPN identifiers that attempted login into this I/O port.
Used extents	usedexts	Number of extents that are allocated to volumes in a rank.
Virtual extent conversion	virextconv	Count of virtual extent conversion.
Virtual extent pool capacity	virextcap	Number of gigabytes of virtual extent pool capacity.
Virtual extents	virext	Count of virtual extents.
Vol group	vol	Volume group ID. The unique identifier that is assigned to this volume.
Volume group	volgrp	Volume group.
Vols	vols	Number of logical volumes in an address group.
Volume type	voltype	Volume type.
Wide arrays	widearrays	Number of wide arrays in a rank.
Writes	writes	Count of write I/O operations.
WWNN	WWNN	Worldwide node name.

Output field name	Abbreviation	Description
WWPN	WWPN	Worldwide port name.
XDC interval	XDCintvl	Global Mirror copy interval.

## Framework command

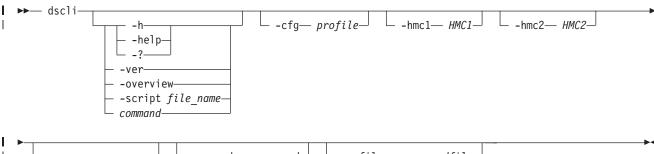
This section contains the user interface framework commands for the DS command-line interface.

The dscli command starts the DS command-line interface (CLI). Use this command to perform storage management tasks from the command-line.

## dscli

I

The dscli command starts the command-line interface (CLI) program. Use this command to run CLI commands in interactive mode, to run a single command, or to run a set of commands from a script. For more information about how to use this command, see "Completing DS CLI postinstallation."



#### -passwd— password— -user— user name-

## **Parameters**

#### -help | -h | -?

Displays a help screen about how to use the DS CLI program.

#### -ver

Displays the DS command-line interface version.

#### -overview

Provides overview information about the DS CLI application.

## -script file name

Initiates the script mode so that multiple dscli program commands can be issued consecutively using a saved file.

#### file name

(Required) Specifies the file with the stored program commands to be executed.

Format options that are specified using the framework setoutput command apply to all commands in the file. Output from successful commands routes to stdout, and output from failed commands routes to stderr. If an error occurs during the processing of one of the commands in the file, the script exits at the point of failure and returns to the system prompt.

command

Specifies the single command that you want to run.

## -cfg profile

Specifies a profile file. This parameter is not required if you are using default profiles. The default profile is the dscli.profile, and it is provided as part of the DS CLI package under the profile directory.

## -hmc1 HMC1

Specifies the primary management console IP address or the host name.

HMC1

(Required) The IP address for the primary management console.

This parameter is not required if you have established this information as a profile variable.

#### -hmc2 HMC2

Specifies the secondary management console IP address or the host name.

HMC2

(Required) The IP address for the secondary management console.

This parameter is not required if you have established this information as a profile variable.

Note: The *HMC1* and *HMC2* values must apply to two different management consoles.

#### -user user name

Specifies your user name for issuing DS CLI commands on the command-line.

user name

(Required) Your user name.

This parameter is not required if you have established this information as a profile variable.

## -passwd password

Specifies the password that you use for issuing DS CLI commands on the command line.

password

(Required) Your password.

This parameter is not required or recommended. If you use this method to designate your password, the password is displayed on the screen. Another option is to specify a password file (see the next parameter) that is used when you start the DS CLI application.

## -pwfile passwordfile

Specifies the password file that contains your password.

passwordfile

Specifies a password file as an alternative to the -passwd parameter.

### Example

#### This command invokes the CLI in interactive mode:

>dscli

## The resulting output

dscli>

## exit

Ends an interactive command-line interface session.



## **Parameters**

## -? | -h | -help

Displays a detailed description of this command, including syntax, parameter descriptions, and examples. If you specify a help option, all other command options are ignored.

## **Example**

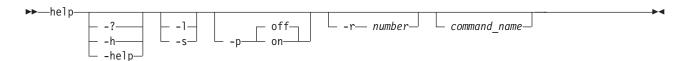
#### Exit interactive mode

dscli>exit

#### Out of interactive mode

# help

Displays a list of commands available in a command-line interface and optionally displays the syntax or brief description of each command. If you specify this command with no parameters, this command displays only a list of available commands.



## **Parameters**

## -? | -h | -help

Displays a detailed description of this command, including syntax, parameter descriptions, and examples. If you specify a help option, all other command options are ignored.

- -I Displays a list of available commands with the syntax diagrams for each. If you specify a command name with this parameter, this command displays the syntax for only the specified command.
- -s Displays a list of available commands with a brief description of each. If you specify a command name with this parameter, this command displays a brief description for only the specified command.
- -p off | on

Specifies whether to display one page of text at a time or all text at once.

off Displays all text at one time. This is the default value.

on Displays one page of text at a time. Pressing any key displays the next page.

## -r number

Specifies the number of rows per page to display when the -p parameter is on. The default is 24 rows. You can specify a value from 1 to 100.

#### command\_name

Displays help information for the specified command, including the syntax diagram, parameter descriptions, return codes and errors, descriptions, examples, and miscellaneous remarks.

## Example

## Invoke help

#dscli>help -s exit

## The resulting output

Ends a command-line interface session.

## quit

Ends an interactive command-line interface session.



## **Parameters**

#### -? | -h | -help

Displays a detailed description of this command, including syntax, parameter descriptions, and examples. If you specify a help option, all other command options are ignored.

## **Example**

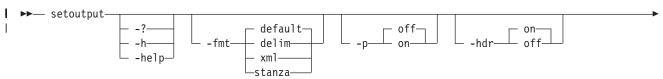
#### Quit interactive mode

dscli>quit

#### Out of interactive mode

# setoutput

The setoutput command sets or displays command output format options. You can use this command to set either default or user-defined output formats. The output format set by this command remains in effect for the duration of the interactive command session unless reset either with a command option or the re-issuance of the setoutput command. Running this command with no parameters displays the current output settings in the default output format.



-delim— char— -r- numberoffoff-**Parameters** -? | -h | -help Displays a detailed description of this command, including syntax, parameter descriptions, and examples. If you specify a help option, all other command options are ignored. -fmt default | delim | xml | stanza Specifies the format of the output. You can specify one of the following values: default Specifies that the output be displayed in a tabular format using spaces as the delimiter between the columns. This is the default value. delim Specifies that the output format be set to a table and sets the column delimiter to a single character specified by the -delim char option. xml Specifies that the output be displayed in XML format. Specifies that the output be displayed in stanza (horizontal table) format. -p off | on Specifies whether to display one page of text at a time or all text at once. off Displays all text at one time. This is the default value. on Displays one page of text at a time. Pressing any key displays the next page. -hdr on | off Specifies whether to display the table header. on Displays the table header. This is the default value. off Does not display the table header. -delim char Specifies the delimiter character (such as a comma) used in the report. -r number Specifies the number of rows per page to display when the -p parameter is on. The default is 24 rows. You can specify a value from 1 to 100. -v off ∣ on Specifies whether to enable verbose mode. off Disables verbose mode. This is the default value. on Enables verbose mode. -bnr off | on

Specifies whether the banner (command header) message be enabled.

off

Turns the header mode off so that the command header does not display.

**on** Turns the header mode on so that the command header is displayed.

## **Format Examples**

## Invoke the setoutput command with no options

When you specify the setoutput command with no options, the DS CLI always displays the current output settings in the default format (space-separated plain text table), regardless of the values of the output settings. Issue the setoutput command as follows:

dscli>setoutput

## The resulting output

```
Paging Rows Format Header Verbose Banner
_____

    Default On Off On
```

## Invoke the setoutput command using the -delim parameter

The following is an example of the commands that you would issue to get (long) output in comma-separated format for an unassigned rank only. Issue the setoutput command to specify the report format and then issue the Isrank command to designate the rank being queried.

```
dscli> setoutput -fmt delim -delim ,
dscli> 1srank -dev IBM.2107-75FA120 -state unassigned
```

## The resulting output

Note: While this example shows the header turned on, you can choose to turn the header off, in which case you issue the command and include the -hdr off parameter.

```
ID, Group, State, datastate, Array, RAIDtype, extpool ID, stgtype
RO,-,Unassigned,Normal,AO,5,-,fb
```

## Invoke the setoutput command using the -fmt xml parameter

The following is an example of the commands that you would issue to get (long) output in XML format for an unassigned rank only. Issue the setoutput command to specify the report format and then issue the Isrank command to designate the unassigned rank being queried.

```
dscli> setoutput -fmt xml
dscli> 1srank -dev IBM.2107-75FA120 -state unassigned
```

## The resulting output

```
<IRETURNVALUE>
<INSTANCE CLASSNAME="CliRankHandler"><PROPERTY NAME="rank id">
<DISPLAY TYPE="string">R0</DISPLAY><VALUE TYPE="string">R0</VALUE>
</PROPERTY><PROPERTY NAME="grp"><DISPLAY TYPE="unit8">-</DISPLAY>
<VALUE TYPE="unit16">-</VALUE></PROPERTY><PROPERTY NAME="state">
<DISPLAY TYPE="string">Unassigned/DISPLAY><VALUE TYPE="string">
unassigned</VALUE></PROPERTY><PROPERTY NAME="data">
<DISPLAY TYPE="string">Normal</DISPLAY><VALUE TYPE="string">
Normal</VALUE></PROPERTY><PROPERTY NAME="array id>
```

```
<DISPLAY TYPE=string">A0</DISPLAY><VALUE TYPE="string">A0
</VALUE></PROPERTY><PROPERTY NAME="raidtype"><DISPLAY TYPE="unit8">5</DISPLAY>
<VALUE TYPE="string">5</VALUE><PROPERTY><PROPERTY NAME="extpool_id">
<DISPLAY TYPE="string">-</DISPLAY><VALUE TYPE=string">-<VALUE>
<PROPERTY><PROPERTY NAME="stgtype"><DISPLAY TYPE="string">fb</DISPLAY>
<VALUE TYPE="string">fb</VALUE><PROPERTY></INSTANCE><IRETURNVALUE></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY></PROPERTY>
```

## Invoke the setoutput command using the -fmt stanza parameter

When columns are horizontally long, output can be difficult to visually align. Using the stanza format option eliminates this problem. The following is an example of the commands that you would issue to get (long) output in stanza format for an unassigned rank only. Issue the **setoutput** command to specify the report format and then issue the **Isrank** command to designate the unassigned rank being queried.

```
dscli> setoutput -fmt stanza
dscli> lsrank -dev IBM.2107-75FA120 -state unassigned
```

## The resulting output

ID R0 Group -State unassigned datastate normal Array A0 RAIDtype 5 extpoolID stgtype fb

## User account and security commands

This section contains commands that are used to maintain command-line interface (CLI) user accounts and security.

The following commands add, modify, delete, and show CLI user accounts and security information.

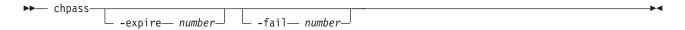
# chpass

I

ı

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The chpass command changes the password expiration time and the number of login attempts for a storage complex.



## **Parameters**

## -expire number

(Optional) Specifies the number of days a Storage Manager user account password is valid before it expires. The default number of days is 365. If you do not want the password to expire, enter 0. After the password expires, the user is not allowed to log in unless the password is changed.

#### -fail number

(Optional) Specifies the number of login attempts allowed on any given Storage Manager user account. The number of login attempts can be 0 to nine. The

default number of login attempts is three. If you do not want a limit on the number of login attempts, enter zero (0). After the number of login attempts is exceeded, the user account is locked.

## Example

## Invoking the chpass command

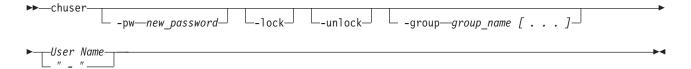
dscli>chpass -expire 20 -fail 0

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version 5.0.0.0 DS:IBM 2107-75FA120 Password parameters successfully changed.

## chuser

The chuser command is used to modify and lock or unlock a DS CLI or a DS Storage Manager user account. A CLI user with administrative authority uses this command to update a user account password, modify user group authority, or to lock or unlock a user account. Users that do not have administrator authority, use this command to change an expired password and create a password that is not known to the administrator who created their account.



## **Parameters**

Note: When a person with administrator authority designates the password, the password is set as expired upon its initial use. The user of the password is required to establish a new password using the chuser command before access to the rest of the DS CLI application is granted.

-pw

(Optional) Specifies that a new password be assigned to the user.

#### Note:

- When a person with administrator authority is using this parameter in association with the -unlock parameter, the new password is temporary and expires upon the initial use.
- When a person without administrator authority uses this parameter, the new password becomes their valid password and replaces their prior password.

## new\_password

The new password.

The new password and its usage must meet the following criteria:

- Be six to 16 characters long.
- Must contain five or more letters, and it must begin and end with a letter.
- Must contain one or more numbers.
- · Cannot contain the user's user ID.

Is case-sensitive.

#### -lock

(Optional) Locks a user account.

Persons with administrator authority can use this parameter to lock a user account. The affect of this locking action is not enacted until the user authenticates their account. In other words, if a user is already active (authenticated) and using the DS CLI application, the lock does not take place until they log out of the application.

#### -unlock

(Optional) Unlocks a user account.

A person with administrator authority can use this parameter to unlock a user account when the user can no longer log into the DS CLI application. The reasons a user might not be able to log into the DS CLI application can include:

The user forgot their password and in an attempt to log in they went beyond the set number of allowable attempts. Going beyond the set limit locks the user account.

Note: When unlocking a user account for this scenario, the administrator must also assign a new password to the user using the -pw parameter. The new password is temporary and immediately expires after its initial use. The administrator must notify the user of this new password.

· Someone with administrator authority has locked the user account.

## **-group** group name [...]

(Optional) The user's access authority group.

group\_name [...]

The following list provides the list choices that can be assigned to a user. Multiple names must be separated by commas. For example, op\_copy\_services, service.

#### admin

The administrator user group has access to all management console server service methods and all storage image resources.

## op\_storage

The storage operator user group has access to physical configuration service methods and resources, including storage complex, storage image, array, rank, and extent pool objects. This user group inherits all the authority of the op\_copy\_services and monitor user groups, excluding security methods.

## op\_volume

The volume operator user group has access to service methods and resources that relate to logical volumes, hosts, host ports, logical subsystems, logical volumes, and volume groups, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

#### op copy services

The copy services operator user group has access to all Copy Services service methods and resources, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

#### service

The service user group includes monitor authority, plus access to all management console server service methods and resources, such as performing code loads and retrieving problem logs.

#### monitor

The monitor user group has access to list and show commands. It provides access to all read-only, nonsecurity management console server service methods and resources.

#### no access

The no access user group does not have access to any service methods or storage image resources. By default, this user group is assigned to any user account in the security repository that is not associated with any other user group.

User Name | -

(Required) The user account name.

#### Note:

- · The administrator inserts the name of the user account that is affected by the changes (group name, lock, or unlocking).
- · Users who are changing their passwords insert their user account

Alternatively accepts input from stdin when the dash (–) is specified.

## **Example (2107)**

## Invoking the chuser command

dscli>chuser -pw xy0abcde testuser

## The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

User Name testuser successfully modified.

## Isuser

The Isuser command returns a list of storage image user account names and access authority levels.

#### ▶►—lsuser-

## **Parameters**

There are no parameters for this command.

## **Example**

## Invoking the Isuser command

dscli>lsuser

## The resulting output

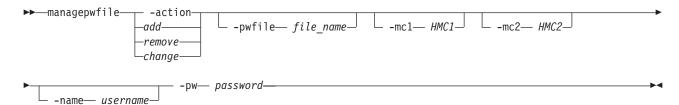
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI

Name Group State Testuser services,op\_copy\_services active Biguser admin active Smalluser op\_storage 1ocked

Column Header	Description	
Name	User name assigned to the user account.	
Group	The user's access authority group. One or more of the following group designations is displayed:	
	admin	
	op_storage	
	op_volume	
	op_copy_services	
	service	
	monitor	
	no access	
State	The status of the user account for the specified user group, either active or locked.	

## managepwfile

The managepwfile command creates a password file for an existing ESS user account. This command processes the password requirements for 2105, 2107, and 1750 systems.



#### **Parameters**

#### -action

(Required) Specifies that a process that is designated by the subparameter be enacted on the password file.

Specifies that the password file be created, adding the first line of the add file, which contains the primary HMC designation and the HMC username.

remove

Specifies that the password file be removed for the designated user.

change

Specifies that the password file be changed for the designated user.

## -pwfile file name

(Optional) Specifies the name that you want to use for the password file. The password file can be specified as an absolute path or a relative path. The relative path is obtained from the current working directory.

file name

The user-specified ESS password file name.

## -mc1

(Optional) Specifies the DNS name or the IP address.

Note: You can use the default value that is specified for HMC1 in your profile file, or you can use the value specified for the current CLI session connection.

HMC1

Designates the primary HMC or 2105 DNS name or IP address. This information along with the -name parameter is used as a key in the password file.

#### -mc2

(Optional) Specifies the DNS name or the IP address of the secondary HMC.

Note: You can use the default value that is specified for HMC2 in your profile file, or you can use the value specified for the current CLI session connection.

HMC2

Designates the secondary HMC or 2105 DNS name or IP address.

#### -name

(Optional) Specifies the name that you use to access the DS CLI application.

username

Designates the user-specified HMC or 2105 user name. This information along with the -mc1 parameter information is used as a key in the password file.

#### -pw password

(Required) Specifies a user-assigned password.

password

Specifies the password that enables user name access to this ESS CLI client installation. The password is case-sensitive.

#### Note:

- · A password file is created with a user's default protection mask. The user needs to update the protection mask to allow access only to the owner of
- The password file has a default value of <home>/dscli/security.dat. The following examples provide the environment variable for specific operating systems:
  - For Windows: %USERPROFILE%\dscli\security.dat
  - For UNIX or Linux: \$HOME/dscli/security.dat

## **Example (2107)**

#### Invoking the managepwfile command

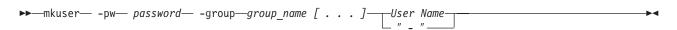
dscli>managepwfile -action add -mc1 myess.ibm.com -name testuser -pw AB9cdefg

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version 5.0.0.0 DS: IBM.2107-75FA120 Record myess.ibm.com/testuser successfully added to password file c:\Documents and Settings\testuser\dscli\security.dat

## mkuser

The mkuser command creates a DS CLI or a DS Storage Manager user account. A CLI user with administrative authority uses this command to create a user account with a password and user group authority.



#### **Parameters**

## pw

(Required) Specifies the password that is assigned to the user that allows them to access the use of the DS CLI command line function. This password is temporary and set to expire after the initial use. The user must assign themselves a new password using the chuser command before they can us any other commands in the DS CLI application.

## password

The password assigned by the administrator to user.

The password and its usage must meet the following criteria:

- Be six to 16 characters long.
- · Must contain five or more letters, and it must begin and end with a letter.
- · Must contain one or more numbers.
- Cannot contain the user's user ID.
- Is case-sensitive.

#### **-group** *group\_name* [...]

(Required) The user's access authority group.

## group name [...]

The following list provides the list choices that can be assigned to a user. Multiple names must be separated by commas. For example, op\_copy\_services, service.

## admin

The administrator user group has access to all management console server service methods and all storage image resources.

## op\_storage

The storage operator user group has access to physical configuration service methods and resources, including storage complex, storage image, array, rank, and extent pool objects. This user group inherits all the authority of the op copy services and monitor user groups, excluding security methods.

## op volume

The volume operator user group has access to service methods and resources that relate to logical volumes, hosts, host ports, logical subsystems, logical volumes, and volume groups, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

## op\_copy\_services

The copy services operator user group has access to all Copy Services service methods and resources, excluding security methods. In addition, this user group inherits all authority of the monitor user group.

#### service

The service user group includes monitor authority, plus access to all management console server service methods and resources, such as performing code loads and retrieving problem logs.

#### monitor

The monitor user group has access to list and show commands. It provides access to all read-only, nonsecurity management console server service methods and resources.

#### no access

The no access user group does not have access to any service methods or storage image resources. By default, this user group is assigned to any user account in the security repository that is not associated with any other user group.

User Name | -

(Required) The current user account user name.

Alternatively accepts input from stdin when the dash (–) is specified.

## **Example (2107)**

## Invoking the mkuser command

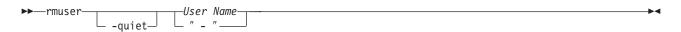
dscli>mkuser -pw AB9cdefg -group service,op copy services testuser

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version 5.0.0.0 DS: IBM.2107-75FA120 User Name testuser successfully created.

## rmuser

The rmuser command removes a storage image user account. CLI users with administrative authority use this command to delete a user account file. Administrators use their passwords in the required field.



## **Parameters**

## -quiet

(Optional) Turns off the confirmation prompt.

User Name | -

(Required) The current user account user name.

Alternatively accepts input from stdin when the dash (–) is specified.

## **Example (2107)**

## Invoking the rmuser command

dscli>rmuser testuser

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version 5.0.0.0 DS: IBM.2107-75FA120 Are you sure you want to delete User Name testuser? y/n User Name testuser successfully deleted.

## showpass

The showpass command lists the properties of passwords.

▶► showpass-

## **Parameters**

There are no parameters for this command.

## **Example (2107)**

## Invoking the showpass command

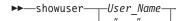
dscli>showpass

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version 5.0.0.0 DS: IBM.2107-75FA120 Password Expiration (days) 33 days Failed Logins Allowed

## showuser

The showuser command displays storage image user account details. A CLI user with administrative authority uses this command to display the properties (group assignment, user account status and number of failed logins) that is associated with a current user account name.



## **Parameters**

User Name | -

(Required) The user account name.

Alternatively accepts input from stdin when the dash (-) is specified.

## **Example (2107)**

## Invoking the showuser command

dscli>showuser testuser

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Name testuser

Group services,op\_copy\_services

State active FailedLogins 2

Column Header	Description
Name	Name of the user that you have queried.
Group	The user's access authority group. One or more of the following group designations is displayed:
	admin
	op_storage
	op_volume
	op_copy_services
	service
	• monitor
	• no_access
State	The status of the user account for the specified user group, either active or locked.
FailedLogins	Count of login failures since last successful login for this user. This number resets to 0 with each successful login.

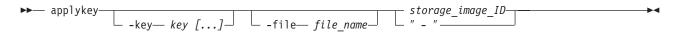
# Application key and version commands

This section contains commands that are used to maintain application keys and view the current CLI version.

Use the following commands to add and list application keys and show the current command-line interface version.

# applykey

The applykey command applies the licensed machine code (LMC) activation keys for a storage server. You can enter the LMC keys manually, or you can import the keys from an XML file. The file that contains the LMC keys must be downloaded from an IBM Web site.



## **Parameters**

**-key** *key* [...]

(Optional) Specifies the LMC key. To specify multiple keys, enter a comma between each key. Do not include a blank space between each key.

This parameter is required if the -file parameter is not specified.

-file file name

(Optional) Specifies the file name of the LMC activation key file.

This parameter is required if the -key parameter is not specified.

storage\_image\_ID | -

(Required) Specifies the storage image ID where the LMC activation key file will be imported. The ID includes manufacturer, type, and serial number.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

# Invoking the applykey command

dscli>applykey -file keys.xml IBM.2107-75FA120

# Iskey

I

The Iskey command displays the type of licensed machine code (LMC) activation keys that are installed and available for use by the storage image. For instance, the following list represents the type of LMC activation keys: Operating Environment, FlashCopy, Remote Mirror and Copy, Parallel Access Volumes, Remote Mirror for z/OS.



# **Parameters**

storage\_image\_ID | -

(Required) Specifies the storage image ID for which to view a list of activated features. The ID includes manufacturer, type, and serial number.

Alternatively, accepts input from stdin when the dash (–) is specified.

## **Example**

Note: The following table represents the headers that are displayed on the output report that is associated with the Iskey command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

#### Invoking the Iskey command

dscli>lskey IBM.2107-75FA120

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI

Activation Key	Capacity (TB)	Storage Type
Operating Environment	45	All
FlashCopy	23	FB

# Report field definitions

# **Activation key**

Specifies the type of LMC activation key that is activated for the storage image. One of the following values are displayed:

- · Operating Environment
- FlashCopy
- Remote Mirror and Copy

Parallel Access Volumes

Remote Mirror for z/OS

# Capacity (TB)

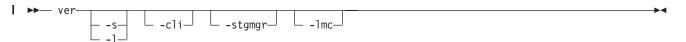
Specifies the capacity of the specified license feature for this image (quantity is displayed in terabytes).

# Storage Type

Specifies the storage type for the designated license: fixed block (FB), count key data (CKD), or ALL. Parallel Access Volumes and Remote Mirror for z/OS only display the values CKD or ALL.

#### ver

The ver command displays the versions of the command-line interface, Storage Manager, and licensed machine code.



## **Parameters**

- **-s** (Optional) The -s displays the version of the command line interface program. You cannot use the -s and -l parameters together.
- -I (Optional) The -I displays the versions of the command line interface, Storage Manager, and licensed machine code. You cannot use the -i and -s parameters together.

#### -cli

(Optional) Displays the version of the command line interface program. Version numbers are in the format version.release.modification.fixlevel.

#### -stgmgr

(Optional) Displays the version of the Storage Manager.

#### -lmc

(Optional) Displays the version of the licensed machine code.

#### **Example**

# Invoking the ver command

dscli>ver -1

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS Storage Manager 5.0.1.0 LMC 5.0.1.0

# Physical enclosure information commands

This section contains commands that are used to view information about the physical enclosures in your storage complex.

Use the following commands to view information about the physical enclosures in your storage complex.

# Isstgencl

I Ι The Isstgencl command displays a list of storage enclosures and status information for each enclosure in the list.



# **Parameters**

- -s (Optional) Displays the storage enclosure ID. You cannot use the -I and the -s parameters together.
- (Optional) Displays default output, plus the storage enclosure feature code and engineering change level. You cannot use the -l and the -s parameters together.

storage\_image\_ID . . . | -

(Required) Displays storage enclosure information for the specified storage image IDs. A storage image ID consists of manufacturer, machine type, and serial number. You must separate multiple IDs with a space between each ID.

Note: You cannot specify an ID range.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example**

Note: The following tables represent the headers that are displayed on the output report that is associated with the **Isstgencl** command using the -I parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

# Invoking the Isstgencl command

dscli>lsstgencl -l IBM.2107-75FA120

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID	Frame	Enclnum	Loc	FC	Interfaces
IBM.2107- D21.75FA120 /R1-S11	R1	S11	U2107. 921. 75FA120	3221	0111, 0112, 0113, 0114
IBM.2107- D21.75FA120 /R1-S12	R1	S12	U2107. 921. 75FA120	3221	0121, 0122, 0123, 0124

Interadd	Storslot	Stordev	Сар	RPM
0 x 0	16	16	145	10000
0 x 1	16	16	145	10000

# Report field definitions

ID Specifies the enclosure ID and enclosure number. Note: This is the only information displayed if you use the -s parameter. None of the other values are displayed.

Frame Specifies the frame number within the designated storage unit that contains this storage enclosure.

#### **Encloum**

Identifies a storage enclosure within a storage unit frame. The values displayed for the enclosure are S11 - S18 or S21 - S28. These values are interpreted as follows:

- Enclosures S1x are located in front of the frame.
- Enclosures S2x are located in the rear of the frame.
- Enclosure Sx1 is located at the top of the frame.
- Enclosure Sx8 is located at the bottom of the frame.

Loc Specifies the storage enclosure location by identifying the storage unit frame that contains the storage enclosure. The location format is: "Utttt.mmm.ppsssss".

FC Specifies the feature code that was used to order this storage enclosure.

#### Interfaces

Specifies a list of four interface identifiers, one for each DA I/O port.

A DA interface ID consists of four hexadecimal characters with a format of: '00eeeeeeaaaapppp'b, where:

- eeeeee = enclosure number
- aaaa = adapter number
- pppp = port number

# Interadd

Specifies the FC-AL interface base address assigned to this storage enclosure for DDM access.

#### Storslot

Specifies the number of slots for storage devices in this storage enclosure.

# Stordev

Specifies the number of storage devices installed in this storage enclosure.

Cap Specifies the capacity of DDMs in the storage enclosure.

**RPM** Specifies the RPM of the DDMs in the storage enclosure.

# **Isframe**

The Isframe command displays a list of frame enclosures for a storage image.



#### **Parameters**

- -s Displays the rack enclosure ID. You cannot use the -I and the -s flags together.
- -I Displays default output and the frame enclosure location. You cannot use the -I and the -s flags together.

storage\_image\_ID . . . | -

Displays frame enclosure information for the specified storage image IDs. A storage image ID includes manufacturer, type, and serial number. You must separate multiple IDs with spaces.

**Note:** ID ranges cannot be specified.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example**

# Invoking the Isframe command

dscli>lsframe -l IBM.2107-75FA120

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120 Table 5.

ID	frm#	Frame	loc
IBM.2107- 75FA120/R1	R1	1	U2107- 75FA120
IBM.2107- 75FA120/R2	R2	1	U2107- 75FA120

# **Output guidelines**

You can use the following information to help you understand the output that is generated from this command:

ID Identifies the unique identifier of the frame enclosure.

Frame Identifies the the frame number within a storage unit that contains the specified frame enclosure.

#### frameID

Identifies the unique identifier of the storage unit equipment frame that contains the specified frame enclosure.

Loc Identifies the frame enclosure location.

The location format is Uttt.mmm.ppsssss.

# Field replaceable unit information commands

This section contains commands that are used to view information about the field replaceable units (FRUs) in your storage complex.

Use the following commands to view information about the field replaceable units in your storage complex.

# Isda

The Isda command displays a list of device adapter (DA) field replaceable units (FRUs) for each storage image. You can use this command to look at the status of each device adapter FRU in the list.

## **Parameters**

- -s (Optional) Displays only DA FRU IDs. You cannot use the -I and the -s parameters together.
- -I (Optional) Displays the same output as the default output. You cannot use the -I and the -s parameters together.
- -encl enclosure ID

(Optional) Displays the DA FRUs that are associated with the specified processor complex or I/O enclosure.

-server server\_ID

(Optional) Displays only DA FRUs that are associated with the specified server.

-dapair dapair ID

(Optional) Displays only DA FRUs that are associated with the specified DA pair.

-state online | offline | failed | loopx

(Optional) Displays only DA FRUs that are in the specified state.

storage image ID . . . | -

(Required) Displays DA FRUs for the specified storage images. A storage image ID includes manufacturer, type, and serial number. You must separate multiple IDs with spaces.

Note: ID ranges cannot be specified.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example**

# Invoking the Isda command

dscli>lsda -l IBM.2107-75FA120

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID	State	Loc
IBM.2107-75FA120 /R1-11-P1-C1	Online	U2107-75FA120 -11/P1-C1
IBM.2107-75FA120 /R1-11-P1-C6	Online	U2107-75FA120 -11/P1-C6
IBM.2107-75FA120 /R1-12-P1-C1	Online	U2107-75FA120 -12/P1-C1
IBM.2107-75FA120 /R1-12-P1-C6	Online	U2107-75FA120 /R1-12-P1-C6

FC	Server	DA pair	Interfaces
1234	00	IBM.2107- 75FA120/11	111,0112,0113,0114
1234	01	IBM.2107- 75FA120/12	111,0112,0113,0114
1234	00	IBM.2107- 75FA120/11	111,0112,0113,0114
1234	01	IBM.2107- 75FA120/12	111,0112,0113,0114

# Report field definitions

The following supplies information that you can use to help you understand the output that is generated from this command.

ID Identifies the unique identifier of the DA FRU.

State Indentifies the current availability state of the specified DA FRU

Loc Identifies the I/O enclosure and the DA FRU location.

The I/O enclosure location format is Uttt.mmm.ppsssss.

The DA FRU location format is Pn-Cn where Pn indicates the Planner number (1) and *Cn* indicates the card number (1 - 6).

FC Identifies the feature code that is used to order the specified DA FRU.

#### Server

Identifies the server or DA group that the DA FRU is assigned to.

# DA pair

Identifies the storage unit ID that is followed by the DA pair ID that is associated with the specified DA FRU. The DA pair identifier is a two-digit decimal number, with no leading zeros. DA pairs are located in I/O enclosure pairs. DA pair ID implies I/O enclosure location.

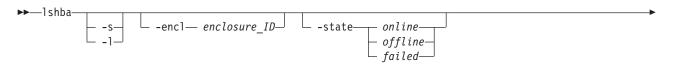
An even numbered DA pair ID indicates the first DA pair in an I/O enclosure pair. An odd numbered DA pair ID indicates the second DA pair in an IO enclosure pair.

#### **Interfaces**

Identifies the four interface IDs that are associated with the FC-AL ports.

# Ishba

The Ishba command displays a list of storage image host bus adapter (HBA) field replaceable units (FRUs) and status information for each FRU in the list.



- -s (Optional) Displays HBA FRU IDs. You cannot use the -l and the -s parameters together.
- -I (Optional) Displays the default output plus the HBA feature code and interface IDs. You cannot use the -I and the -s parameters together.

#### -encl enclosure ID

(Optional) Displays HBA FRUs that are associated with a common processor complex or I/O enclosure ID.

## -state online | offline | failed

(Optional) Displays HBA FRUs that are in a specified state.

# storage\_image\_ID . . . | -

(Optional) Displays HBA FRU information for the specified storage image IDs. A storage image ID includes manufacturer, model, and serial number. You must separate multiple IDs with spaces.

Note: ID ranges cannot be specified.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example**

# Invoking the Ishba command

dscli>lshba -l IBM.2107-75FA120

## The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID	State	Loc
IBM.2107-75FA120 /R1-11-P1-C2	Online	U2107-75FA120 -11/P1-C2
IBM.2107-75FA120 /R1-11-P1-C3	Online	U2107-75FA120 -11/P1-C3
IBM.2107-75FA120 /R1-12-P1-C2	Online	U2107-75FA120 -/R1-12-P1-C2
IBM.2107-75FA120 /R1-12-P1-C3	Online	U2107-75FA120 /R1-12-P1-C3

FC	Interfaces
1234	0x0121,0x0121,0x0123,0x0124
1234	0x0131,0x0131,0x0133,0x0134
1234	0x0221,0x0221,0x0223,0x0224
1234	0x0231,0x0231,0x0233,0x0234

# Report field definitions

You can use the following information to help you understand the output that is generated from this command:

**ID** Identifies the unique identifier of the HBA FRU.

State Identifies the current availability state of the specified HBA FRU.

Loc Identifies the I/O enclosure and the HBA FRU location.

The I/O enclosure location format is Uttt.mmm.ppsssss.

The HBA FRU location format is Pn-Cn where Pn indicates the Planner number (1) and Cn indicates the card number (1 - 6).

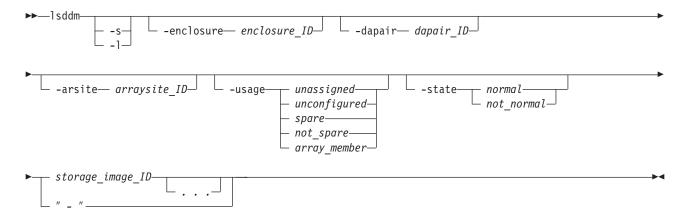
**FC** Identifies the feature code that is used to order the specified HBA FRU.

#### **Interfaces**

Identifies the four interface IDs that are associated with the I/O ports on the HBA FRU.

# Isddm

The Isddm command displays a list of device drive modules (DDMs) and status information for each DDM in the list.



## **Parameters**

- **-s** (Optional) Displays the DDM IDs. You cannot use the -s and -l parameters together.
- **-I** (Optional) Displays the default output. You cannot use the -s and -I parameters together.

## -enclosure enclosure ID

(Optional) Displays DDMs that are associated with a common storage enclosure ID. Accepts a fully qualified enclosure ID, which includes either the storage image ID or a shortened version without the storage image ID. The shortened version is a hexadecimal number within the range (00 - 3F).

#### -dapair dapair\_ID

(Optional) Displays DDMs that are associated with a common DA pair ID. Accepts a fully qualified DA pair ID, which includes either the storage image ID or a shortened version without the storage image ID. The shortened version is a two-digit decimal number with no leading zeroes.

# -arsite arraysite\_ID

(Optional) Displays DDMs that are associated with a common array site ID. Accepts a fully qualified array site ID, which includes either the storage image ID or a shortened version without the storage image ID. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter "S".

**-usage** unassigned | unconfigured | spare | not\_spare | array\_member (Optional) Displays DDMs that are associated with a specified usage.

#### -state normal | not normal

(Optional) Displays DDMs that are associated with a specified state.

# storage\_image\_ID . . . | -

(Required) Displays DDM information for the specified storage image IDs. A storage image ID includes manufacturer, type, and serial number. You can specify multiple IDs and when you do the IDs must be separated with a space between each ID.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example**

Note: The following tables represent the headers that are displayed on the output report that is associated with the **Isddm** command using the -I parameter. A separate example is not shown for the 1750 as the information is the same for both. The only difference is the model number designation, 2107 versus 1750. Also, the table shows only the first 2 DDMs.

# Invoking the Isddm command

dscli>lsddm -l IBM.2107-75FA120

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID	loc	DA pair	dkcap (10^9B)	diskrpm	dkinf	dkrate
IBM.2107- D21- 75FA120 /R1-S11- P1-D1	U2107.921 .75FA120	11	145	10000	FCAL	2
IBM.2107- D21- 75FA120 /R1-S11- P1-D2	U2107.921 .75FA120	11	145	10000	FCAL	2

dkuse	arsite	Position	state
array member	S1123	1	Normal
array member	S1123	2	Normal

# Report field definitions

ID Specifies the system assigned unique identifier for the DDM.

Specifies the storage enclosure and DDM location. DDM location format is loc "Pn-Dn', where "Pn" is the Planer number (1), and "Dn" is the DDM number (1 - 16).

# DA pair

Identifies the DA pair ID. DA pairs are located in I/O enclosure pairs. DA pair ID implies the I/O enclosure location.

Note: An even-numbered DA pair ID indicates the first DA pair in an I/O enclosure pair. An odd-numbered DA pair ID indicates the second DA pair in an I/O enclosure pair.

## dkcap (10^9B)

Specifies the DDM raw capacity in gigabytes.

#### diskrpm

Specifies the DDM RPM. One for the following values is displayed:

- 10000
- 15000

**dkinf** Specifies the DDM interface type.

**dkrate** Specifies the DDM interface rate.

dkuse Identifies the DDM usage in an array site. One of the following values are displayed:

- unassigned
- unconfigured
- spare required
- spare not required
- array member

arsite Specifies the array site ID.

# **Position**

Specifies the DDM position in an array site configuration of DDMs.

State Specifies the current DDM state. One of the following values are displayed:

#### Normal

The storage device is operational and functional in its current disk usage.

#### Installing

A new storage device has been discovered.

The storage device is made accessible to the device adapter, its characteristics are determined, cabling is checked, and diagnostics are run.

# **Formatting**

A verified storage device requires low-level formatting and the formatting operation is in progress.

# Initializing

The storage device is being initialized with all zero sectors.

# Certifying

The storage device is being read accessed to determine that all sectors can be read.

# Rebuilding

Sparing has occurred and this formerly spare storage device is being rebuilt with data from the array that it is now an array member of.

# Migration Target

DDM migration is migrating another array member storage device to this spare storage device.

# **Migration Source**

DDM migration is migrating this array member storage device to another spare storage device.

#### **Failed**

The storage device has failed and an immediate repair action is required.

#### Failed/Deferred Service

The storage device has failed and a repair action is not immediately required.

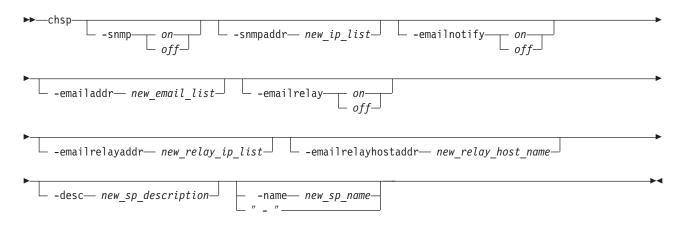
# Storage complex configuration commands

This section contains commands that are used to configure a storage complex.

Use the following commands to configure a storage complex and show storage complex information.

# chsp

The chsp command modifies a storage complex for items such as notification of the Simple Network Management Protocol (SNMP) traps and e-mail problem notification lists in a storage complex.



# **Parameters**

**Note:** The Storage Manager server domain is a single storage-complex. The storage-complex object can only be created or deleted by service personnel.

-snmp on | off

(Optional) The Simple Network Management Protocol (SNMP) trap notification

feature sends notifications when a problem occurs on a storage complex. This parameter enables this feature. SNMP traps that are generated by the storage complex are sent to the IP address that is specified by the -snmpaddr flag. If disabled, SNMP traps are not sent.

# -snmpaddr new ip list

(Optional) Specifies a new SNMP trap destination list. This consists of one or two IP addresses that receive SNMP traps that are generated by the storage complex if SNMP is enabled. Multiple IP addresses must be separated with commas and no space before or after each comma.

# -emailnotify on | off

(Optional) If enabled, e-mail notifications are sent to the designated e-mail addresses when a problem occurs on a storage complex. If disabled, e-mail is not sent.

## -emailaddr new email list

(Optional) Specifies a new e-mail problem notification list. You can specify multiple e-mail addresses, but each address must be separated by a comma with no space before or after each comma.

# -emailrelay on | off

(Optional) When emailnotify and emailrelay are enabled, the e-mail to be sent to the e-mail IP address is directed to the IP address that is associated with the email relay host system name (if one is specified) or to the email relay IP address list. When emailnotify is enabled and emailrelay is disabled, the e-mail is sent to the e-mail address.

# -emailrelayaddr new\_relay\_ip\_list

(Optional) Specifies the new e-mail relay IP address list. Multiple e-mail relay IP addresses are separated with commas and no space before or after each comma.

# -emailrelayhostaddr new\_relay\_host\_name

(Optional) Specifies the new e-mail relay host system name.

#### -desc new sp description

(Optional) Specifies your description of the storage complex. This description is limited to 256 byte or 128 double-byte characters.

## -name new\_sp\_name |-

(Optional) Specifies the user-defined name for the storage complex. This name is limited to 32 byte or 16 double-byte characters.

Alternatively, accepts input from stdin when the dash (-) is specified.

## **Example**

#### Invoking the chsp command

dscli>chsp -desc "my storage complex"

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Storage-complex IBM.2107-75FA120 successfully modified.

# showsp

The showsp command displays detailed properties of a storage complex. Detailed properties include your names, descriptions, and customer account names for the storage complex.

▶►—showsp-

## **Parameters**

There are no parameters for this command.

# **Example**

# Invoking the showsp command

dscli>showsp

# The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
```

```
Name My_storage-complex
desc Production storage-complex
acct ABC Company
SNMP Enabled
SNMPaddr 9.115.14.245
emailnotify Enabled
emailaddr email1@ibmds8000.com, email2@ibmds6000.com
emailrelay Disabled
emailrelayaddr 9.115.14.45
emailrelayhostaddr relay host
```

# **Output guidelines**

The following information can help you understand the output that is generated from this command.

Name User-defined name for the storage-complex.

**desc** User-defined description for the storage-complex.

**acct** Customer account name for the storage-complex.

**SNMP** This column displays the words Enabled or Disabled. If enabled, SNMP traps that are generated by the storage complex are sent to the IP address that is specified by the **-snmpaddr** parameter. If disabled, SNMP traps are not sent

#### **SNMPaddr**

One or two IP addresses are displayed if SNMP is enabled. These addresses indicate where SNMP traps that are generated by the storage complex are sent. Multiple IP addresses are separated with commas and no space before and after each for example: 9.115.14.254,9.115.22.236

#### emailnotify

This column displays the words Enabled or Disabled.

When both email and emailrelay are enabled, the e-mail to be sent to the e-mail IP addresses is directed to the IP address that is associated with the emailrelayhost hostname attribute, if this attribute is specified. Otherwise, the e-mail is directed to the e-mail relay address.

When email is enabled and emailrelay is disabled, the e-mail is sent directly to the specified e-mail address.

#### emailaddr

This column displays one or more e-mail addresses to which notification is sent if service is required when e-mail is enabled. A null (-) is displayed if e-mail is not enabled, or if an e-mail address is not available.

Multiple e-mail addresses are separated with commas and no space before and after each comma.

#### emailrelayaddr

This column displays one or more e-mail relay IP addresses. These represent the addresses through which notification is relayed if service is required when e-mail is enabled.

Multiple e-mail relay IP addresses are separated with commas and no space before and after each comma.

#### emailrelayhostaddr

E-mail relay host system name.

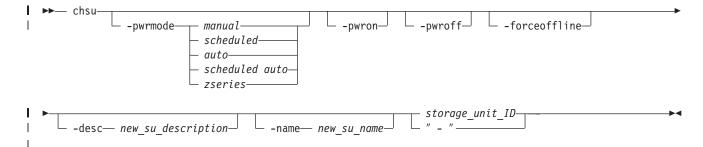
# Storage unit configuration commands

This section contains commands that are used to configure a storage unit.

Use the following commands to configure a storage unit and show storage unit information.

# chsu

The chsu command modifies a storage unit. You can use this command to power-on and power-off a storage unit.



# **Parameters**

Note: There is a local/remote switch under the cover on the rear of the first rack of a storage facility. This service switch is customer accessible when the rear cover is open. This control selects whether local or remote power controls are enabled. When the local/remote switch is set to local, the local power on/local force power-off switch controls storage facility power. When the local/remote switch is set to remote, the remote power control mode setting on the SMC determines which remote power control mode is in effect.

-pwrmode manual | scheduled | auto | scheduled auto | zseries
 (Optional) Sets a requested remote power control mode on the storage unit.

#### manual

Specifies that the storage facility power-on and power-off sequences are performed based on the manual power on and off controls.

#### scheduled

Specifies that a storage facility power on sequence is initiated if the current time is the same as the setting of the scheduled power on time control. A storage facility power off sequence is initiated if the current time is the same as the setting of the scheduled power off time control.

#### auto

A storage facility power-on sequence is performed when external power first becomes available to the first rack of a storage facility (for example, when standby power is first activated to the RPC cards).

#### scheduled auto

A storage facility power-on sequence is initiated if either of the following conditions exist:

- The current time is the same as the setting of the scheduled power-on time control.
- · The current time is between the setting of the scheduled power on time control and the setting of the scheduled power off time control and external power first becomes available to the first rack of a storage facility (for example, when standby power is first activated to the RPC cards).

Note: A storage facility power-off sequence is initiated if the current time is the same as the setting of the scheduled power-off time control.

Specifies that the power control mode is set to zSeries remote power control.

(Optional) Turns on power to the storage unit. This parameter is valid if the control mode is set to manual and the switch is set to remote.

(Optional) Turns off power to the storage unit. This parameter is valid if the control mode is set to manual and the switch is set to remote.

#### -forceoffline

(Optional) Specifies that the force offline storage state be enabled. This parameter is valid if the SMC local/remote switch is set to remote and the storage unit state is Quiesce Exception.

## -desc new\_su\_description

(Optional) Allows you specify a description for the storage unit. The description is limited to 256 byte or 128 double-byte characters.

#### -name new su name

(Optional) Allows you to specify a user-defined name for the storage unit. This name is limited to 32 bytes or 16 double-byte characters.

#### storage unit ID | -

(Required) Accepts the fully qualified storage unit ID. The storage unit ID consists of manufacturer, machine type, and serial number. For example, IBM.2107-75FA120.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the chsu command

dscli>chsu -pwrmode manual IBM.2107-75FA120

# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0

DS: IBM.2107-75FA120

Storage unit IBM.2107-75FA120 successfully modified.

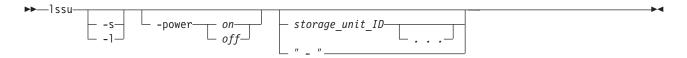
# Issu

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The Issu command displays a list of storage units in a storage complex. You can use this command to look at the status and other properties of each storage unit in the list.



# **Parameters**

- -s (Optional) Displays storage unit IDs. You cannot use the -I and the -s parameters together.
- (Optional) Displays default output and remote mode with scheduled power-on and power-off times, and the storage unit description. You cannot use the -I and the -s parameters together.

## -power on | off

(Optional) Displays only the storage units in the specified power state.

storage\_unit\_ID . . . | -

(Optional) Displays storage units with the specified storage unit IDs. A storage unit ID includes manufacturer, type, and serial number. You must separate multiple IDs with a space between each ID.

Note: You cannot specify ID ranges.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example**

Note: The following table represents the headers that are displayed on the output report that is associated with the Issu command using the -I parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

# Invoking the Issu command

dscli>lssu -l

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Name	ID	Model	wwnn	Pw State	Pw Mode	Desc
SU 1	IBM.2107- 75FA110	921	3007ACF 3012399 E0	On	Local	Test
SU 2	IBM.2107- 75FA120	921	3007ACF 3045699 E0	On	Local	Produc- tion
SU 3	IBM.2107- 75FA130	921	3007ACF 3078999 E0	On	Local	Backup

# Report field definitions

Name Specifies the user-defined name for each storage unit found within the storage complex. This value is null (-) if you have not assigned a name to a storage unit.

ID Specifies the storage unit ID which consists of the manufacture name, machine type, and serial number. When the -s parameter is used, this is the only information that is displayed for the Issu command.

#### Model

Identifies the model number of the storage unit.

## **WWNN**

Specifies the World Wide Node Name for the listed storage unit. This value is null (-) if the WWNN is not known

## Pw State

Indicates the power status of the listed storage unit. One of the following values is displayed:

#### On

Indicates the storage unit power is on.

#### Off

Indicates the storage unit power is off.

# **Turning On**

Indicates the storage unit power is in the process of turning on.

## **Turning Off**

Indicates the storage unit power is in the process of turning off.

## **Power Exception**

Indicates that storage unit power is on, but online operation is not possible due to a power fault in one of the storage unit frames.

# Pw Mode

Indicates the power control mode in effect for the listed storage unit. One of the following values is displayed:

Indicates that the SMC local/remote switch is set to the local power control mode.

# **Remote SMC Manual**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to manual power control.

#### Remote SMC Scheduled

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to scheduled power control.

#### **Remote SMC Auto**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to auto-power control.

#### Remote SMC Scheduled/Auto

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to auto/scheduled power control.

#### Remote zSeries Power Control

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to zSeries remote power control.

Specifies the user-defined description for the listed storage unit. This value Desc is displayed as a null (-) if no description has been assigned.

# showsu

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The showsu command displays detailed properties of an individual storage unit.



#### **Parameters**

storage unit ID

(Required) Accepts a fully qualified storage unit ID. A storage unit ID consists of manufacturer, machine type, and serial number.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example**

Note: The following table represents the headers that are displayed on the output report that is associated with the **showsu** command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

# Invoking the showsu command

dscli>showsu -fullid DS: IBM.2107-75FA120

# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0

DS: IBM.2107-75FA120

Name	Desc	ID	Model	WWNN	Config
Му	This	IBM.2107-	921	3007ACF	One I/O
Stor-	is my	75FA120		3012399	interface
age	DS Stor-			E0	
Unit	age Unit				

Pw State	Pw Mode	Reqpm
On	Local	Remote SMC scheduled

# Report field definitions

Name Specifies the user-defined name for the designated storage unit. This value is null (-) if you have not assigned a name to a storage unit.

Specifies the user-defined description for the designated storage unit. This value is displayed as a null (-) if no description has been assigned.

ID Specifies the storage unit ID which consists of the manufacture name, machine type, and serial number.

**Model** Identifies the model number of the designated storage unit.

# **WWNN**

Specifies the World Wide Node Name for the listed storage unit. This value is null (-) if the WWNN is not known.

## Config

Specifies the internal I/O interface configuration for the storage unit. One of the following values is displayed:

#### Undefined

Indicates that a configuration upgrade is in progress that causes the configuration option to change.

#### One I/O interface

Indicates that there is one dedicated I/O interface between the I/O enclosure pairs and storage enclosures.

## Two I/O interfaces

Indicates that there are two dedicated I/O interfaces between the I/O enclosure pairs and storage enclosures.

#### Four I/O interfaces

Indicates that there are four dedicated I/O interfaces between the I/O enclosure pairs and storage enclosures.

# Six I/O interfaces

Indicates that there are six dedicated I/O interfaces between the I/O enclosure pairs and storage enclosures.

#### Pw State

Indicates the power status of the listed storage unit. One of the following values is displayed:

# On

Indicates the storage unit power is on.

# Off

Indicates the storage unit power is off.

#### **Turning On**

Indicates the storage unit power is in the process of turning on.

#### **Turning Off**

Indicates the storage unit power is in the process of turning off.

## **Power Exception**

Indicates that storage unit power is on, but online operation is not possible due to a power fault in one of the storage unit frames.

#### Pw Mode

Indicates the power control mode in effect for the listed storage unit. One of the following values is displayed:

#### Local

Indicates that the SMC local/remote switch is set to the local power control mode.

#### Remote SMC Manual

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to manual power control.

# **Remote SMC Scheduled**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to scheduled power control.

#### **Remote SMC Auto**

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to auto-power control.

#### Remote SMC Scheduled/Auto

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to auto/scheduled power control.

#### Remote zSeries Power Control

Indicates that the SMC local/remote switch is set to remote and that the power control mode is set to zSeries remote power control.

## Reqpm

Indicates the power control mode to apply when the local/remote switch is set to remote power control mode. One of the following values is displayed:

- Remote SMC Manual
- · Remote SMC Scheduled
- Remote SMC Auto
- · Remote SMC Scheduled/Auto
- · Remote zSeries Power Control

**Note:** The default value is remote SMC Manual mode.

# Storage image configuration commands

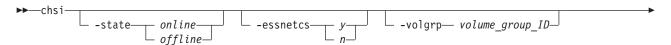
This section contains commands that are used to configure a storage image.

Use the following commands to configure a storage image and show storage image information.

# chsi

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The chsi command modifies a storage image. You can use it to set characteristics such as online or offline state, name, and description.



## **Parameters**

#### -state online | offline

(Optional) Sets a new, requested state for the storage image. Either online or

# -essnetcs y | n

(Optional) Enables or disables the storage complex ESSNet user interface to invoke Copy Services operations for the storage image.  $\gamma$  (yes) is the default.

# -volgrp volume\_group\_ID

(Optional) Accepts a fully qualified volume group ID including the storage image ID or a shortened version. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter "V".

If -essnetcs = "y", specifies the Copy Services type volume group that contains the logical volumes that are eligible to be controlled by Copy Services operations. If -essnetcs = "y" and the volume group ID is not specified, then all logical volumes are eligible to be controlled by Copy Services operations.

# -desc new\_si\_description

(Optional) Sets your description for the storage image. The description is limited to 256 byte or 128 double byte characters.

# -name new\_si\_name

(Optional) Sets your name for the storage image. The storage image name is limited to 32 byte or 16 double byte characters.

# storage\_image\_ID | -

(Required) Accepts a fully qualified storage image ID. The storage image ID consists of manufacturer, machine type, and serial number.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

#### Invoking the chsi command

dscli>chsi -essnetcs n IBM.2107-75FA120

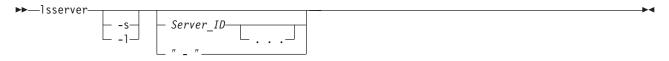
# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Storage image IBM.2107-75FA120 successfully modified.

#### Isserver

The Isserver command displays all servers in a storage complex or a list of specified servers, and displays status information for each server in the list.



#### **Parameters**

- -s (Optional) Displays the server ID. You cannot use the -l and the -s flags together.
- (Optional) Displays the default output plus the state. You cannot use the -I and the -s flags together.

```
Server_ID . . . | -
```

(Optional) Displays the server information for the specified server IDs. Accepts a fully qualified server ID, which includes the storage image ID, or a shortened version without the storage image ID. The shortened version is a two-digit decimal number with no leading zeroes.

To specify a range of server IDs, separate the server IDs with a hyphen.

You must separate multiple server IDs or ranges of server IDs with a blank space between each ID or range of IDs.

Alternatively accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

# Invoking the Isserver command

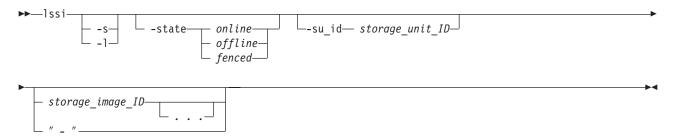
```
dscli>lsserver -1
```

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
ID LPAR ID LPAR Name Power Control SFI
State LIC Version MCP Version Bundle Version
IBM.2107-75FA120/00 -
  Online
IBM.2107-75FA120/01 -
  Online - -
```

## Issi

The Issi command displays a list of storage images in a storage complex. You can use this command to look at the status of each storage image in the list. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN when using the Isavailpprcport and mkpprcpath commands.



#### **Parameters**

- -s (Optional) Displays storage image IDs. You cannot use the -l and the -s flags together.
- -I (Optional) Displays the default output, ESSNet, volume group, and storage image description. You cannot use the -I and the -s flags together.

#### -state online | offline | fenced

(Optional) Displays only the storage images in the specified state.

# -su\_id storage\_unit\_ID . . .

(Optional) Displays the storage images that are associated with the specified storage unit. A storage unit ID consists of manufacturer, machine type, and serial number.

```
storage_image_ID . . . | -
```

(Optional) Accepts fully qualified storage image IDs. A storage image ID consists of manufacturer, machine type, and serial number. You must separate multiple IDs with a space between each ID.

Note: You cannot specify ID ranges.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the Issi command

dscli>lssi -l

# The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
Name ID Storage Unit WWNN State ESSNet
Volume Group Desc
DS 1 IBM.2107-75FA111 IBM.2107-75FA110 3007ACF3012399E0 Online Enabled
- Test
DS 2 IBM.2107-75FA112 IBM.2107-75FA110 3007ACF3045699E0 Online Enabled

    Production

DS 3 IBM.2107-75FA120 IBM.2107-75FA120 3007ACF3078999E0 Online Enabled
- Backup
```

## showsi

The showsi command displays detailed properties of a storage image. The storage image worldwide node name (WWNN) is displayed when this command is used. You must use the storage image WWNN when using the Isavailpprcport and mkpprcpath commands.

```
__ storage_image_ID-
```

## **Parameters**

storage\_image\_ID | -

(Required) Accepts a fully qualified storage image ID. A storage image ID consists of a manufacturer, machine type, and serial number.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

## Invoking the showsi command

dscli>showsi -fullid IBM.2107-75FA120

# The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
      My Storage Image
name
desc
       This is my DS Storage Image
ID IBM.2107-75FA120
Storage Unit IBM.2107-75FA120
Model
      921
WWNN
      3007ACF3012399E0
Signature
          0123-4500-0000
State Online
ESSNet Enabled
Volume Group
```

# I/O port and host connection configuration commands

This section contains storage image I/O port and host connection configuration commands.

Use the following commands to configure your storage image I/O ports and host connections and to display connection information.

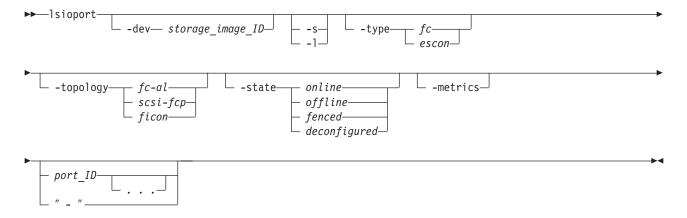
# Storage image I/O port commands

This section contains commands that are used to configure storage image I/O port information and to display storage image I/O port information.

Use the following commands to configure storage image I/O port information and to display storage image I/O port information.

# **Isioport**

The Isioport command displays a list of I/O ports (both ESCON and fibre channel) on a specified storage image and optionally provides performance metrics for each I/O port listed.



# **Parameters**

-dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number.

**-s** (Optional) Displays fully qualified port IDs. You cannot use the -l and -s flags together.

-I (Optional) Displays default output plus maximum login limit and the number of current logins. You cannot use the -l and -s flags together.

# -type fc | escon

(Optional) Displays I/O ports of the specified port type.

# -topology fc-al | scsi-fcp | ficon

(Optional) Displays fibre channel I/O ports with the specified topology.

-state online | offline | fenced | deconfigured

(Optional) Displays I/O ports of the specified state.

#### -metrics

(Optional) Displays port ID and performance metrics for each port specified.

```
port ID . . . | -
```

(Optional) Displays I/O ports matching the specified IDs. Accepts a fully qualified port ID, which includes the storage image ID, or a shortened version without the storage image ID when the -dev flag is specified.

A port ID is prefixed with letter "I" and consists of four hexadecimal characters in the format "EEAP", where:

- "EE" is an I/O port enclosure number in the range of 00 17 (2107 machine
- "A" is the adapter number and is specified as 1, 2, 4, or 5 (2107 machine types).
- "P" is the port number (0 3).

To specify a range of port IDs, separate the port IDs with a hyphen.

You must separate multiple port IDs or ranges of port IDs by a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (–) is specified.

#### **Example (2107)**

#### Invoking the Isioport command

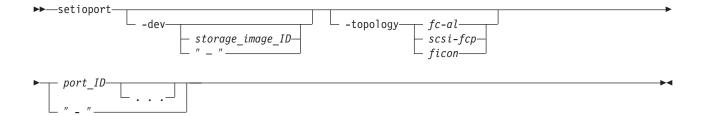
```
dscli>lsioport -fullid -l
```

## The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
     WWPN State Type topo portgroup
IBM.2107-75FA120/I0111 307BCF30A3299E0 Online FC-LW SCSI-FCP 0
IBM.2107-75FA120/I0112 307BCF30A3399E0 Online FC-LW SCSI-FCP 0
IBM.2107-75FA120/I0121 307BCF30A3499E0 Online FC-LW SCSI-FCP 0
IBM.2107-75FA120/I0122 307BCF30A3599E0 Online FC-LW SCSI-FCP 0
IBM.2107-75FA120/I0211 307BCF30A3699E0 Online FC-LW SCSI-FCP 0
IBM.2107-75FA120/I0212 307BCF30A3799E0 Online FC-LW SCSI-FCP 0
IBM.2107-75FA120/I0221 307BCF30A3899E0 Online FC-LW SCSI-FCP 0
IBM.2107-75FA120/I0222 307BCF30A3999E0 Online FC-LW SCSI-FCP 0
```

#### setioport

The setioport command configures one or more I/O ports for open systems or zSeries host system connections. This command cannot be used for ESCON ports.



# **Parameters**

# -dev storage\_image\_ID | -

(Optional) Accepts a fully qualified storage image ID. The storage image ID consists of manufacturer, machine type, and serial number.

# -topology fc-al | scsi-fcp | ficon

(Optional) Sets the topology for an I/O port, either fibre channel arbitrated loop, SCSI-FCP, or FICON.

# fibre channel arbitrated loop (code fc-al)

The fc-al topology setting enables the SCSI ULP with a FC-AL topology. The FC-AL topology does not support PPRC path I/O operations.

## **SCSI-FCP**

The SCSI-FCP topology setting enables the SCSI ULP with a point-to-point or switched fabric topology. PPRC path I/O operations are enabled for this setting.

#### ficon

The ficon topology setting enables the FICON ULP with a point-to-point or switched fabric topology. PPRC path I/O operations are not supported for FICON ULP.

## port\_ID . . . | -

(Optional) Displays I/O ports matching the specified IDs. Accepts a fully qualified port ID, which includes the storage image ID, or a shortened version without the storage image ID when the -dev flag is specified.

A port ID is prefixed with letter "I" and consists of four hexadecimal characters in the format "EEAP", where:

- "EE" is an I/O port enclosure number in the range of 00 17 (2107 machine types).
- "A" is the adapter number and is specified as 1, 2, 4, or 5 (2107 machine types).
- "P" is the port number (0 3).

To specify a range of port IDs, separate the port IDs with a hyphen.

You must separate multiple port IDs or ranges of port IDs by a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

#### Invoking the setioport command

This example configures four I/O ports for FICON topology.

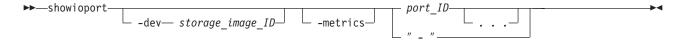
# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
```

```
I/O Port IO111 successfully configured.
I/O Port IO121 successfully configured.
I/O Port IO211 successfully configured.
I/O Port IO221 successfully configured.
```

# showioport

The showioport command displays properties of an ESCON or fibre channel I/O port. It optionally displays the performance metrics for an I/O port.



#### **Parameters**

# -dev storage image ID

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the port.

#### -metrics

Displays the port ID and performance metrics for the specified I/O port.

Note: All performance counts are an accumulation since the most recent counter wrap or counter reset. I/O port performance counters are reset each time a storage unit is powered up.

```
port ID . . . | -
```

(Required) Displays the property level details for the specified port IDs. This command accepts a fully qualified unique port ID, that consists of the manufacturer, machine type, and serial number/portID.

For example IBM.2107-75FA120/I0110

A port ID is prefixed with letter "I" and consists of four hexadecimal characters in the format "EEAP", where:

- "EE" is an I/O port enclosure number in the range of 00 17 (2107 machine
- "A" is the adapter number and is specified as 1, 2, 4, or 5 (2107 machine types).
- "P" is the port number (0 3).

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

## Invoking the showioport command to show port information

dscli>showioport -dev IBM.2107-75FA120 I0112

# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

```
ID IBM.2107-75FA120/I0112
WWPN 307ACF30A2399E0
State Online
loc U2107-75FA123-I1-P1-C2-T1
Type Fibre channel-LW
Speed (Gb/sec) 2
topo SCSI-FCP
portgrp 0
unkSCSIlog -
```

# Invoking the showioport command to show performance metrics

dscli>showioport -dev IBM.2107-75FA120 -metrics I0112

# The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004
IBM DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
ΙD
                         IBM.2107-75FA120/I0112
                         10/11/04 02:23:47
Date
byteread (FICON/ESCON)
                        10000
bytewrit (FICON/ESCON)
                        10000
Reads (FICON/ESCON)
                         10000
                         10000
Writes (FICON/ESCON)
timeread (FICON/ESCON)
                        10000
timewrite (FICON/ESCON) 10000
bytewrit (PPRC)
                         10000
byteread (PPRC)
                        10000
Writes (PPRC)
                         10000
Reads (PPRC)
                         10000
timewrite (PPRC)
                         10000
timeread (PPRC)
                         10000
byteread (SCSI)
                         10000
bytewrit (SCSI)
                         10000
Reads (SCSI)
                         10000
                         10000
Writes (SCSI)
timeread (SCSI)
                         10000
timewrite (SCSI)
                         10000
```

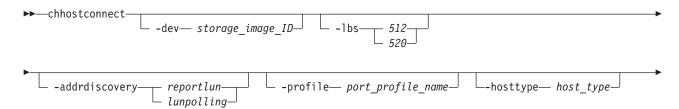
# **Host connection commands**

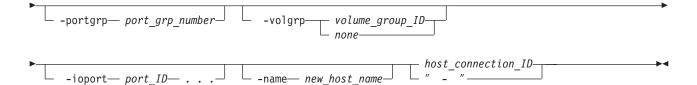
This section contains commands that are used to configure host connections and to display host connection information.

Use the following commands to configure host connections and to display host connection information.

#### chhostconnect

The chhostconnect command modifies a SCSI host port configuration.





## **Parameters**

Note: The chhostconnect command can be disruptive to host system I/O operations if the affected host port is logged into the target storage unit. You must ensure that the host port is offline to the host system before you process the chhostconnect command.

# -dev storage image ID

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified host connection ID.

Example of a fully qualified storage image ID: IBM.2107-75FA120

#### -lbs 512 | 520

(Optional) Specifies the logical block size that is used by the host system. The block size must be compatible with the volume group type and the volume type configurations that apply to the host port connection. The 520 logical block size is typically used by the IBM iSeries systems (OS/400).

#### Note:

- Do not use the -lbs parameter if you specify the -hosttype parameter.
- · It is recommended that you use the Isportprof command to determine the block size that you need to specify.

# -addrdiscovery reportlun | lunpolling

(Optional) Specifies the method for discovering logical unit number (LUN) addresses.

- · The reportlun method specifies that the host system can access up to 64K LUNs.
- The lunpolling method specifies that the host system can access up to 256 LUNs.

#### Note:

- Do not use the -addrdiscovery parameter if you specify the -hosttype parameter.
- · It is recommended that you use the Isportprof command to determine the size that you need to specify.

# -profile port\_profile\_name

(Optional) Specifies the name of the host connection behavior profile. If the name includes a blank space, enclose the name with double quotation marks. For example, -profile "IBM pSeries - Sun".

#### Note:

- · Do not use the -profile parameter if you specify the -hosttype parameter.
- · Use the Isportprof command to get available profiles if you are not using the -hosttype parameter.

#### **-hosttype** host type

(Optional) Specifies information about the following three parameters:

- · -profile
- -addrdiscovery
- -lbs

With the -hosttype parameter, do not use the -profile, addrdiscovery, or -lbs parameters.

Note: Use the Ishosttype command to obtain a list of known host types.

# -portgrp port\_grp\_number

(Optional) Specifies a user-assigned number that you use to associate two or more host ports with access to a common volume group. Port group zero is reserved for ports that have not been associated with a port group.

# -volgrp volume\_group\_ID | none

(Optional) Specifies an available volume group or no volume group if the none subparameter is used. This command accepts a fully qualified volume group ID including the storage image ID or a shortened version if the -dev flag is specified. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter "V".

A host connection can use only one volume group per storage image. In other words, a single WWPN can access only one volume group per storage image. Host operations cannot be initiated until a volume group ID is assigned.

If "none" is specified, the volume group ID assignment is removed from a SCSI host port object.

## -ioport port\_ID . . .

(Optional) Specifies all, none, one, or more I/O port IDs that allow host connection access to volumes.

Enter all to specify that you want to add all I/O ports.

Enter none to specify that you do not want any I/O ports added. If you do not specify I/O ports, the image is configured to allow host connection access to the specified volume group using any I/O port that is configured for FC-AL or SCSI-FCP topology.

You can select up to 128 ports for an open systems host attachment assignment. If you enter a list of I/O port IDs, access from this host connection to the specified volume group is allowed using only the specified list.

A port ID is prefixed with letter I and consists of four hexadecimal characters in the format EEAP, where:

- EE is an I/O port enclosure number in the range of 00 17 (2107 machine types).
- A is the adapter number and is specified as 1, 2, 4, or 5 (2107 machine types).
- *P* is the port number (0 3).

To specify a range of port IDs, separate the port IDs with a hyphen.

Separate multiple port IDs or ranges of port IDs with a comma between each ID or range of IDs.

Note: Changing the I/O port values can result in a disruption of current logins by the host systems.

## -name new\_host\_name

(Optional) Specifies the user-assigned host system or port name. The name is limited to 32-byte or 16-double byte characters.

## host\_connection\_ID | -

(Required) Specifies the host connect ID which is a unique identifier using any number from 0 - 65534 within the scope of a storage image. This parameter accepts a fully qualified ID (includes manufacture.type-serial number/hostconnectID) or a shortened version if the -dev flag is specified.

Example of a fully qualified host connection ID: IBM.2107-75FA120/1

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the chhostconnect command

dscli>chhostconnect -dev IBM.2107-75FA120 -name host 1 port 2 1

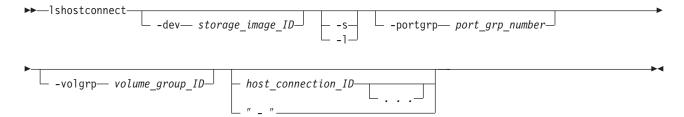
# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Host connection 1 successfully modified.

#### Ishostconnect

The Ishostconnect command displays a list of host connections for a storage image and the status information for each host connection in the list.



# **Parameters**

## -dev storage\_image\_ID

(Optional) Displays the host connections for the specified storage image. A storage image ID consists of manufacturer, machine type, and serial number. This parameter is required if you do not specify a fully qualified host connect ID.

Example of a fully qualified storage image ID: IBM.2107-75FA120

- -s (Optional) Displays the host connection IDs. You cannot use the -I and -s flags together.
- -I (Optional) Displays the default output and your description for each host connection in the list. You cannot use the -I and -s flags together.

# -portgrp port\_grp\_number

(Optional) Displays the host connections that have an associated group number.

## -volgrp volume\_group\_ID

(Optional) Displays only the host connections with the specified volume group ID. Accepts a fully qualified volume group ID including the storage image ID or a shortened version. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter "V".

host\_connection\_ID . . . | -

(Optional) Displays host connection information for the specified host connection IDs. Accepts a fully qualified ID (includes manufacture.type-serial number/hostconnectID) or a shotened version if the -dev parameter is specified..

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a fully qualified host connection ID: IBM.2107-75FA120/1

# **Example (2107)**

Note: The following tables represent the headers that are displayed on the output report associated with the Ishostconnect command using the -I parameter.

# Invoking the Ishostconnect command

dscli>lshostconnect -fullid -dev IBM.2107-75FA120 -l

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Name	ID	WWPN	HostType	LBS	Addrdis covery
My host port 1	IBM.2107- 75FA120/1	3007ACF3 0A2399E0	Unknown	512	reportLUN
My host port 2	IBM.2107- 75FA120/2	3007ACF3 0A2399E1	Unknown	512	reportLUN
My host port 3	IBM.2107- 75FA120/3	3007ACF3 0A2399E2	Unknown	512	reportLUN
My host port 4	IBM.2107- 75FA120/4	3007ACF3 0A2399E3	Unknown	512	reportLUN

Profile	portgrp	volgrpID	achtopo	ESSIOport
IBM pSeries - AIX	0	100	SCSI -FCP	I0111,I0121 I0211,I0221
IBM pSeries - AIX	0	100	SCSI -FCP	All
IBM pSeries - pLinux	0	100	SCSI-FCP	I0111,I0121 I0211,I0221
IBM pSeries - pLinux	0	100	SCSI -FCP	-

# Report column definitions

#### Name

Host Connection/SCSI Port Nickname.

The name is limited to 32 byte or 16 double byte characters.

ID A fully qualified host connection ID: manufacturer.type-serial number/hostconnectID

The hostconnectID component is a unique identifier (0-65,534) within the scope of a storage image.

#### **WWPN**

World wide name (WWPN) for this host system port.

# HostType

The name of the Host Type.

"Unknown" is displayed when the information is not available. This indicates that the host type was not specified when the host connection was created or modified.

#### **LBS**

The logical block sized used by this host system and host system port.

The logical block setting must be compatible with the volume group type that is configured for volume access. The 520 block size is typically used for IBM iSeries host system attachments.

# Addrdiscovery

The LUN address discovery method used by this host system and host system port.

The LUN Discovery method must be compatible with the volume group type that is configured for volume access.

The Poll LUNs method enables access to a maximum of 256 LUNs. The Report LUNs method enables access to a maximum of 64K LUNs.

#### **Profile**

The name of the Host Connection behavior profile.

## portgrp

Host Port Group ID. The ID associates a group of SCSI host port objects that are accessing a common volume group. If set to zero the host port is not associated with any port group.

#### volgrpID

Volume Group ID. A unique identifier within the DS8000 for the SCSI volume group that this SCSI host port is assigned to.

## achtopo

Indicates attached ESS IO port topology.

#### **ESSIOport**

The set of ESS IO ports that this SCSI host port is allowed to log into. "all" indicates that this SCSI host port is allowed to log into any ESS IO port. A null (-) value indicates that this SCSI host port is not allowed to log into any ESS IO port.

# Ishostvol

The Ishostvol command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs.

## ▶ 1shostvol —

#### **Parameters**

There are no parameters for this command.

#### Additional notes

The **Ishostvol** command displays only volumes that are accessed using a direct fibre channel path when you use the command on an OpenVMS host system that is a member of an OpenVMS cluster. The command output does not display information about the following OpenVMS cluster devices:

- Volumes to which the host system only has MSCP paths.
- Volumes to which the host system uses only MSCP paths at this time even though it has both MSCP and direct paths.

If you do not have IBM Subsystem Multipathing Device Driver (SDD) installed, the virtual path (vPath) name is not displayed..

# **Example (2107)**

# Invoking the Ishostvol command

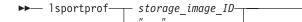
dscli>lshostvol

# The resulting output

# **Isportprof**

The Isportprof command displays a list of port profiles that are supported on a storage image and their recommended address discovery and logical block size values. You can use this command to view known values for the block size (lbs) and address discovery (addrdiscovery) parameters in the mkhostconnect command.

**Note:** Use this command to get the recommended values for the mkhostconnect command.



## **Parameters**

storage\_image\_ID | -

(Required) Displays a list of port profiles for the specified storage image IDs. A storage image ID consists of manufacturer, type, and serial number.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example: IBM.2107-75FA120

# **Example (2107)**

#### Invoking the Isportprof command

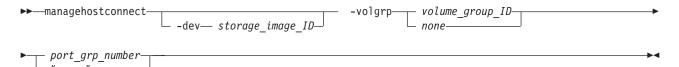
dscli>lsportprof IBM.2107-75FA120

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
      AddrDiscovery LBS
IBM pSeries - AIX ReportLUN 512
IBM pSeries - pLinux LUNPolling 512
```

# managehostconnect

The managehostconnect command modifies the volume group assignment for a SCSI host port.



# **Parameters**

Note: The managehostconnect command can be disruptive to host system I/O operations if the affected host port is logged into the target storage unit. Ensure that the host port is offline to the host system before processing the managehostconnect command.

# -dev storage image ID

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number.

# -volgrp volume\_group\_ID | none

(Required) Specifies that SCSI host port connections that are associated with the specified port group number will be modified to access this volume group ID. A volume group ID is a four-digit decimal number with no leading zeroes, prefixed with the letter V.

If none is specified, the volume group ID assignment is removed from all SCSI host port objects that are associated with a common port group number.

Example: -volgrp none

## port\_grp\_number | -

(Required) Specifies your number that associates two or more host ports as having access to a common volume group.

Alternatively, accepts input from stdin when the dash (–) is specified.

#### **Example (2107)**

# Invoking the managehostconnect command

dscli>managehostconnect -dev IBM.2107-75FA120 -volgrp 10 1

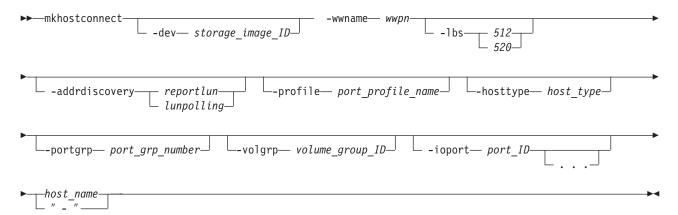
#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Port group number 1 successfully modified.

# mkhostconnect

The mkhostconnect command configures open systems hosts port attachments to fibre channel ports that are configured for FC-AL or SCSI-FCP topology. Open systems hosts port attachments to fibre channel ports are configured for identified access mode and SCSI protocol.



# **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes the manufacturer, type, and serial number.

#### -wwname wwpn

(Required) Specifies the worldwide port name (WWPN). The WWPN is a 16-character hexadecimal ID. The names are host attachment specific; for example, 12341234000A000F.

#### -lbs 512 | 520

(Optional) Specifies the logical block size that is used by this host system, in bytes. The block size must be compatible with the volume group type and the volume type configurations that apply to this host port connection. The 520-byte size is typically used by IBM iSeries systems (OS/400).

Note: Do not use the -lbs parameter if you specify the -hosttype parameter.

### -addrdiscovery reportlun | lunpolling

(Optional) Specifies the method for discovering logical unit number (LUN) addresses.

- The reportlun method specifies that the host system can access up to 64K LUNs.
- The lunpolling method specifies that the host system can access up to 256 LUNs.

For Sun, Linux, and Windows operating systems, the lunpolling method is typically selected.

**Note:** Do not use the -addrdiscovery parameter if you specify the -hosttype parameter.

# -profile port\_profile\_name

(Optional. If you specify the -hosttype parameter, this parameter is not used.)

Specifies the name of the host connection behavior profile. If the name includes blank space, enclose the name with double quotation marks. For example, -profile "IBM pSeries - Sun".

#### Note:

- · Do not use the -profile parameter if you specify the -hosttype parameter.
- · Use the Isportprof command to get available profiles if you are not using the -hosttype parameter.

#### **-hosttype** host type

(Optional) Specifies information about the following three parameters:

- -profile
- · -addrdiscovery
- -lbs

When the -hosttype parameter is specified, do not use the -profile, addrdiscovery, or -lbs parameters.

**Note:** Use the Ishosttype command to obtain a list of known host types.

# -portgrp port\_grp\_number

(Optional) Specifies the number that associates two or more host ports with access to a common volume group. Port group zero is reserved for ports that have not been associated with a port group.

# -volgrp volume group ID

(Optional) Specifies an available volume group. This parameter accepts a fully qualified volume group ID including the storage image ID or a shortened version. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter V.

A host connection uses only one volume group per storage image; in other words, a single WWPN can access only one volume group per storage image.

Note: If you do not specify a volume group when a host connection is created, the volume group ID is 65 535, which indicates that a valid volume group is not assigned.

# -ioport port\_ID . . .

(Optional) Specifies all, none, one, or more I/O port IDs that allow host connection access to volumes.

Enter all to specify that you want all I/O ports added.

Enter none to specify that you do not want I/O ports added. If you do not specify I/O ports, then the image is configured to allow host connection access to the specified volume group using any I/O port that is configured for FC-AL or SCSI-FCP topology.

You can select up to 128 ports for an open systems host attachment assignment. If you enter a list of I/O port IDs, then access from this host connection to the specified volume group is allowed only using the specified list.

A port ID is four hexadecimal characters in the format *EEAP*, where:

- EE is an I/O port enclosure number in the range of 00 17 (2107 machine types).
- A is the adapter number and is specified as 1, 2, 4, or 5 (2107 machine types).

• "P" is the port number (0-3).

This number is prefixed with the letter I.

To specify a range of port IDs, separate the port IDs with a hyphen.

You must separate multiple port IDs or ranges of port IDs with a comma between each ID or range of IDs.

### host\_name | -

(Required) Specifies your host system or port name, limited to 16 characters.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the mkhostconnect command

```
dscli>mkhostconnect -dev IBM.2107-75FA120 -wwname 12341234000A000F
-profile "IBM pSeries - Sun" host_1_port_1
```

# The resulting output

```
Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
```

Host connection 0 successfully created.

#### rmhostconnect

The rmhostconnect command removes a SCSI host port connection from a storage image.

```
-dev- storage_image_ID- -quiet- host_connection_ID-

    rmhostconnect-
```

# **Parameters**

### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all host connections.

# -quiet

(Optional) Turns off the confirmation prompt.

host\_connection\_ID | -

(Required) Specifies a fully qualified host connection ID, which consists of the manufacturer, type, and sequence number if the -dev flag is not used. The host\_connection ID is a unique identifier (0-65,534) within the scope of a storage image. A number (0-65,534) is accepted if the -dev flag is used.

Alternatively, you can provide input from stdin when the dash (-) is specified

#### **Example (2107)**

# Invoking the rmhostconnect command

dscli>rmhostconnect -dev IBM.2107-75FA120 1

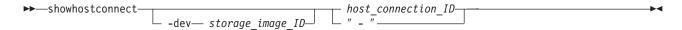
### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to delete Host Connection IBM.2107-75FA120/1? y/n Y Host Connection IBM.2107-75FA120/1 successfully deleted.

### showhostconnect

The showhostconnect command displays detailed properties of a storage image host connection.



### **Parameters**

-dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the host connection.

host\_connection\_ID | -

(Required) Specifies a fully qualified host connection ID, which includes the manufacturer, type, and sequence number if the -dev flag is not used. The host\_connection ID is a unique identifier (0-65 534) within the scope of a storage image. It accepts a number (0 - 65 534) if the -dev flag is used.

Alternatively, input from stdin is accepted when the dash (-) is specified

# **Example (2107)**

Note: The following tables represent the headers that are displayed on the output report associated with the showhostconnect command using the -I parameter.

# Invoking the Ishostconnect command

dscli>lshostconnect -fullid -dev IBM.2107-75FA120 -l

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Name	ID	WWPN	HostType	LBS	Addrdis covery
My host port	IBM.2107- 75FA120/1	3007ACF3 0A2399E0	Unknown	512	reportLUN

Profile	portgrp	volgrpID	achtopo	ESSIOport
IBM pSeries	0	100	SCSI	10111,10121
- AIX			-FCP	10211,10221

# Report column definitions

#### Name

Host Connection/SCSI port nickname.

The name is limited to 32 byte or 16 double byte characters.

ID A fully qualified host connection ID

The value represented by the host connection ID parameter is a unique identifier (0-65 534) within the scope of a storage image.

#### **WWPN**

World wide port name (WWPN) for this host system port.

# HostType

The name of the Host Type.

"Unknown" is displayed when the information is not available. This indicates that the host type was not specified when the host connection was created or modified.

#### **LBS**

The logical block size that is used by this host system and the host system port.

The logical block setting must be compatible with the volume group type that is configured for volume access. The 520 block size is typically used for IBM iSeries host system attachments.

# Addrdiscovery

The LUN address discovery method that is used by this host system and the host system port.

The LUN Discovery method must be compatible with the volume group type that is configured for volume access.

The Poll LUNs method enables access to a maximum of 256 LUNs. The Report LUNs method enables access to a maximum of 64K LUNs.

#### **Profile**

The name of the Host Connection behavior profile.

## portgrp

Host Port Group ID. The ID associates a group of SCSI host port objects that are accessing a common volume group. If set to zero, the host port is not associated with any port group.

# volgrpID

Volume Group ID. A unique identifier within the DS8000 for the SCSI volume group that this SCSI host port is assigned to.

# achtopo

Indicates attached ESS I/O port topology.

#### **ESSIOport**

The set of ESS I/O ports that this SCSI host port can log into. "all" indicates that this SCSI host port is allowed to log into any ESS I/O port. A null (-) value indicates that this SCSI host port cannot log into any ESS I/O port.

# Ishosttype

The Ishosttype command displays a list of known hosts, their associated port profiles, address discovery, and logical block size values. Use this command to get the available host types for the mkhostconnect command.



- -s (Optional) Displays the host types only. You cannot use the -l and -s parameters together.
- (Optional) Displays the default output for the specified host type. You cannot use the -I and -s parameters together.

# -type volumeGroup\_type

(Required) Displays only those host types that are associated with the specified volume group type:

#### volumeGroup\_type [...]

Only one type can be queried at a time. The following list provides the choices that can be specified.

- ficonall
- scsiall
- scsimask
- scsimap256
- os400all
- os400mask

# **Example (2107)**

# Invoking the Ishosttype command

dscli>lshosttype -type -l

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0

Name	Profile	AdrDiscovery	LBS	Description
pSeries	IBM pSeries - AIX	reportlun	512	IBM pSeries, RS/6000 and RS/6000 SP Servers (AIX)
zLinux	IBM zSeries - zLinux	lunpolling	512	IBM zSeries Servers (Linux)

# Storage configuration commands

This section contains storage configuration commands.

The following commands allow you to configure storage for zSeries and open system hosts.

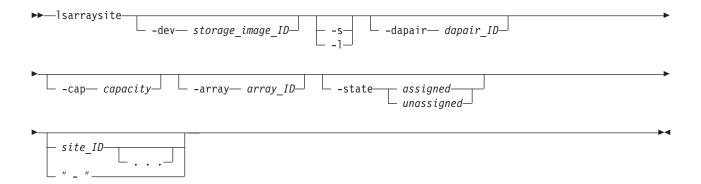
# Array site specific commands

This section contains commands that are used to display array site information.

Use the following commands to display array site image information.

# **Isarraysite**

The Isarraysite command displays a list of array sites and status information for each array site in the list.



# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if the qualified site ID is not specified.

- **-s** (Optional) Displays the array ID. You cannot use the -l and the -s parameters together.
- (Optional) Displays the default output and the disk drive module rpm (revolutions per minute). You cannot use the -l and the -s parameters together.

### -dapair dapair\_ID

(Optional) Displays array sites that are associated with a common device adapter pair ID. A device adapter pair ID is a two-digit decimal number with no leading zeroes.

# -cap capacity

(Optional) Displays in GB the array sites that have the specified disk drive module capacity. You can specify up to three digits after the decimal point; for example -cap 144.7.

# -array array\_ID

(Optional) Displays the array site that is associated with the specified array ID. An array ID is a four-digit decimal number with no leading zeroes, prefixed with the letter  $^{\prime\prime}A^{\prime\prime}$ .

#### -state assigned | unassigned

(Optional) Displays array sites that are in the specified state.

#### site ID . . . | -

(Optional) Displays array sites that have the specified IDs. An array site identifier is a four-digit decimal number with no leading zeroes, prefixed by the letter "S".

To specify a range of array site IDs, separate the array site IDs with a hyphen.

You must separate multiple array site IDs or ranges of array site IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

### **Example**

**Note:** The following tables represent the headers that are displayed on the output report that is associated with the **Isarraysite** command using the **-I** 

parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

# Invoking the Isarraysite command

dscli>lsarraysite -fullid -dev IBM.2107-75FA120 -l

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

arsite	DA pair	dkcap (10^9B)	diskrpm	State	Array
IBM.2107- 75FA120/ S10	IBM.2107- 75FA120 /11	300	15000	assigned	IBM.2107- 75FA120 /A100
IBM.2107- 75FA120 /S11	IBM.2107- 75FA120 /11	300	15000	assigned	IBM.2107- 75FA120 /A101
IBM.2107- 75FA120 /S12	IBM.2107- 75FA120 /12	300	15000	assigned	IBM.2107- 75FA120 /A102
IBM.2107- 75FA120 /S13	IBM.2107- 75FA120 /12	300	15000	assigned	IBM.2107- 75FA120 /A103

# Report field definitions

arsite Specifies the array site ID. The array site ID is a four-digit decimal number, with no leading zeros, prefixed by the letter S.

**Note:** The array site ID does not imply a physical location.

# DA pair

Identifies the DA pair ID. DA pairs are located in I/O enclosure pairs. DA pair ID implies the I/O enclosure location.

Note: An even-numbered DA pair ID indicates the first DA pair in an I/O enclosure pair. An odd-numbered DA pair ID indicates the second DA pair in an I/O enclosure pair.

# dkcap (10<sup>9</sup> Byte)

Specifies the minimum disk capacity of the disks in this array site in gigabytes.

#### diskrpm

Specifies the minimum disk RPM of the disks in this array site.

Identifies the array site state. An unassigned array site is available to be defined as an array.

Array Specifies the array ID that this assigned array site is assigned to. The ID is prefixed by the letter A.

## showarraysite

The showarraysite command displays detailed properties of a specific storage image array site.

# -dev storage image ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the array site.

## site ID | -

(Required) Displays site information for the specified array site ID. Accepts a fully qualified site ID, which consists of the storage image ID, or a shortened version without the storage image ID if the -dev parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed by the letter "S". The array site ID does not imply a physical location.

Alternatively, accepts input from stdin when the dash (–) is specified.

#### Example

Note: The following tables represent the headers that are displayed on the output report that is associated with the showarraysite command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

# Invoking the showarraysite command

dscli>showarraysite -dev IBM.2107-75FA120 S11

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

arsite	DA pair	dkcap (10^9B)	diskrpm	dkinf	dkrate
IBM.2107- 75FA120/ S11	IBM.2107- 75FA120 /11	146	15000	FC-AL	2

DDMSN	Spares	State	Array
0123456789 ABCDEF	0	Assigned	IBM.2107- 75FA120 /A44

# Report field definitions

arsite Identifies the array site ID. The array site ID is a four digit decimal number, no leading zeros, prefixed by the letter S.

**Note:** The array site ID does not imply a physical location.

#### DA pair

Identifies the DA pair ID. DA pairs are located in I/O enclosure pairs. DA pair ID implies the I/O enclosure location.

Note: DA Adapters are installed in slot 3 in one enclosure and slot 6 in the peer enclosure. The DA pair ID identifies the enclosure that contains the DA Adapter in slot 3. For example, a DA adapter is installed in slot of 3 of enclosure 2. Its peer is installed in slot 6 of enclosure 3. In this case, the DA Pair ID will be 2.

# dkcap (10^9B)

Specifies the minimum disk capacity of the disks in this array site in gigabytes.

# diskrpm

Specifies the minimum disk RPM of the disks in this array site.

**dkinf** Identifies the disk interface type for the disks in this array site.

**dkrate** Specifies the minimum disk interface rate of the disks in this array site.

### **DDMSN**

Specifies the list of DDM serial numbers that are associated with the array site.

# **Spares**

Identifies, if any, the number of spare DDMs that are allocated from the

State Identifies the array site state. An unassigned array site is available to be defined as an array.

Identifies, if any, the array ID that this assigned array site is assigned to. The ID is prefixed by the letter A.

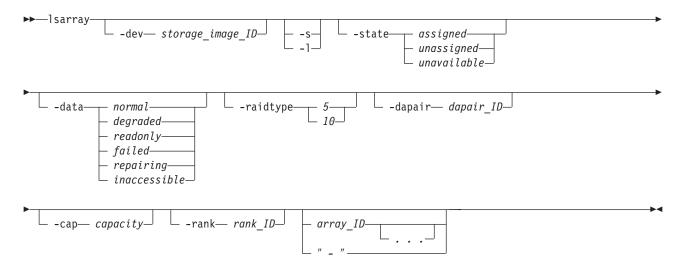
# Array specific commands

This section contains commands that are used to create and delete arrays and to display array information.

Use the following commands to create and delete arrays and to display array information.

# Isarrav

The Isarray command displays a list of arrays in a storage image and status information for each array in the list.



# -dev storage image ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if the fully qualified array ID is not specified.

- -s (Optional) Displays the array ID. You cannot use the -l and the -s parameters together.
- -I (Optional) Displays the default output data. You cannot use the -I and the -s parameters together.

# -state assigned | unassigned | unavailable

(Optional) Displays the array in the specified state.

-data normal | degraded | readonly | failed | repairing | inaccessible (Optional) Displays the arrays in the specified data state.

# **-raidtype** *5* | *10*

(Optional) Displays arrays with the specified RAID type.

# -dapair dapair ID

(Optional) Displays the arrays with the specified device adapter pair ID. A device adapter pair ID is a two-digit decimal number with no leading zeroes.

(Optional) Displays in GB the arrays with the specified DDM capacity. You can specify up to three digits after the decimal point, for example -cap 144.7.

#### -rank rank ID

(Optional) Displays the arrays that are assigned to the specified rank ID. A rank ID is a four-digit decimal number with no leading zeroes, prefixed with the letter "R".

# array\_ID . . . | -

(Optional) Displays array information for the specified arrays. An array ID is a four-digit decimal number with no leading zeroes, prefixed with the letter "A".

To specify a range of array IDs, separate the array IDs with a hyphen. For example: A10-A12 (equates to A10 A11 A12)

You must separate multiple array IDs or ranges of array IDs with a blank space between each ID or range of IDs. For example: A11 A12 A14-A16. Your command in this case could look like dscli>lsarray -fullid IBM.2107-75FA120 -l A11 A12 A14-A16

Alternatively, accepts input from stdin when the dash (-) is specified.

## **Example**

**Note:** The following tables represent the headers that are displayed on the output report that is associated with the **Isarray** command using the **-I** parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

### Invoking the Isarray command

dscli>lsarray -dev IBM.2107-75FA120

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Array	State	Data	RaidType
A10	assigned	Normal	5(6+p)
A11	assigned	Normal	5(7+p)
A12	assigned	Normal	5(6+p)
A13	unassigned	Normal	5(7+p)

arsite	Rank	DA Pair	DDMcap (10^9B)
S20	R11	10	145
S21	R12	11	145
S30	R13	20	300
S31	_	21	300

# Report field descriptions

Specifies the array number. The array number starts with an A prefix, followed by a four digit decimal number, no leading zeros (for example,

**State** Indicates the array state. One of the following values is displayed:

# **Assigned**

The array is assigned to a rank.

The array is not assigned to a rank and all of the storage devices that are indicated by the disk serial numbers attribute are in the normal state.

#### Unavailable

The array is not assigned to a rank and one or more of the disk drive modules (DDMs) that are indicated by the disk serial numbers attribute are not in the normal state.

Data This value reflects the current data status. One of the following values is displayed:

## **Normal**

The array is in the Normal data state if none of the other data states applies. This status applies if the array is unassigned.

### Degraded

The array is in the Degraded data state if both of the following conditions exist:

- · The Read-only, Failed, Repairing, or Inaccessible data states do not
- · One or more redundancy groups are rebuilding (that is, there is a DDM with a rebuilding state in the array).

### **Read Only**

The array is in the Read-only data state if all of the following conditions

- The Failed, Repairing, and Inaccessible data states do not apply.
- · One or more DDMs have failed.
- There are insufficient spares to support all rebuild operations.

 Continued write operation without redundancy could result in data loss.

### **Failed**

The array is in the Failed data state if all of the following conditions

- The Repairing and Inaccessible data states do not apply.
- · Two or more DDMs in the array have failed.
- There are insufficient DDMs left in the array to rebuild the data that was lost on the failing storage devices.

# Repairing

The array is in the Repairing data state if all of the following conditions exist:

- The Inaccessible data status does not apply.
- · The array has previously entered the failed state.
- The repair array function has been accepted.
- The repair array function has not completed.

#### Inaccessible

The array is in the Inaccessible data state if the storage unit cannot access a set of storage devices that are sufficient to access all the data on the array.

# RaidType

Indicates the type of RAID array (5 or 10) and the array configuration (for example, 6+P).

arsite Indicates the array sites that are associated with the array.

Rank Specifies the rank the array is assigned to. The value is displayed as a combination of a Storage Image ID and a rank number. The rank number is an R prefix, followed by a four-digit decimal number, with no leading zeros (for example, R26).

### DA pair

Identifies the DA pair ID. DA pairs are located in I/O enclosure pairs. DA pair ID implies the I/O enclosure location.

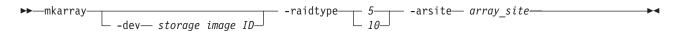
Note: An even-numbered DA pair ID indicates the first DA pair in an I/O enclosure pair. An odd-numbered DA pair ID indicates the second DA pair in an I/O enclosure pair.

#### DDMcap (10<sup>9</sup> Byte)

Indicates the minimum disk capacity (10^9 Byte) of the storage devices (DDMs) in this array.

#### mkarray

The mkarray command creates arrays.



# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified array site.

### **-raidtype** *5* | *10*

(Required) Specifies a RAID type for the array.

#### -arsite array\_site

(Required) Specifies the array site for the array. An array site number is a four-digit decimal number with no leading zeroes, prefixed with the letter "S".

Example of fully qualified array site: IBM.2107-75FA120/S11

# **Example (2107)**

# Invoking the mkarray command

dscli>mkarray -dev IBM.2107-75FA120 -raidtype 10 -arsite S10,S11

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Array A10 successfully created.

# rmarray

The rmarray command deletes arrays.



### **Parameters**

# -dev storage image ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for all array IDs.

(Optional) Turns off the confirmation prompt for this command.

#### array ID . . . | -

(Required) Specifies the array IDs that are to be deleted. Accepts a fully qualified array ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified. The shortened version is a four digit decimal number with no leading zeros, prefixed by the letter "A".

To specify a range of array IDs, separate the array IDs with a hyphen.

You must separate multiple array IDs or ranges of array IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

### **Example (2107)**

# Invoking the rmarray command

dscli>rmarray -dev IBM.2107-75FA120 A44

# The resulting output

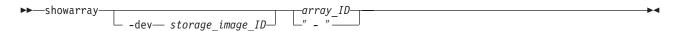
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to delete array IBM.2107-75FA120/A44? [y/n]: Y

Array Storage Image ID/A44 successfully deleted.

# showarrav

The showarray command displays detailed properties of a specific array.



# **Parameters**

# -dev storage image ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the array.

# array\_ID | -

(Required) Specifies the array IDs of the arrays that you want to view. Accepts a fully qualified array ID, which consists of the storage image ID, or a shortened version without the storage image ID if the -dev parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed by the letter "A".

Alternatively, accepts input from stdin when the dash (–) is specified.

#### Example

Note: The following tables represent the headers that are displayed on the output report that is associated with the **showarray** command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

# Invoking the showarray command

dscli>showarray -dev IBM.2107-75FA120 A44

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Array	SN	State	datastate	RaidType	arsite
IBM.2107- 75FA120/A44	AZ123AQ	Available	Normal	5 (6+P)	S21

#### Table 6.

Rank	DA pair	DDMcap (10^9B)	DDMRPM	Interface Type	Interrate (GB/secs)
2107- 75FA123/R26	2107- 75FA123/11	145	15000	FCAL	2

# Report field definitions

Identifies the array ID number. The array ID number starts with an A prefix, followed by a four-digit decimal number, no leading zeros (for example, A44).

SN Identifies the unique internal identifier for the data space of this array (for example, AZ123AQ).

State Indicates the array state. One of the following values is displayed:

# **Assigned**

The array is assigned to a rank.

# Unassigned

The array is not assigned to a rank and all of the storage devices that are indicated by the disk serial numbers attribute are in the normal

#### Unavailable

The array is not assigned to a rank and one or more of the disk drive modules (DDMs) that are indicated by the disk serial numbers attribute are not in the normal state.

#### datastate

This value reflects the current data state. One of the following values is displayed:

#### Normal

The array is in the Normal data state if none of the other data states applies. This status applies if the array is unassigned.

The array is in the Degraded data state if both of the following conditions exist:

- The Read-only, Failed, Repairing, or Inaccessible data states do not apply.
- One or more redundancy groups are rebuilding (that is, there is a DDM with a rebuilding state in the array).

# Read Only

The array is in the Read-only data state if all of the following conditions

- The Failed, Repairing, and Inaccessible data states do not apply.
- One or more DDMs have failed.
- There are insufficient spares to support all rebuild operations.
- · Continued write operation without redundancy could result in data loss.

#### Failed

The array is in the Failed data state if all of the following conditions exist:

- The Repairing and Inaccessible data states do not apply.
- Two or more DDMs in the array have failed.
- · There are insufficient DDMs left in the array to rebuild the data that was lost on the failing storage devices.

# Repairing

The array is in the Repairing data state if all of the following conditions exist:

- The Inaccessible data state does not apply.
- The array has previously entered the failed state.
- · The repair array function has been accepted.
- · The repair array function has not completed.

#### Inaccessible

The array is in the Inaccessible data state if the storage unit cannot access a set of storage devices that are sufficient to access all the data on the array.

# RaidType

Indentifies the type of RAID array (5 or 10) and the array configuration (for example, 6+P).

arsite Indentifies the array sites that are associated with the array.

Rank Identifies the rank the array is assigned to. The value is displayed as a combination of a storage image ID and a rank number. The rank number is an R prefix, followed by a four-digit decimal number, with no leading zeros (for example, R26).

**Note:** If the array is unassigned, the field is null (–)

# DA pair

Identifies the DA pair ID. DA pairs are located in I/O enclosure pairs. DA pair ID implies the I/O enclosure location.

Note: DA Adapters are installed in slot 3 in one enclosure and slot 6 in the peer enclosure. The DA pair ID identifies the enclosure that contains the DA Adapter in slot 3. For example, a DA adapter is installed in slot of 3 of enclosure 2. Its peer is installed in slot 6 of enclosure 3. In this case, the DA Pair ID will be 2.

#### DDMcap (10^9B)

Indicates the minimum disk capacity (10^9B) of the storage devices (DDMs) in this array.

# **DDMRPM**

Indicates the minimum disk RPM of the DDMs in this array.

# **Interface Type**

Indicates the disk interface type of the DDMs in this array

#### Interrate

Indicates the minimum disk interface rate of the disks in this array.

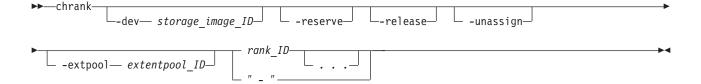
# Rank specific commands

This section contains commands that are used to create, modify, and delete ranks and to display rank information.

Use the following commands to create, modify, and delete ranks and to display rank information.

#### chrank

The chrank command assigns an unassigned rank to a extent pool, or removes an assigned rank from a extent pool. This action can change an assigned rank to an unassigned rank.



# -dev storage image ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all ranks; otherwise, it is optional.

Example: IBM.2107-75FA120

#### -reserve

(Optional) Specifies that the rank configuration state be set to Reserved.

#### -release

(Optional) Specifies that the rank configuration state be set to Normal.

#### -unassign

(Optional) Specifies that the rank configuration state be set to Unassigned.

# -extpool extentpool\_ID

(Optional) Assigns the rank to an extent pool. Accepts either a fully qualified extent pool ID including storage image ID or a shortened version if the -dev flag is used. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter P.

(Required) Specifies one or more ranks to be modified. Accepts either a fully qualified rank ID, or a rank number if the -dev flag is used. A rank number is a four-digit decimal number with no leading zeroes, prefixed by the letter R.

To specify a range of rank IDs, separate the rank IDs with a hyphen.

You must separate multiple rank IDs or ranges of rank IDs with a blank space between each ID or range of IDs.

Example: IBM.2107-75FA120/R2

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

### Invoking the chrank command

dscli>chrank -dev IBM.2107-75FA120 -extpool P101 R2

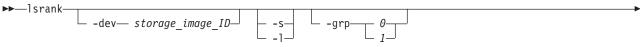
# The resulting output

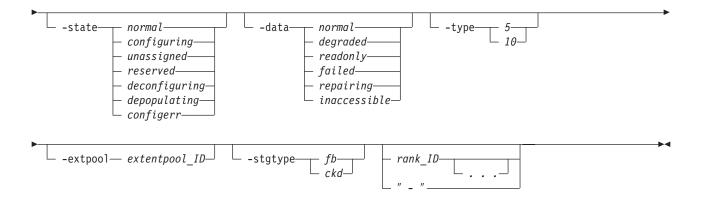
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Rank IBM.2107-75FA120/R2 successfully modified.

#### Isrank

The Isrank command displays a list of defined ranks in a storage image and status information for each rank.





-dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

Example: IBM.2107-75FA120

- **-s** (Optional) Displays the rank ID. You cannot use the -l and the -s parameters together.
- -I (Optional) Displays the default output, extent pool name, number of extents, and extents that are used for each rank. You cannot use the -I and the -s parameters together.
- -grp 0 | 1

(Optional) Displays only the ranks that belong to the specified rank group. A rank in the unassigned state is not associated with a rank group.

-state normal | configuring | unassigned | reserved | deconfiguring | | depopulating configerr

(Optional) Displays only ranks in the specified state.

- -data normal | degraded | readonly | failed | repairing | inaccessible (Optional) Displays only ranks in the specified data state.
- **-type** *5* | *10*

(Optional) Displays only ranks of the specified RAID type.

-extpool extentpool ID

(Optional) Displays only ranks in the specified extent pool. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter P.

-stgtype fb | ckd

(Optional) Displays only ranks that are configured for the specified storage type.

rank\_ID . . . | -

(Optional) Displays rank information for specified rank IDs. An ID range is defined by two IDs that are separated by a hyphen.

You must separate multiple rank IDs or ranges of rank IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example: IBM.2107-75FA120

# **Example (2107)**

# Invoking the Isrank command

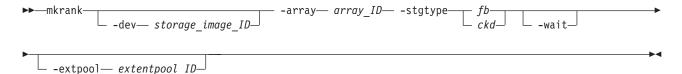
```
dscli>lsrank -dev IBM.2107-75FA120 -l -fullid
```

#### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
    Group State datastate Array RAID Type extentpoolID
extpoolnam stgtype exts usedexts
IBM.2107-75FA120/R1 0 Normal Normal A1 5 P1
host_1_volumes fb 1,000 500
IBM.2107-75FA120/R2 0 Normal Normal A2 5 P1
host 1 volumes fb 1,000 500
IBM.2107-75FA120/R3 0 Normal Normal A3 5 P1
host 1 volumes fb 1,000 500
IBM.2107-75FA120/R4 0 Normal Normal A4 5 P1
host 1 volumes fb 1,000 500
```

### mkrank

The mkrank command creates one fixed block or count key data (CKD) rank from one array.



### **Parameters**

#### -dev storage image ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

# -array array ID

(Required) Specifies the ID of the array from which the rank is to be created. An array ID is a four digit decimal number with no leading zeroes, prefixed with the letter A.

# -stgtype fb | ckd

(Required) Specifies the type of extent for which the rank will be configured, either fixed block or count key data.

#### -wait

(Optional) Delays the command response until the rank configuration process completes.

### -extpool extentpool\_ID

(Optional) Specifies the extent pool that contains the created rank extents. If an extent pool is specified, then the rank will be assigned to the extent pool. Otherwise, the rank state is unassigned. If specified, the extent pool must exist and must be compatible with the specified -stgtype option. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter P.

Note: You will need to use the chrank command if you choose to specify the extent pool ID at a later time.

# **Example (2107)**

# Invoking the mkrank command

dscli>mkrank -dev IBM.2107-75FA120 -array A44 -stgtype fb

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Device: IBM.2107-75FA120

Rank IBM.2107-75FA120/R44 successfully created.

#### rmrank

The rmrank command deletes ranks from a storage image. This command is rejected if any volume extents in the rank are being used. In addition, this command formats the drives (DDMs). Until the formatting is done, the associated array cannot be removed.



#### **Parameters**

Note: The processing time that is associated with this command can be lengthy and might inhibit your use of the array on which this command is being processed.

When the rmrank command is issued, the following processing occurs:

- The rank is unassigned from the array.
- The rank is removed. When this is successful a message is displayed. This piece of the process does not take long; however, the processing that is associated with this command is not complete even though you have received a message that the rank was removed.
- · The array is formatted. This processing can take some time. During this processing the array cannot be removed or assigned to another rank. Also, until this process is fully completed, the array is listed as assigned to the rank from which it is has been removed. Using the Isarray command, you can continue to check on the progress of the processing. When you no longer see the array that is assigned to the rank from which you removed it, the remove rank process is complete.

The following list defines the parameters that are associated with the **rmrank** command:

### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all ranks; otherwise, it is optional.

(Optional) Turns off the confirmation prompt for this command.

rank ID . . . | -

(Required) An array of one or more ranks to be deleted. Accepts a fully qualified rank ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter R.

To specify a range of rank IDs, separate the rank IDs with a hyphen.

You must separate multiple rank IDs or ranges of rank IDs with a space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the rmrank command

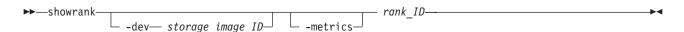
dscli>rmrank -dev IBM.2107-75FA120 R23

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
Are you sure you want to delete rank R23? [y/n]: Y
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
Rank R23 successfully deleted.
```

#### showrank

The showrank command displays detailed properties or performance metrics of a rank.



### **Parameters**

# -dev storage image ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the rank; otherwise, it is optional.

#### -metrics

(Optional) Displays the rank ID and performance statistics for the specified rank.

Note: All performance statistics are an accumulation since the most recent counter wrap or counter reset. Rank performance counters are reset on a power up sequence or by a server failover and failback sequence

### rank\_ID

(Required) Shows the properties for the rank specified. Accepts a fully qualified rank ID, which consists of the storage image ID, or a shortened version without the storage image ID if the -dev parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed by the letter R.

#### **Example (2107)**

#### Invoking the showrank command to show rank properties

dscli>showrank -dev IBM.2107-75FA120 -fullid R34

#### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
ID Storage Image ID/R34
SN A23567
Group 0
```

State Normal datastate Normal Array IBM.2107-75FA120/A44 RAIDtype 10 extpoolID IBM.2107-75FA120/P48 extpoolnam host 4 extpool volumes IBM.2107-75FA120/R7 stgtype FB exts 1,000 usedexts 500 widearrays 1 nararrays 0 trksize 128 strpsize 4 strpesize 4 extsize 16,384

# Invoking the showrank command to show performance metrics

dscli>showrank -dev IBM.2107-75FA120 -metrics R34

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID IBM.2107-75FA120/R1
Date 10/11/04 02:23:47
byteread 10000
bytewrite 10000
Reads 10000
Writes 10000
timeread 10000
timewrite 10000

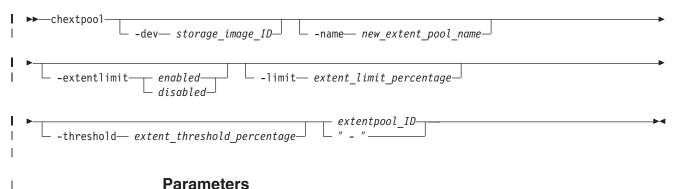
# **Extent pool specific commands**

This section contains commands that are used to create, modify, and delete extent pools and to display extent pool information.

Use the following commands to create, modify, and delete extent pools and to display extent pool information.

# chextpool

The chextpool command modifies an extent pool name.



#### i arameters

-dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the extent pool; otherwise, it is optional.

-name new\_extent\_pool\_name

(Optional) Specifies a new name for the extent pool.

Note: To change any other extent pool attributes, you must delete the extent pool and create a new one.

#### -extentlimit enabled | disabled

(Optional) Specifies that the extent limit function be enabled or disabled.

# -limit extent\_limit\_precentage

(Optional) Specifies the maximum value of the percentage of allocated real extents that are allowed in this extent pool.

# -threshold extent\_threshold\_precentage

(Optional) Specifies threshold as a percentage of the available real extents that is compared to the actual percentage of available real extents.

# extentpool ID | -

(Required) Specifies the ID of the extent pool to be changed. Accepts either a fully qualified extent pool ID or a shortened version if the -dev parameter is used. The shortened version is a four-digit decimal number with no leading zeros, prefixed with the letter P.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the chextpool command

dscli>chextpool -name host\_4\_extpool IBM.2107-75FA120/P21

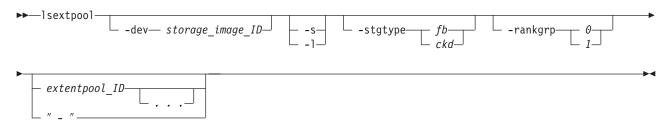
# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Extent Pool IBM.2107-75FA120/P21 successfully modified.

# Isextpool

The Isextpool command displays a list of extent pools in a storage image and status information on each extent pool in the list.



# **Parameters**

### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number.

- -s (Optional) Displays extent pool IDs. You cannot use the -l and the -s parameters together.
- (Optional) Displays default output plus additional attributes that are identified as long output. You cannot use the -I and the -s parameters together.

# -stgtype fb | ckd

(Optional) Displays only extent pools with the specified storage type.

# -rankgrp 0 | 1

(Optional) Displays only extent pools in the specified rank group.

# extentpool ID . . . | -

(Optional) Displays only the extent pools with the specified IDs. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed by the letter

To specify a range of extent pool IDs, separate the extent pool IDs with a hyphen.

You must separate multiple extent pool IDs or ranges of extent pool IDs with a space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

#### Example

Note: The following tables represent the headers that are displayed on the output report that is associated with the Isextpool command using the -I parameter. A separate example is not shown for the 1750 as the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

# Invoking the Isextpool command

dscli>lsextpool -dev IBM.2107-75FA120 -l

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Name	ID	Stgtype	Rankgrp	Status	Avail- stor (2^30B)
host_1 _extpool	IBM.2107- 75FA120 /P21	fb	0	exceeded	1000
host_1 _extpool	IBM.2107- 75FA120 /P22	fb	1	exceeded	1000
host_2 _extpool	IBM.2107- 75FA120 /P23	fb	0	exceeded	1000
host_2 _extpool	IBM.2107- 75FA120 /P24	fb	1	exceeded	1000
host_3 _extpool	IBM.2107- 75FA120 /P25	fb	0	exceeded	1000
host_3 _extpool	IBM.2107- 75FA120 /P26	fb	1	exceeded	1000

%allo- cated	Avail- able	Reser- ved	Num- vols	Num- ranks
10	1000	100	4	4
10	1000	100	4	4
10	1000	100	4	4
10	1000	100	4	4
10	1000	100	4	4
10	1000	100	4	4

# Report field definitions

Name Identifies the name you assigned to the extent pool.

ID Specifies the system assigned unique identifier for the extent pool object.

# stgtype

Identifies the storage type associated with the extent pool. One of the following is displayed:

- fb
- ckd

# rankgrp

Specifies the rank group in which the designated extent pool is configured.

#### **Status**

Specifies the extent status. One of the following values is displayed:

#### exceeded

Specifies that the %Extents available is greater than the extent threshold

Specifies that the %Extents Available is less than the extent threshold

#### full

Specifies that the %Extents Available is 0.

### availstor (2<sup>30</sup> Bytes)

Specifies the available storage for the designated extent pool, in gigabytes (2 ^ 30 Bytes).

#### %allocated

Specifies the percentage of extents allocated.

#### available

Specifies the maximum number of extents available for allocation in the designated extent pool.

# reserved

Specifies the extents reserved in the designated extent pool.

#### numvols

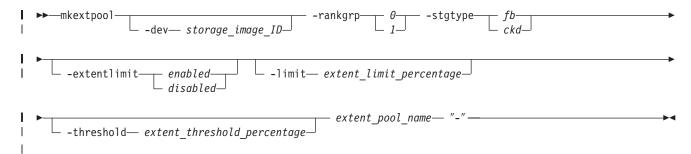
Identifies the number of logical volumes that have been configured from the designated extent pool.

# numranks

Identifies the number of ranks that have been configured in the designated extent pool.

# mkextpool

The mkextpool command creates a fixed block or count key data (CKD) storage type extent pool.



### **Parameters**

#### Note:

I

- An extent pool object is assigned to either rank group 0 or 1, which allows
  the extent pool to be managed by storage unit server 0 or 1 respectively.
- · Create extent pool objects before creating array and rank objects.
- Create extent pools of a given type for both rank groups 0 and 1 so that volumes that are assigned to a volume group can be spread across both rank groups 0 and 1.

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

# -rankgrp 0 | 1

(Required) Assigns the extent pool to either rank group 0 or 1. Rank group 0 is managed by server 0, and rank group 1 is managed by server 1.

Note: If an extent pool does not exist, you can issue the chrank command after an extent pool is created in order to assign the rank to the extent pool. In addition, you can create extent pools of a given type for both rank groups 0 and 1 so that volumes that are assigned to a volume group might be spread across both rank groups 0 and 1.

#### -stgtype fb | ckd

(Required) Specifies the volume storage type that is contained by this extent pool.

#### -extentlimit enabled | disabled

(Optional) Specifies that the extent limit function be enabled or disabled. Disabled is the default.

# -limit extent\_limit\_precentage

(Optional) Specifies the maximum value of the percentage of allocated real extents that are allowed in this extent pool. This value defaults to 100 if not specified.

## -threshold extent\_threshold\_precentage

(Optional) Specifies threshold as a percentage of the available real extents that is compared to the actual percentage of available real extents.

#### extent\_pool\_name | -

(Required) Specifies your extent pool name, which is limited to 16 characters.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

# Invoking the mkextpool command

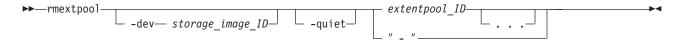
dscli>mkextpool -dev IBM.2107-75FA120 -rankgrp 0 -stgtype fb my extpool

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120 Extent pool P2 successfully created.

# rmextpool

The rmextpool command deletes extent pools from a storage image.



# **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all extent pools; otherwise, it is optional.

# -quiet

(Optional) Turns off the confirmation prompt for this command.

# extentpool\_ID . . . | -

(Required) Specifies the IDs of one or more extent pools to be deleted. A fully qualified extent pool ID is accepted, which consists of the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified. The shortened version is a four-decimal digit number with no leading zeroes, prefixed with the letter P.

Note: All rank assignments must be removed before extent pool can be deleted.

To specify a range of extent pool IDs, separate the extent pool IDs with a hyphen.

You must separate multiple extent pool IDs or ranges of extent pool IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the rmextpool command

dscli>rmextpool IBM.2107-75FA120/P101

### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120 Are you sure you want to delete extent pool IBM.2107.75FA120/P101? [y/n]: Y Extent pool IBM.2107-75FA120/P101 successfully deleted.

# showextpool

The showextpool command displays detailed properties or performance metrics of an extent pool.



### **Parameters**

#### -dev storage image ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the extent pool; otherwise, it is optional.

#### -metrics

(Optional) Displays the extent pool ID and performance metrics for the specified extent pool.

Note: All performance metrics are an accumulation since the most recent counter wrap or counter reset. The extent pool performance counters are reset on the following occurrences:

- The storage unit is powered-up.
- · A server has failed and the failover and failback sequence is performed.

# extentpool ID | -

(Required) Specifies the extent pool to be displayed. Accepts a fully qualified extent pool ID, which consists of the storage image ID, or an extent pool number without the storage image ID if the -dev parameter is specified. The extent pool number is a four-digit decimal number with no leading zeroes, prefixed with the letter P. Even numbered extent pools are associated with rank group 0. Odd numbered extent pools are associated with rank group 1.

Alternatively, accepts input from stdin when the dash (-) is specified.

#### Example

Note: The following tables represent the headers that are displayed on the output reports that are associated with the showextpool command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the model number designation, 2107 versus 1750.

# Invoking the showextpool command to show extent pool properties

dscli>showextpool -dev IBM.2107-75FA120 P101

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Name	ID	stgtype	totistor (2^30B)	availstor (2^30B)	resvdstor (2^30B)	rankgrp
host_4 _extpool	IBM.2107- 75FA120 /P21	fb	1000	800	0	0

num ranks	numvols	status	%allo- cated	%avail- able	config- ured	allowed	avail- able
4	3	exceeded	20	80	1000	600	800

allocated	reserved	%limit	%thres- hold
200	0	80	70

# Report field definitions

Name Identifies the name you assigned to the extent pool.

ID Specifies the system assigned unique identifier for the extent pool object.

# stgtype

Identifies the storage type associated with the extent pool. One of the following is displayed:

- fb
- ckd

# totistor (2^30 Bytes)

Specifies the amount of storage associated with the extent pool, in gigabytes.

# availstor (2<sup>30</sup> Bytes)

Specifies the available storage for the designated extent pool, in gigabytes.

# resvdstor (2<sup>30</sup> Bytes)

Specifies the amount of reserved storage for the designated extent pool, in gigabytes.

#### rankgrp

Specifies the rank group in which the designated extent pool is configured.

#### numranks

Specifies the number of ranks configured in the designated extent pool.

#### numvols

Identifies the number of logical volumes that have been configured from the designated extent pool.

**status** Specifies the extent status. One of the following values is displayed:

#### exceeded

Specifies that the %Extents available is greater than the extent threshold

# below

Specifies that the %Extents Available is less than the extent threshold

# full

Specifies that the %Extents Available is zero.

#### %allocated

Specifies the percentage of extents allocated. A value of 1 - 100 is displayed.

### %available

Specifies the percentage of extents available. A value of 1 - 100 is displayed.

1

# configured

Specifies the number of extents contained in the extent pool.

#### allowed

Specifies the number of extents that are below the applicable extent limit.

#### available

The number of extents of a given type that are available for allocation to a logical volume.

#### allocated

Specifies the number of extents of a given type in the extent pool that are allocated to a logical volume or meta-volumes.

#### reserved

Specifies the number of unallocated extents of a given type in the extent pool that are on ranks of the same extent type that are in the reserved state. In addition, the number of unallocated extents above the applicable extent limit on ranks of the same extent type that are not in the reserved state are included in this value.

%limit Specifies the maximum percentage of allocated real extents that are allowed in this extent pool.

#### %threshold

Specifies threshold as a percentage of the real extents available that is compared to the actual percentage of real extents available.

# Performance request

# Invoking the showextpool command to show performance metrics

dscli>showextpool -metrics -fullid IBM.2107-75FA120/P101

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID	Date	real extcap	realext	real allocext	real extconv
IBM.2107- 75FA120 /P101	10/11/04 02:23:47	10000	10000	10000	10000

dyreloc	dyreloc		
source	target		
10000	10000		

# Report field definitions

ID Specifies the system assigned unique identifier for the extent pool object.

Date Identifies the current time stamp for the extent pool performance counters.

#### realextcap

Specifies the real extent pool capacity in gigabytes.

#### realext

Specifies the number of real extents in the extent pool.

#### realallocext

Specifies the number of real allocated extents in the extent pool..

#### realextconv

Specifies real extent conversions.

#### dyrelocsource

Specifies the number of extents that were sources of a dynamic extent relocation

# dyreloctarget

Specifies the number of extents that were targets of a dynamic extent relocation

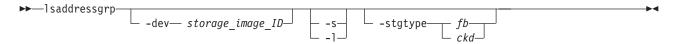
# Address group specific commands

This section contains commands that are used to display address group information.

Use the following commands to display address group information.

# Isaddressgrp

The Isaddressgrp command displays a list of address groups for a storage image and status information for each address group in the list.



# **Parameters**

#### -dev storage image ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. Displays only the objects for the storage unit specified.

Example: IBM.2107-75FA120

- -s (Optional). Displays the address group IDs only. You cannot use the -l and the -s parameters together.
- -I (Optional). Displays the default output. You cannot use the -I and the -s parameters together.

# -stgtype fb | ckd

(Optional). Displays only the address groups with the specified storage type.

Alternatively, accepts input from stdin if the dash (–) is specified.

### **Example (2107)**

# Invoking the Isaddressgrp command

dscli>lsaddressgrp -dev IBM.2107-75FA120 -l -fullid

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID stgtype basevolnum Vols LSSs confgvols IBM.2107-75FA120/0 fb 0000 4096 16 4096 IBM.2107-75FA120/1 fb 0100 4096 16 4096 IBM.2107-75FA120/2 ckd 0200 4096 16 4096 IBM.2107-75FA120/3 ckd 0300 4096 16 4096

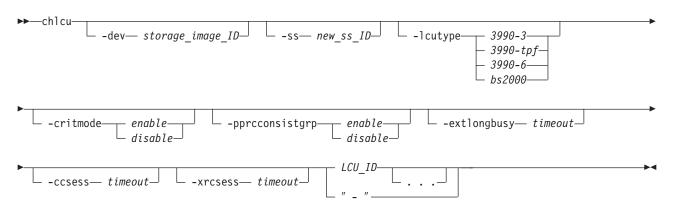
# Logical control unit specific commands

This section contains commands that are used to create, modify, and delete logical control units for zSeries systems and to display logical control unit information.

Use the following commands to create, modify, and delete logical control units and to display logical control unit information.

# chlcu

The chlcu command modifies a logical control unit.



# **Parameters**

-dev storage\_image\_ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number.

Example: IBM.2107-75FA120

-ss new\_ss\_ID

(Optional). Specifies your new LCU subsystem ID value (valid range is hexadecimal '0x0001 - 0xFFFF'). If this flag is specified, multiple LCUs are not allowed. The new SID that you specify replaces the existing SSID value in the initial target LCU ID.

Example: F010

-lcutype 3990-3 | 3990-tpf | 3990-6 | bs2000

(Optional). Changes the target LCUs to the new LCU type:

3990-3

TYPE\_3990\_MODEL\_3

3990-tpf

TYPE\_3990\_MODEL\_3\_for\_TPF

3990-6

TYPE 3990 MODEL 6

**BS2000** 

TYPE BS 2000

-critmode enable | disable

(Optional). Updates the critical mode setting in the target LCUs. Critical mode controls the behavior of the remote mirror and copy (formerly PPRC) pairs that have a primary logical volume on this LCU that are in an LCU consistency group.

# -pprcconsistgrp enable | disable

(Optional). Enables a volume that is associated with a logical subsystem and becomes suspended to enter an extended long busy state if it has not received a notification that a consistency group has been created.

#### -extlongbusy timeout

(Optional). Specifies the time in seconds that an LCU consistency group volume stays long busy after reporting an error that causes a remote mirror and copy (formerly PPRC) suspension if a consistency group has not been created.

#### -ccsess timeout

(Optional). Sets the Copy Services parameter to the time in seconds that any LCU volume in a concurrent copy session stays long busy before suspending a concurrent copy session. The valid timeout range is 1 - 9999 seconds.

Example: 500

#### -xrcsess timeout

(Optional). This Copy Services parameter is the time in seconds that any LCU volume in an XRC session stays long busy before suspending an XRC session. The valid timeout range is 1 - 9999 seconds.

Example: 500

# LCU ID . . . | -

(Required). Specifies one or more LCUs that are to be modified by this command. An LCU ID is two hexadecimal characters '0-x00 - 0xFE'. You must separate multiple IDs and multiple ID ranges with a space. Accepts a fully qualified LCU ID, or a shortened version if the -dev flag is specified.

To specify a range of LCU IDs, separate the IDs with a hyphen (-).

If you have specified a new subsystem ID value with the -ss parameter, only one LCU ID can be specified.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example: 00-03 08

#### **Example (2107)**

# Invoking the chlcu command

dscli>chlcu -dev IBM.2107-75FA120 -critmode enable 00-0F

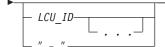
#### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
LCU 00 successfully modified.
LCU 01 successfully modified.
LCU OF successfully modified.
```

#### Islcu

The Islcu command displays a list of logical control units (LCUs) for a storage image and status information for each logical control unit in the list.

```
-addrgrp— address_group-
-dev— storage image ID—
```



# -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. Displays only the objects for the storage unit that is specified.

Example: IBM.2107-75FA120

- -s (Optional). Use this parameter to display LCU IDs only. You cannot use the -l and the -s flags together.
- -I (Optional). Use this parameter to display the default output. You cannot use the -I and the -s flags together.

#### -addgrp address group

(Optional). Specifies an address group. Only the LCUs that belong to the specified address group are displayed. An address group is a single character in the range of 0 - 9 or A - F.

# LCU\_ID . . . | -

(Optional). Specifies the ID associated with an LCU. An LCU ID is two hexadecimal characters '0x00 - 0xFE'.

To specify a range of LCU IDs, separate the LCU IDs with a hyphen (-).

You must separate multiple LCU IDs or ranges of LCU IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example: 00-03 08

### **Example (2107)**

# Invoking the Islcu command

dscli>lslcu -dev IBM.2107-75FA120 -l

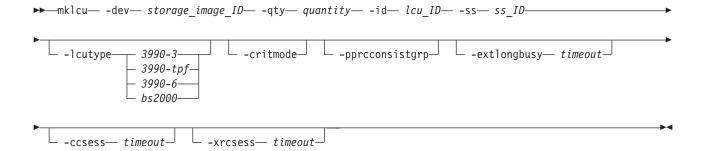
#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID Group addrgrp of conbasetype	100	nfgvo	ols subsys	
IBM.2107-75FA120/10 3990-6	0	0	256	8010
IBM.2107-75FA120/11 3990-6	1	0	256	8011
IBM.2107-75FA120/12 3990-6	0	0	256	8012
IBM.2107-75FA120/13 3990-6	1	0	256	8013

# mklcu

The mklcu command creates a logical control unit (LCU) in a storage image.



#### Note:

- 1. A logical control unit is configured to represent a grouping of logical CKD volumes.
- 2. Multiple sequential LCU IDs may be created with a single request, but all logical control units must be of the same type and specify the same options.

#### -dev storage image ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number.

Example: IBM.2107-75FA120

# **-qty** quantity

(Required). Specifies the number of LCU IDs to be created. The valid range is 1 - 255.

This command is rejected if any of the LCU IDs, based on starting LCU ID and Quantity, are currently defined, or outside the range of supported LCU IDs. The valid LCU ID range is '0x00 - 0xFE'.

Example: 16

#### -id Icu ID

(Required). Specifies the LCU ID to be created, or the first LCU ID in a sequence of LCU IDs to be created. A LCU ID is two hexadecimal characters '0x00 - 0xFE'.

Example: 00

### -ss ss\_ID

(Required). Specifies the LCU subsystem ID. A subsystem ID is four hexadecimal characters '0x0001 - 0xFFFF'. If multiple LCU IDs are being created, then this value increments for each additional LCU ID that is created.

If 16 LCUs are created, starting with SSID 0x10, then the SSID values will be '0x0010 - 0x001F'.

Example: 0010

#### -lcutype 3990-3 | 3990-tpf | 3990-6 | bs2000

(Optional). Creates LCUs of this type:

# 3990-3

type 3990 model 3

# 3990-tp

type 3990 model 3 for tpf

#### 3990-6

type 3990 model 6

#### bs2000

type bs 2000

#### -critmode

(Optional). Enables critical mode to control the behavior of the remote mirror and copy (formerly PPRC) pairs that have a primary logical volume on this LCU and are in an LCU consistency group.

# -pprcconsistarp

(Optional). Enables a volume that is associated with a logical subsystem and becomes suspended to enter an extended long busy state if it has not received a notification that a consistency group has been created.

# -extlongbusy timeout

(Optional). Specifies the time in seconds that an LCU consistency group volume stays long busy after reporting an error that causes a remote mirror and copy (formerly PPRC) suspension if a consistency group has not been created.

#### -ccsess timeout

(Optional). Specifies the Copy Services parameter as the time in seconds that any LCU volume in a concurrent copy session stays long busy before suspending a concurrent copy session. The valid timeout range is 1 - 9999 seconds.

Example: 500

#### -xrcsess timeout

(Optional). Specifies the Copy Services parameter as the time in seconds that any LCU volume in an XRC session stays long busy before suspending an XRC session. The valid timeout range is 1 - 9999 seconds.

Example: 500

#### **Example (2107)**

#### Invoking the mklcu command

dscli>mklcu -dev IBM.2107-75FA120 -qty 16 -id 80 -ss 2300

#### The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
LCU 80 successfully created.
LCU 81 successfully created.
LCU 8F successfully created.
```

# rmlcu

The rmlcu command deletes existing logical control units.



#### **Parameters**

# -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all logical control units.

Example: IBM.2107-75FA120

#### -quiet

(Optional). Turns off the confirmation prompt for this command.

```
LCU_ID . . . | -
```

(Required). An array of one or more LCUs to be removed. Accepts a fully qualified LCU ID or a shortened version, if the -dev flag is specified. A LCU ID is two hexadecimal characters in the range "0x00 – 0xFE".

To specify a range of LCU IDs, separate the LCU IDs with a hyphen (-).

You must separate multiple LCU IDs or ranges of LCU IDs with a blank space between each ID or range of IDs.

Example: 00-03 08

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

# Invoking the rmlcu command

dscli>rmlcu -dev IBM.2107-75FA120 00-0F

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to delete LCU 00 ? y/n Y

LCU 00 successfully deleted.

Are you sure you want to delete LCU 01 ? y/n Y

LCU 01 successfully deleted.

...

Are you sure you want to delete LCU 0F ? y/n Y

LCU 0F successfully deleted.
```

## showlcu

The showlcu command displays the detailed properties of an individual logical control unit (LCU).

## **Parameters**

-dev storage image ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the logical control unit.

Example: IBM.2107-75FA120

LCU ID | -

(Required). Displays the properties for the specified logical control unit. Accepts a fully qualified LCU ID, which consists of the storage image ID or a shortened version without the storage image ID, if the -dev flag is specified.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example: IBM.2107-75FA120/10

# **Example (2107)**

# Invoking the showlcu command

dscli>showlcu -dev IBM.2107-75FA120 10

## The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
ID IBM.2107-75FA120/10
Group 0
addrgrp 1
confgvols 256
subsys 0010
conbasetype 3990-6
pprcconsistgrp Disabled
xtndlbztimout (secs) 120
ccsesstimout (secs) 300
xrcsesstimout (secs) 300
crithvmode Disabled
```

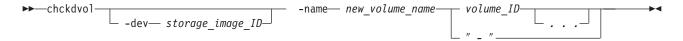
# CKD logical volume specific commands

This section contains commands that are used to create, modify, and delete count key data (CKD) logical volumes for zSeries systems and to display logical volume information.

Use the following commands to create, modify, and delete count key data logical volumes and to display logical volume information.

# chckdvol

The chckdvol command changes the name of a count key data (CKD) base volume.



# **Parameters**

-dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified volume ID.

-name new\_volume\_name

(Required) User specified nickname for this CKD base volume. This nickname should not exceed 16 characters. It may contain one of the following wild cards:

- (#d) insert volume\_ID (decimal format)
- (#h) insert volume\_ID (hexadecimal format)

volume ID . . . | -

(Required) An array of one or more CKD base volume IDs or volume ID ranges to modify.

A volume ID range is defined by two volume IDs that are separated by a dash. Multiple volume IDs or volume ID ranges must be separated with a blank space between each ID.

Example: 0100-010F 0180-018F 0120

The volume ID format is hexadecimal "LLVV", where "LL" is a logical control unit number (00 - FE), and "VV" is a volume number (00 - FF) that is contained by a logical subsystem object. You must fully qualify the volume ID with manufacturer, type, and serial number if you do not use the -dev flag.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the chckdvol command

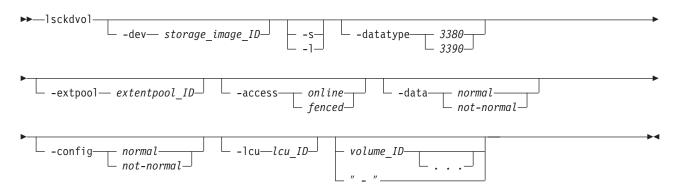
dscli>chckdvol -dev IBM.2107-75FA120 -name my\_volume\_#d 0100

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120 CKD volume 0100 successfully modified.

#### Isckdvol

The lsckdvol command displays a list of count key data (CKD) base and alias volumes in a storage image and status information for each volume in the list.



#### **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

- **-s** (Optional) Displays volume IDs. You cannot use the -l and the -s parameters together.
- -I (Optional) Displays default output plus additional attributes that are identified as long output. You cannot use the -I and the -s parameters together.

#### -datatype 3380 | 3390

(Optional) Displays only volumes of the specified volume data type.

#### -extpool extentpool\_ ID

(Optional) Display only volumes that are associated with the specified extent pool.

#### -access online | fenced

(Optional) Displays only volumes with the specified access state.

# -data normal | not\_normal

(Optional) Displays only volumes with the specified data state.

#### **-config** *normal* | *not normal*

(Optional) Displays volumes with the specified configuration state.

#### -lcu lcu ID

(Optional) Displays only volumes with IDs that contain the specified logical control unit ID (up to 256 volumes can contain a specified LCU ID). A logical control unit ID is two hexadecimal characters (00 - FE).

Note: If you are doing a query on a fully configured storage unit, it is recommended that you specify a specific LCU. If you do not specify a specific LCU, the entire storage unit is queried resulting in a longer processing time.

volume ID . . . | -

(Optional) Displays volumes with the specified IDs. A volume ID is four hexadecimal characters (0000 - FEFF).

To specify a range of volume IDs, separate the volume IDs with a dash.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Example: 0100-010F 0180-018F 0120

Alternatively, accepts input from stdin when the dash (–) is specified.

#### Example

Note: The following tables represent the headers that are displayed on the output report that is associated with the **Isckdvol** command using the **-I** paramater. A separate example is not shown for the 1750 as the information is the same for both machine types. The only difference is the model number designation, 2107 versus 1750.

The following example is based on the output results for a volume with 3340 cylinders.

#### Invoking the Isckdvol

dscli>lsckdvol -l 1410

# The resulting output

Date/Time: April 12, 2005 6:06:31 PM JST

IBM DS CLI Version: 5.0.3.40

DS: IBM.2107-1300861

Name	ID	acc state	data state	config state	device MTM	data type
My_ volume _1410	1410	Online	Normal	Normal	3390-9	3390

voltype	orgbvols	extentpool	exts	cap (cyl)	cap (2^30B)	cap (10^9B)
CKD base	-	P2	4	3340	2.6	2.8

# Report field definitions

Name Identifies the nickname you assigned to for the designated volume object.

ID Identifies the unique identifier that is assigned to the designated volume object

#### accstate (access state)

One of the following designations can be displayed:

#### Online

Specifies that the logical volume is accessible to a host.

#### **Fenced**

Specifies that the logical volume is in the volume fenced state and is not accessible to the host.

#### datastate

One of the following designations can be displayed:

#### Normal

Specifies that none of the other data states apply. The access state is Online.

# Read only

Specifies that the logical volume is read only because one or more extents on the logical volume are on a rank in the read only data state. The access state is Online.

#### Inaccessible

Specifies that one or more extents associated with the logical volume are on a rank that is in the inaccessible data state. The access state is fenced.

#### Rank failed

Specifies that one or more extents associated with the logical volume are on a rank that is in the failed data state. The access state is Fenced. This condition might be cleared by using the restorevolaccess command.

## Rank repairing

Specifies that one or more extents associated with the logical volume are on ranks that are in the repairing data state. The access state is fenced.

# Rank repaired

Specifies that one or more extents associated with the logical volume are on ranks that were in the repairing state, but are not in the repairing state now. The access state is Fenced. This condition might be cleared by using the restorevolaccess command.

#### - (null)

Specifies that the logical volume is designated as a CKD alias.

# configstate (configuration state)

One of the following designations can be displayed:

#### Normal

Specifies that there are no logical volume configuration operations in progress.

# Configuration pending

Specifies that a creation request for the logical volume has been accepted and is queued for processing. The logical volume object has been created.

#### Configuring

Specifies that the logical volume is in the process of being configured for the first time.

# Deconfiguring

Specifies that the logical volume is in the process of being deleted.

# **Configuration Error**

Specifies that the initial configuration did not complete successfully.

Specifies that the logical volume is designated as a CKD alias.

#### deviceMTM

One of the following will be displayed:

- 3380-2
- 3380-3
- 3390-3
- 3390-9

Volume MTM is determined by the CKD base volume data type and volume capacity (in cylinders).

# datatype

Identifies the volume data type setting.

#### voltype

Identifies that the logical volume is one of the following:

- · CKD base
- · CKD alias

# orgbvols (original base vol)

One of the following will be specified:

- · Identifies the original base CKD volume ID to which this CKD alias volume is assigned.
- · For a CKD Alias type volume, the base and alias volume IDs are of a common LCU ID.
- (null) is displayed for a CKD base volume type.

# extpool

Identifies the extent pool ID. Volume extents are allocated from this extent pool ID.

#### exts (extents)

Identifies the number of extents used by the designated volume ID.

#### cap (cyl)

Specifies the quantity of volume CKD cylinders that are available for host system access.

# cap (10<sup>9</sup>B)

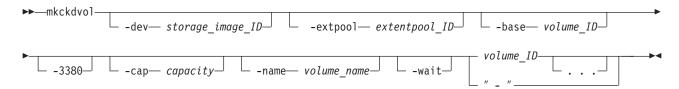
Specifies the size of volume that is available for host system access in 10<sup>9</sup>B (decimal GB) unit.

# cap (2<sup>30</sup>B)

Specifies the size of volume that is available for host system access in 2<sup>30</sup>B (binary GB) unit.

#### mkckdvol

The mkckdvol command creates zSeries count key data (CKD) base or CKD alias volumes in a storage image.



## **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

# -extpool extentpool\_ID

(Optional) Creates the base or alias volumes from data extents that are contained in this extent pool. The extent pool storage type defines the volume storage type. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter "P".

Note: This parameter is not required and ignored if the -base parameter is specified.

#### -base volume ID

(Optional) Specifies an existing base CKD volume ID. The volume ID format is four hexadecimal characters "LLVV" where "LL" is a logical control unit number (00 - FE), and "VV" is a volume number (00 - FF).

Use the-base parameter to create one or more CKD alias volumes that are assigned to the specified base CKD volume ID. The LCU ID component for all volume IDs must be identical.

Note: It is recommended that you use the -mkaliasvol command to create alias volumes.

# -3380

(Optional) Specifies the 3380 volume type setting. Otherwise, the 3390 volume type is created. The -3380 prameter is ignored when the -base parameter is specified.

**Note:** You must ensure that the volume data type is compatible with the host systems that access this volume.

#### -cap capacity

(Optional) Specifies the quantity of CKD cylinders that are allocated to this volume. The **-cap** parameter is ignored when the **-base** parameter is specified.

For -3380, -cap=2226 (1.59 GB) or 3339 (2.37 GB).

For 3390 volumes (default type), -cap=1 -65520 (849KB to 55.68 GB).

Note: This parameter is not required, and it is ignored if the -base parameter is specified.

#### -name volume name

(Optional) Specifies your nickname for the CKD base volumes that are created by this command. Your volume name cannot exceed 16 characters. It can contain one of the following wild cards:

- (#d) insert volume ID (decimal)
- (#h) insert volume ID (hexadecimal)

Note: The -name parameter is ignored when the -base parameter is specified.

#### -wait

I

(Optional) Delays the command response until the volume configuration processes complete.

```
volume ID . . . | -
```

(Required) An array of one or more CKD base or alias volume IDs or volume ID ranges to be created. The volume IDs must share a common logical control unit

Note: Volumes are automatically assigned to the FICON/ESCON – ALL volume group ID 0.

The volume ID format is hexadecimal "LLVV" where "LL" is a logical control unit number (00 - FE), and "VV" is a volume number (00 - FF).

A volume ID range is defined by two volume IDs that are separated by a dash.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs. Example: 0100-010F 0180-018F 0120

Note: Multiple volumes can be created with a single request, but all volumes must have the same capacity, extent pool, and data type.

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

#### Invoking the mkckdvol command

```
dscli>mkckdvol -dev IBM.2107-75FA120 -extpool PO -name my_volume_#d
   -cap 3339 0100 0101 0102 0103
```

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS IBM.2107-75FA120
```

```
CKD volume 0100 successfully created.
CKD volume 0101 successfully created.
```

#### rmckdvol

The rmckdvol command deletes count key data (CKD) base or alias volumes from a storage image.

CKD volume 0102 successfully created.

CKD volume 0103 successfully created.



#### **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all logical volumes.

## -quiet

(Optional) Turns off the confirmation prompt for this command.

```
volume ID . . . | -
```

(Required) An array of one or more CKD base or CKD alias volume IDs or volume ID ranges to be removed. Accepts a fully qualified volume ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified. The shortened volume ID format is hexadecimal "LLVV" where "LL" is a logical control unit (LCU) number (00 - FE), and "VV" is a volume number (00 - FF) that is contained by a logical control unit (logical subsystem).

**Note:** A CKD base volume cannot be removed if an alias volume is associated with it.

A volume ID range is defined by two volume IDs that are separated by a dash.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Example: 0100-010F 0180-018F 0120

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

#### Invoking the rmckdvol command

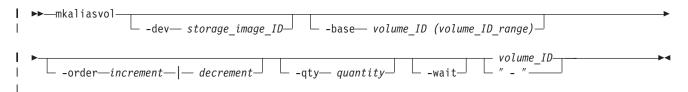
dscli>rmckdvol -dev IBM.2107-75FA120 0000 0001

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120 Are you sure you want to delete Volume 0000? y/n Y Volume 0000 successfully deleted. Are you sure you want to delete Volume 0001? y/n Y Volume 0001 successfully deleted.
```

#### mkaliasvol

The mkaliasvol command creates zSeries CKD alias volumes (generally referred to as parallel access volumes or PAVs) in a storage image.



# ı

#### **Parameters**

Note: Volumes are automatically assigned to the FICON/ESCON - ALL volume group ID 10.

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

# -base volume\_ID (volume\_ID\_range)

(Required) Specifies an existing base CKD volume ID or a volume ID range.

Note: You cannot use multiple volume IDs separated by commas and multiple ID ranges in combination. This combination is rejected.

Use the -base parameter to create one or more CKD alias volumes that are assigned to the specified base CKD volume ID. The LCU ID component for all volume IDs must be identical.

The alias volume IDs are assigned consecutively in the order specified by the -order parameter. The following examples show the processing affects of the -order parameter:

dscli>mkaliasvol -base 0000 -order increment -qty 2 0080 creates two alias volumes 0080 and 0081 for base volume 0000.

```
dscli>mkaliasvol -base 0000-003F -order increment -qty 2 0080
creates two alias volumes for each base volume as follows:
0080,0081 for base volume 0000
0082,0083 for base volume 0001
00FE,00FF for base volume 003F
```

#### -order increment | decrement

(Optional) Specifies the order in which alias volume IDs are assigned. For example:

```
dscli>mkaliasvol -base 0000-003F -order decrement -qty 2 00FF
creates two alias volumes for each base volume as follows:
00FF,00FE for base volume 0000
00FD,00FC for base volume 0001
0081,0080 for base volume 003F
```

Note: If the-order parameter is not specified the default value is decrement.

#### -qty quantity

(Optional) Specifies the number of alias volumes that will be assigned to each specified CKD base volume.

#### -wait

(Optional) Delays the command response until the volume configuration processes complete.

#### volume ID -

(Required) Identifies the starting alias volume ID in a sequence of volume IDs to be created

The volume ID format is hexadecimal "LLVV" where "LL" is a logical control unit number (00 - FE), and "VV" is a volume number (00 - FF).

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

# Invoking the mkaliasvol command

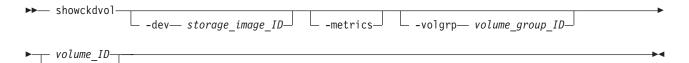
dscli> mkaliasvol -dev IBM.2107-75FA120 -base 0100-010F -order decrement -qty 2 01FF

#### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version:
5.0.0.0 DS: IBM.2107-75FA120
CKD Volume 01FF successfully created.
CKD Volume 01FE successfully created.
CKD Volume 01E1 successfully created.
CKD Volume 01E0 successfully created.
```

# showckdvol

The showckdvol command displays detailed properties of an individual count key data volume. This command can also be used to display the performance metrics for an individual volume ID.



#### **Parameters**

Note: All performance counts are an accumulation from the most recent counter wrap or counter reset. A reset of the volume performance counters occurs in association with the following events:

- · The storage unit is turned on.
- · There has been a server failure and the server failover or failback sequence has been initiated.

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the logical volume.

#### -metrics

(Optional) Displays the volume ID and performance metrics for the specified volume.

#### -volgrp volume\_group\_ID

(Required if you do not specify the *volume\_ID* parameter.) Specifies that the CKD volumes that are associated with the designated volume group ID be displayed. There is only one volume group for CKD volumes and it contains all volumes.

# Note:

- The -volgrp parameter can only be used when you are doing a query for performance metrics.
- Do not use the *-volgrp* parameter with the *volume\_ID* parameter.

# volume ID | -

(Required when you do not specify the -volgrp parameter.) Displays information

for the specified volume. This parameter accepts a fully qualified volume ID, which consists of the storage image ID or a shortened version without the storage image ID, if you specify the -dev parameter. The shortened version format is hexadecimal XXYZZ where X is an address group number (0-F), XY is a logical subsystem (LSS) number (00-FE), and ZZ is a volume number (00-FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

**Note:** Do not use the *volume\_ID* parameter with the *-volgrp* parameter.

#### Example

Note: The following tables represent the headers that are displayed on the output reports that is associated with the showckdvol command using the -fullid command flag. A separate example is not shown for the 1750 because the information is the same for both machine types. The only difference is the machine type designations 2107 versus 1750.

# Invoking the showckdvol to show volume properties

Note: The following example is based on the use of the showckdvol command for a 3390 volume with 3339 cylinders.

dscli>showckdvol 1410

# The resulting output

Date/Time: April 13, 2005 3:44:27 PM JST IBM DS CLI Version: 5.0.3.40 DS: IBM.2107-1300861

Name	ID	acc state	data state	config state	device MTM	Volser	data type
My_ volume_ 1410	1410	Online	Normal	Normal	3390-3	A03967	3390

voltype	orgb- vols	addrgrp	extpool	exts	cap (cyl)	cap (2^30B)	cap (10^9B)
CKD Base	_	1	P2	3	3339	2.6	2.8

# Report field definitions ( -metrics parameter not specified)

## Name

Specifies the nickname that you assigned for this volume object.

**ID** Specifies the unique identifier that is assigned to this volume object.

#### accstate

One of the following designations can be displayed:

# Online

Specifies that the logical volume is accessible to a host.

Specifies that the logical volume is in the volume fenced state and is not accessible to the host.

#### datastate

One of the following designations can be displayed:

Specifies that none of the other data states apply. The access state is Online.

#### Read only

Specifies that the logical volume is read only because one or more extents on the logical volume are on a rank in the read only data state. The access state is Online.

#### Inaccessible

Specifies that one or more extents that are associated with the logical volume are on a rank that is in the inaccessible data state. The access state is fenced.

#### Rank failed

Specifies that one or more extents that are associated with the logical volume are on a rank that is in the failed data state. The access state is Fenced. This condition might be cleared by using the restorevolaccess command.

# Rank repairing

Specifies that one or more extents that are associated with the logical volume are on ranks that are in the repairing data state. The access state is fenced.

# Rank repaired

Specifies that one or more extents that are associated with the logical volume are on ranks that were in the repairing state, but are not in the repairing state now. The access state is Fenced. This condition might be cleared by using the restorevolaccess command.

## - (null)

Specifies that the logical volume is designated as a CKD alias.

#### configstate

One of the following designations can be displayed:

Specifies that there are no logical volume configuration operations in progress.

#### Configuration pending

Specifies that a creation request for the logical volume has been accepted and is queued for processing. The logical volume object has been created.

#### Configuring

Specifies that the logical volume is in the process of being configured for the first time.

#### Deconfiguring

Specifies that the logical volume is in the process of being deleted.

#### **Configuration Error**

Specifies that the initial configuration did not complete successfully.

#### - (null)

Specifies that the logical volume is designated as a CKD alias.

One of the following will be displayed:

- 3380-2
- 3380-3
- 3390-3
- 3390-9

#### Volser

Specifies the volume serial number. A volume serial number is six bytes of data, displayed as six characters.

#### datatype

Specifies the volume data type setting (3380 or 3390).

Specifies the designated volume ID as either a base or alias volume.

# orgbvols

One of the following will be specified:

- Identifies the original base CKD volume ID to which this CKD alias volume is assigned.
- For a CKD Alias type volume, the base and alias volume IDs share a common LCU ID.
- (null) is displayed for a CKD base volume type.

Specifies the address group that contains this volume object. An address group ID is one hexadecimal character (0-F).

Specifies the extent pool ID.

#### exts

Specifies the number of extents used by the designated volume ID.

## cap (cyl)

Specifies the quantity of volume cylinders that are available for host system access.

#### cap (10<sup>9B</sup>)

Specifies the size of volume that is available for host system access in (10^9B decimal GB) units.

# cap (2<sup>30</sup>B)

Specifies the size of volume that is available for host system access in (2^30B binary GB) units.

#### **Example**

# Invoking the showckdvol to show performance metrics

dscli>showckdvol -metrics -fullid IBM.2107-75FA120/0101

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID IBM.1750-75FA120/0101 Date 10/11/04 02:23:49 normrdrqts 10000 normrdhits 10000 normwritereg 10000

normwritehits 10000 segreadregs 10000 segreadhits 10000 segwritereq 10000 segwritehits 10000 cachfwrregs 10000 cachfwrhits 10000 cachfwreqs 10000 cachfwhits 10000 inbcachload 10000 bypasscach 10000 seqDASDtrans 10000 DASDtrans 10000 cachetrans 10000 NVSspadel 10000 normwriteops 10000 segwriteops 10000 reccachemis 10000 gwriteprots 10000 CKDirtrkac 10000 CKDirtrkhits 10000 cachspdelay 10000 timelowifact 10000 phread 10000 phwrite 10000 phbyteread 10000 phbytewrit 10000 recmoreads 10000 sfiletrkreads 10000 contamwrts 10000 PPRCtrks 10000 NVSspallo 10000 timephread 10000 timephwrite 10000 byteread 10000 bytewrit 10000 timeread 10000 timewrite 10000

# Report column definitions ( -metrics parameter specified)

**ID** Specifies the unique identifier that is assigned to this volume object.

# **Date**

Specifies the current time stamp for the volume performance counters.

# normrdrqts

Specifies Search/Read Normal I/O Requests.

#### normrdhits

Specifies Search/Read Normal I/O Requests

# normwritereq

Specifies Write Normal I/O Requests

#### normwritehits

Specifies DASD Fast Write I/O Request Hits

#### segreadregs

Specifies Search/Read Sequential I/O Requests

#### segreadhits

Specifies Search/Read Sequential I/O Request Hits

# segwritereg

Specifies Write Sequential I/O Requests

#### segwritehits

Specifies DASD Fast Write Sequential I/O Request Hits

#### cachfwrreqs

Specifies Search/Read Cache Fast Write I/O Requests

#### cachfwrhits

Specifies Search/Read Cache Fast Write I/O Request Hits

#### cachfwreqs

Specifies Cache Fast Write I/O Requests

#### cachfwhits

Specifies Cache Fast Write I/O Requests Hits

#### inbcachload

Specifies Inhibit Cache Loading I/O Requests that operate with DASD

# bypasscach

Specifies Bypass Cache I/O Requests

# seqDASDtrans

Specifies Sequential DASD to Cache Transfer Operations

#### **DASDtrans**

Specifies DASD to Cache Transfer Operation Count

#### cachetrans

Specifies Cache to DASD Transfer Operation Count

#### **NVSspadel**

Specifies DASD Fast Write Operations Delayed Due to nonvolatile storage Space Constraints

# normwriteops

Specifies Normal 'DASD Fast Write' Write Operation Counts

#### segwriteops

Specifies Sequential Access 'DASD Fast Write' Write Operation Counts

# reccachemis

Specifies Number of record cache Read Misses

# **qwriteprots**

Specifies Quick Write Promotes

#### **CKDirtrkac**

Specifies Irregular Track Accesses

#### **CKDirtrkhits**

Specifies Irregular Track Accesses Hits

#### cachspdelay

Specifies Operations Delayed Due To Cache Space Constraints

#### timelowifact

Specifies Milliseconds of lower interface I/O activity for the indicated device.

# phread

Specifies Physical Storage Read Operations

## phwrite

Specifies Physical Storage Write Operations

Specifies Physical Storage Bytes Read in 128 KB increments.

# phbytewrit

Specifies Physical Storage Bytes Written in 128 KB increments.

## recmoreads

Specifies Record Mode Read Operations

#### sfiletrkreads

Specifies the Number of tracks read from the Concurrent Copy or XRC Sidefile.

#### contamwrts

Specifies the Number of Contaminating writes for a Concurrent Copy or XRC volume

#### **PPRCtrks**

Specifies the Number of tracks or portion of tracks that were transferred to the secondary device of a PPRC pair.

#### **NVSspallo**

Specifies the NVS Space Allocations

# timephread

Specifies the physical storage read response time in 16 ms increments.

# timephwrite

Specifies the physical storage write response time in 16 ms increments.

Specifies the number of bytes read in 128 KB increments

# bytewrit

Specifies the number of bytes written in 128 KB incremnts.

#### timeread

Specifies the accumulated response time for all read operations.

#### timewrite

Specifies the accumulated response time for all write operations.

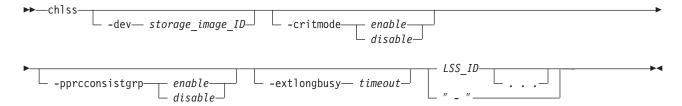
# Logical subsystem specific commands

This section contains commands that are used to modify logical subsystems for Open Systems and to display logical subsystem information.

Use the following commands to modify logical subsystems and to display logical subsystem information.

#### chiss

The chlss command modifies a logical subsystem.



#### **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type,

and serial number. This flag is required if you do not specify a fully qualified ID for all logical subsystems (LSSs); otherwise, it is optional.

#### -critmode enable | disable

(Optional) Updates the critical mode setting in the target LSS IDs. Critical mode controls the behavior of the remote mirror and copy (formerly PPRC) volume pairs that have a primary logical volume on this LSS that are in an LSS consistency group.

# -pprcconsistgrp enable | disable

(Optional) Enables a volume that is associated with a logical subsystem to become suspended and enter an extended long busy state if it has not received a notification that a consistency group has been created. Otherwise, the volumes associated with the LSS do not go to a long-busy state.

# -extlongbusy timeout

(Optional) Specifies the time in seconds that an LCU consistency group volume stays long busy after reporting an error that causes a remote mirror and copy (formerly PPRC) suspension if a consistency group has not been created.

# LSS ID . . . | -

(Requiredl) Specifies one or more LSSs to be modified by this command. An LSS ID is two hexadecimal characters (00 - FE).

To specify a range of LSS IDs, separate the IDs with a hyphen.

You must separate multiple LSS IDs or ranges of LSS IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example: 00-03 08

# **Example (2107)**

#### Invoking the chiss command

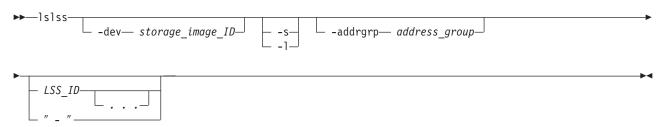
dscli>chlss -dev IBM.2107-75FA120 -critmode enable 06 0F

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
LSS 06 successfully modified.
LSS OF successfully modified.
```

# Islss

The Islss command displays a list of logical subsystems (LSSs) for a storage image and status information for each logical subsystem in the list.



#### **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number.

- -s (Optional) Displays LSS IDs. You cannot use the -I and the -s parameters together.
- -I (Optional) Displays the default output. You cannot use the -I and the -s paraameters together.

# -addgrp address\_group

(Optional) Displays only LSSs that belong to the specified address group. An address group is a single hexadecimal character (0 - F).

```
LSS_ID . . . | -
```

(Optional) Specifies the logical subsystem IDs. An LSS ID is two hexadecimal characters (00 - EF).

To specify a range of logical subsystem IDs, separate the logical subsystem IDs with a hyphen.

You must separate multiple logical subsystem IDs or ranges of logical subsystem IDs with a blank space between each ID or range of IDs.

Example: 00-03 08

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the Islss command

dscli>lslss -dev IBM.2107-75FA120 -l -fullid

#### The resulting output

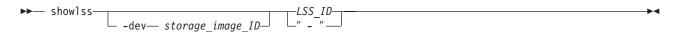
IBM.2107-75FA120/12 0 1 fb

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
ID Group addrgrp stgtype
confavols
IBM.2107-75FA120/10 0 1 fb
IBM.2107-75FA120/11 1 1 fb
```

# showlss

256

The showlss command displays detailed properties of a logical subsystem (LSS).



#### **Parameters**

#### -dev storage image ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the logical subsystem; otherwise, it is optional.

LSS ID | -

(Required) Displays the properties for the specified logical subsystem. Accepted

is a fully qualified LSS ID, which consists of the storage image ID, or a shortened version without the storage image ID if the -dev parameter is specified. The shortened version is two hexadecimal digits in the range 00 - FE.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

# Invoking the showlss command to show default information

dscli>showlss IBM.2107-75FA120/10

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
   IBM.2107-75FA120/10
Group 0
addrgrp
statype fb
confgvols 256
pprcconsistgrp Disabled
xtndlbztimout (secs) 120
crithvmode Disabled
```

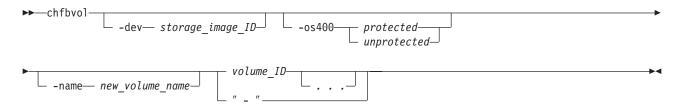
# FB logical volume specific commands

This section contains commands that are used to create, modify, and delete fixed block (FB) logical volumes for Open Systems and to display logical volume information.

Use the following commands to create, modify, and delete fixed block logical volumes and to display logical volume information.

#### chfbvol

The chfbvol command changes the name or data type of a fixed block volume.



# **Parameters**

#### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified volume ID.

# -os400 protected | unprotected

(Optional) Specifies options for the OS 400 volume data types. If the current volume data type is os400-protected(FB 520P) or os400-unprotected(FB 520U) then this data type may be modified to either os400-unprotected(FB 520U) or os400-protected(FB520P) respectively. If the current volume data type is 512, then this setting cannot be modified.

# -name new\_volume\_name

(Optional) Specifies your nickname for this volume. A nickname cannot exceed 16 characters.

```
volume_ID . . . | -
```

(Required) Specifies one or more volume IDs to be modified. The volume ID format is hexadecimal XYZZ, where X is an address group number (0 - F), XY is a logical subsystem (LSS) number (00 - FE), and ZZ is a volume number (00 - FF). You must fully qualify the volume ID with manufacturer, type, and serial number if you do not use the -dev flag.

To specify a range of volume IDs, separate the volume IDs with a hyphen.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Example: 0100-010F 0180-018F 0120

Alternatively, accepts input from stdin when the dash (-) is specified.

#### **Example (2107)**

# Invoking the chfbvol command

dscli>chfbvol -dev IBM.2107-75FA120 -os400 protected 0100 0101

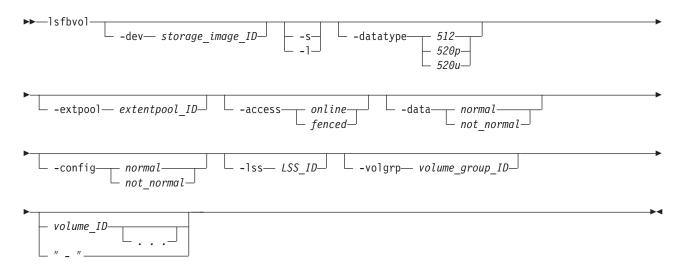
#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FB volume 0100 successfully modified. FB volume 0101 successfully modified.

#### Isfbvol

The Isfbvol command displays a list of fixed block volumes in a storage image and status information for each volume in the list.



# **Parameters**

# -dev storage image ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number.

- -s (Optional) Displays the volume IDs. You cannot use the -I and the -s parameters together.
- -I (Optional) Displays default output plus additional attributes that are identified as long output. You cannot use the -I and the -s parameters together.

# -datatype 512 | 520p | 520e

(Optional) Displays volumes of the specified volume data type. Standard 2107/1750 volume (512), OS/400 protected (520p), OS/400 unprotected (520u).

# -extpool extentpool\_ID

(Optional) Displays volumes that are sourced from the specified extent pool. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter P.

#### -access online | fenced

(Optional) Displays volumes with the specified access state.

# -data normal | not-normal

(Optional) Displays volumes with the specified data state.

# -config normal | not-normal

(Optional) Displays volumes with the specified configuration.

#### -Iss LSS ID

(Optional) Displays volumes with IDs that contain the specified logical subsystem ID (up to 256 volumes can contain a specified logical subsystem ID). A logical subsystem ID is two hexadecimal characters (0x00 - 0xFF).

# -volgrp volume group ID

(Optional) Displays volumes that are assigned to the specified volume group ID. A volume group ID is a four-digit decimal number, with no leading zeros, prefixed by the letter V. For example, V123.

#### volume ID . . . | -

(Optional) Displays volumes with the specified IDs. A volume ID is four hexadecimal characters (0000 - FEFF).

To specify a range of volume IDs, separate the volume IDs with a hyphen.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example: 0100-010F 0180-018F 0120

#### Example

Note: The following tables represent the headers that are displayed on the output report that is associated with the **Isfbvol** command using the **-I** parameter. A separate example is not shown for the 1750 as the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

# Invoking the Isfbvol command

dscli>lsfbvol -dev IBM.1750-75FA120 -volgrp -l

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.1750-75FA120

Name	ID	accstate	data	config state	device MTM	data type
My_ volume_ 0001	0100	Online	Normal	Normal	1750-511	FB 512
My_ volume_ 0002	0102	Online	Normal	Normal	1750-EX1	FB 520P
My_ _volume 0003	0103	Online	Normal	Normal	1750-511	FB 512

extpool	exts	captype	cap (2^30B)	cap (10^9B)	cap (blocks)
P21	1	DS	64.0	-	134217728
P31	1	iSeries	128.0	68.7	268435456
P21	1	ESS	-	35.0	68359424

# Report field definitions

Name Identifies the nickname you assigned for the specified volume object.

ID Identifies the unique identifier that is assigned to this volume object.

#### accstate

One of the following access states are displayed: Online or Fenced.

#### **Online**

The logical volume is accessible to a host.

The logical volume is in the volume fenced state and is not accessible to the host.

# data(state)

One of the following data states are displayed:

#### Normal

Specifies that none of the other data states apply. The access state is Online.

# Read only

Indicates that the logical volume is read only because one or more extents on the logical volume are on a rank in the read only data state. The access state is Online.

#### Inaccessible

Indicates that one or more extents that are associated with the logical volume are on a rank that is in the inaccessible data state. The access state is fenced.

#### Rank failed

Indicates that one or more extents that are associated with the logical volume are on a rank that is in the Failed data state. The access state is Fenced. This data state transitions to the Rank repairing state if the rank transitions to the Rank repairing state through use of the repair array function.

#### Rank Repairing

Indicates that one or more extents that are associated with the logical volume are on ranks in the repairing data state. The access state is fenced.

#### **Rank Repaired**

Indicates that one or more extents that are associated with the logical volume are on ranks that were in the repairing state, but are not in the repairing state now. The access state is fenced. This condition might be cleared by using the restorevolaccess command.

# configstate

One of the following configuration states are displayed:

#### Normal

Indicates that there are no logical volume configuration operations in progress.

# Configuration pending

Specifies that a creation request for the logical volume has been accepted and is gueued for processing. The logical volume object has been created.

# Configuring

Indicates that the logical volume is in the process of being configured for the first time.

# Deconfiguring

Indicates that the logical volume is in the process of being deleted.

# Configuration error

Indicates that the initial configuration did not complete successfully.

#### deviceMTM

Indicates the volume device type and model. The volume MTM (machine type, model) is determined by the fixed block volume data type and the volume capacity (in GB). The model is either 2107 or 1750; however, the MTM can be any one of the following depending on your system:

## 2107-900

Indicates a standard 2107 volume.

#### 1750-500

Indicates a standard 1750 volume.

#### xxxx-A0x

The xxxx is 2107 or 1750. The A0 indicates an OS/400 protected volume (for example, 2107-A01 or 1750-A07).

Indicates that the xxxx is 2107 or 1750. The A8 indicates an OS/400 unprotected volume (for example, 2107-A81 or 1750-A87).

#### datatype

Indicates the volume data type setting. One of the following binary (B) values will be displayed:

- FB 512
- FB 520P
- FB 520U

# **Extpool**

Identifies the extent pool ID. Volume extents are allocated from this extent pool ID.

#### Exts (extents)

Identifies the number of extents used by the designated volume ID.

#### Captype

Indicates capacity unit type used at volume creation. One of the following values is displayed:

#### **ESS**

The capacity unit is 10<sup>9</sup>B.

#### DS

The capacity unit is 2<sup>30</sup>B.

#### DS/ESS

The capacity unit is 2<sup>30</sup>B or 10<sup>9</sup>B.

#### **Blocks**

The capacity unit is 512B.

#### **iSeries**

The capacity unit was not specified at volume creation. This fixed block volume was created only for iSeries.

# cap (2<sup>30</sup>B)

Specifies the size of the volume that is available for host system access in 2^30B (binary GB) units.

**Note:** "-" (null) is displayed if the capacity unit type of the volume is ESS (captype=ESS)

# cap (10<sup>9B</sup>)

Specifies the size of the volume that is available for host system access in 10^9B (decimal GB) units.

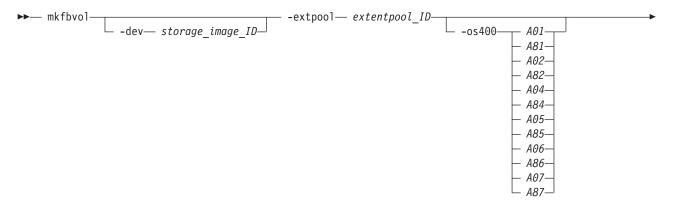
**Note:** "-" (null) is displayed if the capacity unit type of the volume is DS (captype=DS)

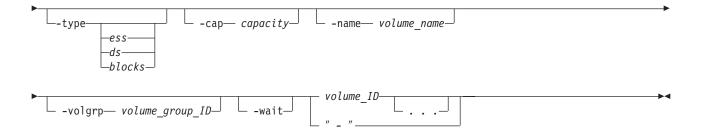
# cap blocks

Indicates the quantity of volume logical blocks that are available for host system access.

#### mkfbvol

The mkfbvol command creates open systems fixed block (FB) volumes in a storage image.





#### **Parameters**

#### Note:

- You can create multiple volumes with one command; however, all volumes must have the same capacity, extent pool, and data type.
- If host attachment volume groups have not yet been created, create temporary volume groups and assign new fixed block volumes to the temporary volume groups according to the volume type and capacity characteristics.

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number.

# -extpool extentpool\_ID

(Required) Creates the base or alias volumes from data extents that are contained in this extent pool. The extent pool storage type defines the volume storage type. An extent pool ID is a four-digit decimal number with no leading zeroes, prefixed with the letter P.

**-os400** *A01* | *A81* | *A02* | *A82* | *A04* | *A84* | *A05* | *A85* | *A06* | *A86* | *A07* | *A87* (Optional) The OS 400 volume options. If this flag is not specified, the default standard 2107/1750 volume is created.

This parameter is required if capacity is not specified.

The storage sizes and the data types for this volume:

- A01 8.6 GB, protected
- · A81 8.6 GB, unprotected
- A02 17.5 GB, protected
- A82 17.5 GB, unprotected
- · A04 70.5 GB, protected
- A84 70.5 GB, unprotected
- A05 35.1 GB, protected
- A85 35.1 GB, unprotected
- A06 141.12 GB, protected
- A86 141.12 GB, unprotected
- A07 282.25 GB, protected
- · A87 282.25 GB, unprotected

GB is 10<sup>9</sup> Byte.

**Note:** You must ensure that the volume data type is compatible with the host systems that can access this volume.

# -type ess | ds | blocks

(Optional) Specifies the unit type of capacity that is specified by the -cap parameter.

ess: Specifies that the unit is 10^9 Bytes.

**ds**: Specifies that the unit is 2^30 Bytes.

blocks: Specifies that the unit is 512 blocks.

# Note:

- If the -type parameter is not specified the lun is created as type ds.
- The -type parameter is ignored when the -os400 parameter is specified.

#### -cap capacity

(Optional) Specifies the storage size that is allocated to this volume object.

Note: This parameter is required if the -os400 parameter is not specified.

If the **-type** parameter is omitted or the **-type ds** parameter is specified:

- 1GB = 1,073,741,824 (2^30 Bytes)
- Supported storage sizes range from 1 to 2048.

If the -type ess parameter is specified:

- capacity = X.Y or X
  - where X is whole gigabytes, with 1 GB=1,000,000,000 (10^9 Bytes).
  - where Y represents a fraction of 1 GB. Y is limited to a single digit (0...9) to the right of the decimal.
- Supported storage sizes range from 0.1 to 982.2 (0.1 increment).

If the -type blocks parameter is specified, capacity is the number of 512 blocks. Supported storage sizes range from 1 to 4 GB blocks (the actual number of gigabytes is the number of blocks times 512).

#### -name volume name

(Optional) Your nickname for this volume. The nickname can be 16 characters long, and it can contain one of the following wildcard characters:

- (#d) decimal volume ID
- (#h) hexadecimal volume ID

#### -volgrp volume\_group\_ID

(Optional) Specifies to which volume group the volumes are assigned. A volume group ID is a four-digit decimal number with no leading zeroes, prefixed with the letter V.

#### -wait

(Optional) Delays the command response until the volume configuration processes complete.

Note: If you specify this parameter, you must wait until your original command processes completely before you can issue a new command.

# volume ID . . . | -

(Required) An array of one or more fixed block volume IDs to be created. The volumes must share a common logical subsystem ID.

The volume ID format is hexadecimal XYZZ where X is an address group number (0 - F), XY is a logical subsystem number (00 - FE), and ZZ is a volume number (00 - FF) that is contained by a logical subsystem.

To specify a range of volume IDs, separate the volume IDs with a dash.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Example: 0100-010F 0180-018F 0120

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

# Invoking the mkfbvol command

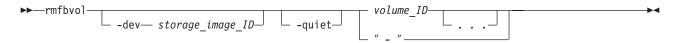
```
dscli>mkfbvol -dev IBM.2107-75FA120
 -extpool P1 -name my vol #d -type ess
-cap 8.6 0100 0100 01\overline{01} 0\overline{102} 0103
```

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Device: IBM.2107-75FA120
FB volume 0100 sucessfully created.
FB volume 0101 sucessfully created.
FB volume 0102 sucessfully created.
FB volume 0103 sucessfully created.
```

# rmfbvol

The rmfbvol command deletes fixed block volumes from a storage image.



# **Parameters**

-dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all logical volumes.

#### -quiet

(Optional) Turns off the confirmation prompt for this command.

```
volume_ID . . . | -
```

(Required) An array of one or more fixed block volume IDs to be removed. Accepts a fully qualified volume ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified. The volume ID format is hexadecimal XYZZ where X is an address group number (0-F), XY is a logical subsystem (LSS) number (00-FE), and ZZ is a volume number (00-FF) that is contained by a logical subsystem.

To specify a range of volume IDs, separate the volume IDs with a hyphen.

You must separate multiple volume IDs or ranges of volume IDs with a blank space between each ID or range of IDs.

Example: 0100-010F 0180-018F 0120

Alternatively, accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

# Invoking the rmfbvol command

dscli>rmfbvol -dev IBM.2107-75FA120 0100 0101

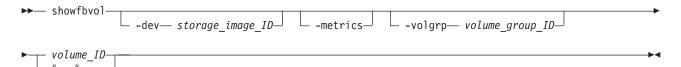
#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to delete 0100? y/n Y Volume 0100 successfully deleted. Are you sure you want to delete 0101? y/n Y Volume 0101 successfully deleted.

# showfbvol

The showfbvol command displays detailed properties for an individual volume. This command can also be used to display the performance metrics of a fixed block volume.



# **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of the manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the logical volume.

#### -metrics

(Optional) Displays volume ID and performance metrics for the specified volume.

Note: All performance counts are an accumulation since the most recent counter wrap or counter reset. Volume performance counters are reset on a power-up sequence. Volume performance counters are reset by a server failover and failback sequence.

#### -volgrp volume\_group\_ID

(Required if you do not specify the volume\_ID parameter.) Specifies that the fixed block volumes that are associated with the designated volume group ID be displayed.

#### Note:

- You can only use the -volgrp parameter when you are doing a query for performance metrics.
- Do not use the *-volgrp* parameter with the *volume ID* parameter.

# volume ID | -

(Required when you do not specify the -volgrp parameter.) Displays information for the specified volume. This parameter accepts a fully qualified volume ID, which consists of the storage image ID or a shortened version without the storage image ID, if you specify the -dev parameter. The shortened version format is hexadecimal XXYZZ where X is an address group number (0-F), XY

is a logical subsystem (LSS) number (00-FE), and ZZ is a volume number (00-FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (–) is specified.

**Note:** Do not use the *volume\_ID* parameter with the *-volgrp* parameter.

#### **Example**

Note: The following tables represent the headers that are displayed on the output reports that are associated with the wshowfbvol command. A separate example is not shown for the 1750 as the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

# Invoking the showfbvol to show volume properties

Note: The example output is based on using the showfbvol command for a 1.0 (Binary) GB volume.

dscli>showfbvol 6000

# The resulting output

Date/Time: April 13, 2005 2:38:14 PM JST IBM DS CLI Version: 5.0.3.40 DS: IBM.2107-1300861

Name	ID	acc state	data state	config state	device MTM	data type	addgrp
My_ volume _6000	6000	Online	Normal	Normal	2107-900	FB 512	6

extpool	exts	captype	cap (2^30B)	cap (10^9B)	cap (blocks)	volgrp
P0	1	DS	1.0	_	2097152	V20

# Report field definitions ( -metrics parameter not specified)

# Name

Specifies the nickname that you assigned for this volume object.

**ID** Specifies the unique identifier that is assigned to this volume object.

#### accstate

One of the following access states are displayed: Online or Fenced.

# Online

The logical volume is accessible to a host.

#### **Fenced**

The logical volume is in the volume fenced state and is not accessible to the host.

#### datastate

One of the following data states are displayed:

None of the other data states apply. The access state is Online.

# Read only

Indicates that the logical volume is read only because one or more extents on the logical volume are on a rank in the read only data state. The access state is Online.

#### Inaccessible

Indicates that one or more extents that are associated with the logical volume are on a rank that is in the inaccessible data state. The access state is fenced.

#### Rank failed

Indicates that one or more extents that are associated with the logical volume are on a rank that is in the Failed data state. The access state is Fenced. This data state transitions to Rank repairing if the rank transitions to the Rank repairing state through use of the repair array function.

#### Rank Repairing

Indicates that one or more extents that are associated with the logical volume are on ranks in the repairing data state. The access state is fenced.

# Rank Repaired

Indicates that one or more extents that are associated with the logical volume are on ranks that were in the repairing state, but are not in the repairing state now. The access state is fenced. This condition might be cleared by using the restorevolaccess command.

# configstate

One of the following configuration states are displayed:

#### Normal

Indicates that there are no logical volume configuration operations in progress.

#### Configuration pending

Specifies that a creation request for the logical volume has been accepted and is queued for processing. The logical volume object has been created.

#### Configuring

Indicates that the logical volume is in the process of being configured for the first time.

## Deconfiguring

Indicates that the logical volume is in the process of being deleted.

#### Configuration error

Indicates that the initial configuration did not complete successfully.

#### deviceMTM

Indicates the volume device type and the model. The volume MTM is determined by the fixed block volume data type and the volume capacity (in GB). The model is either 2107 or 1750, however the MTM can be any one of the following depending on your system:

#### 2107-900

This indicates a standard 2107 volume.

# 1750-500

This indicates a standard 1750 volume.

#### xxxx-A0x

The xxxx is 2107 or 1750; the A0 indicates an OS/400 protected volume (for example, 2107-A01 or 1750-A07).

# *xxxx***-A8***x*

The xxxx is 2107 or 1750; the A8 indicates an OS/400 unprotected volume (for example, 2107-A81 or 1750-A87).

## datatype

Indicates the volume data type setting. One of the following values will be displayed:

- FB 512
- FB 520P
- FB 520U

#### addrgrp

Specifies the address group that contains the designated volume object. An address group ID is one hexadecimal character (0-F).

#### extpool

Specifies the extent pool ID. Volume extents are allocated from this extent pool ID.

#### exts

Specifies the number of extents used by the designated volume ID.

Indicates capacity unit type used at volume creation. One of the following values is displayed:

# **ESS**

The capacity unit is 10 ^ 9B.

#### DS

The capacity unit is 2 ^ 30B.

# **DS/ESS**

The capacity unit is 2 ^ 30B or 10 ^ 9B.

#### **Blocks**

The capacity unit 512B.

#### **iSeries**

The capacity unit was not specified at volume creation. This fixed block volume was created for iSeries.

# cap (2 ^ 30B)

Specifies the size of volume that is available for host system access in 2 ^ 30B (binary GB) unit.

**Note:** "-" (null) is displayed if the capacity unit type of the volume is ESS (captype=ESS)

# cap (10 ^ 9B)

Specifies the size of volume that is available for host system access in 10 ^ 9B (decimal GB) unit.

**Note:** "-" (null) is displayed if the capacity unit type of the volume is DS (captype=DS)

# cap blocks

Indicates the quantity of volume logical blocks that are available for host system access.

# **Example**

# Invoking the showfbvol to show performance metrics

dscli>showfbvol -metrics -dev IBM.2107-75FA120/0101

#### The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120 ID IBM.1750-75FA120/0101 Date 10/11/04 02:23:49 normrdrqts 10000 normrdhits 10000 normwritereq 10000 normwritehits 10000 segreadregs 10000 segreadhits 10000 segwritereg 10000 segwritehits 10000 cachfwrreqs 10000 cachfwrhits 10000 cachfwreqs 10000 cachfwhits 10000 inbcachload 10000 bypasscach 10000 seqDASDtrans 10000 DASDtrans 10000 cachetrans 10000 NVSspadel 10000 normwriteops 10000 segwriteops 10000 reccachemis 10000 gwriteprots 10000 CKDirtrkac 10000 CKDirtrkhits 10000 cachspdelay 10000 timelowifact 10000 phread 10000 phwrite 10000 phbyteread 10000 phbytewrit 10000 recmoreads 10000 sfiletrkreads 10000 contamwrts 10000 PPRCtrks 10000 NVSspallo 10000 timephread 10000 timephwrite 10000 byteread 10000 bytewrit 10000 timeread 10000

# Report field definitions ( -metrics parameter specified)

ID Specifies the unique identifier that is assigned to this volume object.

#### **Date**

Specifies the current time stamp for the volume performance counters.

#### normrdrqts

timewrite 10000

Specifies Search/Read Normal I/O Requests.

#### normrdhits

Specifies Search/Read Normal I/O Requests instances.

#### normwritereq

Specifies Write Normal I/O Requests.

#### normwritehits

Specifies DASD Fast Write I/O Request instances.

# segreadregs

Specifies Search/Read Sequential I/O Requests.

#### segreadhits

Specifies Search/Read Sequential I/O Request instances.

# segwritereg

Specifies Write Sequential I/O Requests.

## segwritehits

Specifies DASD Fast Write Sequential I/O Request instances.

#### cachfwrreqs

Specifies Search/Read Cache Fast Write I/O Requests.

#### cachfwrhits

Specifies Search/Read Cache Fast Write I/O Request instances.

#### cachfwregs

Specifies Cache Fast Write I/O Requests.

#### cachfwhits

Specifies Cache Fast Write I/O Requests instances.

#### inbcachload

Specifies Inhibit Cache Loading I/O Requests that operate with DASD.

# bypasscach

Specifies Bypass Cache I/O Requests.

#### seqDASDtrans

Specifies Sequential DASD to Cache Transfer Operations.

# **DASDtrans**

Specifies DASD to Cache Transfer Operation Count.

#### cachetrans

Specifies Cache to DASD Transfer Operation Count.

#### NVSspadel

Specifies DASD Fast Write Operations Delayed Due to nonvolatile storage Space Constraints.

#### normwriteops

Specifies Normal 'DASD Fast Write' Write Operation Counts.

# segwriteops

Specifies Sequential Access 'DASD Fast Write' Write Operation Counts.

#### reccachemis

Specifies Number of record cache Read Misses.

## **qwriteprots**

Specifies Quick Write Promotes.

#### **CKDirtrkac**

Specifies Irregular Track Accesses.

#### **CKDirtrkhits**

Specifies Irregular Track Accesses instances.

## cachspdelay

Specifies Operations Delayed Due To Cache Space Constraints.

#### timelowifact

Specifies Milliseconds of lower interface I/O activity for the indicated device.

#### phread

Specifies Physical Storage Read Operations.

#### phwrite

Specifies Physical Storage Write Operations.

# phbyteread

Specifies Physical Storage Bytes Read in 128 KB increments.

# phbytewrit

Specifies Physical Storage Bytes Written in 128 KB incremnts.

#### recmoreads

Specifies Record Mode Read Operations.

#### sfiletrkreads

Specifies the Number of tracks read from the Concurrent Copy or XRC Sidefile.

#### contamwrts

Specifies the Number of Contaminating writes for a Concurrent Copy or XRC volume.

#### **PPRCtrks**

Specifies the Number of tracks or portion of tracks that were transferred to the secondary device of a PPRC pair.

#### **NVSspallo**

Specifies the NVS Space Allocations.

#### timephread

Specifies the Physical Storage Read Response Time in 16 ms increments.

#### timephwrite

Specifies the Physical Storage Write Response Time in 16 ms increments.

# byteread

Specifies the number of Bytes read in 128 KB increments.

Specifies the number of Bytes written in 128 KB incremnts.

#### timeread

Specifies the accumulated response time for all read operations.

#### timewrite

Specifies the accumulated response time for all write operations.

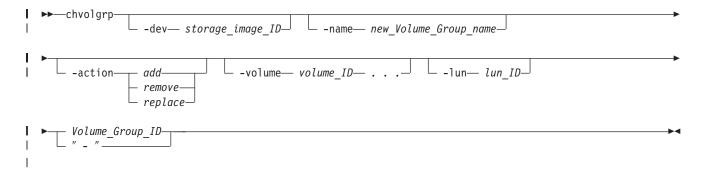
# Volume group specific commands

This section contains commands that are used to create, modify, and delete volume groups and to display volume group information.

Use the following commands to create, modify, and delete volume groups and to display volume group information.

# chvolgrp

The chvolgrp command modifies a volume group name and volume members.



# **Parameters**

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# -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the volume group ID.

Example: IBM.2107-75FA120

# -name new\_Volume\_Group\_name

(Optional). Specifies a new name for the volume group. The name is limited to 16 characters. The name must be unique across volume groups that are contained by a storage image.

# -action add | remove | replace

(Optional).

**add** Specifies that the volumes be added to the volume group.

#### remove

Specifies that the volumes be removed from the volume group.

#### replace

Specifies that the existing volumes be replaced by the specified volumes.

If the **-action** parameter is not specified, the existing volumes are replaced by the specified volumes. The **-action** parameter is ignored if the **-volume** parameter is not specified.

#### -volume volume ID . . .

(Optional). Specifies an array of one or more volume IDs or volume ID ranges to be included in the volume group when the **-action** parameter is specified. The format of the ID is a hexadecimal number '0000 - FEFF'.

To specify a range of volume IDs, separate the volume IDs with a dash (-).

You must separate multiple volume IDs or ranges of volume IDs with a comma between each ID or range of IDs.

Example: 0100-010F,0180-018F,0120

### -lun lun\_ID

(Optional - SCSI MAP 256 only). Specifies the LUN ID in hexadecimal value (00 - FF), which is mapped to the specified volume ID when the **-action add** or **-action replace** parameter is specified. If multiple volume IDs are specified by

the **-volume** parameter, the LUN ID is consecutively assigned in incremental order. If the specified LUN ID is not valid, the command is rejected.

Note: This parameter is only valid when the target volume group type is SCSI MAP 256. Otherwise, this command fails.

If the **-action add** parameter is specified and the specified LUN ID is already mapped to the other volume in the specified volume group, the command fails.

If the -action add parameter is specified without the -lun parameter, an unused LUN ID is assigned to the volume ID. In this case, the unused LUN ID is selected from a smaller number.

The following example shows how this works:

```
A volume group of "SCSI Map 256" type has Volume 0000 and 0001. Their
LUNs are the members of the following volume group:
(showvolgrp displays the current mapping.)
0000 : 10
0001:11
Because the range of LUN IDs is 00-FF, the unused LUN IDs
are 00,01,\ldots,0F,12,13,\ldots,FF.
If you add volume 0002 and 0003 to this volume group without the -lun
parameter, the mapping results in the following because 00 and 01 are
"smaller" unused LUN IDs:
0000:10
0001:11
0002:00
0003:01
```

If the -action replace parameter is specified without specifying the -lun parameter, lun ID=00 is assumed.

```
Volume Group ID | -
```

(Required). Specifies the ID of the volume group being changed. The volume group ID is made up of the storage unit ID followed by the volume group ID. Accepts a fully qualified volume group ID including the storage image ID or a shortened version. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter "V".

Alternatively, accepts input from stdin if the dash (–) is specified.

Example: IBM.2107-75FA1243/V1231

# **Example (2107)**

# Invoking the chvolgrp command

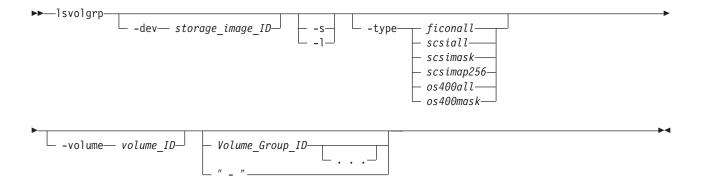
dscli>chvolgrp -volume 0000-000F IBM.2107-75FA120/V2341

# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
Volume group V2341 successfully modified.
```

# Isvolgrp

The Isvolgrp command displays a list of volume groups in a storage image and status information for each volume group in the list.



# **Parameters**

# -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. Displays only the objects for the storage unit that is specified. This parameter is required if you do not specify a fully qualified volume group ID.

Example: IBM.2107-75FA120

- **-s** (Optional). Displays volume group IDs only. You cannot use the -I and the -s parameters together.
- -I (Optional). Displays the default output plus users. You cannot use the -I and the -s parameters together.
- -type ficonall | | scsiall | scsimask | scsimap256 | os400all | os400mask | (Optional). Displays only volume groups that are configured as the specified volume group type.

# -volume volume\_ID

(Optional). Displays volume groups that contain the specified volume ID. A volume ID is four hexadecimal characters '0x0000 - 0xFEFF'.

#### Volume Group ID . . . | -

(Optional). Displays volume groups with the specified IDs. A volume group ID is a four-digit decimal number with no leading zeroes, prefixed with the letter "V".

Accepts a fully qualified volume group ID or a shortened version, if the -dev flag is specified.

To specify a range of volume group IDs, separate the volume group IDs with a hyphen. You must separate multiple volume group IDs or ranges of volume group IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (–) is specified.

# **Example (2107)**

# Invoking the Isvolgrp command

dscli>lsvolgrp -dev IBM.2107-75FA120 -l

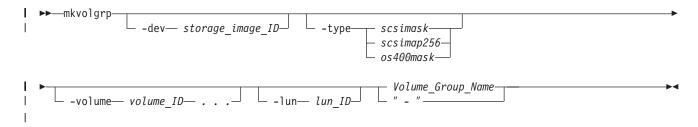
# The resulting output

```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Device: IBM.2107-75FA120
```

```
Name ID Type
Host_xxx_volumes V1011 OS400 Mask
Host_yyy_volumes V1111 OS400 Map 256
Host_zzz_volumes V1211 SCSI Mask
```

# mkvolgrp

The mkvolgrp command creates a volume group in a storage image.



# **Parameters**

-dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified volume group name.

Example: IBM.2107-75FA120

-type | scsimask | scsimap256 | os400mask |

(Optional). Specifies the type of the volume group.

#### scsimask (default)

Creates a SCSI mask volume group. This option is available if the host adapter supports four-byte LUN addresses.

# scsimap256

Creates a SCSI-MAP 256 volume group.

#### os400mask

Creates an OS400 mask volume group. The IBM iSeries host system typically uses fixed block volumes of 520-byte logical block size. This option is available only if the host adapter supports four-byte LUN addresses.

**Note:** This volume group is also referred to as SCSI520-MASK. When an error message is displayed for the OS400 MASK, SCSI520-MASK is referenced instead.

-volume volume ID | . . .

(Optional). Specifies the array of volume IDs to include in the volume group. The format is a hexadecimal number in the range '0000 - FEFF'. For the **-scsimap256** parameter, the array cannot exceed 256 volume ID entries. Otherwise, up to 64 384 entries are allowed.

To specify a range of volume IDs, separate the volume IDs with a dash (-).

You must separate multiple volume IDs or ranges of volume IDs with a comma between each ID or range of IDs.

Example: 0100-010F,0180-018F,0120

-lun lun ID

(Optional)Specifies the LUN ID in hexadecimal value (00 - FF) which is mapped

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to the specified volume ID for a SCSI-MAP256 type volume group. If multiple volume IDs are specified by the -volume parameter, LUN IDs are assigned consecutively in incremental order.

Note: This parameter is only valid for a SCSI-MAP 256 type volume group. If this parameter is specified for any other type of volume group, the command fails.

Volume\_Group\_Name | -

(Required). Specifies the volume group name, not to exceed 16 characters. Ensure that the name is unique within the scope of the storage image. Accepts a fully qualified volume group name or a shortened version, if the -dev parameter is specified.

Alternatively accepts input from stdin when the dash (-) is specified.

# **Example (2107)**

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I

# Invoking the mkvolgrp command

dscli>mkvolgrp -dev IBM.2107-75FA120 -volume 0000-000F host\_xyz\_volumes

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Volume group VO successfully created.

# rmvolgrp

The rmvolgrp command deletes existing volume groups from a storage image.



## **Parameters**

-dev storage\_image\_ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all volume groups (all ID values that take a storage image ID in the command input required for this command).

Example: IBM.2107-75FA120

### -quiet

(Optional). Turns off the confirmation prompt for this command.

Volume Group ID . . . | -

(Required). An array of one or more volume groups IDs to be deleted. All volume groups specified must belong to the same storage unit. Accepts a fully qualified volume group ID, which consists of the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified. The shortened version is a four-digit decimal number with no leading zeroes, prefixed with the letter "V".

To specify a range of volume group IDs, separate the volume group IDs with a dash (-).

You must separate multiple volume group IDs or ranges of volume group IDs with a blank space between each ID or range of IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example: IBM.2107-75FA1243/V123

# **Example (2107)**

# Invoking the rmvolgrp command

dscli>rmvolgrp IBM.2107-75FA1243/V123

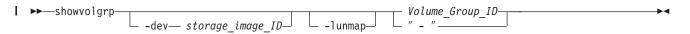
# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120 Are you sure you want to delete Volume Group IBM.2107-75FA1243/V123? y/n Y

Volume group IBM.2107-75FA1243/V123 successfully deleted.

# showvolgrp

The showvolgrp command displays detailed properties of a volume group.



## **Parameters**

# -dev storage image ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the volume group.

Example: IBM.2107-75FA120

#### -lunmap

(Optional). Specifies that a LUN mapping table be displayed that shows the volume ID and LUN ID relationship. This parameter is valid for all scsi and os400 type volume groups.

# Volume Group ID | -

(Required). Shows the properties for the target volume group that are specified within the storage unit. Accepts a fully qualified volume group ID, which consists of the storage image ID, or a shortened version without the storage image ID if the **-dev** parameter is specified. The shortened version is a four-digit decimal number with no leading zeros, prefixed with the letter "V".

Alternatively, accepts input from stdin when the dash (-) is specified.

Example: IBM.2107-75FA120/V1001

# **Example**

**Note:** The following tables represent the headers that are displayed on the output reports that are associated with the **showvolgrp** command. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

# Invoking the showvolgrp command

dscli>showvolgrp -lunmap IBM.2107-75FA120/V1001

# The resulting output

Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Name	ID	Туре	Vols
My_host_ system_ volumes	IBM.2107- 75FA120 /V100	SCSI- MAP 256	0000 0001 0002 0003

============LUN Mapping==================

Vol	LUN
0000	0A
0001	0B
0002	10
0003	11

# Report field definitions

Name Specifies the name that you assigned for the designated volume group ID..

ID Specifies the storage unit ID followed by the volume group ID. The volume group identifier is a four-digit decimal number having no leading zeros, and prefixed by a V.

Type Specifies the configured volume group type.

Vols Identifies the complement of accessible volume numbers within the designated volume group.

# Vol (part of LUN map table)

Specifies the volume ID.

## LUNS (part of LUN map table)

Specifies the LUN ID that is mapped to the designated volume ID.

# **Advanced operation commands**

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This section contains commands that are used to further administer and tune storage.

Use the following commands to administer and tune storage.

## clearvol

The clearvol command clears Copy Services relationships for a base logical



### **Parameters**

# -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the volume ID.

Example: IBM.2107-75FA120

# -pprcsource

(Optional). This is applicable to a base logical volume. Removes any remote mirror and copy (formerly PPRC) relationships on the logical volume where this logical volume operates as a remote mirror and copy source.

# -pprctarget

(Optional). This is applicable to a base logical volume. Removes any remote mirror and copy (formerly PPRC) relationships on the logical volume where this logical volume operates as a remote mirror and copy target.

#### -fcsource

(Optional). This is applicable to a base logical volume. Removes any FlashCopy relationships on the logical volume where this logical volume operates as a FlashCopy source.

#### -fctarget

(Optional). This is applicable to a base logical volume. Removes any FlashCopy relationships on the logical volume where this logical volume operates as a FlashCopy target.

## Volume ID | -

(Required). Clears Copy Services relationships for the specified volume ID. Accepts a fully qualified volume ID, which includes the storage image ID or a shortened version, if the -dev flag is specified. The volume ID is four hexadecimal characters in the range '0000 - FEFF'.

Alternatively, accepts input from stdin if the dash (–) is specified.

Example: IBM.2107-75FA120/0001

#### **Example (2107)**

# Invoking the clearvol command

dscli>clearvol -dev IBM.2107-75FA120 0001

# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Volume 0001 successfully cleared.

#### restorevolaccess

The restorevolaccess command resets the fenced access state for a volume when the volume is in a fenced access state.



#### **Parameters**

#### Note:

- 1. If the logical volume is in the the rank repaired data state, the restore volume access function causes any indications that are associated with this condition to be reset. The data state is updated to reflect the current condition of the logical volume after this condition has been reset. Normally, the data state changes to normal or read-only.
- 2. If the restore volume access function command is accepted repeatedly, but does not result in an online access state, delete the logical volume and then reconfigure the logical volume.

# -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the volume ID, which includes the storage image ID.

Example: IBM.2107-75FA120

# -quiet

(Optional). Turns off the confirmation prompt for this command.

# Volume\_ID | -

(Required). Resets the fenced access state for the specified volume ID. Accepts a fully qualified volume ID, which includes the storage image ID, or a shortened version, if the -dev parameter is specified. The Volume ID is four hexadecimal characters '0000 - FEFF'.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example: IBM.2107-75FA120/0001

# Example

# Invoking the restorevolaccess command

dscli>restorevolaccess -dev IBM.2107-75FA120 0001

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to reset the access state for Volume ID 0001? y/n Y Access state for Volume 0001 successfully reset.

# Copy Services commands

This section contains Copy Services commands.

You can use the following Copy Services commands to manage Copy Services tasks.

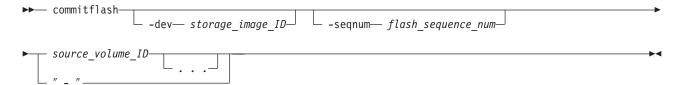
# FlashCopy commands

This section contains commands that are used to configure FlashCopy relationships and to display FlashCopy information.

Use the following commands to configure FlashCopy relationships and to display FlashCopy information.

# commitflash

The commitflash command commits data to a target volume to form a consistency between the source and target. Before you use this command, you must first issue the mkflash command with the -record and -persist flags. After the pair is established, you must then issue the setflashrevertible command against the pair.



# **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type. and serial number. This flag is required if you do not specify a fully qualified ID for all the source volumes and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

# -segnum flash sequence number

(Optional) When a flash sequence number is specified, the commit is performed only on those relations associated with the specified number. The sequence number is a four digit hexadecimal number (0000 - FFFF). The default value is 0000.

This flag is not supported for machine type 2105.

Example: 0010

source\_volume\_ID . . . | -

(Required) Commits FlashCopy relationships for the source volumes with the IDs specified. The chosen FlashCopy pair is the one established or modified with the -record flag. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if either the -dev flag is specified or you specify a value for the devid variable in your profile file. You must separate multiple source volume IDs with spaces.

The format of a volume ID is hexadecimal "XYZZ", where "XY" is a logical subsystem (LSS) number (00 - FE), and "ZZ" is a volume number (00 - FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a fully qualified volume ID: IBM.2107-75FA120/0001

Example of a shortened version: 0001

Example of multiple IDs: 0001 0003 0008

# **Example (2107)**

#### Invoking the commitflash command

dscli>commitflash -dev IBM.2107-75FA120 0100

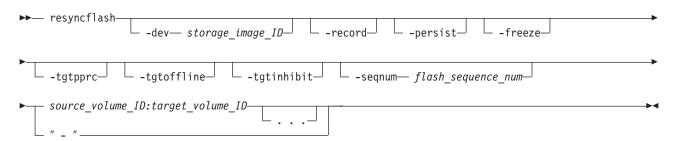
## The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully committed.

# resyncflash

The resyncflash command (formerly called incflash for an incremental FlashCopy process) increments an existing FlashCopy pair that has been established with the -record and -persist flags. When a pair is established with the -record and -persist flags, the pair initially synchronizes and then a record of all host writes to the source is maintained in the source volumes. When the resyncflash command is issued on the pair, the new writes to the source are copied to the target. The flags specified in this command will replace the flags in the existing relationship. In order to keep the initial -record and -persist flags, they must be specified in the resyncflash command.



# **Parameters**

# -dev storage image ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

## -record

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Use this flag if you intend to use the resyncflash command again with this pair. The -persist flag is automatically selected when this flag is selected.

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until broken by a rmflash command. This flag is automatically selected when the -record flag is selected. Select this flag along with the -record flag if you will be using this volume pair with the commands resyncflash, reverseflash, or setflashrevertible.

#### -freeze

(Optional) Triggers the queue full condition for the source volume. All writes to the source volume are queued by the host and are written after the queue full condition is reset.

During the queue full condition, the source volume reports long busy status.

The queue full condition is reset by an extended long busy timeout. The timeout condition affects all FlashCopy source volumes that are contained within a respective logical subsystem and that are established or modified with the -freeze flag.

#### -tgtpprc

(Optional) Allows the FlashCopy target volume to be a Remote Mirror and Copy source volume.

# -tgtoffline

(Optional) Causes the mkflash command to be rejected if the target volume is online for host system access. This flag only applies to CKD volumes.

# -tgtinhibit

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

# -seqnum flash\_sequence\_num

(Optional) Associates the FlashCopy relations that are established with the specified sequence number. This sequence number can be used as an identifier for a relation or group of relations. Only the relations that are modified successfully by the resyncflash command will get the specified sequence number, leaving the ones that failed with the previous one ( if previously specified ). The sequence number is a four digit hexadecimal number (0000 -FFFF). The default is 0000.

This flag is not supported for machine type 2105.

Example: 0010

```
source volume ID:target volume ID . . . | -
```

(Required) Increments a FlashCopy relationship for the source and target volume pairs with the IDs specified. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified or you specify a value for the devid variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal 'XYZZ', where 'XY' is a logical subsystem (LSS) number (00 - FE), and 'ZZ' is a volume number (00 - FF) that is contained by a logical subsystem..

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## **Example (2107)**

#### Invoking the resyncflash command

dscli>resyncflash -dev IBM.2107-75FA120 0100:0200

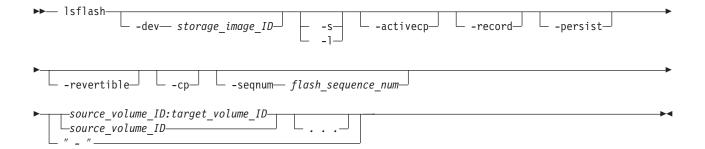
#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully incremented.

#### Isflash

The Isflash command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list.



#### **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

- **-s** (Optional) Displays FlashCopy pair IDs. You cannot use the -l and the -s flags together.
- (Optional) Displays the default output plus copy indicator, out of sync tracks, date created, and date synchronized. You cannot use the -l and the -s flags together.

#### -activecp

(Optional) Displays the FlashCopy relationships where their background copy process is active.

**Note:** The background copy process might be inactive for a while before it starts, according to an internal algorithm.

#### -record

(Optional) Displays the FlashCopy relationships that were established with the -record flag.

#### -persist

(Optional) Displays the FlashCopy relationships that were established with the -persist flag.

#### -revertible

(Optional) Displays the FlashCopy relationships that were established with the revertible flag.

#### -ср

(Optional) Displays the FlashCopy relationships that were established with the -cp flag.

#### -segnum flash sequence number

(Optional) Displays the FlashCopy relationships that are associated with the specified sequence number. The default is 0000.

This parameter is not supported for machine type 2105.

source\_volume\_ID:target\_volume\_ID | source\_volume\_ID . . . | -

(Required) Displays the FlashCopy relationships for the source and target volume pairs with the specified IDs, or displays the FlashCopy relationships for a single volume ID if the source volume ID is specified.

Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified or you specify a value for the devid variable in your profile file.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal "XYZZ", where "XY" is a logical subsystem (LSS) number (00 - FE), and "ZZ" is a volume number (00 - FF) that is contained by a logical subsystem.

You must separate multiple IDs with spaces. You can specify FlashCopy pair IDs and a range of FlashCopy pair IDs, or you can specify source volume IDs and a range of source volume IDs. You cannot specify a combination of FlashCopy pair IDs and source volumes IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

# **Example (2107)**

# Invoking the Isflash command

dscli>lsflash -l -dev IBM.2107-75FA120 0100:0200 0101:0201 0102:0202 0103:0203

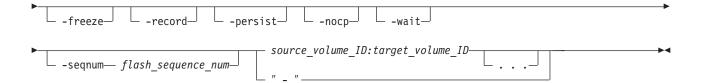
#### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
ID SrcLSS Sequence Num Timeout Active Copy Recording
Persistent Revertible Source Write Enabled Target Write Enabled
 Background Copy Out Of Sync Tracks Date Created Date Synced
0100:0200 01 10 120 Disabled Disabled
Disabled Disabled Enabled Disabled
 Disabled 0 12/01/2003 02:20:00 12/01/2003 02:23:47
0101:0201 01 10 120 Disabled Disabled
Disabled Disabled Enabled
                           Disabled
 Disabled 0 12/01/2003 02:20:00 12/01/2003 02:23:47
0102:0202 01 11 120 Disabled Disabled
Disabled Disabled Enabled Disabled
 Disabled 0 12/01/2003 02:20:00 12/01/2003 02:23:47
0103:0203 01 11 120 Disabled Disabled
Disabled Disabled Enabled Disabled
 Disabled 0 12/01/2003 02:20:00 12/01/2003 02:23:47
```

# mkflash

The mkflash command initiates a point-in-time copy from source volumes to target

```
— mkflash-
           -dev— storage image ID—  -tgtpprc— -tgtoffline—  -tgtinhibit—
```



# **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which consists of a manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

# -tgtpprc

(Optional) Allows the FlashCopy target volume to be a remote mirror and copy source volume.

#### -tqtoffline

(Optional) Causes the mkflash command to be rejected if the target volume is online for host system access. This flag applies only to count key data volumes.

#### -tgtinhibit

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

#### -freeze

(Optional) Triggers the queue full condition for the source volume. All writes to the source volume are queued by the host and are written after the queue full condition is reset.

During the queue full condition, the source volume reports long busy status.

The queue full condition is reset by an extended long busy timeout. The timeout condition affects all FlashCopy source volumes that are contained within a respective logical subsystem and that are established or modified with the -freeze flag.

# -record

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Select this flag when you establish an initial FlashCopy volume pair that you intend to use with the resyncflash command. The -persist flag is automatically selected when this flag is selected.

# -persist

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until you issue a rmflash command. This flag is automatically selected when the -record flag is selected. Select this flag along with the -record flag if you will be using this volume pair with the resyncflash, reverseflash, or setflashrevertible commands.

#### -nocp

(Optional) Inhibits background copy. Data is copied from the source volume to the target volume only if a track on the source volume is modified. The FlashCopy volume pair relationship remains indefinitely until it is broken by a rmflash command, or until all tracks on the source volume are modified.

#### -wait

(Optional) Delays the command response until the background copy process completes. You cannot use the -wait flag with either the -persist or -nocp flag.

# -seqnum flash\_sequence\_num

(Optional) Associates the FlashCopy relations that are established with the specified sequence number. This sequence number can be used as an identifier for a relation or group of relations. The sequence number is a four-digit hexadecimal number (0000 - FFFF). The default is 0000.

This parameter is not supported for machine type 2105.

Example: 0010

source\_volume\_ID:target\_volume\_ID . . . | -

(Required) Establishes a FlashCopy relationship for the source and target volume pairs with the specified IDs. This command accepts fully qualified volume IDs, which consist of storage image IDs or a shortened version without storage image IDs, if the -dev flag is specified. You can also specify a value for the devid variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

Note: It is possible that during processing you will receive an error message indicating that relationships have been exceeded or that an initial volume format is in progress. This means that the FlashCopy relationship cannot be established because the maximum number of relationships have already been established. Or, the volume was recently created and is still being initialized to support FlashCopy. Later, you can issue another the FlashCopy relationship after the initial volume format process is complete.

The format of a volume ID is hexadecimal XYZZ, where XY is a logical subsystem (LSS) number (00 - FE), and ZZ is a volume number (00 - FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

**Example (2107)** 

Invoking the mkflash command

dscli>mkflash -dev IBM.2107-75FA120 0100:0200

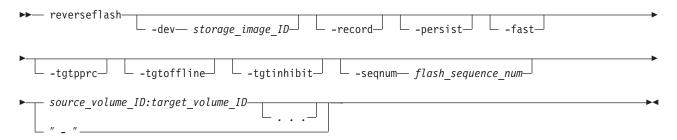
The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully created.

#### reverseflash

The direction of a FlashCopy relationship can be reversed, where the volume that was previously defined as the target becomes the source for the volume that was previously defined as the source (and is now the target). The data that has changed is copied to the volume that was previously defined as the source. For example, suppose you create a FlashCopy relationship between source volume A and target volume B. Data loss occurs on source volume A. To keep applications running, you can reverse the FlashCopy relationship so that volume B is copied to volume A.



# **Parameters**

The source volume and the target volume that are specified by this command are the current source and target volumes that, as a result of this command process, become reversed. The specified target volume becomes the source and the specified source volume becomes the target. The target parameters specified by this command apply to the new target (the source volume that becomes the target volume when this command is processed).

After the reversal takes place, ensure that you designate this new relationship when you issue any future commands. Failure to designate this reversed relationship could produce unexpected results. For example, you reverse the relationship of source volume 1600 and target volume 1800. Using the reverseflash command, your source volume becomes 1800 and your target volume become 1600. All queries and future processing on this relationship must show volume 1800 as your source and volume 1600 as your target.

The following list defines the parameters that are associated with the reverseflash command:

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Select this flag when you establish an initial FlashCopy volume pair that you intend to use with the resyncflash command. The -persist flag is automatically selected when this flag is selected.

#### -persist

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until it is broken by a rmflash command. This flag is automatically selected when the -record flag is selected. Select this flag along with the -record flag if you are using this volume pair with the resyncflash. reverseflash, or setflashrevertible commands.

#### -fast

(Optional) Specify this flag when the reverseflash command will be issued before the background copy completes.

# -tatpprc

(Optional) Allows the FlashCopy target volume to be a Remote Mirror and Copy source volume.

# -tqtoffline

(Optional) Causes the reverseflash command to be rejected if the target volume is online for host system access. This flag only applies to CKD volumes.

# -tgtinhibit

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

# -segnum flash sequence num

(Optional) Associates the FlashCopy relations that are reversed with the specified sequence number. Only the relations that are successfully modified by the command receive the specified sequence number, leaving the ones that failed with the previous number (if previously specified). The sequence number is a four-digit hexadecimal number (0000 - FFFF). The default is 0000.

Example: 0010

This parameter is not supported for machine type 2105.

### source\_volume\_ID:target\_volume\_ID . . . | -

(Required) Reverses a FlashCopy relationship for the source and target volume pairs with the specified IDs. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified or you specify a value for the devid variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal "XYZZ", where XY is a logical subsystem (LSS) number (00 - FE), and ZZ is a volume number (00 - FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

# **Example (2107)**

# Invoking the reverseflash command

dscli>reverseflash -dev IBM.2107-75FA120 0100:0200

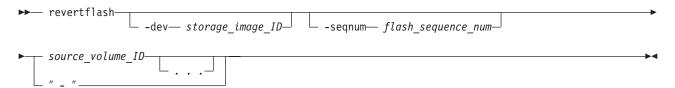
# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully reverse restored.

# revertflash

The revertflash command overwrites new data with data saved at the last consistency formation. To use this command, you must first issue the mkflash command with the -record and -persist flags. You must then issue the setflashrevertible command against the pair.



# **Parameters**

-dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source volume and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

# -segnum flash sequence num

(Optional) Specifies the FlashCopy sequence number. When this number is specified, the revertflash operation is performed only on those relations associated with the specified number. The sequence number is a four-digit hexadecimal number (0000 - FFFF). The default is 0000.

This parameter is not supported for machine type 2105.

Example: 0010 source volume ID . . . | -

(Required) Specifies the source volume ID for which the FlashCopy relationship is to be reverted. The chosen FlashCopy pair is the one established or modified with the -record flag. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified or you specify a value for the devid variable in your profile file. You must separate multiple source volume IDs with spaces.

The format of a volume ID is hexadecimal "XYZZ", where "XY" is a logical subsystem (LSS) number (00 - FE), and "ZZ" is a volume number (00 - FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified volume ID: IBM.2107-75FA120/0001

Example of a shortened version: 0001

Example of multiple IDs: 0001 0003 0008

# **Example (2107)**

# Invoking the revertflash command

dscli>revertflash -dev IBM.2107-75FA120 0100

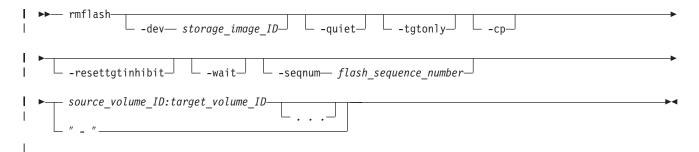
#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully reverted to the previous consistency.

# rmflash

The rmflash command removes a relationship between FlashCopy volume pairs.



## **Parameters**

#### Note:

- Invoking this command with the -cp parameter on a FlashCopy relationship that was previously marked with -persist will not remove the relationship. Instead, the source data is copied to the target.
- Invoking this command with the -resettgtinhibit parameter does not withdraw the relationship, but resets the -tgtinhibit option if it was previously set.
- All settings apply to all FlashCopy pairs specified.
- Do not use the -wait parameter on persistent relations.
- The-segnum parameter is not supported for model 2105.

## -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

(Optional) Specifies that the confirmation prompt for this command be turned off.

#### -tqtonly

(Optional) Specifies the target volume of the FlashCopy pair to remove the relationship. In addition, the Copy Indicator for the target volume is reset. This flag applies only to fixed block volumes.

#### -ср

(Optional) Specifies that the FlashCopy relationship be changed from No Copy to Copy and that the remaining source volume tracks be copied to the target volume. The relationship is removed when all the data is copied unless the relationship is persistent. When this flag is specified, the copy takes place for all volume pairs where the source volume ID is identical to the source volume specified in the command.

# -resettgtinhibit

(Optional) Specifies that target write access is allowed. The -resettgtinhibit parameter resets the flag that does not allow host system write operations to the target ID while the FlashCopy relationship exists, in case it was previously set.

#### -wait

(Optional) Specifies that the command response be delayed until the background copy process completes.

**Note:** The -cp flag must be used with this flag.

Do not use this flag on relations that are marked -persist. This will result in an error.

# -segnum flash sequence num

(Optional) Specifies the FlashCopy sequence number. When this number is specified, the rmflash operation is performed only on those relations associated with the specified number. The sequence number is a four-digit hexadecimal number (0000 - FFFF). The default is 0000.

Example: 0010

**Note:** This parameter is not supported for machine type 2105.

# source\_volume\_ID:target\_volume\_ID . . . | -

(Required) Specifies the source and target volume pairs for which the FlashCopy relationships are removed. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified or you specify a value for the devid variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

When the -tgtonly option is specified, you must enter volume IDs. Volume pair IDs are not valid with the -tgtonly option.

The format of a volume ID is hexadecimal "XYZZ", where "XY" is a logical subsystem (LSS) number (00 - FE), and "ZZ" is a volume number (00 - FF) that is contained by a logical subsystem..

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

# **Example (2107)**

# Invoking the rmflash command

dscli>rmflash -dev IBM.2107-75FA120 0100:0200

# The resulting output

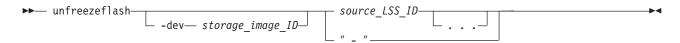
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to remove the FlashCopy pair 0001:0002? [y/n]: Y

FlashCopy pair 0100:0200 successfully removed.

#### unfreezeflash

The unfreezeflash command resets a FlashCopy consistency group that was previously established with the -freeze flag when the mkflash or resyncflash commands were issued.



# **Parameters**

-dev storage\_image\_ID

(Optional) Specifies the source storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified source LSS ID and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

source LSS ID . . . | -

(Required) Resets the FlashCopy consistency group for these source logical subsystems (LSSs). Accepts fully qualified LSS IDs, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified or you specify a value for the devid variable in your profile file.

The fully qualified LSS ID format is storage image ID/XX, where "XX" is a hexadecimal number in the range (00 - FE).

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/00

Example of a shortened version: 00 Example of multiple IDs: 10 20 30

#### **Example (2107)**

# Invoking the unfreezeflash command

dscli>unfreezeflash -dev IBM.2107-75FA120 01

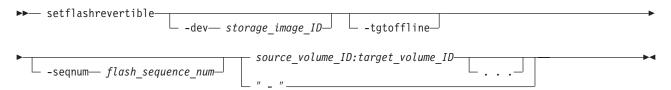
### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy consistency group for logical subsystem 01 successfully reset.

# setflashrevertible

The setflashrevertible command modifies a FlashCopy volume pair that is part of a Global Mirror relationship to revertible. This command must be run before the FlashCopy pair can be committed or reverted. Once a pair is revertible, the data can be committed to the target to form a new consistency, or reverted back to the last consistency.



#### **Parameters**

Note: The nocp, record, persist, tgtinhibit (target inhibit) options are included automatically when this command processes.

# -dev storage image ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source volume and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

# -tgtoffline

(Optional) Causes an establish FlashCopy volume pair command to be rejected if the target volume is online for host system access. This flag applies only to CKD volumes.

# -segnum flash sequence num

(Optional) Associates the FlashCopy relations that are changed with the specified sequence number. Only the relations that are successfully modified by the command will get the specified sequence number, leaving the ones that failed with the previous number (if previously specified). The sequence number is a four digit hexadecimal number (0000 - FFFF). The default is 0000.

This parameter is not supported for machine type 2105.

Example: 0010

# source volume ID:target volume ID . . . | -

(Required) Modifies FlashCopy relationships for the source and target volume pairs with the IDs specified. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified or you specify a value for the devid variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal "XYZZ", where "XY" is a logical subsystem (LSS) number (00 - FE), and "ZZ" is a volume number (00 - FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

# **Example (2107)**

# Invoking the setflashrevertible command

dscli>setflashrevertible -dev IBM.2107-75FA120 0100:0200

# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy volume pair 0100:0200 successfully made revertible.

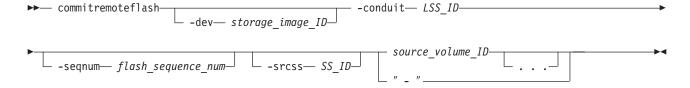
# Remote FlashCopy commands

This section contains commands that are used to configure Remote FlashCopy relationships and to display Remote FlashCopy information. Remote FlashCopy commands are used to process what was formerly known as inband FlashCopy transactions. These types of transactions can not be handled through the GUI.

Use the following commands to configure Remote FlashCopy relationships and to display Remote FlashCopy information. Also, see the Processing Remote FlashCopy (inband) transactions scenario for more details.

# commitremoteflash

The commitremoteflash command commits data to a target volume to form a consistency between the remote source and target FlashCopy pair. Before you use this command, you must first issue either the command mkflash or mkremoteflash with the -record and -persist flags. After the pair is established, you must then issue either the setflashrevertible or setremoteflashrevertible command against the pair.



#### **Parameters**

# -dev storage image ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for all the source volumes and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

#### -conduit LSS ID

(Required) Specifies the source logical subsystem (LSS) of an existing Remote Mirror and Copy relationship that is to be used as a conduit for communicating

with the remote storage image. The source volume IDs that are specified in source volume ID:target volume ID must serve as secondary volumes in a Remote Mirror and Copy relationship in which one of the conduit LSS volumes serves as a primary volume. Accepts a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is storage image ID/XX, where "XX" is a hexadecimal number in the range (00 -FE).

Example: IBM.2107-75FA120/00

# -seqnum flash\_sequence\_number

(Optional) Specifies that the commit is to be performed only on those source volumes associated with the sequence number specified. The sequence number is a four-digit hexadecimal number in the range (0000 - FFFF). The default value is 0000.

This parameter is not supported for machine type 2105.

Example: 0010

# -srcss SS ID

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The subsystem ID is a four-digit hexadecimal number in the range (0001 - FFFF). When this flag is used, all source volumes must be within the same logical subsystem.

This flag is required only for IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: FF10

#### source volume ID . . . | -

(Required) Commits remote FlashCopy relationships for the source volumes with the IDs specified. If multiple relationships exist for a source volume, then the chosen pair is the one with the enabled -record flag. You must separate multiple source volume IDs with spaces.

Accepts fully qualified volume IDs, which includes storage image ID, or a shortened version without the storage image ID if either the -dev flag is specified or you specify a value for the devid variable in your profile file.

The shortened volume ID format is hexadecimal "XYZZ", where "X" is an address group number (0 - F), "XY" is a logical subsystem (LSS) number (00 -FE), and "ZZ" is a volume number (00 - FF) that is contained by the logical subsystem.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a fully qualified volume ID: IBM.2107-75FA120/0001

Example of a shortened version: 0001

Example of IDs: 0001 0003 0008

# **Example (2107)**

#### Invoking the commitremoteflash command

dscli>commitremoteflash -dev IBM.2107-75FA120 -conduit IBM.2107-75FA150/10 0100

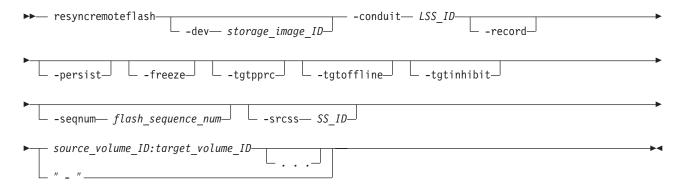
#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully committed.

# resyncremoteflash

The resyncremoteflash command (formerly called the incremoteflash command and associated with the incremental FlashCopy process) increments an existing remote FlashCopy pair that has been established with the -record and -persist flags. When a pair is established with the -record and -persist flags, the pair initially synchronizes and then a record of all host writes to the source is maintained in the source volumes. When the resyncremoteflash command is issued on that pair, the new writes to the source are copied to the target. The specified flags in this command replace the flags in the existing relationship. In order to keep the initial -record and -persist flags, they must be specified using the resyncremoteflash command.



#### **Parameters**

### -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes and you do not specify a value for the devid variable in your profile file.

Example: IBM.2107-75FA120

#### -conduit LSS ID

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy relationship that is to be used as a conduit for communicating with the remote storage image. The source volume IDs that are specified in source\_volume\_ID:target\_volume\_ID must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume. This command accepts a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is storage image ID/XX, where "XX" is a hexadecimal number in the range (00 -FE).

Example: IBM.2107-75FA120/00

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Select this flag if you intend to use the resyncremoteflash command again with this pair. The -persist flag is automatically selected when this flag is selected.

#### -persist

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until it is broken by a rmremoteflash command. This flag is automatically selected when the -record flag is selected. Select this flag along with the -record flag if you will be using this volume pair with the resyncremoteflash, reverseremoteflash, or setremoteflashrevertible commands.

#### -freeze

(Optional) Triggers the queue full condition for the source volume. All writes to the source volume are queued by the host and are written after the queue full condition is reset.

During the queue full condition, the source volume reports long busy status.

The queue full condition is reset by an extended long busy timeout. The timeout condition affects all FlashCopy source volumes that are contained within a respective logical subsystem and that are established or modified with the -freeze flag.

# -tgtpprc

(Optional) Allows the FlashCopy target volume to be a remote mirror and copy source volume.

# -tatoffline

(Optional) Causes the resyncremoteflash command to be rejected if the target volume is online for host system access. This flag applies only to count key data volumes.

# -tgtinhibit

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

# -seqnum flash\_sequence\_num

(Optional) Associates the FlashCopy relations that are established with the specified sequence number. You can use this sequence number as an identifier for a relation or group of relations. Only the relations that are modified successfully by the resyncremoteflash command will get the specified sequence number, leaving the ones that fail with the previous one ( if they were previously specified ). The sequence number is a four-digit hexadecimal number (0000 -FFFF). The default is 0000.

This parameter is not supported for machine type 2105.

Example: 0010

#### -srcss SS ID

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The subsystem ID is a four-digit hexadecimal number in the range (0001 - FFFF). When this flag is used, all source volumes must be within the same logical subsystem.

This flag is required only for IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: FF10

## source\_volume\_ID:target\_volume\_ID . . . | -

(Required) Increments a remote FlashCopy relationship for the source and target volume pairs with the specified IDs. This command accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without

storage image IDs, if the -dev flag is specified, You specify a value for the devid variable in your profile file. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal "XYZZ", where "XY" is a logical subsystem (LSS) number (00 - FE), and "ZZ" is a volume number (00 - FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

# **Example (2107)**

# Invoking the resyncremoteflash command

dscli>resyncremoteflash -dev IBM.2107-75FA120 -conduit IBM.2107-75FA150/10 0100:0200

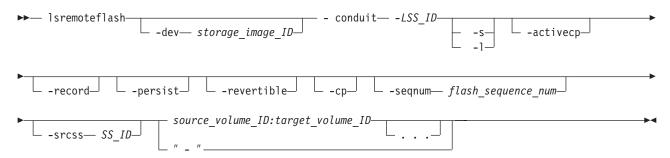
# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully incremented.

#### Isremoteflash

The Isremoteflash command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list.



# **Parameters**

Note: All settings apply to all FlashCopy Pairs specified.

-dev storage image ID

(Optional) Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes.

Example: IBM.2107-75FA120

#### -conduit LSS ID

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy (formerly PPRC) relationship that is to be used as a conduit for communicating with the remote storage image. The source volume IDs that are specified in source\_volume\_ID:target\_volume\_ID must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume. Accepts a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is storage\_image\_ID/XX, where XX is a hexadecimal number in the range (00 -FE).

Example: IBM.2107-75FA120/00

- -s (Optional) Displays FlashCopy pair IDs. You cannot use the -l and the -s flags together.
- (Optional) Displays the default detailed output plus Out-of-Sync Tracks and Date Created. You cannot use the -I and the -s flags together.

(Optional) Displays the FlashCopy relationships where their background copy process is active.

Note: The background copy process might be inactive for a while before it starts, according to an internal algorithm.

#### -record

(Optional) Displays the FlashCopy relationships that were established with the -record flag.

#### -persist

(Optional) Displays the FlashCopy relationships that were established with the -persist flag.

## -revertible

(Optional) Displays the FlashCopy relationships that were established with the -revertible flag.

#### -ср

(Optional) Displays the FlashCopy relationships that were established with the -cp flag.

**Note:** When you issue this command, with the cp option on a remote FlashCopy relationship that was created with the persistent option, the relationship will not be removed. Instead, the source volume is copied to the target volume. To display whether the relationship is deleted, issue the Isremoteflash command.

# -segnum flash sequence number

(Optional) Displays the FlashCopy relationships that are associated with the specified sequence number. The sequence number is a four digit hexadecimal number (0000 - FFFF). The default is 0000.2.

Example: 0010

This parameter is not supported for machine type 2105.

# -srcss SS ID

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1. When you specify SS IDs, the source volumes are restricted to one LSS.

Example: FF10

```
source volume ID:target volume ID . . . | -
```

(Required) Displays the FlashCopy relationships for the source and target volume pairs with the specified IDs, or displays the FlashCopy relationships for a single volume ID if the source volume ID is specified.

Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal XYZZ, where XY is a logical subsystem (LSS) number (00 - FE), and ZZ is a volume number (00 - FF) that is contained by a logical subsystem.

You must separate multiple IDs with spaces. You can specify FlashCopy pair IDs and a range of FlashCopy pair IDs, or you can specify volume IDs and a range of volume IDs. You cannot specify a combination of FlashCopy pair IDs and volumes IDs.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified volume ID pair: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

#### **Example (2107)**

# Invoking the Isremoteflash command

```
dscli>lsremoteflash -l -fullid -dev IBM.2107-75FA120
-conduit IBM.2107-75FA150/10 IBM.2107-75FA120/0100:IBM.2107-75FA120/0200
```

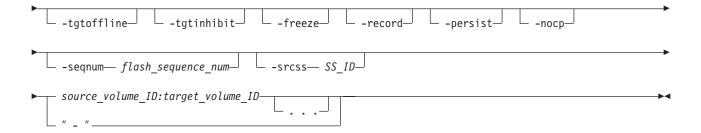
## The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
ID SrcLSS Sequence Num Active Copy Recording Persistent Revertible
Source Write Enabled Target Write Enabled Background Copy
 OutOfSync Tracks DateCreated DateSynced
0100:0200 01 10 Disabled Disabled Disabled Disabled
Enabled Disabled Disabled
      12/01/2003 02:20:00 12/01/2003 02:23:47
```

#### mkremoteflash

The mkremoteflash command initiates a remote copy from source volumes to target volumes through a remote mirror and copy (formerly PPRC) relationship.

```
▶► mkremoteflash
                                                -conduit— LSS_ID-
                     -dev— storage image ID—
```



## **Parameters**

# -dev storage image ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes.

Example: IBM.2107-75FA120

#### -conduit LSS ID

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy relationship that is to be used as a conduit for communicating with the remote storage image. The source volume IDs that are specified in source\_volume\_ID:target\_volume\_ID must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume. Accepts a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is storage\_image\_ID/XX, where XX is a hexadecimal number in the range (00-FE).

Example: IBM.2107-75FA120/00

### -tgtpprc

(Optional) Allows the FlashCopy target volume to be a remote mirror and copy source volume.

## -tgtoffline

(Optional) Causes the mkremoteflash command to be rejected if the target volume is online for host system access. This flag applies only to CKD volumes.

# -tgtinhibit

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

#### -freeze

(Optional) Triggers the queue full condition for the source volume. All writes to the source volume are queued by the host and are written after the queue full condition is reset.

During the queue full condition, the source volume reports long busy status.

The queue full condition is reset by an extended long busy timeout or by a unfreezeflash command. This command must be run from a new session that is connected directly to the storage image.

#### -record

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Select this flag when you establish an initial FlashCopy volume pair that you intend to use with the resyncremoteflash command. The -persist flag is automatically selected when this flag is selected.

#### -persist

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until broken by a rmremoteflash command. This flag is automatically selected when the -record flag is selected. Select this flag along with the -record flag if you will be using this volume pair with the commands resyncremoteflash, reverseremoteflash, or setremoteflashrevertible.

#### -nocp

(Optional) Inhibits background copy. Data will be copied from the source volume to the target volume only if a track on the source volume is modified. The FlashCopy volume pair relationship remains indefinitely until it is broken by a rmremoteflash command, or until all tracks on the source volume are modified.

# -seqnum flash\_sequence\_num

(Optional) Associates the FlashCopy relations that are established with the specified sequence number. This sequence number can be used as an identifier for a relation or group of relations. The sequence number is a four-digit hexadecimal number (0000-FFFF). The default is 0000.

Example: 0010

This parameter is not supported for machine type 2105.

#### -srcss SS ID

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1. 3. When you specify SS IDs, the source volumes are restricted to one LSS.

Example: FF10

# source\_volume\_ID:target\_volume\_ID . . . | -

(Required) Establishes a remote FlashCopy relationship for the source and target volume pairs with the IDs specified. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal XYZZ, where XY is a logical subsystem (LSS) number (00-FE), and ZZ is a volume number (00-FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

# **Example (2107)**

#### Invoking the mkremoteflash command

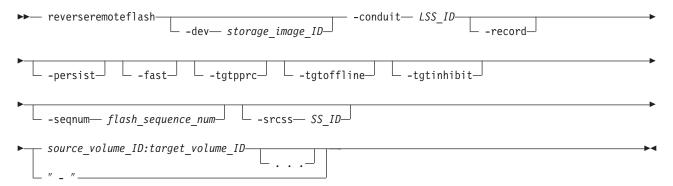
# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy Pair ID 0100:0200 successfully initiated. Use the lsremoteflash command to determine copy completion.

#### reverseremoteflash

The reverseremoteflash command restores an existing remote FlashCopy pair that was previously established with the -record and -persist flags. When a pair is established with the -record and -persist flags, the pair will initially synchronize and then a record will be kept of all host writes to the source. When this command is issued on that pair, the new data on the source will be overwritten with the previously saved data on the target. The pair will be permanently reversed, meaning the source is now the target and the target now the source. The flags specified in this command will replace the flags in the existing relationship. In order to keep the pair with the -record and -persist flags, they must be specified.



#### **Parameters**

## -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source and target volumes.

Example: IBM.2107-75FA120

#### -conduit LSS ID

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy (PPRC) relationship that is to be used as a conduit for communicating with the remote storage image. The source volume IDs that are specified in source\_volume\_ID:target\_volume\_ID must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume. Accepts a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is storage\_image\_ID/XX, where XX is a hexadecimal number in the range (00-FE).

Example: IBM.2107-75FA120/00

#### -record

(Optional) Records the changed tracks on both volumes within a FlashCopy pair. Select this flag when you establish an initial FlashCopy volume pair that you intend to use with the resyncremoteflash command. The -persist flag is automatically selected when this flag is selected.

# -persist

(Optional) Retains the FlashCopy relationship after the background copy completes. The FlashCopy relationship between the source and the target volumes remains indefinitely until broken by a rmremoteflash command. This flag is automatically selected when the -record flag is selected. Select this flag along with the -record flag if you will be using this volume pair with the resyncremoteflash, reverseremoteflash, or setremoteflashrevertible commands.

#### -fast

(Optional) Specify this flag when the reverseremoteflash command will be issued without the background copy completing.

(Optional) Allows the FlashCopy target volume to be a remote mirror and copy source volume also.

#### -tatoffline

(Optional) Causes the reverseremoteflash command to be rejected if the target volume is online for host system access. This flag only applies to CKD volumes.

(Optional) Prevents host system write operations to the target while the FlashCopy relationship exists.

## -segnum flash sequence num

(Optional) Associates the FlashCopy relations that are reversed with the specified sequence number. Only the relations that are successfully modified by the command will get the specified sequence number, leaving the ones that failed with the previous number (if previously specified). The sequence number is a four digit hexadecimal number (0000-FFFF). The default is 0000.

Example: 0010

This parameter is not supported for machine type 2105.

#### -srcss SS ID

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.3. When you specify SS\_IDs, the source volumes are restricted to one LSS.

Example: FF10

#### source\_volume\_ID:target\_volume\_ID . . . | -

(Required) Reverses a remote FlashCopy relationship for the source and target volume pairs with the IDs specified. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal XYZZ, where XY is a logical subsystem (LSS) number (00-FE), and ZZ is a volume number (00-FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

# **Example (2107)**

# Invoking the reverseremoteflash command

dscli>reverseremoteflash -dev IBM.2107-75FA120 -conduit IBM.2107-75FA150/10 0100:0200

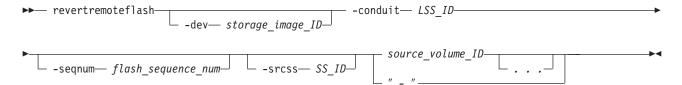
# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully reversed.

#### revertremoteflash

The revertremoteflash command overwrites new data with data saved at the last consistency formation. To use this command, you must first issue the mkremoteflash command with the -record and -persist flags. You must then issue the setremoteflashrevertible command against the pair.



## **Parameters**

# -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source volume.

Example: IBM.2107-75FA120

# -conduit LSS ID

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy (formerly PPRC) relationship that is to be used as a conduit for communicating with the remote storage image. The source volume IDs that are specified in source volume ID:target volume ID must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume. Accepts a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is storage image ID/XX, where XX is a hexadecimal number in the range (00-FE).

Example: IBM.2107-75FA120/00

# -seqnum flash\_sequence\_num

(Optional) When a FlashCopy sequence number is specified, the revertremoteflash operation is performed only on those relations associated with the specified number. The sequence number is a four-digit hexadecimal number (0000 - FFFF). The default is 0000.

Example: 0010

This parameter is not supported for machine type 2105.

#### -srcss SS ID

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1. 3. When you specify *SS\_IDs*, the source volumes are restricted to one logical subsystem.

Example: FF10

source\_volume\_ID . . . | -

(Required) Reverts a remote FlashCopy relationship for the source volume with the ID specified. The chosen FlashCopy pair is the one established or modified with the -record flag. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified. You must separate multiple source volume IDs with spaces.

The format of a volume ID is hexadecimal *XYZZ*, where *XY* is a logical subsystem (LSS) number (00–FE), and *ZZ* is a volume number (00 - FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the hyphen (-) is specified.

Example of a fully qualified volume ID: IBM.2107-75FA120/0001

Example of a shortened version: 0001

Example of multiple IDs: 0001 0003 0008

## **Example (2107)**

# Invoking the revertremoteflash command

dscli>revertremoteflash -dev IBM.2107-75FA120 -conduit IBM.2107-75FA150/10 0100

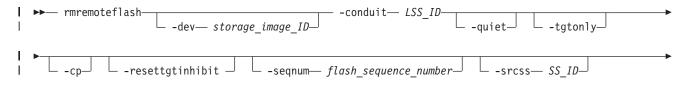
#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully reverted to the previous consistency.

#### rmremoteflash

The rmremoteflash command removes a relationship between remote FlashCopy volume pairs. **Note**:



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### **Parameters**

#### Note:

- Invoking this command and using the -cp parameter on a FlashCopy relationship that was previously marked with -persist will not remove the relationship. Instead, the source volume is copied to the target volume.
- Invoking this command and using the -resettgtinhibit parameter does not
  withdraw the relationship, but resets the -tgtinhibit parameter option if it
  was previously set.
- · All settings apply to all specified FlashCopy pairs.
- The **-seqnum** parameter is not supported for model 2105.
- When SS\_IDs are specified, the source volumes are restricted to 1 LSS.

## -dev storage\_image\_ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes.

Example: IBM.2107-75FA120

#### -conduit LSS\_ID

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy (formerly PPRC) relationship that is to be used as a conduit for communicating with the remote storage image. The source volume IDs that are specified in <code>source\_volume\_ID:target\_volume\_ID</code> must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume.

This parameter allows the use of a fully qualified LSS ID, which includes the storage image ID. The fully qualified LSS ID format is storage\_image\_ID/XX, where XX is a hexadecimal number in the range (00–FE).

Example: IBM.2107-75FA120/00

#### -quiet

(Optional) Turns off the confirmation prompt for this command.

#### -tatonly

(Optional) When you use this parameter, specify only the target volume of the remote FlashCopy pair to remove the relationship. In addition, the Copy Indicator for the target volume is reset.

**Note:** You can use this parameter only with fixed block volumes.

#### -cp

(Optional) Changes the FlashCopy relationship from No Copy to Copy and copies the remaining source volume tracks to the target volume. The relationship is removed when all the data is copied unless the relationship is persistent. When this parameter is specified, the copy is processed for all volume pairs where the source volume ID is identical to the source volume that is specified in the command.

#### -resettgtinhibit

(Optional) The -resettgtinhibit parameter resets the flag that does not allow host system write operations to the target ID while the FlashCopy relationship exists, if it was previously set.

**Note:** If this is the only specified parameter, the relationship is not withdrawn. Only the **-tgtinhibit** parameter is reset.

#### -seqnum flash\_sequence\_num

(Optional) When a FlashCopy sequence number is specified, the rmremoteflash operation is performed only on those relations that are associated with the specified number. The sequence number is a four-digit hexadecimal number (0000 - FFFF). The default is 0000.

Example: 0010

This parameter is not supported for machine type 2105.

#### -srcss SS ID

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1. 4. When you specify SS IDs, the source volumes are restricted to one logical subsystem.

Example: FF10

## source\_volume\_ID:target\_volume\_ID . . . | -

(Required) Removes remote FlashCopy relationships for the source and target volume pairs with the IDs that are specified. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev parameter is specified. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume. When the **-tgtonly** parameter is used, enter volume IDs. Volume pair IDs cannot be used with the **-tgtonly** parameter.

The format of a volume ID is hexadecimal XYZZ, where XY is a logical subsystem (LSS) number (00 – FE), and ZZ is a volume number (00–FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

#### **Example (2107)**

#### Invoking the rmremoteflash command

dscli>rmremoteflash -dev IBM.2107-75FA120 -conduit IBM.2107-75FA150/10 0100:0200

## The resulting output

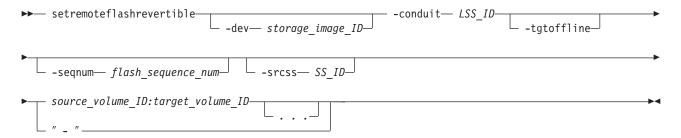
Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to remove the FlashCopy pair 0100:0200? [y/n]: Y

Remove initiated successfully on FlashCopy pair 0100:0200. Use the lsremoteflash command to determine if the relation is deleted.

#### setremoteflashrevertible

The setremoteflashrevertible command modifies a remote FlashCopy volume pair that is part of a Global Mirror relationship to revertible. This command must be run before the FlashCopy pair can be committed or reverted. Once a pair is revertible, the data can be committed to the target to form a new consistency, or reverted back to the last consistency.



## **Parameters**

Note: The nocp, record, persist, tgtinhibit (target inhibit) options are included automatically when this command processes.

### -dev storage image ID

(Optional) Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source volume.

Example: IBM.2107-75FA120

### -conduit LSS ID

(Required) Specifies the source logical subsystem (LSS) of an existing remote mirror and copy (formerly PPRC) relationship that is to be used as a conduit for communicating with the remote storage image. The source volume IDs that are specified in source\_volume\_ID:target\_volume\_ID must serve as secondary volumes in a remote mirror and copy relationship in which one of the conduit LSS volumes serves as a primary volume. Accepts a fully qualified LSS ID. which includes the storage image ID. The fully qualified LSS ID format is storage\_image\_ID/XX, where "XX" is a hexadecimal number in the range (00 -FE).

Example: IBM.2107-75FA120/00

#### -tgtoffline

(Optional) Causes an establish FlashCopy volume pair command to be rejected if the target volume ID is online for host system access. This flag applies only to CKD volumes.

### -segnum flash sequence num

(Optional) Associates the remote FlashCopy relationships that are changed with the specified sequence number. Only the relationships that are successfully modified by the command will get the specified sequence number, leaving the

ones that failed with the previous number (if previously specified). The sequence number is a four-digit hexadecimal number (0000 - FFFF). The default is 0000.

Example: 0010

This parameter is not supported for machine type 2105.

### -srcss SS ID

(Optional) Specifies the subsystem ID of the source logical subsystem at the remote site. The ID is in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: FF10

```
source_volume_ID:target_volume_ID . . . | -
```

(Required) Modifies the remote FlashCopy relationships for the source and target volume pairs with the IDs specified. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified. You must separate multiple FlashCopy pair IDs with spaces.

A FlashCopy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a FlashCopy relationship. You must separate the two volume IDs of a FlashCopy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal XYZZ, where XY is a logical subsystem (LSS) number (00-FE), and ZZ is a volume number (00-FF) that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified FlashCopy pair ID: IBM.2107-75FA120/0001:IBM.2107-75FA120/0004

Example of a shortened version: 0001:0004

Example of multiple pairs: 0001:0004 0003:00FF 0008:000C

## **Example (2107)**

#### Invoking the setremoteflashrevertible command

dscli>setremoteflashrevertible -dev IBM.2107-75FA120 0100:

## The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

FlashCopy pair 0100:0200 successfully modified to the revertible state.

# Remote Mirror and Copy path commands

This section contains commands that are used to create and delete Remote Mirror and Copy (formerly PPRC) paths and to display Remote Mirror and Copy path information.

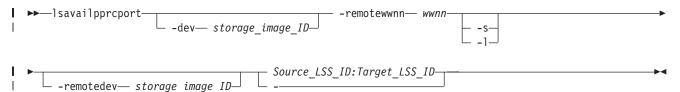
Use the following commands to create and delete Remote Mirror and Copy paths and to display Remote Mirror and Copy path information.

# Isavailpprcport

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The Isavailpprcport command displays a list of ESCON or fibre channel I/O ports that can be defined as remote mirror and copy (formerly PPRC) paths. The DS8000 supports only fibre channel ports. The Enterprise Storage Server (2105 machine type) supports ESCON ports.



## **Parameters**

#### -dev storage\_image\_ID

(Optional). Specifies the source volume storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source logical subsystem.

Example: IBM.2107-75FA120

#### -remotewwnn wwnn

(Required). Specifies the worldwide node name (WWNN). The format is a 16-hexadecimal ID.

**Note:** You want to use the WWNN that is associated with the storage image. Run the **Issi** or **showsi** command to obtain this number. If you use the WWNN that is associated with the storage unit, this command fails.

WWNN example: 12341234000A000F

- **-s** (Optional). Displays the local port ID. You cannot use the -I and the -s parameters together.
- -I (Optional). Displays all fields. You cannot use the -I and the -s parameters together.

#### -remotedev storage image ID

(Optional). Specifies the target volume storage image that contains the queried I/O ports. This ID consists of manufacturer, type, and serial number. This parameter is required if you specify the -dev parameter.

Example: IBM.2107-75FA120

#### Source LSS ID:Target LSS ID | -

(Required). Queries I/O ports that are available for a remote mirror and copy path relationship for the source and target LSSs. Accepts fully qualified LSS IDs, which includes the storage image ID or shortened version without the storage image ID, if the -dev parameter is specified.

A remote mirror and copy path LSS pair ID consists of two LSS IDs, one designated as the source LSS and the other as the target LSS for a remote mirror and copy path relationship. The two LSS IDs must be separated with a colon and no spaces. The first LSS ID is the source LSS. The second LSS ID is the target LSS.

The fully qualified LSS ID format is storage\_image\_ID/xx, where 'xx' is a hexadecimal number in the range '00 - FE'.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example pair: 00:00

Example of multiple pairs: 00:00 01:01 02:02

# **Example**

Note: The following tables represent the headers that are displayed on the output report that is associated with the Isavailpprcport command using the -I parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

## Invoking the Isavailpprcport command

dscli>lsavailpprcport -l -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 -remotewwnn 12341234000A000F 01:01

### The resulting output

ESCON port information displays for the 2105 machine type.

Local port	Attached port	Туре	Switch ID	Switch port
10100	10200	FCP	N/A	N/A
10150	10620	ESCON	N/A	N/A
10200	N/A	ESCON Switch	IBM.111.2222. 75113AB	110
10250	N/A	ESCON Switch	IBM.111.2222. 75113AB	120

## Report field descriptions

#### Local port

Specifies the fully qualified unique Port ID on the local storage unit. FCP and ESCON port IDs are displayed as follows:

## FCP port ID

Four hexadecimal characters in the format 0xEEAP, where 'EE' is a port enclosure number (00 - 3F), 'A' is the adapter number (0 - F), and 'P' is the port number (0 - F). The FCP port ID number is prefixed with the letter I.

## **ESCON port ID**

Four hexadecimal characters in the format 0xEEAP, where 'EE' is a port enclosure number (04 - 07), 'A' is the adapter number (0 - 3), and 'P' is the port number (0 - 1). The ESCON port ID number is prefixed with the letter I.

Note: When you specify the -s parameter, the local port information is the only information displayed on the report.

## Attached port

Specifies the fully qualified unique Port ID on the attached storage unit. FCP and ESCON port ID numbers are displayed in the format that is described for Local port. However, if there is an ESCON Switch value, the value displayed in this column is N/A (not applicable).

Specifies the connection type. FCP is the only applicable value for a 2107 Type or 1750 machine type. For a 2105 machine type, you can have a value of ESCON or ESCON Switch.

#### Switch ID

Specifies the Switch ID for ESCON Switch connections.

Note: For FCP and direct ESCON, the displayed value in this field is N/A (not applicable).

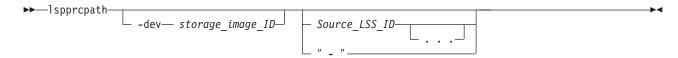
### Switch port

Specifies the Port ID on the Switch device that is connected to the attached ESS. The Switch port ID component is two hexadecimal characters in the format 0xPP, where 'PP' is a port number (00 - ff). The number is prefixed with the letter I.

Note: For FCP and direct ESCON, the value of this field is N/A (not applicable).

# **Ispprcpath**

The Isppropath command displays a list of existing remote mirror and copy (formerly PPRC) path definitions.



### **Parameters**

## -dev storage image ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the source LSS IDs and source port IDs.

Example: IBM.2107-75FA120

Source LSS ID . . . | -

(Required if -lss specified). Displays the remote mirror and copy paths that are defined for the specified source LSS IDs.

Accepts either a fully qualified LSS IDs, including the storage image ID, or a shortened version if the -dev flag is specified. The fully qualified LSS ID format is storage\_image\_id/xx, where 'xx' is a logical subsystem (LSS) hexadecimal number '00-FE'.

You must separate multiple LSS IDs with spaces.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example: 00

Example of multiple source LSS IDs: 00 01 02

## **Example (2107)**

### Invoking the Ispprepath command

dscli>lspprcpath -fullid -dev IBM.2107-75FA120 10

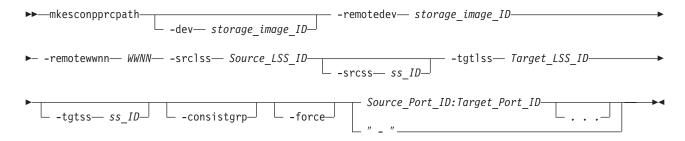
### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Src Tgt State SS Port Attached Port IBM.2107-75FA120/10 IBM.2107-75FA150/10 Established 0010 IBM.2107-75FA120/I0100 IBM.2107-75FA150/I0100 IBM.2107-75FA120/10 IBM.2107-75FA150/11 Established 0011 IBM.2107-75FA120/I0100 IBM.2107-75FA150/I0100 IBM.2107-75FA120/10 IBM.2107-75FA150/12 Established 0012 IBM.2107-75FA120/I0100 IBM.2107-75FA150/I0100 IBM.2107-75FA120/10 IBM.2107-75FA150/13 Established 0013 IBM.2107-75FA120/I0100 IBM.2107-75FA150/I0100

## mkesconpprcpath

The mkesconpprepath command creates a remote mirror and copy (formerly PPRC) path between source and target logical subsystems over an ESCON connection. The command allows you to specify ESCON direct and ESCON switch connections. Use this command only with IBM TotalStorage Enterprise Storage Servers (2105, Model 800 and Model 750).



#### **Parameters**

#### Note:

- 1. The mkesconpprepath command is applicable **only** for the IBM TotalStorage Enterprise Storage Server (2105, Model 800 and Model 750). Models 2107 and 1750 support only fiber channel connections.
- 2. When you specify a switch port ID as the target port, specify the outgoing port that is connected to the remote ESS and not to the incoming port that is connected to the local ESS.

#### -dev storage\_image\_ID

(Optional). Specifies the source storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not fully qualify the source LSS ID.

Example: IBM.2105-75FA120

## -remotedev storage\_image\_ID

(Optional). Specifies the remote storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not fully qualify the target LSS ID.

Example: IBM.2105-75FA120

### -srclss Source LSS ID

(Required). Specifies the source logical subsystem (LSS) ID. Accepts a fully qualified LSS ID, which includes the storage image ID or a shortened version

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without the storage image ID, if the -dev parameter is used. The fully qualified LSS ID format is storage\_image\_ID/xx, where 'xx' is a hexadecimal number in the range '00 - FE'.

#### -srcss ss\_ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

## -tgtlss Target\_LSS\_ID

(Required). Specifies the target logical subsystem (LSS) ID. Accepts a fully qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID, if the -remotedev parameter is used. The fully qualified LSS ID format is storage\_image\_ID/xx, where 'xx' is a hexadecimal number in the range '00 - FE'.

#### -remotewwnn WWNN

(Required). Specifies the worldwide node name. The format is a 16-hexadecimal ID.

Example: 12341234000A000F

### -tgtss ss\_ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

### -consistgrp

(Optional). Creates a consistency group for the remote mirror and copy volume pairs that are associated with the PPRC paths that are established by this command. A remote mirror and copy consistency group is a set of remote mirror and copy volume pairs that have the same source and target LSS.

Normally, when an error occurs in a member of a remote mirror and copy volume pair, the volume is put in a suspended state. However, if the volume is participating in a consistency group, it is placed in a long busy state.

#### -force

(Optional). Creates a new remote mirror and copy path even if the specified remote mirror and copy path already exists.

### Source\_Port\_ID:Target\_Port\_ID . . . | -

(Required). Establishes a remote mirror and copy path between the source and target ports for the specified source and target logical subsystems. The source port must be an ESCON I/O port that is configured for point-to-point or switch topology. The source port is enabled automatically for remote mirror and copy primary I/O operations. The target port must be a switch I/O port that is configured for point-to-point or switch topology. The target port is enabled automatically for remote mirror and copy primary I/O operations.

**Note:** Do not specify a target port ID when you specify an ESCON direct connection. Instead, specify only the source port ID.

Accepts only nonfully qualified port IDs, which does not include the storage image ID. A remote mirror and copy path port pair ID consists of two port IDs. The first is designated as the source port and the second as the target port for the remote mirror and copy path. You must separate the two port IDs with a colon and no spaces. A direct ESCON I/O port ID is four hexadecimal characters in the format 0xEEAP, where 'EE' is a port enclosure number '00 -3F', 'A' is the adapter number '0 - F', and 'P' is the port number '0 - F'. This number is prefixed with the letter I. A switch ESCON I/O port ID is two hexadecimal characters in the range '00 - FF'. This number is prefixed with the letter I.

Accepts up to eight remote mirror and copy path port pair IDs. You must separate multiple port pair IDs with spaces.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example pair: I1A10:I20

Example of a source ESCON port and target switch port pair: I1A10:I20

Example of multiple pairs: I1A10:I20 I1A11:I21 I1A12 (the last object identifies an ESCON connection)

## Example (2105 use only)

## Invoking the mkesconpprepath command

dscli>mkesconpprcpath -dev IBM.2105-75FA120 -remotedev IBM.2105-75FA150 -srclss 01 -tgtlss -remotewwnn 12341234000A000F 01 I0100:I20 I0110:I21

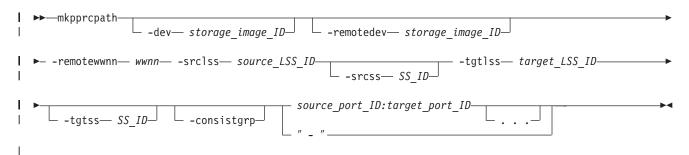
### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2105-75FA120

PPRC path IBM.2105-75FA120/01:IBM.2105-75FA150/01 successfully created.

#### mkpprcpath

The mkpprcpath command establishes or replaces a remote mirror and copy (formerly PPRC) path between source and target logical subsystems (LSSs) over a fibre channel connection. This is the only supported connectivity for machine types 2107 and 1750. Paths can be established between the following machine types: 2105:2105, 2107:2107, 2107:1750, 2107:2105, 1750:1750, 1750:2105.



#### **Parameters**

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### -dev storage\_image\_ID

(Optional) Specifies the source storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified source port ID.

Example: IBM.2107-75FA120

#### -remotedev storage\_image\_ID

(Optional) Specifies the ID of the secondary storage image, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified target port ID or if the -dev parameter is used.

Example: IBM.2107-75FA150

#### -remotewwnn wwnn

(Required) Specifies the worldwide node name of the secondary storage image. The format is a 16-hexadecimal ID.

**Note:** Use the worldwide node name that is associated with the storage image. Run the Issi or showsi command to obtain this number. If you use the WWNN that is associated with the storage unit, this command fails.

Example: 12341234000A000F

### -srclss source LSS ID

(Required) Specifies the source logical subsystem ID. Use a fully qualified LSS ID, which includes the storage image ID, or use a shortened version without the storage image ID, if the -dev parameter is used. The fully qualified LSS ID format is storage image ID/XX, where XX is a hexadecimal number in the range (00 - FE).

Example of a fully qualified LSS ID: IBM.2107-75FA120/00

Example of a shortened version: 00

#### -srcss SS ID

(Optional) Specifies the subsystem ID of the primary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### -tgtlss target\_LSS\_ID

(Required) Specifies the target logical subsystem ID. Use a fully qualified LSS ID, which includes the storage image ID, or use a shortened version without the storage image ID if the -remotedev parameter is used. The fully qualified LSS ID format is storage image ID/XX, where XX is a hexadecimal number in the range (00 - FE).

Example of a fully qualified LSS ID: IBM.2107-75FA150/01

Example of a shortened version: 01

### -tatss SS ID

(Optional) Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### -consistgrp

(Optional) Creates a consistency group for the remote mirror and copy volume pairs. A remote mirror and copy consistency group is a set of remote mirror and copy volume pairs that have the same source and target LSS.

Normally, when an error occurs in a member of a remote mirror and copy volume pair, the storage unit places the volume in a suspended state. However, if the volume participates in a consistency group, it is placed in a long busy state.

```
source_port_ID:target_port_ID . . . | -
```

(Required) Establishes a remote mirror and copy path between the source and target ports for the specified source and target logical subsystems. The source and target ports must be fibre channel I/O ports that are configured for point-to-point or switched fabric topology. They are enabled automatically for remote mirror and copy secondary I/O operations. They are not enabled for FICON I/O operations.

Use fully qualified port IDs, which includes the storage image ID, or use a shortened version without the storage image ID if the -dev and -remotedev parameters are specified. A remote mirror and copy path port pair ID consists of two port IDs. Designate the first as the source port and the second as the target port for the remote mirror and copy path. You must separate the two port IDs with a colon and no spaces. A port ID is four hexadecimal characters in the format "EEAP", where EE is a port enclosure number (00 - 3F), A is the adapter number (0 - F), and P is the port number (0 - F). This number is prefixed with the letter I.

Accepts up to eight remote mirror and copy path port pair IDs. You must separate multiple port pair IDs with spaces.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified remote mirror and copy path pair: IBM.2107-75FA120/I1A10:IBM.2107-75FA150/I2A20

Example of the shortened version: I1A10:I2A20

Example of multiple pairs: I1A10:I2A20 I1A11:I2A21 I1A12:I2A22

## **Example (2107)**

#### Invoking the mkpprcpath command

```
dscli>mkpprcpath -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 -srclss 01 -tgtlss 01 -remotewwnn 12341234000A000F I0100:I0100
```

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

PPRC path 01:01 successfully created.

#### rmpprcpath

The rmpprcpath deletes a remote mirror and copy (formerly PPRC) path.

```
► rmpprcpath _____ -dev— storage_image_ID— -remotedev— storage_image_ID—
```



### **Parameters**

### -dev storage\_image\_ID

(Optional) Specifies the source storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified source LSS ID.

Example: IBM.2107-75FA120

### -remotedev storage\_image\_ID

(Optional) Specifies the target storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified target LSS ID or if the -dev flag is used.

Example: IBM.2107-75FA150

## -type fcp | escon

(Optional) The type of the connection over which the path was created.

fcp Fibre-channel protocol

**escon** Enterprise Systems Connection (IBM S/390 and zSeries)

#### -quiet

(Optional) Turns off the confirmation prompt for this command.

#### -force

(Optional) Remove remote mirror and copy paths even if remote mirror and copy volume pairs exist. Otherwise, specified paths that are associated with existing remote mirror and copy volume pairs will not be removed.

## source LSS ID:target LSS ID . . . | -

(Required) Specifies the remote mirror and copy path LSS pair ID. The LSS pair ID consists of two LSS IDs, one designated as the source LSS and the other as the target LSS for a remote mirror and copy path relationship. The two LSS IDs must be separated with a colon and no spaces. The first LSS ID is the source LSS. The second LSS ID is the target LSS.

Removes a remote mirror and copy path relationship for the source and target LSSs. Accepts fully qualified LSS IDs, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified.

The fully qualified LSS ID format is storage\_image\_ID/XX, where "XX" is a hexadecimal number in the range (00 - FE).

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a fully qualified pair: IBM.2107-75FA120/00:IBM.2107-75FA150/00

Example of a shortened version: 00:00

Example of multiple pairs: 00:00 01:01 02:02

#### **Example (2107)**

#### Invoking the rmpprcpath command

dscli>rmpprcpath -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 01:01

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120 Are you sure you want to delete PPRC path 01:01? [y/n]: Y PPRC path 01:01 successfully deleted.

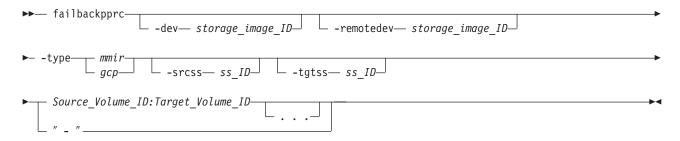
# Remote Mirror and Copy pair commands

This section contains commands that are used to create, manage, and delete Remote Mirror and Copy (formerly PPRC) pairs and to display Remote Mirror and Copy pair information.

Use the following commands to create, manage, and delete Remote Mirror and Copy pairs and to display Remote Mirror and Copy pair information.

# failbackpprc

You can issue the failbackpprc command against any remote mirror and copy volume that is in a primary suspended state. The command copies the required data from the source volume to the target volume in order to resume mirroring. The command is usually used after a failoverpprc command has been issued to restart mirroring either in the reverse direction (recovery site to production site) or original direction (production site to recovery site). However, this command also works if the target volume has been made simplex or is a secondary volume. The command performs a full or partial copy, as required.



#### **Parameters**

Note: A metro mirror (synchronous) pair must be suspended before it can be reestablished as a Global Copy (extended distance) pair and vice versa. Also, when you specify SSIDs, the source and target volumes are restricted to 1 LSS for the source and 1 LSS for the target.

## -dev storage image ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified source volume ID, which includes the storage image ID, for the source volume IDs that are defined by the Source Volume ID: Target Volume ID parameter.

Example: IBM.2107-75FA120

## -remotedev storage\_image\_ID

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. The -remotedev parameter identifies the remote storage unit that contains the target volume IDs that are defined by the Source\_Volume\_ID:Target\_Volume\_ID parameter. This flag is required if you do not specify a fully qualified target volume ID or if you use the -dev flag.

Example: IBM.2107-75FA120

### -type mmir | gcp

(Required). Modify one or more existing remote mirror and copy volume relationships as either Metro Mirror (Synchronous) or Global Copy (Extended Distance) relationships.

mmir Metro Mirror maintains the remote mirror and copy relationship in a consistent manner by returning the I/O write completion status to the application when the updates are committed to the target. This process becomes slower as the physical distance between source and target increases.

gcp Global Copy maintains the remote mirror and copy relationship in a nonsynchronous manner. I/O write completion status is returned to the application when the updates are committed to the source. Updates to the target volume are performed at a later time. The original order of updates is not strictly maintained.

#### -srcss ss ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1. You can ignore this parameter for higher releases of the ESS, and for the 2107 and 1750.

Note: The source and target volumes are restricted to one LSS for the source and one LSS for the target when you specify ss\_IDs.

Example: 0010

## -tgtss ss ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1. You can ignore this parameter for higher releases of the ESS, and for the 2107 and 1750.

Note: The source and target volumes are restricted to one LSS for the source and one LSS for the target when you specify ss\_IDs.

Example: 0010

## Source\_Volume\_ID:Target\_Volume\_ID . . . | -

(Required). This command is used to failback a remote mirror and copy volume relationship for the source and target volume pairs with the specified IDs. This command accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs if the -dev flag is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy volume pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal 0xxyzz, where x is an address group number '0 - F', xy is a logical subsystem (LSS) number '00 - FE', and zz is a volume number 00 - FF that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified pair: IBM.2107-75FA120/0100:IBM.2107-75FA150/0100

Example of multiple pairs: 0101:0101 0102:0102 0103:0103

### **Example (2107)**

### Invoking the failbackpprc command

dscli>failbackpprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 0100:0100 0101:0101 0102:0102 0103:0103

## The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.2107.75FA120

PPRC pair IBM.2107-75FA120/0100:IBM.2107-75FA150/0100 successfully failed back.

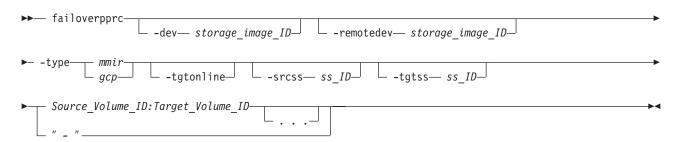
PPRC pair IBM.2107-75FA120/0101:IBM.2107-75FA150/0101 successfully failed back.

PPRC pair IBM.2107-75FA120/0102:IBM.2107-75FA150/0102 successfully failed back.

PPRC pair IBM.2107-75FA120/0103:IBM.2107-75FA150/0103 successfully failed back.
```

# failoverpprc

The failoverpprc command changes a secondary device into a primary suspended device while leaving the primary device in its current state. This command succeeds even if the paths are down and the volume at the production site is unavailable or nonexistent. See "Using the failoverpprc and failbackpprc commands" scenario for further information.



### **Parameters**

#### Note:

- 1. A Metro Mirror (synchronous) pair must be suspended before it can be reestablished by Global Copy (extended distance) and vice versa.
- When you specify subsystem identifier (SSID), the source and target volumes are restricted to one LSS for the source and one LSS for the target.

#### -dev storage\_image\_ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified source volume ID.

Example: IBM.2107-75FA120

### -remotedev storage image ID

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified target volume ID or if you use the -dev flag.

Example: IBM.2107-75FA120

### -type mmir | gcp

(Required). Modifies one or more existing remote mirror and copy volume relationships as either Metro Mirror or Global Copy relationships.

Metro Mirror maintains the remote mirror and copy relationship in a consistent (synchronous) manner by returning the I/O write completion status to the application when the updates are committed to the target. This process becomes slower as the physical distance between source and target increases.

Global Copy maintains the remote mirror and copy relationship in a gcp nonsynchronous manner. I/O write completion status is returned to the application when the updates are committed to the source. Updates to the target volume are performed at a later time. The original order of updates is not strictly maintained.

#### -tgtonline

(Optional). Establishes a remote mirror and copy volume relationship, including when the target volume is online to host systems. This parameter applies to S/390 or zSeries volumes. It does not apply to Open Systems volumes.

#### -srcss ss ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### -tatss ss ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### source\_volume\_ID:target\_volume\_ID . . . | -

(Required) Changes the secondary device into a primary suspended device while leaving the primary device in its current state. This change causes the configuration to be symmetrical with both devices being primaries. You can issue the failbackpprc command (which cannot be issued until the failoverpprc command and process has completed) to resume mirroring in either direction.

This command accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the -dev flag is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal 0x'xyzz", where 'x' is an address group number '0-F', 'xy' is a logical subsystem (LSS) number '00 - FE', and 'zz' is a volume number '00 - FF' that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified pair: IBM.2107-75FA120/0100:IBM.2107-75FA150/0100

Example of a shortened version: 0100:0100

Example of multiple pairs: 0101:0101 0102:0102 0103:0103

## **Example (2107)**

## Invoking the failoverpprc command

dscli>failoverpprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 0100:0100 0101:0101 0102:0102 0103:0103

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

PPRC pair IBM.2107-75FA120/0100:IBM.2107-75FA150/0100 successfully suspended.

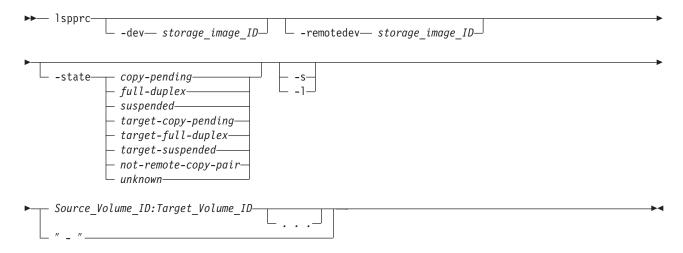
$$\label{eq:perconstraint} \begin{split} & \mathsf{PPRC}^{'} \mathsf{pair} \ \mathsf{IBM.2107-75FA120/0101:IBM.2107-75FA150/0101} \ \mathsf{successfully} \\ & \mathsf{suspended.} \end{split}$$

PPRC pair IBM.2107-75FA120/0102:IBM.2107-75FA150/0102 successfully suspended.

PPRC pair IBM.2107-75FA120/0103:IBM.2107-75FA150/0103 successfully suspended.

### **Ispprc**

The Ispprc command displays a list of remote mirror and copy (formerly PPRC) volume relationships for a storage image, and status information for each remote mirror and copy volume relationship in the list.



## **Parameters**

-dev storage\_image\_ID

(Optional). Specifies the storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified ID for the source and target volumes.

Example: IBM.2107-75FA120

### -remotedev storage\_image\_ID

(Optional). Specifies the target volume storage image ID, which consists of manufacturer, type, and serial number. This parameter is required if you specify the -dev flag.

Example: IBM.2107-75FA120

-state copy-pending | full-duplex | suspended | target-copy-pending | target-full-duplex | target-suspended | not-remote-copy-pair | unknown (Optional). Identifies the state of the remote mirror and copy relationship.

### copy pending

Indicates that the relationship is copy pending. A Global Copy relationship is always copy pending.

#### full-duplex

Indicates that the relationship is full duplex.

#### suspended

Indicates that the relationship is suspended. The Reason attribute might indicate why the relationship is suspended.

## target-copy-pending

Indicates that the source volume is unknown or cannot be gueried and the target state is copy pending.

### target-full-duplex

Indicates that the source volume is unknown or cannot be queried and the target state is full duplex.

#### target-suspended

Indicates that the source volume is unknown or cannot be gueried and the target state is suspended. The Reason attribute might indicate why the relationship is suspended.

#### not-remote-copy-pair

Indicates that the relationship is not a remote copy pair.

## unknown

Indicates that the relationship state is unknown.

- -s (Optional). Displays the remote mirror and copy volume pair IDs. You cannot use the -I and the -s parameters together.
- -I (Optional). Displays the default output and the target read enabled, source cascade, target cascade, and suspended attributes. You cannot use the -I and the -s parameters together.

### Source\_Volume\_ID:Target\_Volume\_ID . . . | -

(Required) Displays the remote mirror and copy relationships for the source and target volume pairs with the specified IDs.

Accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the -dev parameter is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no spaces. The first volume ID is the source volume. The second volume ID is the target volume.

You can enter remote mirror and copy pair IDs, a range of remote mirror and copy pair IDs, single volume IDs, or a range of volume IDs. You cannot enter a combination of remote mirror and copy pair IDs and volume IDs.

The format of a volume ID is hexadecimal 0x'xyzz', where 'x' is an address group number '0-F', 'xy' is a logical subsystem (LSS) number '00-FE', and 'zz' is a volume number '00-FF' that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a fully qualified remote mirror and copy pair ID: IBM.2107-75FA120/0100:IBM.2107-75FA130:0100

Example of a shortened version: 0100:0100

Example of multiple IDs: 0100:0100 0200:0200 0300:0300

#### **Example**

Note: The following tables represent the headers that are displayed on the output report that is associated with the Ispprc command using the -I parameter. A separate example is not shown for the 1750 because the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

## Invoking the Ispprc command

dscli>lspprc -dev IBM.2107-75FA120 -l -remotedev IBM.2107-75FA150 0100:0100 0101:0101

## The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

ID	State	Reason	Туре	Out Of Sync Tracks	Tgt Read	Src Cascade
IBM.2107- 75FA120 /0100: IBM.2107- 75FA150 /0100	Full- Duplex	-	Metro Mirror	0	Enabled	Disabled
IBM.2107- 75FA120 /0101: IBM.2107- 75FA150 /0101	Full- Duplex	-	Metro Mirror	0	Enabled	Disabled

Tgt Cascade	Date Sus pended	Source LSS	Timeout (secs)	Crit Mode	First Pass Status
Enabled	-	01	120	Disabled	False
Enabled	-	02	120	Disabled	False

## Report field descriptions

ID Specifies the source and target volume IDs of a PPRC volume relationship.

Displays the current PPRC volume relationship state. One of the following State values is displayed:

## Copy-Pending

Indicates that the relationship is copy pending. A Global Copy (Extended Distance) relationship is always copy pending.

#### **Full-Duplex**

Indicates that the relationship is full duplex.

### Suspended

Indicates that the relationship is suspended. The Reason attribute might indicate why the relationship is suspended.

## **Target Copy Pending**

Indicates that the source volume is unknown or cannot be gueried and the target state is copy pending.

## **Target Full-Duplex**

Indicates that the source volume is unknown or cannot be queried and the target state is full duplex.

### Target Suspended

Indicates that the source volume is unknown or cannot be queried and the target state is suspended.

### **Not Remote Copy Pair**

Indicates that the relationship is not remote copy pair.

### Invalid-State

Indicates that the relationship state is invalid.

#### Reason

Indicates the reason the PPRC volume relationship is suspended.

**Types** Indicates that the PPRC volume relationship is a Metro Mirror (synchronous) relationship, a Global Copy (extended distance) relationship, or the relationship type is unknown.

## **Out Of Sync Tracks**

Indicates the number of tracks that are not synchronized for this FlashCopy relationship. The maximum value is dependent on the source volume size.

#### Tgt Read

Indicates that Read IO operations to the target volume are allowed.

### **Src Cascade**

Indicates that the source volume of this relationship is enabled to also be a target volume of a different relationship.

#### Tgt Cascade

Indicates that the target volume of this relationship is enabled so that it is also a source volume for a different relationship.

#### **Date Suspended**

Indicates the date when this relationship was last suspended. The value can be displayed as a null (-).

## **SourceLSS**

Indicates the Consistency Group LSS ID that is associated with the source volume of this PPRC volume relationship.

## Timeout (secs)

Indicates the Consistency Group Long Busy Timeout setting for the LSS ID that is associated with the source volume of this PPRC volume relationship. The timeout value is either the default value of 120 seconds, or a user-specified value of 1 to 600 000 seconds.

#### Crit Mode

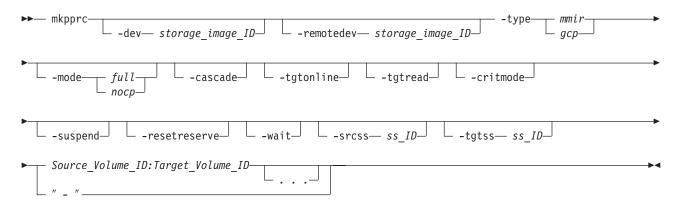
Indicates if the PPRC consistency group attribute Critical Heavy Mode is active for this PPRC volume relationship.

#### **First Pass Status**

Indicates the first pass Global Copy state of the source volume. The data is valid only when you query the primary box and the queried pair is a Global Copy pair.

## mkpprc

The mkpprc command establishes a remote mirror and copy (formerly PPRC) relationship for a volume pair.



## **Parameters**

### Note:

- When you specify ssIDs, the source and target volumes are restricted to 1 LSS for the source and 1 LSS for the target.
- When you use the -wait parameter, you must wait until the original command completely processes before you can issue a new command.
   If you are running in single-shot mode, you can periodically issue the Ispprc command to check the state, and then continue with new commands when the correct state is reached.

### -dev storage\_image\_ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified source volume ID.

Example: IBM.2107-75FA120

### -remotedev storage image ID

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified target volume ID, or if the -dev option is selected.

Example: IBM.2107-75FA120

### -type mmir | gcp

(Required). Establishes one or more remote mirror and copy volume relationships as either Metro Mirror (Synchronous) or Global Copy (Extended Distance) relationships.

mmir Metro Mirror maintains the remote mirror and copy relationship in a consistent (synchronous) manner by returning I/O write completion status to the application when the updates are committed to the target. This process becomes slower as the physical distance between source and target increases.

Global Copy maintains the remote mirror and copy relationship in a gcp nonsynchronous manner. I/O write completion status is returned to the application when the updates are committed to the source. Updates to the target volume are performed at a later point in time. The original order of updates is not strictly maintained.

#### -mode full | nocp

(Optional). Specifies the initial data copy mode for the remote mirror and copy volume relationships.

full Full mode copies the entire source volume to the target volume.

nocp No Copy mode does not copy data from source to target volumes. This option presumes that the volumes are already synchronized.

#### -cascade

(Optional). Enables a remote mirror and copy target volume to be a remote mirror and copy source volume for a different remote mirror and copy volume relationship.

#### -tatonline

(Optional). This parameter applies to S/390 or zSeries volumes. It does not apply to Open Systems volumes. Establishes a remote mirror and copy volume relationship, including when the target volume is online to host systems.

#### -tqtread

(Optional). This parameter applies to Open Systems volumes. It does not apply to IBM S/390 or zSeries volumes. Allows host servers to read from the remote mirror and copy target volume. For a host server to read the volume, the remote mirror and copy pair must be in a full-duplex state.

#### -critmode

(Optional). This parameter protects the source volume from receiving new data. If the last path fails between the pairs, resulting in the inability to send information to the target, the source is protected. Current updates and subsequent attempts to update the source will fail, with a unit check on S/390 or a check condition on SCSI.

**Note:** This parameter can only be used with CKD volumes.

# -suspend

(Optional). This parameter is not valid for a Global Copy (Extended Distance) remote mirror and copy volume relationship. This parameter is not valid for a Metro Mirror (Synchronous) remote mirror and copy volume relationship that is established with the No Copy option. Suspends the remote mirror and copy relationship when the task completes.

#### -resetreserve

(Optional - Open System volumes only). This option can only be used with Open System volumes. It allows the establishment of a remote mirror and copy

relationship when the volume on the secondary logical subsystem is reserved by another host. If this option is not specified and the volume on the secondary logical subsystem is reserved, the command fails.

#### -wait

(Optional). The wait option delays the command response until the PPRC volumes are in one of the final states: simplex, full duplex, suspended, secondary full duplex, secondary suspended or secondary simplex (Until the pair is not in the Copy Pending state). This parameter cannot be used with -type gcp or -mode nocp.

#### -srcss ss ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### -tgtss ss ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

## Source\_Volume\_ID:Target\_Volume\_ID . . . | -

(Required). Establishes a remote mirror and copy volume relationship for the source and target volume pairs with the IDs specified. Accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the -dev flag is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair IDs with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal 'xyzz', where 'x' is an address group number '0-F', 'xy' is a logical subsystem (LSS) number '00 - FE', and 'zz' is a volume number '00 - FF' that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified pair: IBM.2107-75FA120/0100:IBM.2107-75FA150/0100

Example of a shortened version: 0100:0100

Example of multiple pairs: 0101:0101 0102:0102 0103:0103

# Additional processing tips

The following examples represent some CLI volume format options you might want to incorporate in your processing:

## Handling multiple volumes

The following two examples are ways that this circumstance might be handled and both are correct. The first method might be fine if you were

dealing with just a few volumes while the second allows you to handle hundreds or thousands of volumes more efficiently.

- mkpprc -dev IBM.1750-13AB79A -remotedev IBM.1750-13AB76A -type mmir -mode full -tgtread 1000:1205 1001:1206 1002:1207 1003:1208 1004:1209 ..... and so on
- mkpprc -dev IBM.1750-13AB79A -remotedev IBM.1750-13AB76A -type mmir -mode full -tgtread 1000-1004:1205-1209

## Using the grouping method in your command

You can also use grouping, however, the order is critical when grouping is used and must be contiguous. The following shows how to code for grouping:

mkpprc -dev IBM.1750-13AB79A -remotedev IBM.1750-13AB76A -type mmir -mode full -tgtread 1000-1004:1205-1209 1100-1104:1300-1304

### **Example (2107)**

### Invoking the mkpprc command

dscli>mkpprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 0100:0100 -type mmir 0101:0101 0102:0102 0103:0103

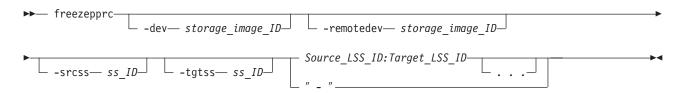
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
```

```
PPRC Pair IBM.2107-75FA120/0100:IBM.2107-75FA150/0100 successfully created.
PPRC Pair IBM.2107-75FA120/0101:IBM.2107-75FA150/0101 successfully created.
PPRC Pair IBM.2107-75FA120/0102:IBM.2107-75FA150/0102 successfully created.
PPRC Pair IBM.2107-75FA120/0103:IBM.2107-75FA150/0103 successfully created.
```

# freezepprc

The freezepprc command creates a new remote mirror and copy consistency group. It places the source logical subsystem (LSS) in the long busy state so that no I/Os can be directed to it. It also removes remote mirror and copy paths between the source LSS and target LSS and sets the queue full condition for the primary volume. This causes the host to queue writes to the primary volume until the queue full condition is reset. During the queue full condition, the primary volume reports long busy status.



#### **Parameters**

**Note:** When specifying ssids, the command is limited to one LSS pair.

-dev storage image ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified source LSS ID.

Example: IBM.2107-75FA120

-remotedev storage image ID

(Optional). Specifies the target storage image ID, which includes manufacturer,

type, and serial number. This flag is required if you do not specify a fully qualified target LSS ID or if the -dev flag is used.

Example: IBM.2107-75FA120

#### -srcss ss ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

## -tatss ss\_ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

## Source\_LSS\_ID:Target\_LSS\_ID . . . | -

(Required). Freezes a consistency group for the source and target LSSs with the IDs specified. Accepts fully qualified LSS IDs, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified.

A remote mirror and copy path LSS pair ID consists of two LSS IDs, one designated as the source LSS and the other as the target LSS for a remote mirror and copy path relationship. The two LSS IDs must be separated with a colon and no spaces. The first LSS ID is the source LSS. The second LSS ID is the target LSS.

The fully qualified LSS ID format is storage\_image\_ID/xx, where 'xx' is a hexadecimal number in the range '00 - FE'.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a pair: 00:00

Example of multiple pairs: 00:00 01:01 02:02

## **Example (2107)**

#### Invoking the freezepprc command

dscli>freezepprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 01:01

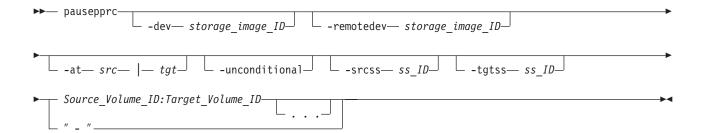
#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

PPRC consistency group 01:01 successfully created.

#### pausepprc

The pausepprc command pauses an existing remote mirror and copy volume pair relationship. Or, this command can be used to pause a single volume ID. To use with a single volume you must specify either the -at src parameter option or the -at tgt parameter option. If neither of these options are specified in the command, single volumes are not valid.



### **Parameters**

Note: When specifying ssids, the command is limited to one LSS pair.

### -dev storage image ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified source volume ID.

Example: IBM.2107-75FA120

### -remotedev storage\_image\_ID

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified target volume ID.

Example: IBM.2107-75FA120

# -at src | tgt (Optional).

Select the -at source option to initiate a suspend action from the source src volume. After the task successfully runs, the source and target volumes are in the suspend state.

The -at source option can also be used with single volumes. When you specify a single volume using this option, the volume is treated as a source and the target is treated as a null.

Select the -at *target* option to initiate a suspend action from the target tgt volume. After the command successfully runs, the target volume is in the suspend state, but there is no guarantee that the source volume is suspended is well. For a suspend action that is issued to the target, the source can remain in the active state.

The -at target option can also be used with single volumes. When you specify a single volume using this option, the volume is treated as a target and the source is treated as a null.

#### -unconditional

(Optional). Use this flag to indicate that a source or target volume has been selected individually, and not as a pair. The -unconditional flag is valid only if the -at flag is selected. When you specify this flag, you can specify only the source volume ID if the -at source option is selected, or specify only the target volume ID if the -at target option is selected. Do not use volume pair IDs.

#### -srcss ss ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### -tgtss ss ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - '0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

Source\_Volume\_ID:Target\_Volume\_ID . . . | -

(Required). Suspends a remote mirror and copy volume relationship for the source and target volume pairs with the IDs specified. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

**Note:** Provide a single volume ID instead of a volume pair if you use the -unconditional flag. Specifying pairs will result in a format error.

A remote mirror and copy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal 0x'xyzz', where where 'x' is an address group number '0-F', 'xy' is a logical subsystem (LSS) number '00 - FE', and 'zz' is a volume number '00 - FF' that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified pair: IBM.2107-75FA120/0100:IBM.2107-75FA150/0100

Example of a shortened version: 0100:0100

Example of multiple pairs: 0101:0101 0102:0102 0103:0103

### **Example (2107)**

## Invoking the pausepprc command

dscli>pausepprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 0100:0100

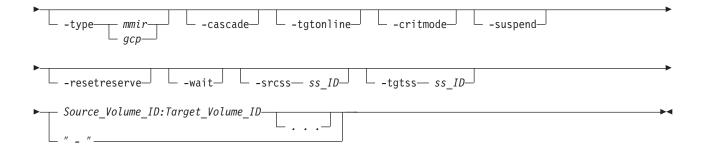
#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

PPRC pair IBM.2107-75FA120/0100:0103 successfully suspended.

### resumepprc

The resumepprc command resumes a remote mirror and copy (formerly PPRC) relationship for a volume pair.



### **Parameters**

#### Note:

- When you specify subsystem IDs, the source and target volumes are restricted to 1 LSS for the source and 1 LSS for the target.
- · When you use the -wait parameter, periodicallt issuance of the Ispprc command. This allows you to verify which of the states the pair has reached during processing.

### -dev storage image ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified source volume ID.

Example: IBM.2107-75FA120

## -remotedev storage\_image\_ID

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified target volume ID or if you specify the -dev parameter.

Example: IBM.2107-75FA120

#### -type mmir | gcp

(Optional). Modifies one or more remote mirror and copy volume relationships to be either Metro Mirror (Synchronous) or Global Copy (Extended Distance) relationships.

Metro Mirror maintains the remote mirror and copy relationship in a consistent (synchronous) manner by returning I/O write completion status to the application when the updates are committed to the target. This process becomes slower as the physical distance between source and target increases.

Global Copy processing maintains the remote mirror and copy qcp relationship in a nonsynchronous manner. I/O write completion status is returned to the application when the updates are committed to the source. Updates to the target volume are performed at a later point in time. The original order of updates is not strictly maintained.

#### -cascade

(Optional). Enables a remote mirror and copy target volume to be a remote mirror and copy source volume for a different remote mirror and copy volume relationship.

## -tgtonline

(Optional). This parameter applies to S/390 or zSeries volumes. It does not apply to Open Systems volumes. It establishes a remote mirror and copy volume relationship, including when the target volume is online to host systems.

#### -critmode

(Optional). This parameter protects the source volume from receiving new data. If the last path fails between the pairs, resulting in the inability to send information to the target, the source is protected. Current updates and subsequent attempts to update the source will fail, with a unit check on S/390 or a check condition on SCSI.

Note: This parameter can only be used with CKD volumes.

#### -suspend

(Optional). This parameter is not valid for a Global Copy (Extended Distance) remote mirror and copy volume relationship. This parameter is not valid for a Metro Mirror (Synchronous) remote mirror and copy volume relationship that is established with the No Copy option. The remote mirror and copy relationship is suspended when the task completes.

#### -resetreserve

(Optional). This option can only be used with fixed block volumes. It allows the establishment of a remote mirror and copy relationship when the volume on the secondary logical subsystem is reserved by another host. If this option is not specified and the volume on the secondary logical subsystem is reserved, the command fails.

#### -wait

(Optional). The wait option delays the command response until the PPRC volumes are in one of the final states: simplex, full duplex, suspended, secondary full duplex, secondary suspended or secondary simplex (Until the pair is not in the Copy Pending state). This parameter cannot be used with -type gcp or -mode nocp.

## -srcss SS ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

## -tatss SS ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format 0x0001 - 0xFFFF.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

### Source\_Volume\_ID:Target\_Volume\_ID . . . | -

(Required). Resumes a remote mirror and copy volume relationship for the source and target volume pairs with the specified IDs. Accepts fully qualified volume IDs, which includes storage image IDs or a shortened version without storage image IDs, if the -dev parameter is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

A remote mirror and copy pair ID consists of two volume IDs: one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal 0x'xyzz', where 'x' is an address group number '0-F', 'xy' is a logical subsystem (LSS) number '00 - FE', and 'zz' is a volume number '00 - FF' that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (–) is specified.

### **Example (2107)**

### Invoking the resumepprc command

dscli>resumempprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 0100:0100

### The resulting output

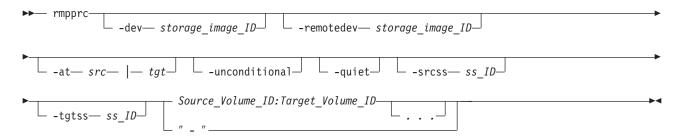
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0

DS: IBM.2107-75FA120

PPRC pair IBM.2107-75FA120/0100:0103 successfully resumed.

## rmpprc

The rmpprc command removes a remote mirror and copy (formerly PPRC) volume pair relationship. Or, this command can be used to remove a single volume ID (which might be useful when a disaster occurs and you want to specify only the available volume and not both the primary and secondary). To use with a single volume you must specify either the -at src parameter option or the -at tgt parameter option. If neither of these options are specified in the command, single volumes are not valid. The -uncondtional parameter must be specified when designating a single volume otherwise an error occurs and the command process fails.



#### **Parameters**

Note: When you specify ssIDs the source and target volumes are restricted to 1 LSS for the source and 1 LSS for the target.

#### -dev storage\_image\_ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified source volume ID.

Example: IBM.2107-75FA120

#### -remotedev storage image ID

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified target volume ID or if you use the -dev flag.

Example: IBM.2107-75FA120

-at src | tgt (Optional).

- Select the -at *source* option to initiate a break action from the source src volume. After the task successfully runs, the source and target volumes are in the simplex state.
- Select the -at target option to initiate a break action from the target tgt volume. After the command successfully runs, the target volume is in the simplex state, but there is no guarantee that the source volume state will change. For a break action issued to the target, the source can remain in the suspend state.

The -at *target* option can also be used with single volumes but you must also specify the -unconditional parameter. When you specify a single volume using this option, the volume is treated as a target and the source is treated as a null.

#### -unconditional

(Optional). Use this parameter to indicate that a source or target volume has been selected individually, and not as a pair. The -unconditional parameter is valid only if the -at parameter is selected. When you specify this parameter, you can specify only the source volume ID if the -at source parameter is selected, or specify only the target volume ID if the -at target parameter is selected. Do not use volume pair IDs.

#### -quiet

(Optional). Turns off the confirmation prompt for this command.

#### -srcss ss ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### -tqtss ss ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### Source Volume ID:Target Volume ID . . . | -

(Required). Removes a remote mirror and copy volume relationship for the source and target volume pairs with the IDs specified. Accepts fully qualified volume IDs, which includes storage image IDs, or a shortened version without storage image IDs if the -dev flag is specified. You must separate multiple remote mirror and copy pair IDs with spaces.

Note: Provide a single volume ID instead of a volume pair if you use the -unconditional flag. Specifying pairs will result in a format error.

A remote mirror and copy pair ID consists of two volume IDs, one designated as the source and the other as the target volume for a remote mirror and copy relationship. You must separate the two volume IDs of a remote mirror and copy pair ID with a colon and no space. The first volume ID is the source volume. The second volume ID is the target volume.

The format of a volume ID is hexadecimal 0x'xyzz', where 'x' is an address group number '0-F', 'xy' is a logical subsystem (LSS) number '00 - FE', and 'zz' is a volume number '00 - FF' that is contained by a logical subsystem.

Alternatively, accepts input from stdin when the dash (-) is specified.

### **Example (2107)**

### Invoking the rmpprc command

dscli>rmpprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 0100:0100

## The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to remove PPRC pair 0100:0100? [y/n]: Y

PPRC pair IBM.2107-75FA120/0100:0103 successfully removed.

## unfreezepprc

The unfreezepprc command thaws an existing remote mirror and copy (formerly PPRC) consistency group. The command resets the queue full condition for the primary volume. All queued writes to the source volume are written.



## **Parameters**

#### Note:

- 1. This command affects all PPRC primary volumes that are contained by the LSS(s) that are defined by the Source LSS ID:Target LSS ID source volume.
- 2. When specifying ssids, the command is limited to one LSS pair.

## -dev storage image ID

(Optional). Specifies the source storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified source LSS ID.

Example: IBM.2107-75FA120

#### -remotedev storage\_image\_ID

(Optional). Specifies the target storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified target LSS ID or if the -dev flag is used.

Example: IBM.2107-75FA120

#### -srcss ss ID

(Optional). Specifies the subsystem ID of the primary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

#### -tatss ss ID

(Optional). Specifies the subsystem ID of the secondary logical subsystem in the format '0x0001 - 0xFFFF'.

This value is required for the IBM TotalStorage Enterprise Storage Server versions 2.4.0 and 2.4.1.

Example: 0010

Source\_LSS\_ID:Target\_LSS\_ID . . . | -

(Required). Thaws a consistency group for the source and target LSSs with the IDs specified. Accepts fully qualified LSS IDs, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified.

A remote mirror and copy path LSS pair ID consists of two LSS IDs, one designated as the source LSS and the other as the target LSS for a remote mirror and copy path relationship. The two LSS IDs must be separated with a colon and no spaces. Multiple remote mirror and copy path LSS pair IDs must be separated with a space between each value. The first LSS ID is the source LSS. The second LSS ID is the target LSS.

The fully qualified LSS ID format is storage image ID/xx, where 'xx' is a hexadecimal number in the range '00 - FE'.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example pair: 00:00

Example of multiple pairs: 00:00 01:01 02:02

### **Example (2107)**

## Invoking the unfreezepprc command

dscli>unfreezepprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150 01:01

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

PPRC Consistency Group ID 01:01 successfully thawed.

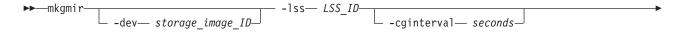
# **Global Mirror commands**

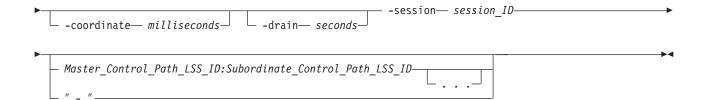
This section contains commands that are used to create, manage, and delete Global Mirror relationships and to display Global Mirror information.

Use the following commands to create, manage, and delete Global Mirror relationships and to display Global Mirror information.

## mkgmir

The mkgmir command starts Global Mirror for a session.





## **Parameters**

### -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID, which includes a storage image ID.

Example: IBM.2107-75FA120

#### -Iss LSS ID

(Required). Specifies the master logical subsystem (LSS) that receives the mkgmir command. Accepts a fully qualified master LSS ID, which includes either the storage image ID or a shortened version without the storage image ID if the -dev parameter is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

### -cginterval seconds

(Optional). Specifies the consistency group interval time, in seconds. This number specifies how long to wait between the formation of consistency groups. If this number is not specified or is set to zero, consistency groups are formed continuously. The consistency group interval setting is required for a start action. If not specified, the default interval is zero. The consistency group interval setting can be modified for a resume action; otherwise, the interval that is specified for the start action is maintained.

The maximum value is 65 535 seconds.

#### -coordinate milliseconds

(Optional). Specifies the maximum coordination interval, in milliseconds. This value indicates the maximum time that Global Mirror processing queues Primary/Host/IO to start forming a consistency group. The coordination interval setting is required for a start action. If this value is not specified, the default interval is 50 milliseconds.

The coordination interval setting can be modified for a resume action: otherwise, the interval that is specified for the start action is maintained. The maximum value is 65 535 milliseconds.

### -drain seconds

(Optional). Specifies the maximum consistency group drain time in seconds and the maximum amount of time that the consistent set of data is allowed to drain to the remote site before failing the current consistency group. The drain time setting is required for a start action. If the drain time is not specified, the default drain time is 30 seconds.

The drain time setting can be modified for a resume action; otherwise, the time that is specified for the start action is maintained.

## -session session ID

(Required). Starts or resumes Global Mirror for the specified session. A session ID is a Global Mirror session number that you assign in the '01 - FF' hexadecimal range or the 1 - 255 decimal range.

Example: 01

## Master\_Control\_Path\_LSS\_ID:Subordinate\_Control\_Path\_LSS\_ID . . . | -

(Optional). Specifies one or more Global Mirror associations. A Global Mirror association consists of two fully qualified LSS IDs. The first is designated as the master resource and the second is the subordinate resource between which a PPRC path has been established. An LSS ID is two characters in the '00 - FE' hexadecimal range. You must separate the fully qualified LSS IDs of a Global Mirror association with a colon and no spaces. The master resource must be identical for all relationships.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of one Global Mirror association with a single subordinate in the configuration: IBM.2107-75FA120/00: IBM.2107-75FA150/00

Example of multiple Global Mirror associations with two subordinates in the configuration: IBM.2107-75FA120/00: IBM.2107-75FA150/00 IBM.2107-75FA120/00: IBM.2107-75FA150/01

### **Example (2107)**

## Invoking the mkgmir command

dscli>mkgmir -dev IBM.2107-75FA120 -lss 10 -session 01 IBM.2107-75FA120/00:IBM.2107-75FA150/00

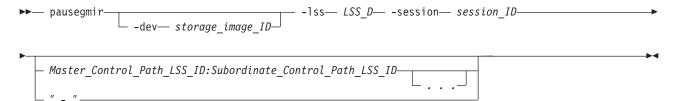
### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Global Mirror for session O1 successfully started.

## pausegmir

The pausegmir command pauses Global Mirror for a session.



### **Parameters**

-dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID.

Example: IBM.2107-75FA120

-Iss LSS ID

(Required). Specifies the master logical subsystem (LSS) that receives the pausegmir command. Accepts a fully qualified master LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev parameter is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

#### -session session ID

(Required). Specifies the session ID for which the Global Mirror process is to be paused. A session ID is a Global Mirror session number that you assign in the '01 - FF' hexadecimal range or the 1 - 255 decimal range.

Example: 01

# Master\_Control\_Path\_LSS\_ID:Subordinate\_Control\_Path\_LSS\_ID . . . | -

(Optional). Specifies one or more Global Mirror path associations. An Global Mirror (Asynchronous PPRC) path association consists of two fully qualified LSS IDs, one designated as the master resource and the other as the subordinate resource between which a PPRC path has been established. A LSS ID is two hexadecimal characters in the range '00 - FE'. You must separate the fully qualified LSS IDs of a Global Mirror path association with a colon and no spaces. The master resource must be identical for all relationships.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of one Global Mirror association with a single subordinate in the configuration: IBM.2107-75FA120/00: IBM.2107-75FA150/00

Example of multiple Global Mirror associations with two subordinates in the configuration: IBM.2107-75FA120/00: IBM.2107-75FA150/00 IBM.2107-75FA120/00: IBM.2107-75FA150/01

### **Example (2107)**

# Invoking the pausegmir command

dscli>pausegmir -dev IBM.2107-75FA120 -lss 10 -session 01 IBM.2107-75FA120/00:IBM.2107-75FA150/00

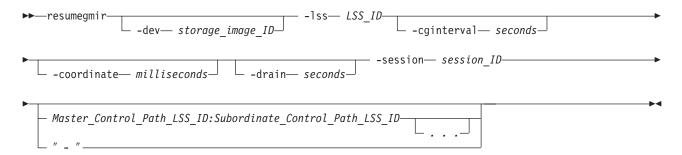
# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Global Mirror for session 01 successfully paused.

### resumegmir

The resumegmir command resumes Global Mirror processing for a session.



# **Parameters**

### -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID.

Example: IBM.2107-75FA120

#### -Iss ID

(Required). Specifies the master logical subsystem (LSS) that is to receive the resumegmir command. Accepts a fully qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev parameter is specified. The shortened version is two hexadecimal digits in the range (00 - FE).

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

### -cginterval seconds

(Optional). Specifies the consistency group interval time, in seconds. This number specifies how long to wait between the formation of consistency groups. If this number is not specified or is set to zero, consistency groups are formed continuously. The consistency group interval setting is required for a start action. If not specified, the default interval is zero. The consistency group interval setting can be modified for a resume action; otherwise, the interval that is specified for the start action is maintained.

The maximum value is 65 535 seconds.

#### -coordinate milliseconds

(Optional). Specifies the maximum coordination interval, in milliseconds. This value indicates the maximum time that Global Mirror processing queues Primary/Host/IO to start forming a consistency group. The coordination interval setting is required for a start action. If this value is not specified, the default interval is 50 milliseconds. (Optional).

The coordination interval setting can be modified for a resume action; otherwise, the interval that is specified for the start action is maintained. The maximum value is 65 535 milliseconds.

### -drain seconds

(Optional). Specifies the maximum consistency group drain time in seconds and the maximum amount of time that the consistent set of data is allowed to drain to the remote site before failing the current consistency group. The drain time setting is required for a start action. If the drain time is not specified, the default drain time is 30 seconds.

The drain time setting can be modified for a resume action; otherwise, the time that is specified for the start action is maintained.

# -session session ID

(Required). Starts or resumes Global Mirror for the specified session. A session ID is a Global Mirror session number that you assign in the '01 - FF' hexadecimal range or the 1 - 255 decimal range.

Example: 01

# Master Control Path LSS ID:Subordinate Control Path LSS ID . . . | -

(Optional). Specifies one or more Global Mirror path associations. A Global Mirror path association consists of two fully qualified LSS IDs. The first is designated as the master resource and the second is the subordinate resource between which a PPRC path has been established. A LSS ID is two hexadecimal characters in the range '00 - FE'. You must separate the fully qualified LSS IDs of a Global Mirror association with a colon and no spaces. The master resource must be identical for all relationships.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of one Global Mirror association with a single subordinate in the configuration: IBM.2107-75FA120/00: IBM.2107-75FA150/00

Example of multiple Global Mirror associations with two subordinates in the configuration: IBM.2107-75FA120/00: IBM.2107-75FA150/00

IBM.2107-75FA120/00: IBM.2107-75FA150/01

### **Example (2107)**

### Invoking the resumegmir command

dscli>resumegmir -dev IBM.2107-75FA120 -lss 10 -session 01 IBM.2107-75FA120/00:IBM.2107-75FA150/00

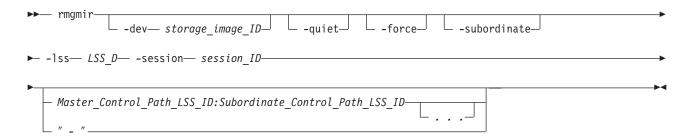
### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Global Mirror for session 01 successfully resumed.

# rmgmir

The rmgmir command removes Global Mirror for the specified session. All of the volumes are removed from the session and the instance of the session no longer



# **Parameters**

#### -dev storage image ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified LSS ID.

Example: IBM.2107-75FA120

# -quiet

(Optional). Turns off the confirmation prompt for this command.

#### -force

(Optional). Forces the Global Mirror to stop regardless of the state of the Global Mirror associations.

#### -subordinate

(Optional). Indicates that the -lss parameter specifies a subordinate LSS ID.

#### -Iss ID

(Required). Specifies the master logical subsystem (LSS) that is to receive the rmgmir command. Accepts a fully qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev parameter is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

### -session session ID

(Required). Specifies the session ID for which the Global Mirror path

association will be removed. A session ID is a Global Mirror session number you assign in the '01 - FF' hexadecimal or 1 - 255 decimal ranges.

Example: 01

Master\_Control\_Path\_LSS\_ID:Subordinate\_Control\_Path\_LSS\_ID . . . | -(Optional). Specifies one or more Global Mirror path associations. A Global Mirror path association consists of two fully qualified LSS IDs. The first is designated as the master resource and the second is the subordinate resource between which a PPRC path has been established. A LSS ID is two hexadecimal characters in the range '00 - FE'. You must separate the fully qualified LSS IDs of a Global Mirror association with a colon and no spaces. The master resource must be identical for all relationships.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of one Global Mirror association with a single subordinate in the configuration: IBM.2107-75FA120/00: IBM.2107-75FA150/00

Example of multiple Global Mirror associations with two subordinates in the configuration: IBM.2107-75FA120/00: IBM.2107-75FA150/00 IBM.2107-75FA120/00: IBM.2107-75FA150/01

### **Example (2107)**

# Invoking the rmgmir command

dscli>rmgmir -dev IBM.2107-75FA120 -lss 10 -session 01 IBM.2107-75FA120/00:IBM.2107-75FA150/00

# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to stop Session ID 01? [y/n]: Y Global Mirror for Session ID 01 successfully stopped.

# showgmir

The showgmir command displays detailed properties and performance metrics for a Global Mirror.



### **Parameters**

-dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This parameter is required if you do not specify a fully qualified master logical subsystem (LSS) ID.

Example: IBM.2107-75FA120

### -metrics

(Optional). Displays the logical subsystem ID and its performance statistics.

Master LSS ID | -

(Required). Specifies the logical subsystem (LSS) that receives the showgmir command. Accepts a fully qualified master LSS ID, which includes the storage image ID or a shortened version without the storage image ID if the -dev parameter is specified. The LSS ID is two hexadecimal digits in the range '00 -FE'.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

### **Example (metrics not specified)**

Note: The following tables represent the headers that are displayed on the output report that is associated with the showgmir command using the -fullid command flag. A separate example is not shown for the 1750 as the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

# Invoking the showgmir command

dscli>showgmir -dev IBM.2107-75FA120 -fullid 10

#### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0

DS: IBM.2107-75FA120

ID	Master Count	Master Session ID	Copy State	Fatal Reason	CG Inter- val	Global Mirror Inter- val	CG Drain Time	Current Time
IBM. 2107- 75FA120 /10	1	01	Running	00	60	50	240	01/03 /2005 08:00:00 MST 0

CG Time	CG Failed Attempt	Succes- sful CG Percen- tage	Flash- Copy Sequ- ence Number	Master ID	Subor- dinate Count	Master SSID	Subor- dinate SSID
01/03 /2005 07:58:00 MST 0	0	100	10	IBM. 2107- 75FA120	1	0010	0020

# Report field definitions

ID Specifies the LSS ID which consists of a Storage Image ID followed by two hexadecimal characters (00-FE) that identify a Global Mirror (Asynchronous PPRC) master LSS ID.

### **Master Count**

Specifies the number of Global Mirror (Asynchronous PPRC) masters. This value could be null (-) if none exist.

#### **Master Session ID**

Identifies the session ID that you assigned, '01-FF' (1-255 decimal).

# **Copy State**

Identifies the Global Mirror (Asynchronous PPRC) copy state. The value displayed is one of the following

#### Running

Running indicates that the PPRC copy is running.

Paused indicates that the PPRC copy is paused.

#### **Fatal**

Fatal indicates that the PPRC copy is failed.

### **Pause In Progress**

Pause In Progress indicates that the PPRC copy is in the process of pausing.

#### **Fatal Reason**

Specifies a reason code for the failure.

#### **CG** Interval

Indicates the interval time between attempts to form a consistency group, up to 65 535 seconds.

#### Global Mirror Interval

Indicates the extended distance consistency maximum coordination interval, up to 65 535 milliseconds.

#### **CG Drain Time**

The CG drain time is the maximum time that the consistent set of data is allowed to drain to the remote site before failing the current consistency group, the maximum value is 65,535 seconds.

# **Current Time**

Indicates the time stamp for when this report was generated. The date is displayed in the "MM/DD/YYYY" format. The time is displayed in the "HH:MM:SS" format on a 24 hour clock.

Note: Daylight Savings is set to 1 if the clock is to be automatically adjusted at applicable times between standard and daylight savings times. Set to 0 if the clock is not to be automatically adjusted for daylight savings time.

### **CG Time**

Indicates the time recorded when the last successful Consistency Group was formed.

#### **CG** Failed Attempt

Indicates the number of unsuccessful attempts to form a Consistency Group since the last time a Consistency Group was formed.

### Successful CG Percentage

Indicates the percentage of attempts to form a Consistency Group that was successful, from 0% to 100%.

# FlashCopy Sequence Number

Specifies the FlashCopy sequence number associated with the current Consistency Group.

Note: This value does not apply to a 2105 so a null (-) is displayed when a 2105 is associated with this reporting.

### Master ID

Identifies the Global Mirror (Asynchronous PPRC) master Storage\_Image\_ID.

#### **Subordinate Count**

Specifies the count of subordinate associations. The master-subordinate association fields repeat according this count.

### **Master SSID**

Identifies the SSID value that is associated with the master LSS ID.

#### Subordinate SSID

Identifies the SSID value that is associated with the subordinate LSS ID. This field repeats for each master-subordinate path association.

Note: The following tables represent the headers that are displayed on the output report that is associated with the **showgmir** command using the **-metrics** parameter. A separate example is not shown for the 1750 as the information is the same for both. The only difference is the machine type designation, 2107 versus 1750.

# **Example (metrics specified)**

### Invoking the showgmir command

dscli>showgmir -dev IBM.1750-75FA120 -metrics 10

# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0

DS: IBM.1750-75FA120

ID	Total Failed CG Count	Total Succes- sful CG Count	Succes- sful CG Percen- tage	Failed CG after Last Success	Last Succes- sful CG Form Time	Coord. Time (milli- seconds)	Inter- val Time (sec- onds)
IBM. 2107- 75FA120 /10	2	3	40	2	01/13 /1970 13:08:37 PST	50	5

Max Drain Time (seconds)	First Failure Control Unit	First Failure LSS	First Failure Reason	First Failure Master State	Last Failure Control Unit	Last Failure LSS
240	IBM. 2107- 75FA120	0x05	Long Busy	Error Recovery	IBM. 2107- 75FA120	0x05

Last Failure Reason	Last Failure Master State	Previous Failure Control Unit	Previous Failure LSS	Previous Failure Reason	Previous Failure Master State
Long Busy	Error Recovery	IBM. 2107- 75FA120	0x05	Long Busy	Error Recovery

# Report field definitions

ID Identifies the LSS ID. This ID consists of an Storage\_Image\_ID followed by two hexadecimal characters (00-FE) that identify a Global Mirror (Asynchronous PPRC) master LSS ID.

# **Total Failed CG Count**

Specifies the total number of Consistency Groups that did not complete in the user specified drain time.

#### **Total Successful CG Count**

Identifies the total number of Consistency Groups that completed before the user specified drain time.

#### Successful CG Percentage

Identifies the percentage of attempts that were successful in forming a consistency group.

#### Failed CG after Last Success

Specifies the total number of failed Consistency Groups after the last successful completion.

### Last Successful CG Form Time

Identifies the last successful Consistency Group completion time.

### Coord. Time (milliseconds)

Specifies the value in milliseconds that indicates the maximum amount of time Global Mirror will queue Primary/Host I/O to start forming a consistency group. Default is 50 milliseconds.

# Interval Time (seconds)

Specifies the value in seconds that indicates how long to wait between formation of Consistency groups.

#### Max Drain Time (seconds)

Specifies the value in seconds that indicates the maximum amount of time that Global Mirror will allow for the consistent set of data to drain to the remote site.

# First Failure Control Unit

Identifies the Control Unit MTS that has caused the first failure of the consistency group formation.

### First Failure LSS

Identifies the LSS number that has caused the first failure of the consistency group formation.

#### First Failure Reason

Specifies the error reason of the first failure of the consistency group formation attempt.

#### **First Failure Master State**

Identifies the master state for the first Global Mirror failure.

#### Last Failure Control Unit

Identifies the Control Unit MTS that has caused the last failure of the consistency group formation.

#### Last Failure LSS

Identifies the LSS number that has caused the last failure of the consistency group formation.

# Last Failure Reason

Specifies the error reason of the last failure of the consistency group formation attempt.

#### Last Failure Master State

Identifies the master state for the last Global Mirror failure.

### **Previous Failure Control Unit**

Identifies the Control Unit MTS that has caused the previous failure of the consistency group formation.

#### **Previous Failure LSS**

Identifies the LSS number that has caused the previous failure of the consistency group formation.

#### **Previous Failure Reason**

Specifies the error reason of the previous failure of the consistency group formation attempt.

### **Previous Failure Master State**

Specifies the master state for the previous Global Mirror failure.

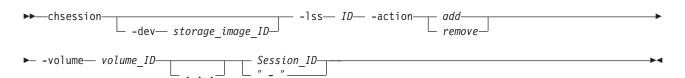
# **Global Mirror session commands**

This section contains commands that are used to create, modify, and delete Global Mirror sessions and to display Global Mirror session information.

Use the following commands to create, modify, and delete Global Mirror sessions and to display Global Mirror session information.

### chsession

The chsession command allows you to modify a Global Mirror session.



### **Parameters**

# -dev storage\_image\_ID

(Optional). Specifies the ID of the storage image containing the logical subsystem. The storage image ID includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified LSS ID.

Example: IBM.2107-75FA120

# -Iss ID

(Required). The logical subsystem (LSS) ID for the Global Mirror session. Accepts a fully qualified LSS ID, which includes either the storage image ID or a shortened version without the storage image ID if the -dev flag is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

# -action add | remove

(Required).

Specifies that volumes will be added to the session. add

#### remove

Specifies that volumes will be removed from the session.

#### -volume volume ID . . .

(Required). An array of one or more volume IDs or volume ID ranges to be added or removed for the Global Mirror session. All volumes must share a common logical subsystem.

To specify a range of volume IDs, you must separate the volume IDs with a hyphen. To specify a combination of one or more volume IDs and a range of volume IDs, separate the volume IDs and ranges with commas.

Do not qualify the volume ID with the storage image ID. The volume ID format is hexadecimal 0x'xyzz', where 'x' is an address group number '0 - F', 'xy' is a logical subsystem number '00 - FE', and 'zz' is a volume number '00 - FF' that is contained by the logical subsystem.

Example of a volume ID: 0010

Example of a range of volume IDs: 0010-001F

Example of multiple volume IDs and ranges: 0100-010F,0180-018F,0120

Session ID | -

(Required). Modifies Global Mirror for this session ID. A session ID is a hexadecimal number in the range '01 - FF'.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a session ID: 01

# **Example (2107)**

### Invoking the chsession command

dscli>chsession -dev IBM.2107-75FA120 -lss 10 -action add -volume 0100-0101 01

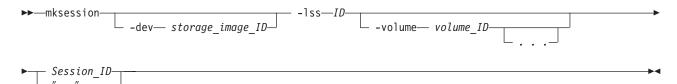
# The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Global Mirror session 01 successfully modified.

#### mksession

The mksession command opens a Global Mirror session.



# **Parameters**

-dev storage image ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the logical subsystem.

Example: IBM.2107-75FA120

(Required). Creates a Global Mirror session for this logical subsystem. Accepts

a fully qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

#### -volume volume ID . . .

(Optional). An array of one or more volume IDs or a range of volume IDs to be included in the Global Mirror session. All volumes must share a common logical subsystem.

To specify a range of volume IDs, you must separate the volume IDs with a hyphen. To specify a combination of one or more volume IDS and a range of volume IDs, separate the volume IDs and ranges with commas.

Do not qualify the volume ID with the storage image ID. The format for a volume ID is hexadecimal 0x'xyzz', where 'x' is an address group number '0 -F', 'xy' is a logical subsystem number '00 - FE', and 'zz' is a volume number '00 - FF' that is contained by the logical subsystem.

Example of a volume ID: 0010

Example of a range of volume IDs: 0010-001F

Example of multiple volume IDs and ranges: 0100-010F,0180-018F,0120

### Session ID | -

(Required). Creates a Global Mirror for this session ID. A session ID is a hexadecimal number in the range '01 - FF'.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a session ID: 01

### **Example (2107)**

# Invoking the mksession command

dscli>mksession -dev IBM.2107-75FA120 -lss 10 -volume 0100-010F 01

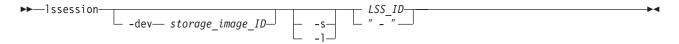
### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Global Mirror session ID 01 successfully opened.

### Issession

The Issession command displays a list of Global Mirror sessions for a logical subsystem (LSS) and information regarding the volumes of each session in the list.



# **Parameters**

### -dev storage\_image\_ID

(Optional). Specifies the storage image ID, which includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified ID for the logical subsystem.

Example: IBM.2107-75FA120

- -s (Optional). Displays the session IDs. You cannot use the -I and the -s flags together.
- -I (Optional). Displays the default output. You cannot use the -I and the -s flags together.

#### LSS ID

(Required). The logical subsystem (LSS) ID for the Global Mirror session. Accepts a fully qualified LSS ID, which includes the storage image ID, or a shortened version without the storage image ID if the -dev flag is specified.

Alternatively, accepts input from stdin when the dash (-) is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

### **Example (2107)**

### Invoking the Issession command

dscli>lssession -fullid -dev IBM.2107-75FA120 01

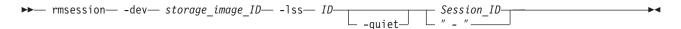
### The resulting output

```
Date/Time: Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0
DS: IBM.2107-75FA120
```

LSSID Session Status Volume VolumeStatus PrimaryStatus SecondaryStatus FirstPassComplete True IBM.2107-75FA120/10 01 Normal IBM.2107-75FA120/1001 Active PrimaryFullDuplex SecondarySimplex True IBM.2107-75FA120/10 01 Normal IBM.2107-75FA120/1002 Active PrimaryFullDuplex SecondarySimplex True IBM.2107-75FA120/10 01 Normal IBM.2107-75FA120/1003 Active PrimaryFullDuplex SecondarySimplex True IBM.2107-75FA120/10 02 Normal IBM.2107-75FA120/1011 Active PrimaryFullDuplex SecondarySimplex True IBM.2107-75FA120/10 02 Normal IBM.2107-75FA120/1012 RemovePending PrimarySimplex SecondarySimplex True IBM.2107-75FA120/10 02 Normal IBM.2107-75FA120/1013 JoinPending PrimarySimplex SecondarySimplex False

#### rmsession

The rmsession command closes an existing Global Mirror session.



# **Parameters**

-dev storage image ID

(Optional). Specifies the ID of the storage image containing the logical subsystem. The storage image ID includes manufacturer, type, and serial number. This flag is required if you do not specify a fully qualified LSS ID.

Example: IBM.2107-75FA120

-Iss ID

(Required). The logical subsystem (LSS) ID for the Global Mirror session. Accepts a fully qualified LSS ID, which includes the storage image ID, or shortened version without the storage image ID if the -dev flag is specified.

Example of a fully qualified LSS ID: IBM.2107-75FA120/10

# -quiet

(Optional). Turns off the confirmation prompt for this command.

# Session\_ID | -

(Required). Closes Global Mirror for this session ID. A session ID is a hexadecimal number in the range '01 - FF'.

Alternatively, accepts input from stdin when the dash (–) is specified.

Example of a session ID: 01

# **Example (2107)**

# Invoking the rmsession command

dscli>rmsession -dev IBM.2107-75FA120 -lss 10 01

### The resulting output

Date/Time: Sun Aug 11 02:23:49 PST 2004 DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120

Are you sure you want to stop Global Mirror Session ID 01? y/n Y Global Mirror Session ID 01 successfully stopped.

# Chapter 4. CLI use case scenarios

These scenarios describe some typical configuration and configuration management tasks. You can use them as models for writing your own scripts.

The following tasks are illustrated:

- · Determining the physical configuration characteristics of a storage unit.
- Determining the current logical storage and Copy Services configuration settings.
- · Creating new logical storage and Copy Services configuration settings.
- Modifying or deleting logical storage and Copy Services configuration settings.

# **Determining physical resources**

This scenario describes how to determine the physical resources within the storage complex.

Before you begin, you must have the command-line interface prompt and be connected to a configured storage complex.

A machine type 2107 storage unit can be configured to contain one or two storage images. The storage image partitioning is specified as part of the order for the system and is applied in the factory.

A machine type 2107 storage unit contains two processor complex (PC) enclosures. Each PC contains from one to three central electronic complex (CEC) enclosures. Each PC-CEC contains two internal interfaces that connect PC-CEC pairs and attach up to four I/O enclosures per interface to each PC-CEC. If a storage unit is partitioned into two storage images, then each storage image owns the I/O enclosure resources of one PC-CEC pair interface. Otherwise, the single storage unit owns the I/O enclosure resources installed on both PC-CEC pair interfaces.

Use the following CLI command sequence to determine if a machine type 2107 storage unit is partitioned into one or two storage images and to identify resources owned by a storage unit or image. In the case of a machine type 2107 partitioned into two storage images, the parameter *storage\_image\_ID* represents a single storage image.

1. Create a list of all storage units in the storage complex with the following command.

dscli> 1ssu

- Each storage unit is identified by a unique MTS identifier (manufacturer, machine type, serial number).
- For storage units, the last character of the MTS will be zero.
- Create a list of the storage images in the storage complex with the following command.

dscli> 1ssi

- · The storage image ID is associated with the storage unit ID.
- A machine type 2107 storage unit contains one or two storage images. The storage unit MTS and first storage image ID are identical (both end with the number "0"). A second storage image ID differs from the first only in the last character, which is "1".
- 3. Create a list of I/O ports with the following command.

dscli> lsioport -dev storage image ID

- Each I/O port is associated with its parent HBA ID.
- · Each I/O port is associated with its parent I/O enclosure ID and with a PC enclosure (pair) interface set.
- Use this information when selecting a complement of I/O ports to be used for host system access to volumes. When possible, select a combination of I/O ports that are associated with different PC interfaces. I/O enclosures and HBA FRUs in order to maximize access bandwidth.
- 4. Create a list of storage enclosures with the following command.

dscli> lsstgencl storage\_image\_ID ... storage\_image\_ID

- · Each storage enclosure is associated with its parent storage unit ID and storage image ID.
- Each storage enclosure is associated with a DA pair ID.
- 5. Create a list of array sites with the following command. Use this information when configuring arrays, ranks, extent pools, and volumes that will be accessed by a host system. When possible, select a combination of array sites that are associated with different DA pair IDs in order to maximize access bandwidth.

dscli> lsarraysite -dev storage image ID

- Each array site is associated with a storage image ID and DA pair ID.
- Each array site is associated with its parent storage enclosure ID and DA pair ID.

# Configuring new count key data storage

This scenario describes how to configure new count key data (CKD) storage within your storage image for a zSeries host system.

Before you begin, you must have the command-line interface prompt, and you must be connected to a storage image that will be used for zSeries host system storage.

The scenario first creates the CKD storage configurations, then configures the storage unit I/O ports for zSeries host system attachment. These two basic steps can be run in the reverse order, but it is better to create storage configurations first, thereby creating the media to back up nonstorage-related configuration data.

To configure new count key data storage, perform the following steps:

1. Create CKD extent pools. Each extent pool is defined with a rank group [0 | 1] and storage type [fb | ckd] attribute. The minimum requirement is to define one extent pool for each rank group and storage type attribute combination. This means that you must make a minimum of two extent pools for a DS8000 that only contains CKD storage, one CKD extent pool per rank group.

You can make more than the minimum number of extent pools. For example, unique extent pools can be defined for each RAID type (5 or 10) that is configured in a DS8000. Or extent pools can be defined and named according to the host system attachments that access the volumes created from extent pool extents. There can be as many extent pools as rank groups.

Extent pools that are defined for rank group 0 or 1 are assigned an even- or odd-numbered extent pool ID, respectively. Even-numbered extent pools are managed by storage server ID 0. Odd-numbered extent pools are managed by storage server ID 1. Each rank group is assigned to one extent pool, therefore storage server workload is directly affected by the rank assignments to evenand odd-numbered extent pool IDs. It is best to evenly distribute rank and extent pool allocations in order to keep the storage server workloads balanced.

Extent pools can be defined before or after the arrays and rank groups are defined. If extent pools are defined before the arrays and rank groups are defined, then the new ranks can be directly assigned to existing extent pools. Otherwise, you must modify each rank to complete the extent pool ID assignment after extent pools have been defined.

Determine if the minimum set of extent pool objects exist. Identify the rank group (0 or 1) assignments for each extent pool object. Determine if additional extent pool object definitions are required. Create a list of the existing CKD extent pools with the following command.

dscli> lsextpool -dev storage image ID -stgtype ckd

Make two extent pools with the following commands. Assign a unique nickname to each extent pool.

dscli> mkextpool -dev storage image ID -rankgrp 0 -stgtype ckd extent pool name

dscli> mkextpool -dev storage image ID -rankgrp 1 -stgtype ckd extent pool name

Optionally, make additional CKD extent pools as necessary. For example:

- For each RAID type (5, 10)
- · For each disk drive module size
- For each CKD volume type (3380, 3390)
- For each LCU address group

Identify the assigned extent pool ID for each new extent pool. Keep this list for the next steps in this scenario. Use the following command to create a list of extent pool IDs.

dscli> lsextpool -dev storage image ID -stgtype ckd

2. Create arrays and ranks. The disk drive modules (DDMs) are packaged into storage enclosure pairs.

A DS8000 contains at least one storage enclosure pair, with a minimum of 16 DDMs. A DS6000 contains at least one storage enclosure pair, with a minimum of eight DDMs. All of the DDMs that are installed in a storage enclosure pair have identical capacity, RPM, and interface characteristics.

The DDMs in a storage enclosure pair interface to a device adapter (DA) pair. A DS contains at least one DA pair. A DA pair interfaces with one to four storage enclosure pairs.

The DDMs of a storage enclosure pair are partitioned into array sites. A DS8000 array site consists of eight DDMs, four from each storage enclosure of a storage enclosure pair, two or four (eight DDM) array sites per storage enclosure pair. A DS6000 array site consists of four DDMs located in one storage enclosure of a storage enclosure pair, two to eight (four DDM) array sites per storage enclosure pair. All array sites of a storage enclosure pair have identical capacity, RPM, and interface characteristics, and interface to a common DA pair.

To begin, create a list of array site IDs and identify all of the array sites with the status "unassigned". Use the following command.

dscli>lsarraysite -dev storage image ID -state unassigned

- Identify the capacity, RPM, interface, and DA pair attributes for each array
- Decide on the RAID type for each array site.

Make one array from one or two of the array sites.

- For the DS6000, specify one or two array sites with identical capacity, RPM, interface, and DA pair attributes.
- For the DS8000, specify one array site.

The new array inherits the capacity, RPM, interface, and DA pair characteristics of its parent array site(s). The array status is "unassigned" until it is assigned to a rank.

Use the following command to make an array.

dscli>mkarray -dev storage image ID -raidtype 5 | 10 -arsite arraysite ID Identify the new array IDs and identify the arrays with status "unassigned" and a common RAID type (5 or 10). Use the following command.

dscli>lsarray -dev storage image ID -state unassigned -raidtype 5 | 10 Make one rank for each array and assign the rank to an extent pool ID. A rank is assigned to rank group 0 or 1 according to the rank group number of the assigned extent pool ID. If a rank is not assigned to an extent pool, then the rank group and configuration state attributes are "unassigned". Assign each

dscli>mkrank -dev storage image ID -array array ID -stgype ckd -extpool extentpool ID

"unassigned" array to a rank using the following command.

3. Create logical control units (logical subsystems). The DS8000 has a 64K-256 volume address space (16K for the DS6000) that is partitioned into 255(64) logical subsystem (LSS) units, where each LSS contains 256 logical volume numbers. The 255(64) LSS units are assigned to one of 16(4) address groups, where each address group contains 16 LSSs, or 4K volume addresses.

there are two volume data types, fixed block and count key data (CKD). An address group contains only one volume data type, either up to 4K fixed block volumes or 4K CKD volumes. When an address group contains CKD volumes. the address group LSSs are defined as logical control units (LCU).

Typically, LCUs are created in groups of 16, beginning at LSS address X'x0'. The LCU logical subsystem objects must be defined before CKD logical volumes can be defined.

To begin, create a list of the unassigned and available address groups using the following command.

>lsaddressgrp -dev storage image ID

Use the list to identify all of the defined address group objects (0-F).

- · If the list is empty, then all of the address groups are available to be defined (0-F or 0-3).
- A defined address group with the storage type FB (fixed block) is not available to be defined.
- A defined address group with the storage type CKD and with fewer than 16 LSSs is available for LCU definition.
- · If you are using an undefined address group to make new LCUs, then select the lowest numbered address group that is not defined.
- If you are defining a new LCU in an existing CKD address group, then use the Islcu command to identify LCUs that are already defined in the target address group.

You also can create a list of the undefined LCUs in an existing CKD address group. Select the lowest numbered logical subsystem object that is not defined. Use the following command.

dscli>1s1cu -dev storage image ID-addrgrp address group

Make one or more LCUs (logical subsystems) using the following command.

dscli>mklcu -dev storage\_image\_ID -qty quantity -id LCU\_ID -ss ss\_ID
-lcutype type

- -qty specifies the quantity of LCU IDs (1-255) to create, starting with the LCU ID that you specify with the -id flag.
- -id specifies the first LCU ID (00-FE) to create.
- · -ss is a user-specified LCU identifier.
- -lcutype is an optional LCU type (the default LCU type is 3990 model 6).
- 4. Create CKD volumes. A DS6000 or DS8000 contains 64K possible logical volumes. The quantity of logical volumes that can be created is dependent on the machine type and model, installed raw storage capacity, the configured storage RAID type, and the size, or capacity of each volume that is created.

A logical volume consists of one or more data extents that are allocated from a single extent pool. Volume data type is inherited from the extent pool extent storage type (fixed block or CKD) characteristic. When a CKD volume is created, volume attributes are further defined as a base or alias volume type, 3390 or 3380 volume cylinder type, and volume capacity in cylinders. These volume attributes characterize the volume to the host system that will eventually access the volume. Each volume is assigned a volume ID, which is the volume address within the DS6000 or DS8000 64K address space. Host access to a volume is enabled when the volume ID is assigned to a volume group, however CKD volumes are automatically assigned to the volume group CKD FICON/ESCON All (ID 0).

To begin, create a list of CKD extent pool IDs. Determine the extent pool IDs that you will use as the source for the CKD logical volumes you will create.

Extent pool attributes determine the size and quantity of volumes that can be created. The extent pool ID (even or odd) indicates the storage server (0 or 1) affinity, which dictates that the LCU ID component of the volume ID must be even- or odd-numbered.

Use the following command to create a list of CKD extent pool IDs.

dscli> lsextpool -dev storage\_image\_ID -stgtype ckd

For each LCU, make 128 base CKD volume using the following command.

dscli> mkckdvol -dev storage\_image\_ID -extpool extentpool\_ID -cap 3339 -name DS\_1\_vol\_#h 0000-007F

- · -extpool identifies a CKD extent pool containing available data extents.
- · -cap specifies the capacity of 3339 cylinders.
- -name assigns a unique name to each volume, including a hexadecimal volume ID.
- Volume ID 0000-007F specifies 128 volumes, starting at CKD address group (0), LCU ID (00), and volume number (00). You must specify volume IDs that have not been previously defined as CKD or fixed block volumes.

For each LCU, make 128 alias volumes using the following command.

 $\begin{tabular}{ll} $\sf dscli> mkckdvol --dev $\it storage\_image\_ID --extpool $\it extentpool\_ID --base 0000 --name DS\_1\_pav\_\#h 0080-00FF \end{tabular}$ 

- -extpool identifies the CKD extent pool that will register the alias volume IDs.
- -base specifies that all 128 alias volumes are assigned to existing base volume ID 0000. Base and alias volumes must be associated with a common LCU ID and a common extent pool ID.
- -name assigns a unique name to each alias volume, including a hexadecimal volume ID.

- Volume ID 0080-00FF specifies 128 alias volumes, starting at CKD address group (0), LCU ID (00), and volume number (80). You must specify volume IDs that have not been previously defined as CKD or FB volumes.
- 5. CKD volume groups are created by the system. The system creates the CKD FICON/ESCON All volume group ID (0) and assigns all CKD base and alias volumes to this volume group. This volume group ID (0) is assigned to I/O ESCON ports and to I/O fibre-channel ports that are configured for FICON I/O operations. The ESCON I/O ports are constrained to access Address Group 0 volume IDs (0000-0FFF).
- 6. Configure I/O ports. The DS8000 supports the ESCON and fibre-channel I/O adapter card types. The DS6000 supports only the fibre-channel I/O adapter card type.

For DS8000, I/O adapter cards are installed in I/O enclosures, each containing up to four I/O adapter cards. For DS6000, one or two I/O adapter cards are installed in each of the two CEC assemblies.

Each ESCON I/O adapter card contains two I/O ports. Each fibre-channel I/O adapter card contains four I/O ports.

The system automatically creates one I/O port object to represent each I/O adapter card I/O port. The default fibre-channel I/O port object settings enable SCSI-FCP "identified" access to fixed block volumes. No user action is necessary for ESCON I/O port setup.

A minimum of four I/O ports should be configured for FICON I/O operations. Select ports with physical locations on different I/O adapter cards. If possible, the I/O adapter cards should be located in different I/O enclosures.

Identify the port ID values that are to be configured for CKD volume access. Create a list of the existing fibre-channel I/O ports with the following command.

dscli>lsioport -dev storage image ID -type fc

Configure the I/O ports to enable the FICON topology using the following command.

dscli>setioport -dev storage image ID -topology ficon port ID1 ID2...IDn The I/O ports will be automatically set offline and returned to the online state after configuration changes are applied.

# Configuring new fixed block storage

This scenario describes how to configure new fixed block storage within a storage image.

Before you begin, you must have the command-line interface prompt, and you must be connected to a storage image that will be used for open systems host system storage.

This scenario first creates the fixed block storage configurations and then configures the storage image SCSI host ports to enable access to fixed block storage. You can run these two basic steps in the reverse order, but it is better to create storage configurations first, thereby creating the media to back up configuration data that is not related to the storage configuration.

Complete the following steps:

1. Create fixed block extent pools. Each extent pool is defined with the rank group [0 | 1] and storage type [fb | ckd] attribute values. The minimum requirement is to define one extent pool for each rank group and storage type attribute value

combination. This means that you must make a minimum of two extent pools for a storage image that contains fixed block storage, one fixed block extent pool per rank group.

You can create more than the minimum number of extent pools. For example, you can define unique extent pools for each RAID type (5 or 10) that is configured in a storage image. Or, you can define and name extent pools according to the host system attachments that access the volumes that are created from extent pool extents. You can have the same number of extent pools as ranks.

Extent pools that are defined for rank group 0 or 1 will be assigned an even- or odd-numbered extent pool ID, respectively. Even-numbered extent pools are managed by storage server ID 0. Odd-numbered extent pools are managed by storage server ID 1. Each rank is assigned to one extent pool, therefore storage server workload is affected by the rank assignments to even- and odd-numbered extent pool IDs. It is better to evenly distribute rank and extent pool allocations in order to keep the storage server workloads balanced.

You can define extent pool objects before or after you define the storage image arrays and ranks are defined. If extent pools are defined before the arrays and ranks, then the new ranks can be assigned to existing extent pools. Otherwise, you must modify each rank object to complete the extent pool ID assignment after extent pools have been defined. Create a list of the existing extent pools with the following command.

dscli> lsextpool -dev storage image ID -stgtype fb

- · Returns a list of fixed block extent pools.
- · Use this list to determine if the minimum set of extent pools exist. Identify the rank group (0 or 1) assignments for each extent pool. Determine if additional extent pools are required.

Create a fixed block extent pool for rank group 0 with the following command. Repeat this step to create a fixed block extent pool for rank group 1. Assign a unique name to each extent pool.

```
dscli> mkextpool -dev storage image ID -rankgrp 0 -stgtype fb
extent_pool_name
```

Create a list of fixed block extent pools using the following command. Use the list to identify the assigned extent pool ID for each new extent pool.

```
dscli> lsextpool -dev storage image ID -stgtype fb
```

2. Create arrays and ranks. The machine type 2107 storage image storage devices (DDMs) are packaged into storage enclosure pairs. The machine type 2107 contains at least one storage enclosure pair, with a minimum of 16 DDMs. All DDMs that are installed in a storage enclosure pair have identical capacity, rpm (revolutions per minute), and interface characteristics.

The DDMs interface to a device adapter (DA) pair. A storage image contains at least one DA pair. A DA pair interfaces with one to four storage enclosure pairs.

The DDMs of a storage enclosure are partitioned into array sites. A machine type 2107 array site consists of eight DDMs, four from each storage enclosure of a storage enclosure pair, two or four (eight DDM) array sites per storage enclosure pair. All array sites of a storage enclosure pair have identical capacity, rpm, and interface characteristics, and interface to a common DA pair.

Create a list of array site IDs for all installed array sites with the status "unassigned" using the following command. Use the list to identify unassigned array site capacity, rpm, and device adapter (DA) pair attributes. Determine the RAID type for each array site.

dscli> lsarraysite -dev storage\_image\_ID -state unassigned

Create one array from one site with the status "unassigned" using the following command. Repeat until all "unassigned" array sites have been assigned to an array.

dscli> mkarray -dev storage image ID -raidtype 5 | 10 S1

The new array site "S1" inherits the capacity, rpm, interface, and DA pair characteristics of its parent array site. The status of the array is "unassigned" until it is assigned to a rank.

Create a list of arrays with the status "unassigned" and the RAID type 5 or 10 using the following command. Use the list to identify the new array IDs.

dscli> lsarray -dev storage image ID -state unassigned -raidtype 5 | 10 Assign a rank to rank group 0 or 1 according to the rank group number of the assigned extent pool ID using the following command. Repeat until all "unassigned" array objects have been assigned to a rank object.

dscli> mkrank -dev storage image ID -array ID -stgype fb -extpool ID If a rank is not assigned to an extent pool, then the rank group and configuration state attributes are "unassigned".

3. Create fixed block volumes. A storage image contains 64 K possible logical volumes. The quantity of logical volumes that you can create in a storage image is dependent on the machine type and model, installed raw storage capacity, the configured storage RAID type, and the size or capacity of each volume that is created.

A logical volume consists of one or more data extents that are allocated from a single extent pool. Volume data type is inherited from the extent pool extent storage type (fixed block or CKD) characteristic. When a fixed block volume is created, volume attributes are further defined as a standard storage image, OS400-protected, or OS400-unprotected volume type and volume capacity in bytes (512-byte logical blocks). These volume attributes characterize the volume to the host system that will access the volume. Each volume is assigned a volume ID, which is the volume address within the storage image 64 KB address space. Host access to a volume is enabled when the volume ID is assigned to a volume group object.

Create a list of fixed block extent pool IDs using the following command.

dscli> lsextpool -dev storage image ID -stgtype fb

Determine which extent pool IDs will be used as the source for the fixed block logical volumes to be created. Extent pool attributes determine the size and quantity of volumes that can be created. The extent pool ID (even/odd) indicates the storage server (0|1) affinity, which dictates that the LSS ID component of the volume ID must be an even or an odd number.

Create a list of unassigned address groups using the following command. dscli> lsaddressgrp -dev ID

- Determine the defined address group objects (0 F). If the returned list is empty, then all address group objects are available to be defined (0 - F).
- Address groups with storage type CKD are not available for the definition of fixed block volumes. Address groups with storage type "FB" and number of defined LSSs less than 16 are available for new fixed block volume ID definition.
- If an undefined address group will be used when making new fixed block volumes, select the lowest numbered address group that is not defined.
- If you are adding new fixed block volumes to an existing fixed block address group, use the Islss command to identify LSSs that are already defined in the target address group.

Create 256 fixed block volumes for the specified LSS using the following command. Specify a volume ID that has not been previously defined as a fixed block or CKD volume. Repeat this step for all of the required logical volumes for each LSS.

dscli> mkfbvol -dev ID -extpool ID -cap 8.6 -name DS 1 vol#h -volgrp volume\_group\_ID 1000-10FF

- All volumes will have the same type and capacity attributes.
- -extpool identifies a fixed block extent pool containing available data extents.
- -cap (capacity) is 8.6 GB.
- · -name assigns a unique name to the volume. The volume name parameter can include a wild card (#d or #h) that inserts a decimal/hexadecimal volume ID value into a volume name, thereby making volume names unique when multiple volumes are created by one command execution.
- -volgrp assigns the new fixed block volumes to an existing volume group ID.
- Volume ID 1000-10FF 256 volumes, starting at a fixed address group (1), LSS ID (10), and volume number (00). A volume ID is four hexadecimal characters in the format "Ilxx", where II specifies an LSS ID (00 - FE) and xx specifies an LSS volume number (00 - FF). A volume ID must be compatible with the extent pool ID that is the specified source for volume data extents. That is, if an extent pool ID is associated with rank group 0/1, then the volume LCU ID must be an even/odd numbered value, respectively.
- 4. Create fixed block volume groups. A volume group identifies the set of fixed block logical volumes that are accessible by one or more SCSI host system ports. If you make volume groups prior to making fixed block volumes, then the mkfbvol command -volgrp parameter can be used to assign new fixed block volumes to a target volume group ID. Otherwise, if you make fixed block volumes prior to making volume groups, then use the mkvolgrp command and the -volume parameter to assign volumes to a new volume group ID, or use the chvolgrp command and the -volume parameter to assign volumes to an existing volume group ID.

SCSI host system access is constrained to the "identified" access mode. For "identified" access mode, a volume group ID is assigned to a SCSI host port. Only those SCSI host ports that are "registered" to a volume group ID are allowed to access the set of logical volumes contained by the volume group.

Logical volumes can be assigned to a volume group when the volume group is created, or the logical volumes can be added (or removed) at a later time. The volume group type determines the maximum number of volumes that can be assigned to a volume group, either a maximum of 256 volumes or a maximum of 64 K volumes. The volume group type must be selected according to the addressing capability of the SCSI host system that will use the volume group.

Create a fixed block volume group using the following command. Repeat this command for each volume group that you want to create.

dscli> mkvolgrp -dev ID -volume ID1,ID2,... volume\_group\_name

- Use the -type scsi256 flag if the volume group is constrained to 256 volume IDs. Otherwise, a volume group may contain up to 64 K volumes. Use the -type 0s400mask flag if the volume group is constrained to fixed block volume types OS400-protected or OS400-unprotected. Otherwise, the volume group is constrained to the fixed block volume type 2107.
- The volume group name should describe the SCSI host system ports that will access volumes using this volume group ID. A SCSI host port can access one and only one volume group ID. Multiple SCSI host ports can register to

access the same volume group ID. In this case, all host ports have shared access to the set of volumes contained by the volume group ID.

Create a list of the assigned volume group IDs using the following command. dscli> lsvolgrp -dev ID

If the SCSI host ports have not yet been configured, save the volume group ID for use when you create the SCSI host port. If the fixed block volumes have not vet been defined, save the volume group ID for use when you create fixed block volumes. If the SCSI host ports were configured prior to the volume groups, use the chhostconnect command to modify each SCSI host port that is configured for SCSI host system access. Add the volume group ID to enable host system access to storage image fixed block volumes.

5. Configure fibre-channel I/O ports. The storage image supports the fibre-channel host bus adapter (HBA) card type. For machine type 2107, HBA cards are installed in I/O enclosures, each containing up to four HBA cards. Each fibre-channel HBA card contains four I/O ports. The storage image microcode automatically creates one I/O port object to represent each HBA card I/O port. The default fibre-channel I/O port object settings enable SCSI-FCP "identified" access to fixed block volumes. You might need to modify the I/O port object settings to enable SCSI FC-AL access to FB volumes.

Create a list of fibre-channel port IDs using the following command.

```
dscli> lsioport -dev ID -type fc
```

Determine which I/O port IDs will be used to access the fixed block volumes. Configure a minimum of four storage image I/O ports for SCSI host I/O operations. Select ports with physical locations on different host bus adapter (HBA) cards. If possible, locate the HBA cards in different I/O enclosures. Identify the port IDs that you want to configure for SCSI host access.

Set the specified I/O ports to enable the FC-AL topology using the following command. I/O ports will be automatically set offline and returned to the online state after configuration changes are applied.

```
dscli> setioport -dev ID -topology fc-al port ID1 ID2...IDn
```

6. Create SCSI host port connections. The storage unit supports the "identified" access mode for SCSI host attachments, which requires that all SCSI host ports be identified to a storage image. This is accomplished by creating a SCSI host port object for each SCSI host port that will access storage image fixed block volumes. A SCSI host port object contains attributes that identify the SCSI host system type, the port profile, the port WWPN, the volume group ID that the port will access, and an array of storage image I/O port IDs that the host port will log into for volume access, or an attribute to indicate that all I/O ports can be used for volume access. Object attributes also include a host port description and port nickname.

Create SCSI host ports using the following command. Create one SCSI host port for each port that will access storage image volumes.

dscli> mkhostconnect -wwname wwpn -profile # -volgrp ID -ioport ID, ID, ID, ID host name

The command specifies the worldwide port name, the fibre-channel communication profile, the volume group ID that this host port is allowed to access, the storage image I/O ports that this port can log in to, and your name for the SCSI host system.

# Modifying fixed block volume groups

This scenario describes how to modify fixed block storage within a storage image.

To modify fixed block volume groups, you must have the command-line interface prompt, and you must be connected to a storage image that will be used for open systems host system storage.

Adding volumes to a volume group and removing volumes from a volume group are typical storage management tasks. The volumes that are added to a volume group can be "unassigned" to a volume group, or they can be volumes that are assigned to a volume group but you want to move them to a different volume group. In either case, you are responsible for managing how the volumes are allocated to volume groups and how the volumes are reserved for future allocation. It is better that you maintain "unassigned" volumes in a volume group that is not accessible by any host system, thereby controlling the accessibility of volumes that are reserved for future allocation.

You can assign a fixed block volume to multiple volume groups. This might be necessary for some host system applications. However, damage to volume data can occur if a volume is accessed by different host systems using different file management systems. To assign a fixed block volume to multiple volume groups, perform the following steps:

1. Find the fixed block volumes that are to be assigned to a volume group using the following command.

```
dscli> lsfbvol -dev ID -type 2107 | os400-protected | os400-unprotected
-extpool ID
```

The command creates a list of all volumes of the specified volume type within the specified extent pool. It includes only the volumes that are contained by the specified storage image.

- Retrieve the current volume group volume map using the following command. dscli> showvolgrp -dev ID volume group ID
  - The command creates a list of volumes that are assigned to the target volume
- 3. Modify the volume group using the following command.

```
dscli> chvolgrp -dev ID -action add | remove | replace -volume
ID,ID,...,ID volume_group_ID
```

You can add or remove volume IDs to the list in order to add or remove volumes. This command applies the updated volume ID list.

# Removing fixed block or count key data storage

This scenario describes how to remove fixed block or count key data (CKD) storage from a storage image.

To remove fixed block or count key data storage, you must have the command-line interface prompt, and you must be connected to a storage image that contains configured storage.

To remove storage, first remove host access to the storage and then remove the storage in order to restore the physical resource to an "equivalent to new" state. At that point, array sites are in the "unassigned" state and can be redefined to make new fixed block or CKD storage. To remove fixed block or count key data storage, perform the following steps:

1. Remove host access to the volumes that will be removed. Create a list of host ports that are associated with the specified port group number using the following commands:

dscli> lshostconnect -dev ID -portgrp #

Remove the volume group assignment from the host port using the following command. Repeat this step for each host port.

dscli> chhostconnect -dev ID -volgrp host connection ID

Remove the volume group assignments from all of the host ports that are associated with the specified port group using the following command:

dscli> managehostconnect -dev ID -volgrp port grp number

Remove the host ports that are associated with the storage volumes to be removed using the following command:

dscli> rmhostconnect -dev ID host connection ID

2. Remove the volume groups if all assigned fixed block volumes are to be removed using one of the following commands:

Option	Description
Isvolgrp -dev ID	Returns a list of volume groups and their characteristics.
showvolgrp -dev ID Volume_group_ID	Returns a list of volumes that are assigned to the target volume group.

You can save the list of volume IDs by using the Isfbvol and Isckdvol commands.

Unassign volumes from a volume group using the following command. This step is not necessary for CKD volumes because they are automatically assigned or unassigned to the FICON/ESCON-All volume group ID (0).

dscli> chvolgrp -dev ID -action remove -volume ID1, ID2,... volume group ID

Remove the volume groups as a means to remove volume access by host systems using the following command:

dscli> rmvolgrp -devID volume group ID...volume group ID

3. Remove fixed block volumes, which will enable ranks, arrays and extent pool objects to be removed.

Create a list of fixed block volume IDs that are candidates for removal using the following command. Use the command filters to develop a list of candidate volume IDs, or use lists of volume IDs that are derived from volume group storage maps.

dscli> lsfbvol -dev ID -type 2107 | os400-protected | os400-unprotected -extpool *ID* -lss *ID* 

In order to enable ranks, arrays, and extent pools to be removed, delete the specified volumes using the following command. An LSS is automatically removed when the last volume contained by the LSS is removed.

dscli> rmfbvol -dev ID -quiet volume ID...volume ID

4. Remove CKD volumes, which will enable ranks, arrays and extent pool objects to be removed.

Create a list of CKD volume IDs that are candidates for removal using the following command. Use the command filters to develop a list of candidate volume IDs, or use lists of volume IDs that are derived from volume group storage maps.

dscli> lsckdvol -dev ID -type 3380 | 3390 -extpool ID -lcu ID

In order to enable ranks, arrays, and extent pools to be removed, delete volumes using the following command:

dscli> rmckdvol -dev ID -quiet volume ID...volume ID

In order to enable address groups to be redefined for fixed block volumes, delete LCUs using the following command:

```
dscli> rmlcu -dev ID -quiet LCU ID...LCU ID
```

5. Remove ranks that have zero rank extents allocated to volumes.

Create a list of rank IDs that are candidates for removal using the following command. Use the command filters to develop a list of candidate rank IDs.

```
dscli> lsrank -dev \mathit{ID} -grp \theta \mid 1 -type 5 \mid 1\theta -extpool \mathit{ID} -stgtype \mathit{fb} \mid \mathit{ckd}
```

Ranks that have used zero extents are eligible to be removed. If used extents are greater than or less than zero, the rank segments are currently assigned to existing volumes.

In order to enable arrays and extent pools to be removed, delete ranks using the following command:

```
dscli> rmrank -dev ID -quiet rank ID...rank ID
```

6. Remove arrays that are not assigned to a rank.

Create a list of arrays that are not assigned to an existing rank ID using the following command:

```
dscli> lsarray -dev storage image ID -state unassigned
```

In order to enable array sites to be redefined as new arrays, delete arrays using the following command:

```
dscli> rmarray -dev storage image ID -quiet array ID ... array ID
```

7. Remove extent pools that do not contain assigned ranks.

Create a list of extent pools using the following command. Extent pool IDs that indicate zero assigned ranks are eligible to be removed. If assigned ranks are greater than or less than zero, then an extent pool contains assigned storage volumes.

dscli> lsextpool -dev  $storage\_image\_ID$  -stgtype  $fb \mid ckd$  -rankgrp  $\theta \mid 1$  Delete extent pool IDs that do not contain assigned rank IDs using the following command:

```
dscli> rmextpool -dev storage_image_ID -quiet
extentpool ID...extentpool_ID
```

Array sites are now in the "unassigned" state and can be redefined to make new fixed block or CKD storage resource.

# Using the failoverpprc and failbackpprc commands

This scenario describes how to use the failoverpprc and failbackpprc DS CLI commands. It does not cover all situations or functions for which these commands can be used. The example uses 4 multiple pairs and it is presumed that your volume relationships are set up as site A to site B or A-->B.

The use of the these two DS CLI commands is associated with recovering data from a planned or unplanned outage of data processing. The failoverpprc command is generally used first and it must complete its process before you can use the failbackpprc command.

To perform the failoverppc process, you must issue the command against your volumes in the order in which you have them. In other words, if you have your original remote mirror and copy pairs set up as A --> B, you must issue the failoverpprc with your volumes in A:B order.

Note: This process differs from the way that was was done on a 2105 whether using the ESS CLI commands or the Specialist.

The following is a description of what these two commands accomplish.

## failoverpprc

This command changes the secondary device into a primary suspended device while leaving the primary device in its current state. After you issue this command, the configuration is symmetrical with both devices being primaries. You can issue the failbackpprc command to resume mirroring in either direction.

### failbackpprc

This command can be issued against any remote mirror and copy volume that is in a primary suspended state. The command copies the required data from the source volume to the target volume in order to resume mirroring. The command is usually used after a failoverpprc command has been issued to restart mirroring either in the reverse direction (recovery site to production site) or original direction (production site to recovery site). However, this command also works if the target volume has been made simplex or is a secondary volume. The command performs a full or partial copy as required.

1. Issue your failoverpprc with your volumes in A:B order. Your command could look like this:

```
dscli>failoverpprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150
 0100:0100 0101:0101 0102:0102 0103:0103
```

- 2. Wait for the command to fully process. B is in a primary suspended state.
- 3. Issue the failbackpprc command so that B becomes your primary and A becomes your new secondary. Your command could look like this:

```
dscli>failbackpprc -dev IBM.2107-75FA120 -remotedev IBM.2107-75FA150
 0100:0100 0101:0101 0102:0102 0103:0103
```

- 4. Start your applications on your server at Site B. To get back to your original pairings, proceed as follows after site A is recovered.
- 5. Issue the failoverpprc command to failover B:A. This makes A primary suspended.
- 6. Wait for the command to fully complete.
- 7. Issue the failbackpprc command to failback B:A. This restores your pairs back to their original relationships.

# Processing Remote FlashCopy (inband) transactions

This scenario describes how to successfully process remote FlashCopy (formerly known as inband FlashCopy) transactions. These can only be processed using the DS CLI Remote FlashCopy commands. These types of transactions cannot be managed through the GUI.

You must be logged into the DS CLI application in interactive command mode.

Remote FlashCopy commands are issued to a source volume of a remote mirror and copy volume pair on a local storage unit and sent across paths (acting as a conduit) to a remote storage unit to enable a FlashCopy pair to be established at the remote site. This eliminates the need for a network connection to the remote site solely for the management of FlashCopy. The following steps are based on an example that uses the sites LSS 22 and LSS2A.

- 1. Establish a remote mirror and copy path between LSS 22 and LSS 2A. You must know which volumes are available for use before you can issue the command to establish the path.
  - a. Issue the following command: lsavailpprcport -dev IBM.2107-1300861 -remotedev IBM.2107-1300861 -remotewwnn 5005076303FFC03D 22:2A

    The following report is generated.

Date/Time: February 7, 2005 4:24:13 PM IST IBM DSCLI Version: 0.0.0.0 DS: IBM.2107-1300861

Local port	Attached port	Туре
10030	10031	FCP
10031	10030	FCP
10100	10101	FCP
10101	10100	FCP

b. Issue the following command: mkpprcpath -dev IBM.2107-1300861 -remotedev IBM.2107-1300861 -remotewwnn 5005076303FFC03D -srclss 22 -tgtlss 2A I0030:I0031 I0100:I0101

The following confirmation is displayed if your command input is correct.

Date/Time: February 7, 2005 4:25:04 PM IST IBM DSCLI Version: 0.0.0.0 DS: IBM.2107-1300861

CMUC00149I mkpprcpath: Remote Mirror and Copy path 22:2A successfully established.

 Establish a PPRC Pair (2200 to 2A00) by issuing the following command: mkpprc -dev IBM.2107-1300861 -remotedev IBM.2107-1300861 -type mmir 2200:2A00

The following confirmation is displayed if your command input is correct.

Date/Time: February 7, 2005 4:25:33 PM IST IBM DSCLI Version: 0.0.0.0 DS: IBM.2107-1300861

CMUC00153I mkpprc: Remote Mirror and Copy volume pair relationship 2200:2A00 successfully created.

3. Use LSS 22 on the Local site as a conduit LSS for new Remote Flash Copy relations on the remote storage unit, that will use volume 2A00 as their source. The target can be any other volume on the remote storage unit (in this example 2A01). Issue the following command: mkremoteflash -dev IBM.2107-1300861 -conduit IBM.2107-1300861/22 -record 2A00:2A01

The following confirmation is displayed if your command input is correct.

Date/Time: February 7, 2005 4:28:11 PM IST IBM DSCLI Version: 0.0.0.0 DS: IBM.2107-1300861

CMUC00173I mkremoteflash: Remote FlashCopy volume pair 2A00:2A01 successfully created. Use the lsremoteflash command to determine copy completion.

4. Issue the resyncremoteflash command since the relation (2A00:2A01) was created with the -record option. Issue the following command: resyncremoteflash -dev IBM.2107-1300861 -conduit IBM.2107-1300861/22 -record 2A00:2A01

The following confirmation is displayed if your command input is correct.

CMUC00175I resyncremoteflash: Remote FlashCopy volume pair 2A00:2A01 successfully resynched. Use the lsremoteflash command to determine copy completion.

5. Verify the transaction has processed as you intended by issuing the following command: lsremoteflash -dev IBM.2107-1300861 -conduit IBM.2107-1300861/22 2A00:2A01

# The following report is displayed if your command input is correct.

Date/Time: February 7, 2005 4:29:42 PM IST IBM DSCLI Version: 0.0.0.0 DS: IBM.2107-1300861

ID	SrcLSS	Sequence Num	ActiveCopy	Recording
2A00:2A01	2A	0	Disabled	Enabled

Persistent	Revertible	SourceWrite Enabled	TargetWrite Enabled	Background Copy
Enabled	Disabled	Disabled	Disabled	Enabled

# Chapter 5. Messages in the CLI and management console server

When you use the command-line interface and the management console, the applications provide messages regarding the application processes, status, and errors. This section also provides information about how the DS CLI manages OpenVMS messages.

The user interfaces and the supporting software issue three types of messages:

#### Informational messages

These messages are identified by the letter "I" at the end of the message identifier. They provide information about system activities as they take place. For instance, an informational message might report that a volume was successfully created. No user action is necessary.

# Warning messages

These messages are identified by the letter "W" at the end of the message identifier. They warn that user activated activities might have consequences that you do not anticipate. Warning messages normally provide the opportunity to continue an activity or to cancel it.

# **Error messages**

These messages are identified by the letter "E" at the end of the message identifier. They indicate that an error has occurred. Refer to the explanations and recommended actions in this document to resolve the problem.

# OpenVMS messages and exit codes

On OpenVMS host systems, the DS CLI application provides additional system messages in the OpenVMS message format. For example, **%facility-level-identification**, **text** 

Each DS CLI message is also communicated by OpenVMS system services. This ensures that messages appear on the screen and in batch logs according to OpenVMS standards. This allows the OpenVMS command **SET MESSAGE** and customer-written tools which scan for such messages to work correctly. The following mapping between DS CLI and OpenVMS messages applies:

- · The facility is IBMDSCLI.
- The level is I (Informational), W (Warning), or E (Error), according to the DS CLI severity level.
- · The identification is the DS CLI message identifier.
- · The text is a is a generic text, identifying the DS CLI message.

After displaying the OpenVMS message, the normal DS CLI message is displayed unchanged. This ensures that the DS CLI messages are identical across platforms and that you can reference the DS CLI documentation.

When you exit the DS CLI, it provides a condition code according to OpenVMS standards instead of the normal DS CLI exit value. The following rules apply:

 A single-shot DS CLI command returns the condition code of the DS CLI message for this command. If there are multiple messages, the code with the highest severity is displayed.

- The DS CLI in interactive mode always returns the OpenVMS generic success status: %X0000001.
- The DS CLI in script mode returns either the OpenVMS generic success code or cancels the script while returning the highest severity code of the failed command.

This ensures that the DCL symbol \$STATUS contains a value that can be evaluated by OpenVMS utilities as usual.

# Framework messages

The framework is the basic software that supports your user interface. There might be times when messages specific to the framework are displayed.

This section provides you a list of the typical Framework messages. Framework message identifiers are prefixed by the letters "CMMC".

# CMMCI9001E Command command name resulted in an internal server error (error number return code). View the log file for details. **Explanation**

An unexpected value was returned for this command.

# **Action**

Run the command again. If the problem persists, contact your service representative.

# CMMC190021 Command command name halted.

# **Explanation**

The command **command\_name** was unexpectedly halted.

#### Action

Perform the following actions to resolve the problem.

- 1. View the cluster log to determine if other errors might be causing this error.
- 2. Run the command again.
- 3. If the problem persists, contact your service representative.

# CMMCI9003W No object name instances found in the system. **Explanation**

You attempted to list all instances of **object name**. No instances were found.

#### Action

No action is required.

# CMMCl9004E Cannot modify object type object name because it does not exist.

# **Explanation**

You are attempting to modify the attributes for the object\_type named object name, but object name does not exist.

### Action

Make sure that the object with the attributes that you are modifying exists.

# CMMCl9005l There is nothing to modify. **Explanation**

You are attempting to modify the attributes for an object, but the values that you specified are already defined for that object.

### Action

If you must modify the attributes for an object, run the command again. Ensure that you are specifying different attribute values.

# CMMCI9006E No class type instances object name found that match criteria: criteria.

# **Explanation**

You are attempting to list all occurrences of an object, but no instances of the object that meet your search criteria were found.

# Action

If the search criteria that you specified was correct, no action is required. Otherwise, attempt to list all occurrences of the object again by specifying different search criteria.

# CMMCI9007E object type object name does not exist.

# **Explanation**

You are attempting to run a command on an object that does not exist.

#### Action

Ensure that you are running this command on an existing object.

# CMMC190081 Unsupported command command name completed successfully. **Explanation**

The command **command\_name** is not a supported command. However, the command did complete successfully.

### Action

No action is required.

# CMMCI9009E The unsupported command name command failed with a **value** return code

# **Explanation**

The command command\_name is not a supported command. The command did not complete successfully.

### Action

Make sure that you are running only supported commands.

# CMMCI9010E The command did not complete successfully. **Explanation**

The command did not complete successfully.

# **Action**

Verify that you are using the correct syntax. Then run the command again.

# CMMCI9013E Command: command name was not found. **Explanation**

You attempted to run a command that does not exist.

### Action

Make sure that you run valid administrative command-line interface commands. Enter "help" for a list of available commands.

# CMMCI9014E The parameter -parameter name is not valid. **Explanation**

You attempted to run a command, but the parameter that you specified is not valid.

### Action

Run the command again, specifying valid parameters. Enter "help **command name**" for a list of valid parameters.

# CMMCI9015E The value value for parameter -parameter name is not formatted correctly.

# **Explanation**

The parameter that you specified is not formatted correctly.

### Action

Run the command again, specifying parameter values that are formatted correctly. Enter "help command\_name" for a list of valid parameters.

# CMMCI9016E Missing parameter name after -. **Explanation**

You specified a dash, but you did not specify a parameter name after the dash.

#### Action

Run the command again using correct parameters. Enter "help command name" for a list of valid parameters.

# CMMCI9017E Parameter parameter name is already specified. **Explanation**

You are attempting to specify the same parameter twice on a single command.

# Action

Run the command again, specifying the parameter only once. Enter "help command\_name" for a list of valid parameters.

# CMMCI9018E Parameter parameter name is missing a required value. **Explanation**

The parameter **parameter\_name** requires a value.

### Action

Run the command again, specifying valid values for all parameters. Enter "help command\_name" for a list of valid parameters and values.

# CMMCI9019E The value for parameter name: value is not valid. **Explanation**

The value that you specified for the listed parameter name is not valid.

# **Action**

Run the command again, specifying valid values for all parameters. Enter "help command\_name" for a list of valid parameters and values.

# CMMC19021E Command command name is not formatted correctly. **Explanation**

The command that you specified is not formatted correctly.

### Action

Run the command again, making sure that it is formatted correctly. Enter "help command name" for the correct format.

# CMMCI9022E Missing required parameter: parameter name. **Explanation**

The parameter **parameter** name is required.

#### Action

Run the command again, specifying all required parameters. Enter "help command\_name" for a list of valid parameters and values.

# CMMC19023E parameter name is mutually exclusive of parameter name **Explanation**

You specified two parameters that cannot be used together. You cannot specify both parameters on a single command.

#### Action

Run the command again, specifying only one of the parameters.

# CMMCl9024E value exceeds the maximum allowable value of maximum value for the parameter command name **Explanation**

The value that you specified is greater than the maximum value that is allowed for this parameter.

# Action

Run the command again, specifying valid values for all parameters. Enter "help command\_name" for a list of valid parameters and parameter values.

# CMMCI9025E value does not meet the minimum allowable value of minimum value for the parameter parameter name **Explanation**

The value that you specified is less than the minimum value that is allowed for this parameter.

### Action

Run the command again, specifying valid values for all parameters. Enter "help command name" for a list of valid parameters and parameter values.

# CMMCI9026E Unmatched character value characters. **Explanation**

There are unmatched character\_value characters in the command that you specified.

Run the command again, making sure that you specify matching character\_value characters, such as matching quotation marks. Enter "help command\_name" for a list of valid parameters and parameter values.

## CMMC19027E Invalid value for parameter name. The length exceeds maximum length characters.

### **Explanation**

The length of the value that you specified for this parameter exceeds the maximum length for this value.

#### Action

Run the command again, making sure that the length of the value that you specify for this parameter is not greater than the maximum length. Enter "help **command** name" for a list of valid parameters and parameter values.

### CMMC19028E The value value specified for parameter value is not valid.

### **Explanation**

The value that you specified for this parameter is not valid for this parameter.

#### Action

Run the command again, making sure that you specify valid values for all parameters. Enter "help command\_name" for a list of valid parameters and parameter values.

## CMMCI9029E object type object name does not exist.

### **Explanation**

You specified the object **object type** with the name **object name**, but it does not exist.

#### Action

Run the command again, making sure that you specify an existing object. Enter "help **command name**" for a list of valid parameters and parameter values.

## CMMC19030E Value value cannot be accepted with any other value for the -parameter name parameter.

### **Explanation**

You specified multiple values for the parameter parameter name. However, if you specify the parameter value of value, it must be the only value that is specified for this parameter.

Run the command again, making sure that you specify valid parameter values. Enter "help command\_name" for a list of valid parameters and parameter values.

### CMMCI9031E The help page for command command name does not exist. **Explanation**

You requested help for the command command\_name, but no help exists for this command.

#### Action

Make sure that you are requesting help for a valid command. Enter "help" for a list of available commands.

## CMMCI9032E You must specify parameter parameter name if you specify parameter parameter name

### **Explanation**

If you specify one of these parameters on a command, you must specify both parameters.

#### **Action**

Run the command again, making sure that you specify both parameters. Enter "help **command\_name**" for a list of valid parameters and parameter values.

## CMMCl9033E File file name does not exist.

### **Explanation**

The file name that you specified does not exist.

#### Action

Run the command again, making sure that you specify a valid file name.

## CMMCI9034E Parameter parameter name cannot be used in the same command as parameter parameter name.

### **Explanation**

These two parameters cannot be used together. You cannot specify both of them in the same command.

### Action

Run the command again, making sure that you specify only one of these parameters. Enter "help command\_name" for a list of valid parameters and parameter values.

### CMMCl9035E object type object name already exists.

### **Explanation**

You are attempting to create an object of type object\_type by the name object\_name, but it already exists.

#### Action

Make sure that this is the object that you are trying to create. If so, no action is required. If not, run the command again using a new object name.

### CMMC19036E The value value for parameter -parameter name is already specified.

### **Explanation**

You are attempting to specify the same parameter twice in a single command.

#### Action

Run the command again, specifying the parameter only once. Enter "help command\_name" for a list of valid parameters.

### CMMCI9037E Multiple targets not allowed for command command name **Explanation**

You cannot specify multiple targets for this command.

#### Action

Run the command again, specifying a single target. Enter "help command name" for a list of valid parameters and parameter values.

## CMMC19038E You cannot specify multiple values when using the parameter name parameter.

#### **Explanation**

You specified multiple values for the parameter parameter\_name. You can specify only a single value for this parameter.

#### Action

Run the command again, making sure that you specify valid parameter values. Enter "help command name" for a list of valid parameters and parameter values.

## CMMC19039E The value value for parameter name is not valid. It contains unsupported characters.

### **Explanation**

You specified a value for this parameter that contains unsupported characters.

Run the command again, making sure that you specify valid parameter values. Enter "help command\_name" for a list of valid parameters and parameter values.

## CMMCI9040E The value value for the parameter parameter name is not valid. It contains unsupported characters.

### **Explanation**

You specified an object name that contains unsupported characters.

#### **Action**

Run the command again, making sure that you specify a valid object name. Enter "help command\_name" for a list of valid parameters and parameter values.

## CMMCI9041E The value for parameter name is not valid. You must specify either value1 or value2.

### **Explanation**

You specified a value for this parameter that is not valid. You must specify either value1 or value2.

#### **Action**

Run the command again, making sure that you specify valid values for all parameters. Enter "help command\_name" for a list of valid parameters and parameter values.

### CMMCI9042E The value for the parameter -parameter name cannot contain a value.

#### **Explanation**

You specified a value for this parameter that is not valid.

#### Action

Run the command again, making sure that you specify valid values for all parameters. Enter "help command\_name" for a list of valid parameters and parameter values.

## CMMCI9043E Number of entries (entries) is exceeded for the -parameter name parameter.

### **Explanation**

You specified too many values for this parameter.

#### **Action**

Run the command again, making sure that you specify valid values for all parameters. Enter "help command\_name" for a list of valid parameters and parameter values.

## CMMC19044E Entry entry value exceeds the length limit (entry limit) for one item for the -parameter name parameter. **Explanation**

The length of the value that you specified for this parameter is too long.

#### Action

Run the command again, making sure that you specify valid values for all parameters. Enter "help command name" for a list of valid parameters and parameter values.

### CMMCI9045E The value for -parameter name must be operator the current setting of value.

### **Explanation**

The value that you specified for the listed operator is not valid. The operator explains how value must be changed.

#### Action

Run the command again, making sure that you specify valid values for all parameters. Enter "help command\_name" for a list of valid parameters and parameter values.

## CMMCI9046E Unrecognized syntax error in command command name **Explanation**

There is a syntax error in the command that you specified.

#### Action

Run the command again, making sure that you use a valid syntax. Enter "help command\_name" for the syntax to use.

CMMC19047E Cannot run command name as a command within the application name application. Tip: Enter "help command name" for more information.

#### **Explanation**

You cannot specify the command **command\_name** within this application.

#### **Action**

Enter "help command\_name" for more information about using this command.

## CMMC19048E The date provided: date value is invalid. Tip: Correct format for the date field is YYYY-MM-DD **Explanation**

The value that you entered for the date specifier is invalid.

The format of the date field is YYYY-MM-DD. Check that the value that you entered follows this format and is a valid date.

## CMMCI9049E You must specify one flag from the following group when issuing this command: param group.

### **Explanation**

It is required that one of the parameters that is specified in the grouping is provided for this command.

#### Action

Restate the command with the correct list of required parameters.

CMMCI9050E The "-" option is not valid in interactive mode. Tip: If you intended to use this as a value substitution indicator, you must enter the value.

### **Explanation**

Using the operator to instruct the process to read from stdin while in interactive mode is illegal.

#### Action

Do not use the stdin read operator. Provide the actual value instead.

## CLI messages

Command-line interface messages are displayed whenever you process a DS CLI command. Command-line message identifiers are prefixed by the letters "CMMC".

### CMUC000001 COMMAND INFO Extent pool VALUE 0 successfully created. **Explanation**

The extent pool has been created successfully.

#### Action

None.

## CMUC000011 COMMAND INFO Extent pool VALUE $\theta$ successfully modified. **Explanation**

The extent pool has been modified successfully.

#### Action

None.

## CMUC00002W COMMAND INFO Are you sure you want to delete extent pool EXTENT POOL ID? [y/n]:

### **Explanation**

You are being asked to confirm that you want to delete the extent pool.

#### Action

Enter Y to delete the extent pool. Enter N to cancel the operation.

## CMUC00003I COMMAND INFO Extent pool VALUE O successfully deleted. **Explanation**

The extent pool has been deleted successfully.

#### Action

None.

## CMUC000041 COMMAND INFO Array VALUE 0 successfully created. **Explanation**

The array has been created successfully.

#### Action

None.

## CMUC00005W COMMAND INFO Are you sure you want to delete array ARRAY ID? [y/n]:

### **Explanation**

You are being asked to confirm that you want to delete the array.

#### Action

Enter Y to delete the array. Enter N to cancel the operation.

## CMUC000061 COMMAND INFO Array VALUE 0 successfully deleted. **Explanation**

The array has been deleted successfully.

#### Action

None.

## CMUC000071 COMMAND INFO Rank VALUE 0 successfully created. **Explanation**

The rank has been created successfully.

None.

### CMUC000081 COMMAND INFO Rank VALUE 0 successfully modified. **Explanation**

The rank has been modified successfully.

#### **Action**

None.

## CMUC00009W COMMAND INFO Are you sure you want to delete rank RANK ID? [y/n]:

### **Explanation**

You are being asked to confirm that you want to delete the rank.

#### Action

Enter  $\mathbf{Y}$  to delete the rank. Enter  $\mathbf{N}$  to cancel the operation.

## CMUC000101 COMMAND INFO Rank VALUE 0 successfully deleted. NOTE: The rank might still be visible to queries until reformatting completes.

### **Explanation**

The rank has been deleted successfully. However, device reformatting can take up to several hours to complete, depending on the size of the devices. The rank might still be visible in queries until reformatting completes.

#### Action

None.

### CMUC000111 COMMAND INFO I/O Port VALUE 0 successfully configured. **Explanation**

The I/O port has been configured successfully.

#### Action

None.

### CMUC00012I COMMAND INFO Host connection VALUE O successfully created.

### **Explanation**

The host connection has been created successfully.

None.

CMUC00013I COMMAND INFO Host connection VALUE O successfully modified.

### **Explanation**

The host connection has been modified successfully.

#### Action

None.

CMUC00014W COMMAND INFO Are you sure you want to delete host connection HOST CONNECT ID? [y/n]:

### **Explanation**

You are being asked to confirm that you want to delete the host connection.

#### Action

Enter Y to delete the host connection. Enter N to cancel the operation.

CMUC00015 COMMAND INFO Host connection VALUE 0 successfully deleted.

### **Explanation**

The host connection has been deleted successfully.

#### **Action**

None.

CMUC00016 COMMAND INFO Port group number PORT GROUP successfully modified.

### **Explanation**

The port group has been modified successfully.

### Action

None.

CMUC00017I COMMAND INFO LCU VALUE 0 successfully created.

### **Explanation**

The logical control unit has been created successfully.

#### Action

None.

### CMUC00018 COMMAND INFO LCU VALUE 0 successfully modified. **Explanation**

The logical control unit has been modified successfully.

Action

None.

## CMUC00019W COMMAND INFO Are you sure you want to delete LCU LCU ID? [y/n]:

### **Explanation**

You are being asked to confirm that you want to delete the logical control unit.

#### Action

Enter Y to delete the logical control unit. Enter N to cancel the operation.

## CMUC000201 COMMAND INFO LCU VALUE 0 successfully deleted. **Explanation**

The logical control unit has been deleted successfully.

#### Action

None.

## CMUC00021 COMMAND INFO CKD Volume VALUE 0 successfully created. **Explanation**

The count-key-data volume has been created successfully.

#### Action

None.

## CMUC000221 COMMAND INFO CKD Volume VALUE $\theta$ successfully modified. **Explanation**

The count-key-data volume has been modified successfully.

### **Action**

None.

## CMUC00023W COMMAND INFO Are you sure you want to delete CKD volume VOLUME ID? [y/n]: **Explanation**

You are being asked to confirm that you want to delete the count-key-data volume.

Enter Y to delete the volume. Enter N to cancel the operation.

## CMUC00024I COMMAND INFO CKD volume VALUE 0 successfully deleted. **Explanation**

The count-key-data volume has been deleted successfully.

#### **Action**

None.

## CMUC000251 COMMAND INFO FB volume VALUE 0 successfully created. **Explanation**

The fixed block volume has been created successfully.

#### Action

None.

### CMUC00026 COMMAND INFO FB volume VALUE 0 successfully modified. **Explanation**

The fixed block volume has been modified successfully.

#### Action

None.

## CMUC00027W COMMAND INFO Are you sure you want to delete FB volume **VOLUME ID?** [y/n]:

#### **Explanation**

You are being asked to confirm that you want to delete the fixed block volume.

#### Action

Enter **Y** to delete the volume. Enter **N** to cancel the operation.

## CMUC00028I COMMAND INFO FB volume VALUE O successfully deleted. **Explanation**

The fixed block volume has been deleted successfully.

#### Action

None.

# CMUC00029I COMMAND\_INFO LSS VALUE\_0 successfully modified.

### **Explanation**

The logical subsystem has been modified successfully.

Action

None.

## CMUC000301 COMMAND INFO Volume group VALUE 0 successfully created. **Explanation**

The volume group has been created successfully.

Action

None.

### CMUC000311 COMMAND INFO Volume group VALUE 0 successfully modified.

### **Explanation**

The volume group has been modified successfully.

Action

None.

## CMUC00032W COMMAND INFO Are you sure you want to delete volume group VOLGRP ID? [y/n]:

### **Explanation**

You are being asked to confirm that you want to delete the volume group.

Action

Enter Y to delete the volume group. Enter N to cancel the operation.

## CMUC000331 COMMAND INFO Volume group VALUE O successfully deleted. **Explanation**

The volume group has been deleted successfully.

Action

None.

CMUC00034W COMMAND INFO Data can be lost. You have requested an operation that discards a portion of the volume. Are you sure that you want to delete tracks START to END on volume VOLUME ID? [y/n]: **Explanation** 

You are being asked to confirm that you want to delete pinned data.

#### Action

Enter Y to delete the data. Enter N to cancel the operation.

CMUC000351 COMMAND INFO Pinned tracks START to END on volume **VOLUME ID** successfully deleted.

### **Explanation**

The pinned track data on the volume has been deleted successfully.

#### Action

None.

CMUC00036W COMMAND INFO Are you sure you want to reset the access state for volume VOLUME ID? [y/n]:

### **Explanation**

You are being asked to confirm that you want to restore access to the volume by resetting the volume access state.

#### Action

Enter Y to restore access to the volume. Enter N to cancel the operation.

CMUC000371 COMMAND INFO Access state for volume VOLUME ID successfully reset.

#### **Explanation**

Access to the volume has been restored successfully. The access state has been reset.

#### Action

None.

CMUC00038W COMMAND INFO Are you sure you want to clear volume **VOLUME ID?** [y/n]:

### **Explanation**

You are being asked to confirm that you want to clear the Copy Services relationships for the base volume.

Enter Y to clear the volume. Enter N to cancel the operation.

## CMUC000391 COMMAND INFO No FlashCopy or Remote Mirror and Copy relationships exist for volume VOLUME ID. The volume is clear. **Explanation**

No Copy Services relationships can be found for this volume. No action can be taken because the volume is already clear.

#### Action

None.

### CMUC000401 COMMAND INFO Storage complex VALUE O successfully modified.

### **Explanation**

The storage complex has been modified successfully.

#### **Action**

None.

### CMUC000411 COMMAND INFO Storage unit VALUE 0 successfully modified.

### **Explanation**

The storage unit has been modified successfully.

### Action

None.

### CMUC000421 COMMAND INFO Storage image VALUE 0 successfully modified.

### **Explanation**

The storage image has been modified successfully.

#### Action

None.

## CMUC000431 COMMAND INFO Environment variable successfully set. **Explanation**

The command-line interface environment variable has been set successfully.

None.

### CMUC00044E COMMAND INFO Unknown error returned by management console server.

### **Explanation**

The management console server reports a failure for unknown reasons.

#### Action

Verify that the correct versions of the management console server software and the command-line interface are installed. If the problem persists, contact IBM technical support for assistance.

## CMUC00045E COMMAND INFO ERROR CODE Unknown error code returned by management console server.

### **Explanation**

The management console server returns an unknown error code.

#### Action

Contact IBM technical support for assistance.

### CMUC00046E COMMAND INFO Failure returned by management console server.

#### **Explanation**

The management console server reports that the operation fails.

#### Action

Specify the command and the parameters properly, and then resubmit the command. Verify that the correct versions of the management console server software and the command-line interface are installed. If the problem persists, contact IBM technical support for assistance.

### CMUC00047E COMMAND INFO Resource VALUE O does not exist. **Explanation**

The resource that is specified as a command parameter cannot be found.

#### Action

Correctly specify the resource, and then resubmit the command.

### CMUC00048E COMMAND INFO Array site VALUE 0 does not exist. **Explanation**

You are attempting to list, show, or create an array, but the array site that is specified as a command parameter cannot be found.

#### Action

Correctly specify the array site, or resubmit the command with another array site ID.

Tip: Enter "help **command\_name**" for more information.

### CMUC00049E COMMAND INFO Array ID VALUE 0 does not exist. **Explanation**

The array that is specified as a command parameter cannot be found.

#### Action

Correctly specify the array ID, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

## CMUC00050E COMMAND INFO Rank ID VALUE 0 does not exist. **Explanation**

You are attempting to list, show, change, or remove a rank, but the rank that is specified as a command parameter cannot be found.

#### Action

Correctly specify the rank ID, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00051E COMMAND INFO Extent pool VALUE 0 does not exist. **Explanation**

The extent pool that is specified as a command parameter cannot be found.

### **Action**

Specify the correct extent pool ID, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

### CMUC00052E COMMAND INFO Storage image VALUE O does not exist. **Explanation**

The storage image that is specified as a command parameter (for example, -dev) cannot be found.

Specify a valid storage image, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

## CMUC00053E COMMAND\_INFO I/O port VALUE\_0 does not exist. **Explanation**

The I/O port that is specified as a command parameter cannot be found.

#### Action

Specify the correct I/O port ID, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

## CMUC00054E COMMAND INFO LSS VALUE 0 does not exist. **Explanation**

The logical subsystem ID that is specified as a command parameter cannot be found.

#### Action

Specify the correct logical subsystem ID, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00055E COMMAND INFO Storage image ID VALUE 0 does not exist. **Explanation**

The storage image ID that is specified as a command parameter cannot be found.

#### Action

Specify the correct storage image ID, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00056E COMMAND INFO Storage image VALUE 0 does not exist. **Explanation**

You attempting to list a storage image, but the storage image ID that is specified as a command parameter cannot be found.

### Action

Specify the correct storage image ID, and then resubmit the command.

### CMUC00057E COMMAND INFO Volume group VALUE 0 does not exist. **Explanation**

The volume group ID that is specified as a command parameter cannot be found.

#### Action

Specify the correct volume group ID, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

### CMUC00058E COMMAND INFO Volume VALUE 0 does not exist. **Explanation**

The volume ID that is specified as a command parameter cannot be found.

#### Action

Specify the correct volume ID, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

### CMUC00059E COMMAND INFO Storage complex VALUE 0 does not exist. **Explanation**

The storage complex that is specified as a command parameter cannot be found.

#### Action

Specify the correct storage complex, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

## CMUC00060E COMMAND INFO Enclosure VALUE 0 does not exist. **Explanation**

The enclosure that is specified as a command parameter cannot be found.

#### Action

Specify the correct enclosure, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

### CMUC00061E COMMAND INFO CEC enclosure VALUE O does not exist. **Explanation**

The computer electronic complex (CEC) enclosure that is specified as a command parameter cannot be found.

Specify the correct CEC enclosure, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00062E COMMAND INFO Storage management console enclosure VALUE 0 does not exist.

### **Explanation**

The management console enclosure that is specified as a command parameter cannot be found.

#### Action

Specify the correct management console enclosure, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00063E COMMAND INFO I/O enclosure VALUE 0 does not exist. **Explanation**

The input/output (I/O) enclosure that is specified as a command parameter cannot

#### Action

Specify the correct I/O enclosure, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00064E COMMAND INFO Processor complex enclosure VALUE $\theta$ does not exist.

#### **Explanation**

The processor complex enclosure that is specified as a command parameter cannot be found.

#### Action

Specify the correct processor complex enclosure, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00065E COMMAND INFO Frame enclosure VALUE 0 does not exist. **Explanation**

The frame enclosure that is specified as a command parameter cannot be found.

Specify the correct frame enclosure, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

## CMUC00066E COMMAND INFO Storage enclosure VALUE $\theta$ does not exist. **Explanation**

The storage enclosure that is specified as a command parameter cannot be found.

#### Action

Specify the correct storage enclosure, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

## CMUC00067E COMMAND INFO FRU VALUE 0 does not exist. **Explanation**

The field-replaceable unit (FRU) that is specified as a command parameter cannot be found.

#### Action

Specify the correct FRU, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

### CMUC00068E COMMAND INFO Host connection VALUE 0 does not exist. **Explanation**

The host connection that is specified as a command parameter cannot be found.

#### Action

Specify the correct host connection, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00069E COMMAND INFO Invalid storage image ID VALUE 0. **Explanation**

The format of the specified storage image ID is incorrect.

#### Action

Specify the storage image ID in the correct format, and then resubmit the command.

### CMUC00070E COMMAND INFO Inconsistent storage image ID VALUE O. **Explanation**

Two or more different storage image IDs are specified in a single command.

#### Action

Specify only one storage image ID, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

# CMUC00071E COMMAND INFO Invalid ID VALUE O.

### **Explanation**

The format of the specified ID is incorrect.

#### Action

Specify the ID in the correct format, and then resubmit the command.

Tip: Enter "help command name" for more information.

## CMUC00072E COMMAND INFO Invalid array site ID VALUE O. **Explanation**

The format of the array site ID is incorrect.

#### Action

Specify the array site ID in the correct format, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

## CMUC00073E COMMAND INFO Invalid array ID VALUE 0. **Explanation**

The format of the array ID is incorrect.

#### Action

Specify the array ID in the correct format, and then resubmit the command.

Tip: Enter "help command name" for more information.

## CMUC00074E COMMAND INFO Invalid Rank ID VALUE 0. **Explanation**

The format of the rank ID is incorrect.

Specify the rank ID in the correct format, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

### CMUC00075E COMMAND INFO Invalid extent pool ID VALUE 0. **Explanation**

The format of the extent pool ID is incorrect.

#### Action

Specify the extent pool ID in the correct format, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

## CMUC00076E COMMAND INFO Invalid address group VALUE 0. **Explanation**

The format of the specified address group is incorrect.

#### Action

Specify the address group in the correct format, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

## CMUC00077E COMMAND INFO Invalid storage image ID VALUE 0. **Explanation**

The format of the specified storage image ID is incorrect.

### **Action**

Specify the storage image ID in the correct format, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00078E COMMAND INFO Invalid I/O port VALUE 0. **Explanation**

The format of the specified input/output (I/O) port is incorrect.

#### Action

Specify the I/O port in the correct format, and then resubmit the command.

# CMUC00079E COMMAND INFO Invalid LSS VALUE\_0.

### **Explanation**

The format of the specified logical subsystem is incorrect.

#### Action

Specify the logical subsystem in the correct format, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00080E COMMAND INFO Invalid storage unit ID VALUE 0. **Explanation**

The format of the specified storage unit ID is incorrect.

#### Action

Specify the storage unit ID in the correct format, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00081E COMMAND INFO Invalid storage server ID VALUE 0. **Explanation**

The format of the specified storage server ID is incorrect. Each storage image contains two storage servers: 00 and 01. You must specify a fully qualified server

Example: IBM.2107-1300321/00

### **Action**

Specify a fully qualified storage server ID, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00082E COMMAND INFO Invalid volume group VALUE 0. **Explanation**

The format of the specified volume group ID is incorrect.

#### Action

Specify the volume group in the correct format, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00083E COMMAND INFO Invalid volume VALUE O. **Explanation**

The format of the specified volume ID is incorrect.

Specify the volume in the correct format, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

## CMUC00084E COMMAND INFO The specified parameter VALUE $\theta$ is out of range.

### **Explanation**

The specified parameter value is not within acceptable limits.

#### Action

Specify the parameter within range, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

### CMUC00085E COMMAND INFO The specified parameter VALUE 0 is invalid.

### **Explanation**

The specified parameter value is invalid.

#### Action

Specify a valid parameter value, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00086E COMMAND INFO Invalid topology TOPOLOGY specified for I/O port PORT.

#### **Explanation**

The specified port topology is invalid.

#### **Action**

Specify a valid port topology, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

## CMUC00087E COMMAND INFO The specified LCU VALUE $\theta$ is invalid. **Explanation**

The specified logical control unit is invalid.

#### Action

Specify a valid, existing logical control unit, and then resubmit the command.

### CMUC00088E COMMAND INFO The specified LCU VALUE O already exists. **Explanation**

The specified logical control unit already exists. A new ID is required.

#### Action

Specify a logical control unit ID that is not currently in use, and then resubmit the command.

## CMUC00089E COMMAND INFO The specified ID VALUE $\theta$ is not an LCU. **Explanation**

The specified ID exists, but it is not a logical control unit. A logical control unit is required for this operation.

#### Action

Specify a logical control unit, and then resubmit the command.

Tip: Enter "help command name" for more information.

## CMUC00090E COMMAND INFO The specified ID VALUE $\theta$ is not an LSS. **Explanation**

The specified ID exists, but it is not a logical subsystem. A logical subsystem is required for this operation.

#### Action

Specify a logical subsystem, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00091E COMMAND INFO The specified SSID VALUE 0 is invalid. **Explanation**

The format of the specified subsystem ID is invalid.

#### Action

Specify the subsystem ID in the proper format, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00092E COMMAND INFO The specified volume ID VALUE O already exists.

### **Explanation**

The specified volume exists.

Use a volume ID not currently in use, and then resubmit the command.

### CMUC00093E COMMAND INFO The specified volume VALUE O is not type CKD.

### **Explanation**

The specified volume is a fixed block volume. The volume type must be count-key-data for this operation.

#### **Action**

Specify a count-key-data volume, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

### CMUC00094E COMMAND INFO The specified volume VALUE 0 is not of type FB.

### **Explanation**

The specified volume is a count-key-data volume. The volume type must be fixed block for this operation.

#### Action

Specify a fixed block volume, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00095E COMMAND INFO No storage image ID is specified. **Explanation**

A storage image ID must be specified in your profile or by using the -dev flag with the command.

#### Action

Specify a storage image ID, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

## CMUC00096E COMMAND INFO No remote storage image ID is specified. **Explanation**

The command requires a remote storage image ID as a parameter. No remote storage image ID is specified.

#### Action

Include a remote storage image ID, and then resubmit the command.

## CMUC00097E COMMAND INFO A single storage image ID is specified. A pair of storage image IDs is required for this command. **Explanation**

The command requires a pair of storage image IDs as a parameter. However, a single storage image ID is specified.

#### Action

Specify a pair of storage image IDs, and then resubmit the command.

Tip: Enter "help command name" for more information.

## CMUC00098E COMMAND INFO A pair of storage image IDs is specified. A single storage image ID is required for this command. **Explanation**

The command issued requires a single storage image ID as a parameter. However, a pair of storage image IDs is specified.

#### Action

Specify a single storage image ID, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00099E COMMAND INFO A single subsystem ID VALUE 0 is specified. A pair of subsystem IDs is required for this command. **Explanation**

The command requires a pair of subsystem IDs as a parameter. A subsystem ID pair consists of two subsystem IDs that are separated by a colon, with no spaces.

#### Action

Specify a pair of subsystem IDs, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00100E COMMAND INFO A pair of subsystem IDs VALUE 0 is specified. A single subsystem ID is required for this command. **Explanation**

The command requires a single subsystem ID as a parameter.

#### Action

Specify a single subsystem ID, and then resubmit the command.

### CMUC00101E COMMAND INFO FlashCopy pairs VALUE 0 are persistent. The -wait option cannot be specified for persistent pairs. **Explanation**

The FlashCopy pairs were established as persistent, with the intention of retaining the relationship after the copy completes. This definition overrides the -wait option.

#### Action

Resubmit the command without the -wait option.

Tip: Enter "help **command\_name**" for more information.

### CMUC00102E COMMAND INFO The -cp option must be used in conjunction with the -wait option.

### **Explanation**

You must include a -cp flag and value when the -wait option is used with this command.

#### Action

Resubmit the command, specifying both -cp and -wait flags and values, or omit the -wait option.

Tip: Enter "help **command\_name**" for more information.

## CMUC00103E COMMAND INFO When specifying the -range parameter, the starting and ending volume IDs must be on the same storage image. **Explanation**

The **-range** parameter initiates a query that displays volume relationships that exist for source or target volumes within the specified volume ID range. The range is meaningless unless it is specified for volumes that are on the same storage image.

#### **Action**

Specify volumes on the same storage image, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

## CMUC00104E COMMAND INFO The specified options for this command are incompatible or invalid: VALUE 0

### **Explanation**

You are attempting to establish or change a path. Two or more of the options that have been supplied are incompatible, or at least one of the options is invalid.

#### Action

Specify compatible and valid options, and then resubmit the command.

### **CMUC00105E** *COMMAND INFO* The following parameters are incompatible: VALUE 0.

### **Explanation**

Two or more of the command parameters are incompatible.

#### Action

Specify only compatible parameters, and then resubmit the command.

Tip: Enter "help command\_name" for more information.

## CMUC00106E COMMAND INFO The parameter value VALUE O is larger than the maximum allowable value: VALUE 1.

### **Explanation**

The parameter that has been supplied is larger than the maximum value that is allowed.

#### **Action**

Specify a value equal to or lower than the maximum value that is allowed, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

# CMUC00107E COMMAND INFO The parameter value VALUE 0 is smaller than the minimum allowable value: VALUE 1.

#### **Explanation**

The parameter that has been supplied is smaller than the minimum value that is allowed.

#### Action

Specify a value equal to or higher than the minimum value that is allowed, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

CMUC00108E COMMAND INFO The Remote Mirror and Copy volume pair must be in full-duplex mode before the host server can read from target volumes.

#### **Explanation**

The No Target Read **-notathread** option has been specified, and the pair is not in full-duplex mode. For the host server to read the volume, the Remote Mirror and Copy volume pair must be in full-duplex mode.

Place the pair in full-duplex mode, and then resubmit the command. You can use the -mode full option to place the Remote Mirror and Copy volume pair in full-duplex mode.

Tip: Enter "help **command\_name**" for more information.

## CMUC00109E COMMAND INFO The -uconditional flag is invalid unless it is used in conjunction with the -at parameter. **Explanation**

The -uconditional flag indicates that a source or target volume has been selected individually, and not as a pair. It is valid only if the -at option specifies a source or a target.

#### **Action**

Specify both **-uconditional** and **-at** flags, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

## CMUC00110E COMMAND INFO No matching candidate connection found. **Explanation**

The candidate Remote Mirror and Copy path between source and target ports cannot be established because one or both of the physical connections cannot be found.

#### Action

Specify existing source and target ports, and then resubmit the command.

Tip: Enter "help **command name**" for more information.

## CMUC00111E COMMAND INFO One or more of the specified volumes is not within the specified LSS. **Explanation**

This command requires a logical subsystem ID and one or more volume IDs. The volumes must be members of the specified logical subsystem. One or more of the volumes are not members of the specified logical subsystem.

#### Action

Specify only volumes within the specified logical subsystem, and then resubmit the command.

### CMUC00112E COMMAND INFO Port candidate $VALUE\_\theta$ is not available for an ESCON connection.

### **Explanation**

You are attempting to create a path between source and target logical subsystems on an IBM model 2105 storage unit over an ESCON connection. The specified port is not available for an ESCON connection. This might be because the port does not exist, because it is not identified as an ESCON port, or because it is already in use.

#### Action

Use the **Isavailpprcport** command to list available ports and their types. Specify an available ESCON port, and then resubmit the command.

### CMUC00113E COMMAND INFO Record VALUE 1 already exists in password file FILE NAME.

### **Explanation**

You are attempting to add a password record in the password file. However, the specified user name already exists in the file.

#### Action

Specify a user name that is not currently in use, and then resubmit the command. If you want to change the record specified, issue the managepwfile command with the -action change flag.

## CMUC00114E COMMAND INFO Record VALUE 1 does not exist in password file FILE NAME.

### **Explanation**

You are attempting to change or remove a record in the password file. However, the file contains no record for the specified user name and management console.

#### **Action**

Specify a valid record, and then resubmit the command. If you want to add a new record, issue the managepwfile command with the -action add flag.

### CMUC00115E COMMAND INFO User account file VALUE O not found. **Explanation**

You are attempting to change or remove a user. The specified user account file cannot be found. This might be because the file name is incorrect, or because you lack necessary permissions.

#### Action

Ensure that you have appropriate permissions. Specify the correct user account file name, and then resubmit the command.

### CMUC00116E COMMAND INFO User account file FILE NAME is used for another user.

### **Explanation**

You are attempting to create a user. The specified user account file is in use for another user. A different file name must be specified.

#### Action

Specify another file name, and then resubmit the command.

### CMUC00117E COMMAND INFO Unable to create password file FILE NAME. **Explanation**

You are attempting to create a password file. The system is unable to create the file. This might be because you lack necessary permissions or have exceeded a quota.

#### Action

Ensure that you have appropriate file creation permissions or alter the quota, and then resubmit the command.

### CMUC00118E COMMAND INFO Unable to update password file FILE NAME. **Explanation**

You are attempting to update a password file. The system is unable to update the file. This might be because you lack necessary permissions or have exceeded a quota.

#### Action

Ensure that you have appropriate file permissions or alter the quota, and then resubmit the command.

# CMUC00119E COMMAND INFO Invalid password format.

### **Explanation**

The format of the specified password is invalid.

- A password must be a minimum of six alphanumeric characters (a z, A Z, or 0 - 9) in length.
- A password must contain at least one numeric character (0 9).
- The initial character of the password cannot be numeric.
- · Passwords are case-sensitive.

#### Action

Use an appropriately formatted password, and then resubmit the command.

## CMUC00120E COMMAND INFO Invalid password.

### **Explanation**

The specified password is incorrect.

#### Action

Use the correct password, and then resubmit the command.

### CMUC00121E COMMAND INFO Invalid account file VALUE 0 for user USERNAME.

### **Explanation**

You are attempting to change or remove a user. The user and account file name do not match.

#### **Action**

Use the correct user name and account file name combination, and then resubmit the command.

### CMUC00122E COMMAND INFO Invalid admin user.

### **Explanation**

You are attempting to show a user. Your user name is not a member of the admin group, and lacks sufficient privileges to use this command.

#### Action

Resubmit the command as a user who is a member of the admin group.

### CMUC00123E COMMAND INFO Unable to create user account USERNAME. **Explanation**

You are attempting to create a new user on the management console server. The task fails.

#### **Action**

Ensure that the management console server is available and that you have proper privileges to create a user account. You must be a member of the admin group to use this command. Resubmit the command.

### CMUC00124E COMMAND INFO Unable to assign user USERNAME to group GROUP.

### **Explanation**

You are attempting to create a new user on the management console server. The user cannot be assigned to the specified group.

Ensure that the group exists. If the problem persists, contact IBM technical support for assistance.

### CMUC00125E COMMAND INFO Unable to modify user group to NEW GROUP. **Explanation**

You are attempting to change a user's group to a new group. The user's group cannot be modified to the specified group.

#### Action

Ensure that the group exists. If the problem persists, contact IBM technical support

## CMUC00126E COMMAND INFO Unable to modify password.

### **Explanation**

You are attempting to change a user's password. The password cannot be changed to the specified password.

- A password must be a minimum of six alphanumeric characters (a z, A Z, or 0 - 9) in length.
- A password must contain at least one numeric character (0 9).
- The initial character of the password cannot be numeric.
- · Passwords are case-sensitive.

#### Action

Correctly specify the new password. If the problem persists, contact IBM technical support for assistance.

## CMUC00127E COMMAND INFO Unable to delete user account USERNAME on the management console server.

#### **Explanation**

You are attempting to delete a user on the management console server. The task fails.

#### **Action**

Ensure that you have appropriate privileges. You must be a member of the admin group to use this command. If the problem persists, contact IBM technical support for assistance.

## CMUC00128E COMMAND INFO Unable to find a Remote Mirror and Copy path for the specified logical subsystems.

#### **Explanation**

The paths cannot be deleted for the specified logical subsystems. No paths can be found.

Ensure that the correct logical subsystems are specified, and then resubmit the task.

## CMUC00129E COMMAND INFO All source volumes must be within the same logical subsystem.

### **Explanation**

The -srcss flag is specified with the command. This flag requires that all source volumes are contained within the same logical subsystem. Not all of the source volumes specified are contained within the same logical subsystem.

#### Action

Specify source volumes that are all contained within the same logical subsystem, and then resubmit the command. Issue separate commands for volumes that are contained within different logical subsystems.

## CMUC00130E COMMAND INFO All target volumes must be within the same logical subsystem.

### **Explanation**

The **-tqtss** flag is specified with the command. This flag requires that all target volumes are contained within the same logical subsystem. Not all of the target volumes specified are contained within the same logical subsystem.

#### **Action**

Specify target volumes that are all contained within the same logical subsystem, and then resubmit the command. Issue separate commands for volumes that are contained within different logical subsystems.

### CMUC00131E COMMAND INFO Operation failure **Explanation**

The **Ishostvol** command fails for one of the following reasons:

- The CLI installation did not complete successfully.
- · A platform-dependent external command is being invoked unsuccessfully.
- · You lack sufficient privileges.

#### Action

Check the CLI installation log for errors and reinstall if necessary. Ensure that you have the appropriate privileges to perform the task. If the problem persists, contact IBM technical support for assistance.

## CMUC00132E COMMAND INFO Command interrupted. Resubmit the command. **Explanation**

The Ishostvol command was interrupted for an unknown reason.

Resubmit the command. If the problem persists, contact IBM technical support for assistance.

### CMUC00133I COMMAND INFO User USERNAME successfully created. **Explanation**

The user has been created successfully.

Action

None.

### CMUC00134I COMMAND INFO User USERNAME successfully modified. **Explanation**

The user has been modified successfully.

Action

None.

## CMUC00135W COMMAND INFO Are you sure you want to delete user USERNAME? [y/n]:

### **Explanation**

You are being asked to confirm that you want to delete the user.

Action

Enter Y to delete the user. Enter N to cancel the operation.

### CMUC00136 COMMAND INFO User USERNAME successfully deleted. **Explanation**

The user has been deleted successfully.

Action

None.

## CMUC001371 COMMAND INFO FlashCopy pair VALUE 0 successfully created.

### **Explanation**

The FlashCopy pair has been created successfully.

Action

None.

# CMUC001381 COMMAND INFO Background copy for FlashCopy pair VALUE 0 successful.

# **Explanation**

The command has been invoked with the -wait flag. The background copy for the specified pair ran successfully.

### Action

None.

# CMUC00139E COMMAND INFO FlashCopy pair VALUE 0 cannot be created. **Explanation**

The FlashCopy pair cannot be created.

### Action

Contact IBM technical support for assistance.

# CMUC001401 COMMAND INFO FlashCopy pair VALUE 0 successfully removed.

### **Explanation**

The command has been invoked without the -cp flag. The specified FlashCopy pair has been removed successfully.

### Action

None.

# CMUC001411 COMMAND INFO Background copy for FlashCopy pair VALUE 0 ended successfully. Relationship successfully removed.

# **Explanation**

The command has been invoked with the **-cp** and **-wait** flags. The background copy for the specified pair ended successfully, and the relationship has been removed.

### Action

None.

CMUC001421 COMMAND INFO Background copy process for FlashCopy pair PAIR ID successfully started. The relationship will be removed when the copy ends.

### **Explanation**

The -cp flag has been used, and the FlashCopy pair is not persistent. The background copy process for the FlashCopy pair has started successfully. The FlashCopy volume pair relationship will be withdrawn when the copy process completes.

None.

CMUC001431 COMMAND INFO Background copy process for FlashCopy pair PAIR ID successfully started. The persistent relationship will not be removed.

### **Explanation**

The -cp flag has been used, and the FlashCopy pair is persistent. The background copy process for the FlashCopy pair has started successfully. The FlashCopy volume pair relationship will continue when the copy process completes.

#### Action

None.

# CMUC00144W COMMAND INFO Are you sure you want to remove the FlashCopy pair PAIR ID? [y/n]:

# **Explanation**

You are being asked to confirm that you want to remove the FlashCopy pair that is specified in the rmflash command.

#### Action

Enter Y to delete the pair. Enter N to cancel the operation.

# CMUC001451 COMMAND INFO Session SESSION ID opened successfully. **Explanation**

The Global Mirror session has opened successfully.

#### Action

None.

# CMUC001461 COMMAND INFO Session SESSION ID closed successfully. **Explanation**

The Global Mirror session has closed successfully.

#### Action

None.

# CMUC001471 COMMAND INFO Session SESSION ID successfully modified. **Explanation**

The Global Mirror session has been modified successfully.

None.

CMUC00148W COMMAND INFO Are you sure you want to close session SESSION ID? [y/n]:

### **Explanation**

You are being asked to confirm that you want to close the session that you specified.

### **Action**

Enter **Y** to close the session. Enter **N** to cancel the operation.

CMUC00149 COMMAND INFO Remote Mirror and Copy path TARGET LSS successfully established.

# **Explanation**

The Remote Mirror and Copy path between source and target logical subsystems has been established successfully.

### **Action**

None.

CMUC001501 COMMAND INFO Remote Mirror and Copy path VALUE 0 successfully removed.

### **Explanation**

The Remote Mirror and Copy path between source and target logical subsystems has been removed successfully.

#### Action

None.

CMUC001511  $COMMAND\_INFO$  Remote Mirror and Copy path  $VALUE\_O$ successfully modified.

### **Explanation**

The Remote Mirror and Copy path between source and target logical subsystems has been modified successfully.

#### **Action**

# CMUC00152W COMMAND INFO Are you sure you want to remove the Remote Mirror and Copy path PATH ID? [y/n]: **Explanation**

You are being asked to confirm that you want to remove the Remote Mirror and Copy path that you specified.

#### Action

Enter Y to remove the path. Enter N to cancel the operation.

# CMUC001531 COMMAND INFO Remote Mirror and Copy volume pair relationship VALUE 0 successfully created.

# **Explanation**

The Remote Mirror and Copy volume pair relationship has been created successfully.

#### Action

None.

# CMUC00154I COMMAND INFO Remote Mirror and Copy volume pair VALUE 0 relationship successfully created and in full-duplex state. **Explanation**

The command has been invoked with the -wait flag. The Remote Mirror and Copy volume pair relationship has been created successfully and is now in full-duplex state.

### **Action**

None.

CMUC001551 COMMAND INFO Remote Mirror and Copy volume pair VALUE 0 relationship successfully withdrawn.

### **Explanation**

The Remote Mirror and Copy source and target pair relationship has been withdrawn successfully.

### Action

None.

# CMUC001561 COMMAND INFO Remote Mirror and Copy volume pair VALUE 0 relationship successfully modified.

### **Explanation**

The Remote Mirror and Copy source and target volume pair relationship has been modified successfully.

None.

CMUC001571 COMMAND INFO Remote Mirror and Copy volume pair VALUE 0 relationship successfully paused.

# **Explanation**

The Remote Mirror and Copy source and target volume pair relationship has paused successfully.

#### Action

None.

CMUC001581 COMMAND INFO Remote Mirror and Copy volume pair VALUE 0 relationship successfully resumed. This message is being returned before the copy completes.

# **Explanation**

The Remote Mirror and Copy source and target volume pair relationship has resumed successfully. An asynchronous copy from source to target began, but this message is being returned before the copy completes.

#### Action

None.

CMUC001591 COMMAND INFO Remote Mirror and Copy volume pair VALUE 0 relationship successfully resumed and completed. All data has been copied to the target. The relationship is now in full-duplex mode. **Explanation** 

> The Remote Mirror and Copy source and target volume pair relationship resumed successfully and completed. The -wait flag was specified when the command was issued, and the command has now completed successfully.

#### Action

None.

CMUC00160W COMMAND INFO Are you sure you want to delete the Remote Mirror and Copy volume pair relationship PAIR ID? [y/n]: **Explanation** 

> You are being asked to confirm that you want to delete the Remote Mirror and Copy volume pair relationship that you specified.

#### Action

Enter Y to delete the Remote Mirror and Copy volume pair relationship. Enter N to cancel the operation.

# CMUC00161W COMMAND INFO Remote Mirror and Copy consistency group VALUE 0 successfully created.

# **Explanation**

The Remote Mirror and Copy consistency group was created successfully.

Action

None.

CMUC001621 COMMAND INFO Global Mirror for session SESSION\_ID successfully started.

**Explanation** 

Global Mirror for the session started successfully.

Action

None.

CMUC001631 COMMAND INFO Global Mirror for session SESSION ID successfully paused.

**Explanation** 

Global Mirror for the session has paused successfully.

Action

None.

CMUC001641 COMMAND INFO Global Mirror for session SESSION\_ID successfully resumed.

**Explanation** 

Global Mirror for the session has resumed successfully.

Action

None.

CMUC001651 COMMAND INFO Global Mirror for session SESSION ID successfully stopped.

**Explanation** 

Global Mirror for the session has been stopped successfully.

Action

# CMUC00166W COMMAND INFO Are you sure you want to stop the Global Mirror session SESSION ID? [y/n]:

# **Explanation**

You are being asked to confirm that you want to stop the specified Global Mirror session.

#### Action

Enter Y to stop the Global Mirror session. Enter N to cancel the operation.

# CMUC001671 COMMAND INFO FlashCopy volume pair PAIR ID successfully made revertible.

### **Explanation**

The FlashCopy volume pair that is part of an Global Mirror relationship has been modified to revertible. The source data can now be committed to the target, or the source data can be reverted to the data image that is currently on the target.

### Action

None.

# CMUC001681 COMMAND INFO FlashCopy volume pair PAIR ID successfully resynchronized.

# **Explanation**

Incremental changes to the FlashCopy source volume data have been written successfully to the target volume.

### **Action**

None.

# CMUC001691 COMMAND INFO FlashCopy volume pair PAIR ID successfully reversed.

### **Explanation**

The original FlashCopy source volume has been made the target volume. The original FlashCopy target volume has been made the source volume. Any uncommitted incremental changes to the original source volume data have been overwritten with older data from the new source volume.

#### **Action**

# CMUC001701 COMMAND INFO FlashCopy volume pair PAIR ID successfully committed.

# **Explanation**

Changes to the FlashCopy source volume data have been committed to the target volume.

### Action

None.

CMUC001711 COMMAND INFO FlashCopy volume pair PAIR ID successfully reverted.

### **Explanation**

All new writes to the source volume since the last time source data was committed to the target volume have been discarded.

#### Action

None.

CMUC001721 COMMAND INFO FlashCopy consistency group for logical subsystem PAIR ID successfully reset.

# **Explanation**

A mkflash -freeze or resyncflash -freeze command has been invoked previously against this consistency group. The unfreezeflash command successfully reset the consistency group.

### **Action**

None.

CMUC001731 COMMAND INFO Remote FlashCopy volume pair PAIR ID successfully created. Use the Isremoteflash command to determine copy completion.

# **Explanation**

The remote FlashCopy relationship has been created and started successfully, but this message is being returned before the copy completes. Use the Isremoteflash command to determine if the copy has completed.

### Action

# CMUC001741 COMMAND INFO Remote FlashCopy pair PAIR ID successfully made revertible.

# **Explanation**

The remote FlashCopy volume pair has been modified to revertible. The source data can now be **committed** to the target, or the source data can be **reverted** to the data image that is currently on the target.

#### Action

None.

CMUC001751 COMMAND INFO Remote FlashCopy volume pair PAIR ID successfully resynchronized. Use the Isremoteflash command to determine copy completion.

# **Explanation**

The remote FlashCopy relationship resynchronization operation started successfully, but this message is being returned before the copy completes. Use the **Isremoteflash** command to determine if the copy has completed.

#### Action

None.

CMUC001761 COMMAND INFO Remote FlashCopy volume pair PAIR ID successfully committed.

### **Explanation**

The remote FlashCopy relationship has been committed. The target data is an identical image of the source data at the time the commit command was issued.

### Action

None.

CMUC001771 COMMAND INFO Remote FlashCopy volume pair PAIR ID successfully reverted.

### **Explanation**

All new writes to the source volume since the last time data was committed to the target volume are being discarded.

### Action

# CMUC001781 COMMAND INFO Remote FlashCopy volume pair PAIR ID successfully reversed.

# **Explanation**

The original remote FlashCopy source volume has been made the target volume. The original remote FlashCopy target volume has been made the source volume. Any uncommitted incremental changes to the original source volume data are being overwritten with older data from the new source volume.

#### Action

None.

# CMUC001791 COMMAND INFO Are you sure you want to remove the remote FlashCopy pair PAIR ID? [y/n]:

# **Explanation**

You are being asked to confirm that you want to remove the remote FlashCopy pair relationship.

#### Action

Enter Y to delete the remote FlashCopy volume pair relationship. Enter N to cancel the operation.

CMUC001801 COMMAND INFO Removal of the remote FlashCopy volume pair PAIR ID has been initiated successfully. Use the Isremoteflash command to determine when the relationship is deleted.

# **Explanation**

The deletion of the remote FlashCopy relationship has been started, but this message is being returned before the process completes. You must use the **Isremoteflash** command to determine if the removal has completed.

### Action

None.

# CMUC00181E COMMAND INFO A user name must be specified.

# **Explanation**

This command requires a user name. You can specify the user name with the -user command-line flag or in the password file.

#### **Action**

Specify a valid user name, and then resubmit the command.

Tip: Enter "help **command\_name**" for more information.

# CMUC00182E COMMAND INFO No management console IP address is specified.

### **Explanation**

No command can be issued until you have specified the IP address of the management console. This IP address establishes communication between the command-line interface client and the management console server.

#### Action

Specify a valid IP address for the management console, and then resubmit the command. Specify the IP address in your user profile or by using appropriate options on some commands.

Tip: Enter "help command\_name" for more information.

# CMUC00183E COMMAND INFO Invalid management console IP address: VALUE 0.

### **Explanation**

An invalid IP address for the management console is specified in the user profile or with command flags.

### **Action**

Specify a valid IP address for the management console, and then resubmit the command. You can specify the IP address in your user profile or by using appropriate options on some commands.

Tip: Enter "help command\_name" for more information.

# CMUC00184E COMMAND INFO Management console server connections cannot be changed during an interactive or script session. **Explanation**

The current CLI session is either in interactive mode or script mode, and the command specifies a new management console server address. The command is rejected because changing the management console server connection is not permitted.

### Action

Open a different session to issue commands to the new management console server.

# CMUC00185E Unable to access CLI user profile file FILE NAME. **Explanation**

The CLI is unable to read your user profile for one of the following reasons:

- · The file does not exist.
- · The file is in the wrong location.
- · The file is corrupted.

· You lack sufficient privileges on the profile directory or file.

### Action

Ensure that the file exists in the proper location, and that you have access privileges.

# CMUC00186E User profile file FILE NAME. not found. **Explanation**

The specified profile file cannot be found.

#### Action

Ensure that the file exists in the proper location.

# CMUC00187E Unable to access CLI user password file FILE NAME. **Explanation**

The CLI is unable to find your user password file for one of the following reasons:

- · The file does not exist.
- The file is in the wrong location.
- · The file is improperly named.
- · You lack sufficient privileges on the password directory or file.

#### Action

Ensure that the file exists in the proper location, and that you have access privileges.

# CMUC00188E Unable to read CLI user password file FILE NAME. **Explanation**

The CLI is unable to read your user password file for one of the following reasons:

- · The file does not exist.
- · The file is in the wrong location.
- · The file is improperly named.
- · The file is corrupted.
- · You lack sufficient privileges on the password directory or file.

#### Action

Ensure that the file exists in the proper location, and that you have access privileges.

# CMUC00189E Internal error: VALUE 0. **Explanation**

The CLI reports an internal error.

Contact IBM technical support for assistance.

# CMUC00190E VALUE 0: Authentication failure: invalid password **Explanation**

Authentication fails because the password is incorrect.

#### Action

Provide a valid password, and then resubmit the task.

# CMUC00191E VALUE 0: Authentication failure: invalid user name **Explanation**

Authentication fails because the specified user account does not exist.

### Action

Provide a valid user name, and then resubmit the task.

# CMUC00192E VALUE 0: Authentication failure: the user account is locked.

### **Explanation**

Authentication fails because the specified user account has been locked by the system administrator or because the wrong password was entered three times in succession. Your system administrator can unlock the account with the chuser command.

#### Action

Contact your system administrator.

# CMUC00193E VALUE $\theta$ : Authentication failure: unable to access account database.

### **Explanation**

Authentication fails because the user account database cannot be accessed. The system administrator might be performing maintenance or other activities.

### Action

Contact your system administrator.

# CMUC00194E VALUE 0: Authentication failure: unable to authenticate on Enterprise Storage Server.

# **Explanation**

You are attempting to authenticate on an Enterprise Storage Server (2105). Authentication fails for an unknown reason, Additional information is unavailable from the ESS.

#### Action

Ensure that you are providing the correct user name and password for the ESS. Contact your system administrator. If the problem persists, contact IBM technical support for assistance.

# CMUC001951 COMMAND INFO Security properties successfully set. **Explanation**

The security properties have been set successfully.

#### Action

None.

# CMUC001961 COMMAND INFO Remote Mirror and Copy pair PAIR ID successfully reversed.

# **Explanation**

The source and target volume have been reversed. The secondary volume at the recovery site is now the primary volume.

### Action

None.

# CMUC001971 COMMAND INFO Remote Mirror and Copy pair PAIR ID successfully failed back.

### **Explanation**

The source and target volumes have been resynchronized. The data at the production site and recovery site are now identical.

#### Action

None.

# CMUC001981 COMMAND INFO Remote Mirror and Copy pair PAIR ID successfully thawed.

### **Explanation**

All queued write operations to the source volume are written. The Queue Full condition for the primary volume is reset.

None.

CMUC001991 COMMAND INFO License Machine Code successfully applied to storage image STORAGE IMAGE ID.

# **Explanation**

The License Machine Code has been applied successfully to the storage image.

### Action

None.

CMUC00200E COMMAND INFO This commmand is not supported for machine type TYPE.

# **Explanation**

The command is not supported on the type of machine that is currently connected to the command-line interface. For example, you might be issuing a machine type 2107 command to a storage unit that is machine type 2105.

### Action

Tip: Enter "help **command\_name**" for more information.

# CMUC00201E VALUE 0: Authentication failure: Your password has expired. Change your password with the chuser command. **Explanation**

Authentication fails because your password has expired. You must change your password with the **chuser** command before you can issue any other commands.

#### Action

Change your password using the chuser command.

CMUC002021 COMMAND INFO Remote Mirror and Copy ESCON path TARGET LSS successfully created.

### **Explanation**

The Remote Mirror and Copy ESCON path has been created successfully.

#### Action

# CMUC00203E COMMAND INFO Invalid pair. Each source volume must have a matching target volume.

# **Explanation**

The number of specified source volumes does not equal the number of specified target volumes.

#### Action

Enter complete source\_volume:target\_volume pairs, and then resubmit the task.

# CMUC002041 COMMAND INFO Password file FILE NAME successfully created.

### **Explanation**

The command to create a password file completed successfully.

### Action

Update the **pwfile** entry in your profile to indicate this password file name.

# CMUC002051 COMMAND INFO Password file FILE NAME successfully created.

# **Explanation**

The command succeeded and a new password file was created.

#### Action

Set the appropriate access control level for the new password file.

# CMUC002061 COMMAND INFO Record VALUE 1 successfully added to password file FILE\_NAME.

### **Explanation**

The specified record has been added to the password file.

#### Action

None.

# CMUC002071 COMMAND INFO Record VALUE 1 successfully changed in password file FILE NAME.

### **Explanation**

The specified record has been changed in the password file.

### Action

# CMUC002081 COMMAND INFO Record VALUE 1 successfully removed from password file FILE NAME.

# **Explanation**

The specified record has been removed from the password file.

#### Action

None.

# CMUC00209E COMMAND INFO Unable to open password file FILE NAME for write access.

### **Explanation**

You are attempting to update the specified password file. However, you do not have permission to write to the file.

#### Action

Ask your system administrator to grant you write permissions to the file, and then resubmit the command.

# CMUC00210E Password file FILE NAME is not formatted corrrectly. **Explanation**

You are attempting to authenticate, but the specified password file is not valid. Either this file is corrupted or it is not the correct file.

### **Action**

Specify a correctly formatted password file, and then resubmit the task.

# CMUC00211E COMMAND INFO The specified capacity CAPACITY is not valid for type TYPE.

# **Explanation**

The value that you specified with the **-cap** flag is not valid for the type that you specified with the -type flag. Refer to the IBM TotalStorage DS Command-Line Interface User's Guide for a description of valid capacities.

### Action

Specify a capacity that is valid for the type that is specified, and then resubmit the

# CMUC00212I COMMAND INFO completed successfully.

### **Explanation**

The command completed successfully.

None.

# CMUC00213E COMMAND INFO Unable to read License Machine Code activation codes file

### **Explanation**

The file containing License Machine Code activation codes for this storage image cannot be read. The file that you specify must be an xml formatted file that you have obtained from an authorized IBM source.

#### Action

Resubmit the task. If the problem persists, specify a different file.

# CMUC00214E COMMAND INFO File FILE contains no License Machine Code for storage image STORAGE IMAGE ID.

### **Explanation**

The specified file does not contain License Machine Code activation codes for this storage image. The file that you specify must be an xml formatted file that you have obtained from an authorized IBM source, and it must contain activation codes that are designated for this storage image.

#### Action

Specify the correct file and then resubmit the task.

# CMUC00215E COMMAND INFO Incorrectly formatted License Machine Code activation codes file

### **Explanation**

The file containing License Machine Code activation codes for this storage image is not the correct format. The file that you specify must be an xml formatted file that you have obtained from an authorized IBM source.

#### Action

Specify the correct file and then resubmit the task.

# CMUC002161 COMMAND INFO CKD alias volume VOLUME successfully created.

# **Explanation**

The CKD alias volume was created successfully.

### **Action**

# CMUC00217E COMMAND INFO The specified logical subsystem number for volume VOLUME is not valid.

# **Explanation**

The specified logical subsystem number contains characters that are not valid or is not an existing logical subsystem.

#### Action

Specify a valid logical subsystem number for the volume, and then resubmit the

CMUC00218E COMMAND INFO The specified logical control unit number for volume VOLUME is not valid. Either you specified this volume explicitly or you specified it implicitly by parameter values. **Explanation** 

> The specified logical control unit number contains characters that are not valid or is not an existing logical control unit.

#### Action

Specify a valid logical control unit number for the volume, and then resubmit the

CMUC00219E COMMAND INFO Connection failure: The specified storage management console peers are not valid.

### **Explanation**

The storage management console peers that are specified either as input, as command options, or in a profile file are not valid. The IP addresses might not be correct, or the storage management consoles might not be configured as peers.

### Action

Specify valid peers, and then resubmit the task.

# CMUC00220E COMMAND INFO Connection failure: VALUE 0 **Explanation**

Connection to the specified storage management consoles failed.

### **Action**

Ensure that the storage management console IP addresses are correct, that a network connection to the storage management consoles exists, and that the storage management consoles are available. Then resubmit the task.

# CMUC00219X COMMAND INFO

### **Explanation**

### **Action**

# Management console server messages

These are management console server messages.

# CMUN00000E SOURCE Authentication failure **Explanation**

The storage management console server reports an authentication failure. Authentication information that is provided by the client is invalid.

#### **Action**

Provide the correct user name and password, and then resubmit the task.

# CMUN00001E SOURCE Configuration error **Explanation**

The storage management console server reports an internal error.

### Action

Contact IBM technical support for assistance.

# CMUN00002E SOURCE Internal error **Explanation**

The storage management console server reports an internal error.

### Action

Contact IBM technical support for assistance.

# CMUN00003E SOURCE Configuration connection error **Explanation**

The storage management console server reports an internal error.

### **Action**

Contact IBM technical support for assistance.

# CMUN00004E SOURCE Configuration connection error **Explanation**

The storage management console server reports an internal error.

Contact IBM technical support for assistance.

# CMUN00005E SOURCE Internal error

# **Explanation**

The storage management console server reports an internal Copy Services failure.

### **Action**

Contact IBM technical support for assistance.

# CMUN00006E SOURCE Internal error

# **Explanation**

The storage management console server reports an internal error.

### Action

Contact IBM technical support for assistance.

# CMUN00007E SOURCE Mismatched Jar file

### **Explanation**

The storage management console server or your client software reports that one of the Java resource files is not the correct version. The client and server cannot operate correctly if their respective files are not the same version.

### **Action**

Install the appropriate versions of the management console server software and client software. If the problem persists, contact IBM technical support for assistance.

# CMUN00008E SOURCE Invalid configuration parameter **Explanation**

The storage management console server detects an invalid or nonexistent configuration parameter. Examples include:

- · A null value
- · An invalid extent type
- · An invalid volume type
- · An invalid device type
- · An incorrect storage image
- · An out of range subsystem identifier

### Action

Correctly specify all parameters, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN00009E SOURCE Invalid parameter

### **Explanation**

The storage management console server detects an invalid or nonexistent parameter. Examples include:

- · An invalid volume
- · An invalid logical subsystem
- · An invalid storage image

### Action

Correctly specify all parameters, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN00010E SOURCE Invalid parameter.

### **Explanation**

The storage management console server detects an invalid parameter. Examples include:

- · A null value
- · An invalid type

### Action

Correctly specify all parameters, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN00011E SOURCE Configuration query error **Explanation**

The storage management console server detects an internal error that occurs during a resource query.

#### **Action**

Contact IBM technical support for assistance.

# CMUN00012E SOURCE Configuration query error **Explanation**

The storage management console server detects an internal error that occurs during a resource query.

### **Action**

### CMUN00013E SOURCE Resource not found

### **Explanation**

The storage management console server reports that it cannot find a resource. This might be because the resource is not configured on the console, or because it does not exist in the storage complex.

#### Action

Check the available resources and specify the correct parameters. If the problem persists, contact IBM technical support for assistance.

# CMUN00014E SOURCE Server error

# **Explanation**

The storage management console server reports an internal error.

#### Action

Contact IBM technical support for assistance.

# CMUN00015E SOURCE Command execution timeout

# **Explanation**

The storage management console server reports that an internal timeout has occurred before the task can complete.

#### Action

Check for intermediate task results. Remove intermediate results or modify the task as necessary. Resubmit the task. If the problem persists, contact IBM technical support for assistance.

### CMUN00016E SOURCE Unauthorized access

### **Explanation**

The storage management console server reports that you are not authorized to perform this operation.

### Action

Verify your user name and privileges. Contact your system administrator.

### CMUN00017E SOURCE Unauthorized

#### **Explanation**

The storage management console server reports that you are not authorized to perform this operation.

### Action

Verify your user name and privileges. If your password has expired, renew your password. Contact your system administrator.

# CMUN00018E SOURCE Unable to connect to the storage management console server

# **Explanation**

Your client software cannot connect to the storage management console server. This might be because the server is not enabled, a network problem exists, or the server is refusing connections because the maximum number of clients are connected already.

### Action

Ensure that the storage management console is online. Ensure that you specify the storage management console IP addresses correctly. Ensure that other connections do not already exist.

# CMUN00019E SOURCE Unknown configuration error **Explanation**

The storage management console server detects an unknown internal error that occurs during resource configuration.

### Action

Contact IBM technical support for assistance.

# CMUN00020E SOURCE Unknown error **Explanation**

The storage management console server detects an unknown internal error.

#### Action

Contact IBM technical support for assistance.

# CMUN00021E SOURCE Unknown management console server internal error **Explanation**

The storage management console server reports an unknown internal error.

#### Action

Contact IBM technical support for assistance.

# CMUN00022E SOURCE The specified operation is unsupported. **Explanation**

The storage management console server reports that the command that it received is unsupported. This might be because the command is invalid, because the client issuing the command is at a different software version level than the server, or because the operation is not licensed.

Verify that you are issuing the correct command. Verify that you have installed the same versions of the storage management console server software and the client. Verify that you have installed licensed machine code that supports the operation.

# CMUN01000E SOURCE Operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN01001E SOURCE Operation failure: retrieving rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN01002E SOURCE Operation failure

# **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02000E SOURCE Query failure: This action is supported only for CKD volumes.

### **Explanation**

This action is supported only for count-key-data volumes.

### Action

Specify count-key-data volumes in a CKD logical subsystem, and then resubmit the task.

# CMUN02001E SOURCE Error: The logical volume has been created, but it is not assigned to an address group.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

# CMUN02002E SOURCE Error: The logical volume has been created but it is not assigned to a logical subsystem.

# **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02003E SOURCE Error: The logical volume has been created, but it is not assigned to a volume group.

# **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02004E SOURCE Error: The logical volume has been created, but it is not assigned to an extent pool.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02005E SOURCE Operation failure: already assigned **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02006E SOURCE Unable to query rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

# CMUN02007E SOURCE Unable to query rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02008E SOURCE Unable to query logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02009E SOURCE Unable to create array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02010E SOURCE Unable to create array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02011E SOURCE Unable to create array: internal interface communication error

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

# CMUN02012E SOURCE Unable to create array: The array site is not unassigned.

### **Explanation**

An array site is not in the unassigned state. The task requires a unassigned array site.

### **Action**

Check the status of the specified array site. Specify an unassigned array site, and then resubmit the task. If the problem persists, contact IBM technical support for assistance

# CMUN02013E SOURCE Unable to create array **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

# CMUN02014E SOURCE Cannot delete array. The array is flagged to be serviced.

# **Explanation**

The array is flagged for service. An array in this state cannot be deleted until the service intent flag is removed.

#### Action

Wait until service is completed on the array, and then resubmit the task.

# CMUN02015E SOURCE Unable to delete rank: The rank is still assigned.

# **Explanation**

A rank cannot be deleted while it is still in the **assigned** state.

#### Action

Unassign the rank, and then resubmit the task.

# CMUN02016E SOURCE Unable to delete logical subsystem: Logical volumes are assigned.

# **Explanation**

Logical volumes are assigned to the logical subsystem. The logical subsystem cannot be deleted until these volumes are deleted.

#### Action

Delete the logical volumes, and then resubmit the task.

# CMUN02017E SOURCE Unable to delete rank: Extents are in use. **Explanation**

The rank cannot be deleted because extents are still allocated from the rank.

### **Action**

Unallocate all storage from the rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02018E SOURCE Unable to create or delete array: local server offline

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

# CMUN02019E SOURCE Cannot exceed maximum volume group count **Explanation**

The maximum volume group count has been reached. A new volume group cannot be created.

#### Action

Remove unused volume groups, and then resubmit the task.

# CMUN02020E SOURCE Unable to create logical subsystem: ID already in use.

### **Explanation**

The logical subsystem cannot be created because the specified ID is already in use.

Specify a different logical subsystem ID, and then resubmit the task.

# CMUN02021E SOURCE Unable to create logical volume: the volume number already exists.

# **Explanation**

The specified logical volume exists already.

### Action

Specify a different volume number, and then resubmit the task.

# CMUN02022E SOURCE Unable to create array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02023E SOURCE Unable to modify logical subsystem: cannot set session timeout

### **Explanation**

The specified session timeout value is negative. Only positive values are valid.

### Action

Specify a valid timeout value, and then resubmit the task.

# CMUN02024E SOURCE Unable to modify logical subsystem: invalid critical mode enabled

#### **Explanation**

The specification contains an invalid value for the critical mode enabled parameter.

### Action

Specify a valid value, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02025E SOURCE Unable to modify logical subsystem: invalid extended long busy enabled **Explanation**

The specification contains an invalid value for the extended long busy enabled parameter.

Specify a valid value, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02026E SOURCE Unable to modify logical subsystem: invalid extended long busy time

# **Explanation**

The specified extended long busy time value is negative. Only positive values are

### Action

Specify a valid value, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02027E SOURCE Unable to modify logical subsystem: cannot set session timeout

# **Explanation**

The specified session timeout value is negative. Only positive values are valid.

### **Action**

Specify a valid timeout value, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02028E SOURCE Cannot use array sites. These sites are flagged to be serviced.

### **Explanation**

The array sites are flagged for service. An array cannot be created using these sites.

#### **Action**

Wait until service is completed on the array sites, and then resubmit the task.

# CMUN02029E SOURCE Internal error

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

# CMUN02030E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02031E SOURCE Operation failure: changes are pending **Explanation**

The storage management console server reports a storage unit microcode-level error. The operation cannot be completed because previously stipulated changes have not yet been applied.

#### Action

Ensure that any other tasks that you have initiated have been completed. Wait, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02032E SOURCE Unable to create logical volume **Explanation**

The storage management console server reports a storage unit microcode-level

#### Action

Contact IBM technical support for assistance.

# CMUN02033E SOURCE Error: The logical volume has been deleted, but the logical subsystem deletion fails.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02034E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

# CMUN02035E SOURCE Unable to delete logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02036E SOURCE Unable to delete array **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02037E SOURCE Unable to delete array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02038E SOURCE Unable to delete array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02039E SOURCE Unable to delete array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

# CMUN02040E SOURCE Unable to delete array. The array is still assigned.

### **Explanation**

The array is still assigned. An assigned array cannot be deleted. Either ranks exist on the array, or a format operation is taking place.

#### Action

Delete the ranks on the array or wait until the format completes, and then resubmit

# CMUN02041E SOURCE Unable to create logical subsystem: device type must be CKD

### **Explanation**

The specified device type must be count-key-data.

#### Action

Specify a CKD device type, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02042E SOURCE Operation failure: configuration already exists **Explanation**

You are attempting to create a configuration that already exists.

### **Action**

Specify a unique configuration, and then resubmit the task.

# CMUN02043E SOURCE Operation failure: internal database not open **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02044E SOURCE Operation failure: unable to allocate memory **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

# CMUN02045E SOURCE Operation failure: unable to allocate memory **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02046E SOURCE Operation failure: unable to allocate memory **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02047E SOURCE Operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02048E SOURCE Operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02049E SOURCE Rank reconfiguration failure: memory allocation error

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

# CMUN02050E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02051E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02052E SOURCE Storage unit unavailable **Explanation**

An invalid or unknown storage unit is specified.

### Action

Specify a valid and known storage unit.

# CMUN02053E SOURCE Unable to create extent pool: maximum number of extent pools reached

### **Explanation**

The maximum allowed number of extent pools in the storage image has been reached already.

### **Action**

Delete unused extent pools, and then resubmit the task.

# CMUN02054E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

## CMUN02055E SOURCE Operation failure: unable to allocate memory **Explanation**

The storage management console server reports a storage unit microcode-level error. The storage unit is unable to allocate memory. This might be a temporary problem that occurs during heavy usage.

#### Action

Resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02056E SOURCE Operation failure: unable to allocate memory **Explanation**

The storage management console server reports a storage unit microcode-level error. The storage unit is unable to allocate memory. This might be a temporary problem that occurs during heavy usage.

#### Action

Resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02057E SOURCE Unable to assign rank to extent pool: The rank is already assigned.

### **Explanation**

The rank is already assigned, so it cannot be assigned to another extent pool.

#### Action

Unassign the rank or specify an unassigned rank, and then resubmit the task.

## CMUN02058E SOURCE Unable to assign rank to extent pool **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02059E SOURCE Unable to assign rank to extent pool **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

## CMUN02060E SOURCE Unable to create extent pool **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02061E SOURCE Create logical subsystem failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02062E SOURCE Unable to modify SCSI host port: invalid host type

### **Explanation**

The host type is longer than the 16-character maximum length.

#### Action

Specify a valid host type, and then resubmit the task.

## CMUN02063E SOURCE Unable to create SCSI host port: invalid WWPN **Explanation**

The worldwide port name is invalid. A WWPN must be a 16-character hexadecimal string.

#### Action

Specify a valid worldwide port name, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02064E SOURCE Unable to create SCSI host port: non-unique WWPN **Explanation**

The worldwide port name is not unique.

#### Action

Specify a unique worldwide port name, and then resubmit the task.

### CMUN02065E SOURCE Operation failure: device adapter cannot query data

### **Explanation**

The storage management console server reports a storage unit microcode-level error. This might be a temporary problem due to heavy traffic, or it might indicate a hardware failure.

#### Action

Check for device adapter and storage device hardware errors, and follow the recommended service procedure. If the problem persists, contact IBM technical support for assistance.

### CMUN02066E SOURCE Operation failure: database creation error **Explanation**

The storage management console server reports a storage unit microcode-level error. An internal database cannot be created.

#### Action

Contact IBM technical support for assistance.

## CMUN02067E SOURCE Unable to create SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02068E SOURCE Unable to create SCSI host port: invalid volume group identifier

### **Explanation**

The specification contains an invalid volume group identifier.

#### Action

Specify a valid volume group identifier, and then resubmit the task.

## CMUN02069E SOURCE Unable to create SCSI host port: invalid profile **Explanation**

The port profile length cannot be more than 16 characters.

#### **Action**

Correct the port specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02070E SOURCE Unable to create SCSI host port: invalid WWPN **Explanation**

The worldwide port name is invalid. A WWPN must be a 16-character hexadecimal string.

#### **Action**

Provide a valid worldwide port name, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02071E SOURCE Unable to create SCSI host port: invalid WWPN **Explanation**

The worldwide port name is invalid. A WWPN must be a 16-character hexadecimal strina.

### Action

Provide a valid worldwide port name, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02072E SOURCE Unable to create SCSI host port: invalid override default priority **Explanation**

The attribute value that indicates whether default priority for I/O operations can be overridden is invalid.

#### Action

Correct the port specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02073E SOURCE Unable to create volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02074E SOURCE Unable to create volume group: invalid user name **Explanation**

The specified user name is longer than the 16-character maximum length.

#### Action

Specify a valid user name, and then resubmit the task.

## CMUN02075E SOURCE Unable to delete extent pool **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02076E SOURCE Rank creation cannot complete.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02077E SOURCE Operation failure: addition **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

### CMUN02078E SOURCE Failed to initialize LPAR **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02079E SOURCE Operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

## CMUN02080E SOURCE Unable to create array: The maximum number of arrays have been created.

### **Explanation**

The array cannot be created because the maximum allowed number of arrays have been created already.

#### Action

Add additional storage or delete one or more existing arrays, and then resubmit the

### CMUN02081E SOURCE Unable to create rank: The maximum number of ranks have been created.

### **Explanation**

The rank cannot be created because the maximum allowed number of ranks have already been created.

#### Action

Add additional storage or delete one or more existing ranks, and then resubmit the task.

## CMUN02082E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level

#### **Action**

Contact IBM technical support for assistance.

## CMUN02083E SOURCE Extent pool operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02084E SOURCE Unable to delete extent pool **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

## CMUN02085E SOURCE Unable to delete extent pool **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02086E SOURCE Unable to delete logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

### CMUN02087E SOURCE Unable to query rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

### CMUN02088E SOURCE Unable to query rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02089E SOURCE Failed to initialize LPAR **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

### CMUN02090E SOURCE LPAR startup error

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02091E SOURCE Failed to initialize LPAR

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02092E SOURCE Rank creation cannot complete

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

### CMUN02093E SOURCE Unable to create logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02094E SOURCE Failed to initialize LPAR **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

## CMUN02095E SOURCE Unable to create logical volume **Explanation**

The specification contains an invalid combination of requested capacity, volume type, and data type.

#### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02096E SOURCE Unable to create logical volume **Explanation**

The specification contains an invalid combination of requested capacity, volume type, and data type.

#### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02097E SOURCE Unable to query rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02098E SOURCE Unable to create logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

## CMUN02099E SOURCE Unable to create volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

### CMUN02100E SOURCE Volume group operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

## CMUN02101E SOURCE Unable to query volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02102E SOURCE Unable to delete logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02103E SOURCE Unable to assign volumes to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02104E SOURCE Unable to assign volume to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

## CMUN02105E SOURCE Unable to retrieve volumes assigned to volume group

### **Explanation**

The storage management console server reports a storage unit microcode-level

#### Action

Contact IBM technical support for assistance.

## CMUN02106E SOURCE Unable to retrieve volumes assigned to volume group

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02107E SOURCE Unable to delete volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02108E SOURCE Unable to modify volume group **Explanation**

This volume group is internally reserved and cannot be modified.

#### Action

Specify a different volume group, and then resubmit the task.

## CMUN02109E SOURCE Unable to modify SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

## CMUN02110E SOURCE Unable to modify SCSI host port: invalid address discovery method

### **Explanation**

You must specify how the port discovers the LUNs that are accessible by the host port. The host port can use one of two methods:

- · The Report LUNs command
- LUN polling

#### Action

Specify a valid address discovery method, and then resubmit the task.

## CMUN02111E SOURCE Unable to modify SCSI host port: invalid volume group type

### **Explanation**

The volume group being assigned to the SCSI host port has an invalid type.

#### Action

Specify a volume group with a valid type, and then resubmit the task.

## CMUN02112E SOURCE Unable to modify SCSI host port: invalid volume group ID

### **Explanation**

The specification contains an invalid volume group identifier.

#### Action

Specify a valid volume group identifier, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02113E SOURCE Unable to modify SCSI host port: logical block size and volume group type mismatch

### **Explanation**

A 520-byte block size requires a SCSI520-All or SCSI520-Mask volume group type.

### **Action**

Specify a valid volume group type, and then resubmit the task.

### CMUN02114E SOURCE Unable to modify SCSI host port: invalid logical block size

#### **Explanation**

The logical block size of the devices that the port accesses must be either 512-bytes or 520-bytes.

#### Action

Specify a valid logical block size, and then resubmit the task.

# CMUN02115E SOURCE Unable to modify SCSI host port: logical block size and volume group type mismatch

### **Explanation**

A 512-byte block size requires a SCSI-All, SCSI-Mask, or SCSI-Map 256 volume group type.

#### **Action**

Specify compatible logical block size and volume group type, and then resubmit the task.

### CMUN02116E SOURCE Unable to modify SCSI host port: invalid port mask

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A mask that controls N-port logins contains an invalid value.

#### **Action**

Correct the port specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02117E SOURCE Unable to modify SCSI host port: invalid override default priority value **Explanation**

The attribute that indicates whether the default priority for I/O operations is to be overridden is invalid. The value must be either true or false.

#### **Action**

Correct the port specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02118E SOURCE Unable to modify SCSI host port: invalid port profile

### **Explanation**

The port profile length cannot be more than 16 characters.

#### **Action**

Correct the port specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02119E SOURCE Unable to modify SCSI host port: invalid port topology

### **Explanation**

The attaching port topology must be one of the following:

- Fibre Channel Point to Point or Switched (FCP)
- Fibre Channel Arbitrated Loop (FC-AL)

#### Action

Specify a valid attaching port topology, and then resubmit the task.

## CMUN02120E SOURCE Unable to modify SCSI host port: address discovery method and volume group type mismatch **Explanation**

The Report LUNs address discovery method requires a SCSI-Mask, SCSI-Map 256, or SCSI520-Mask volume group type.

#### Action

Specify compatible address discovery method and volume group types, and then resubmit the task.

## CMUN02121E SOURCE Unable to modify SCSI host port: address discovery method and volume group type mismatch **Explanation**

The LUN Polling address discovery method requires a SCSI-All, SCSI-Map 256, SCSI520-All, or Copy Services volume group type.

#### **Action**

Specify compatible address discovery method and volume group types, and then resubmit the task.

## CMUN02122E SOURCE Unable to modify SCSI host port: invalid value **Explanation**

The storage management console server reports a storage unit microcode-level error. A mask that controls N-port logins contains an invalid value.

#### Action

Correct the port specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02123E SOURCE Unable to modify SCSI host port: nonexistent volume group

### **Explanation**

The specified volume group does not exist.

#### Action

Specify a valid volume group, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

### CMUN02124E SOURCE Unable to modify SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02125E SOURCE Unable to start or end service **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02126E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02127E SOURCE Unable to modify volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

### CMUN02128E SOURCE Unable to open a session to query a logical volume

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02129E SOURCE Unable to open a session **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02130E SOURCE Unable to open a session **Explanation**

The storage management console server reports a storage unit microcode-level

#### **Action**

Contact IBM technical support for assistance.

# CMUN02131E SOURCE Internal database overwrite failure: The database exists and overwrite is off.

### **Explanation**

The storage management console server reports a storage unit microcode-level error. Database overwrite permission is turned off for an existing database. The database cannot be overwritten.

#### Action

Contact IBM technical support for assistance.

## CMUN02132E SOURCE Rank creation cannot complete. **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

### CMUN02133E SOURCE Extent pool operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Check for device adapter and storage device hardware errors, and follow the recommended service procedure. If the problem persists, contact IBM technical support for assistance.

## CMUN02134E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02135E SOURCE Volume group query failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02136E SOURCE Unable to query volume groups: invalid volume number

#### **Explanation**

The specification contains an invalid volume identifier. A logical volume identifier must be a 4-character hexadecimal string.

#### Action

Specify a valid volume, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

### CMUN02137E SOURCE Unable to assign rank to extent pool: type mismatch

#### **Explanation**

The specified rank and extent pool must be the same type.

#### Action

Specify the same type for rank and extent pool, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02138E SOURCE Unable to create rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02139E SOURCE Unable to create rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02140E SOURCE Unable to create rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

## CMUN02141E SOURCE Rank creation failure: check device adapter **Explanation**

The storage management console server reports a storage unit microcode-level error. Creation of the rank did not complete. A device adapter might have failed.

#### Action

Check for device adapter hardware errors, and follow the recommended service procedure. If the problem persists, contact IBM technical support for assistance.

### CMUN02142E SOURCE Rank creation did not complete. **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

### CMUN02143E SOURCE Unable to create rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02144E SOURCE Unable to create rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02145E SOURCE Unable to create rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02146E SOURCE Rank creation failure: server unavailable **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02147E SOURCE Unable to repair array **Explanation**

The task must be invoked against a rank in the FAILED state. The rank is not in the FAILED state.

#### Action

### CMUN02148E SOURCE Unable to repair array **Explanation**

The task must be invoked against a rank in the inaccessible state. The rank is not in the inaccessible state.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02149E SOURCE Unable to repair array **Explanation**

The task must be invoked against a rank in the repairing\_formatted state. The rank is not in the repairing\_formatted state.

#### Action

Contact IBM technical support for assistance.

## CMUN02150E SOURCE Unable to delete rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02151E SOURCE Unable to delete rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02152E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

### CMUN02153E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02154E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02155E SOURCE Rank operation failure: device adapter error **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Check for device adapter and storage device hardware errors, and follow the recommended service procedure. If the problem persists, contact IBM technical support for assistance.

## CMUN02156E SOURCE Unable to reconfigure rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

## CMUN02157E SOURCE Unable to reconfigure rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

### CMUN02158E SOURCE Unable to reconfigure rank: server offline **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

#### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

# CMUN02159E SOURCE Rank reconfiguration failure: The rank is flagged to be serviced.

### **Explanation**

The specified rank is flagged for service. A rank cannot be reconfigured while it is flagged for service.

#### Action

Wait until the service is completed, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02160E SOURCE Unable to reconfigure rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02161E SOURCE Unable to release rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02162E SOURCE Unable to reserve rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

### CMUN02163E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02164E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02165E SOURCE Unable to unassign rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02166E SOURCE Unable to reconfigure rank: The rank remains in the failed state.

#### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02167E SOURCE Unable to release rank **Explanation**

The rank is not **reserved**. Only reserved ranks can be released.

#### Action

Reserve the rank or choose a reserved rank, and then resubmit the task.

## CMUN02168E SOURCE Unable to assign volumes to volume group **Explanation**

At least one of the volumes has an invalid data type for the specified volume group.

- A SCSI-Mask volume group requires a 512-byte block data type.
- A SCSI520-Mask volume group requires a 520-byte block protected data type or a 520-byte block unprotected data type.

#### **Action**

Specify volumes with compatible data types, and then resubmit the task.

### CMUN02169E SOURCE Unable to assign volume to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02170E SOURCE Unable to assign volume to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02171E SOURCE Unable to assign volumes to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

## CMUN02172E SOURCE Unable to assign volume to volume group **Explanation**

No rank has been created. At least one rank must exist before a volume can be created and assigned.

#### Action

Create at least one rank and volume, and then resubmit the task.

## CMUN02173E SOURCE Unable to assign volume to volume group: data type mismatch

### **Explanation**

The data type of the volume does not match the data type of the volume group.

- A SCSI-Mask volume group requires a 512-byte block data type.
- A SCSI520-Mask volume group requires a 520-byte block protected data type or a 520-byte block unprotected data type.

#### Action

Specify compatible data types, and then resubmit the task.

## CMUN02174E SOURCE Unable to assign volume to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02175E SOURCE Unable to assign volume to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02176E SOURCE Unable to assign volume to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02177E SOURCE Unable to assign volume to volume group **Explanation**

No rank has been created. At least one rank must exist before a volume can be created and assigned.

#### **Action**

Create at least one rank and volume, and then resubmit the task.

## CMUN02178E SOURCE Unable to reset Copy Services settings on logical subsystems

### **Explanation**

The storage management console server reports a storage unit microcode-level

#### Action

Contact IBM technical support for assistance.

## CMUN02179E SOURCE Unable to reset Copy Services settings on logical subsystem

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

### CMUN02180E SOURCE Unable to reserve rank **Explanation**

The rank is not **assigned**. Only **assigned** ranks can be reserved.

#### **Action**

Assign the rank or choose an assigned rank, and then resubmit the task.

## CMUN02181E SOURCE Unable to modify SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02182E SOURCE Unable to modify SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

### CMUN02183E SOURCE Unable to modify SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02184E SOURCE Unable to modify SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02185E SOURCE Unable to retrieve volumes assigned to the volume group

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02186E SOURCE Unable to retrieve volumes assigned to volume group

#### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02187E SOURCE Unable to retrieve volumes assigned to the volume group: no ranks exist **Explanation**

No ranks exist on the storage image. Volume information is not available.

#### Action

Create at least one rank and volume on the storage image, and then resubmit the task.

## CMUN02188E SOURCE Unable to retrieve volumes assigned to volume group.

### **Explanation**

The storage management console server reports a storage unit microcode-level

#### Action

Contact IBM technical support for assistance.

## CMUN02189E SOURCE Unable to retrieve volumes assigned to volume group

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02190E SOURCE Unable to assign volume to volume group **Explanation**

No rank has been created. At least one rank must exist before a volume can be created and assigned.

#### **Action**

Create at least one rank and volume, and then resubmit the task.

## CMUN02191E SOURCE Unable to modify volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02192E SOURCE Unable to query rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

### CMUN02193E SOURCE Operation failure

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02194E SOURCE Unable to create SCSI host port: invalid port profile

### **Explanation**

The port profile is not a supported port profile.

#### **Action**

Specify a valid and supported port profile, and then resubmit the task.

# CMUN02195E SOURCE Operation failure

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02196E SOURCE SCSI host port operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02197E SOURCE Unable to modify SCSI host port: invalid port profile

### **Explanation**

The port profile is not a supported port profile.

#### Action

Specify a valid and supported port profile, and then resubmit the task.

# CMUN02198E SOURCE Unable to create, modify, or delete SCSI host port: local server offline

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

#### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02199E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02200E SOURCE Unable to query volume groups **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02201E SOURCE Unable to assign volumes to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02202E SOURCE Unable to assign volumes to volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

## CMUN02203E SOURCE Unable to create, modify, or delete volume group: version update

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

### CMUN02204E SOURCE Volume group query failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02205E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN02206E SOURCE Unable to unassign rank **Explanation**

Only ranks in the **reserved** state can be unassigned. The rank is not in the reserved state.

#### Action

Place the rank in the reserved state, or choose a reserved rank, and then resubmit the task.

## CMUN02207E SOURCE Unable to unassign rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

## CMUN02208E SOURCE Unable to unassign rank: Extents are allocated to logical volumes.

### **Explanation**

Extents from the specified rank are allocated to logical volumes. The rank cannot be deleted while storage is allocated from it. You must remove the volumes to deallocate the extents.

#### Action

Deallocate all extents from the rank by removing any volumes that use the extents, and then resubmit the task.

## CMUN02209E SOURCE Unable to delete SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02210E SOURCE Unable to delete SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02211E SOURCE Unable to delete volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02212E SOURCE Unable to delete volume group: The volume group is still assigned to a SCSI host port.

### **Explanation**

The volume group cannot be deleted because it is assigned to one or more host ports.

#### Action

Unassign the volume group from the host ports, and then resubmit the task.

## CMUN02213E SOURCE Unable to delete volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02214E SOURCE Unable to delete volume group **Explanation**

The specified volume group is internally reserved and cannot be deleted.

#### Action

Select another volume group, and resubmit the task.

## CMUN02215E SOURCE Unable to retrieve volume group information **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02216E SOURCE Unable to modify volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

## CMUN02217E SOURCE Operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

## CMUN02218E SOURCE Operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

### CMUN02219E SOURCE Unable to create or delete volume group: local server offline

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

### **Action**

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02220E SOURCE Unable to retrieve or assign volumes assigned to volume group: local server offline **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

#### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02221E SOURCE Unable to retrieve or assign volumes assigned to volume group: local server offline **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

#### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02222E SOURCE Operation failure

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

# CMUN02223E SOURCE Unable to repair array

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02224E SOURCE Unable to create volume group: invalid volume group type

### **Explanation**

The specified volume group type is invalid. The following volume group types are valid:

- SCSI-Mask
- SCSI-Map 256
- SCSI520-Mask
- · Copy Services

#### Action

Specify a valid volume group type, and then resubmit the task.

## CMUN02225E SOURCE Unable to assign rank to extent pool **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

### CMUN02226E SOURCE Unable to end service: Management console is not authorized.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02227E SOURCE Unable to create logical volume: The data type of the logical volume is incompatible with the extent type of its extent pool.

### **Explanation**

The data type of a logical volume must be compatible with the extent type of its extent pool.

#### Action

Specify compatible types. Either specify a different data type for the logical volume, or specify a different extent pool. If the problem persists, contact IBM technical support for assistance.

### CMUN02228E SOURCE Rank creation cannot complete. **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Check for device adapter and storage device hardware errors, and follow the recommended service procedure. If the problem persists, contact IBM technical support for assistance.

## CMUN02229E SOURCE Unable to create logical volume: Data type is incompatible with data type of other volumes in address group. **Explanation**

The data type of the logical volume must be the same as the data type of other logical volumes in the address group.

#### Action

Specify the same data type or a different address group, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02230E SOURCE Rank definition failure: extent type mismatch **Explanation**

The extent types that are specified for the rank and its extent pool do not match.

#### Action

Specify the same extent type for the rank and its extent pool, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02231E SOURCE Unable to create logical volume: rank group and logical subsystem group mismatch

### **Explanation**

A logical volume is created from an extent pool in a rank group. The logical volume is also a member of a logical subsystem group. The rank group identifier and the logical subsystem group identifier must be identical.

### Action

Specify the same identifier for the rank group and the logical subsystem group. One way to do this is by specifying a different extent pool. If the problem persists, contact IBM technical support for assistance.

## CMUN02232E SOURCE Unable to create logical subsystem: device type mismatch

### **Explanation**

The device type of the new logical subsystem is inconsistent with the device type of existing logical subsystems in the address group.

#### Action

Specify consistent device types, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02233E SOURCE Logical volume operation failure: inconsistent starting and ending logical volume numbers **Explanation**

The starting logical volume and the ending logical volume must belong to the same logical subsystem.

#### Action

Specify the same logical subsystem for the starting and ending logical volumes, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02234E SOURCE Unable to create logical subsystem: device type format error

### **Explanation**

The device type length must be less than 4 characters.

#### Action

Specify a valid device type, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02235E SOURCE Unable to create or modify logical subsystem: invalid format

### **Explanation**

A logical subsystem identifier must be 2 hexadecimal characters.

### Action

Specify a 2-hexadecimal character logical subsystem ID, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02236E SOURCE Unable to create or modify logical subsystem: invalid format

### **Explanation**

A logical subsystem identifier must be 2 hexadecimal characters.

### Action

Specify a 2 hexadecimal character logical subsystem ID, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02237E SOURCE Unable to create array: The RAID type is neither RAID5 nor RAID10.

## **Explanation**

The RAID type must be either RAID5 or RAID10.

#### Action

Specify a RAID5 or RAID10 type, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02238E SOURCE Unable to create or modify logical volume: invalid number

### **Explanation**

A logical volume number must be a 4-digit hexadecimal number.

### **Action**

Specify a 4-digit hexadecimal logical volume number, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02239E SOURCE Unable to create or modify logical volume: invalid volume number

## **Explanation**

A logical volume number must be a 4-digit hexadecimal number.

Specify a 4-digit hexadecimal logical volume number, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02240E SOURCE Unable to create logical volume: invalid volume type

## **Explanation**

The specification contains an invalid volume type.

### **Action**

Specify a valid logical volume type, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02241E SOURCE Service intent is not currently set. Reset ignored.

## **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02242E SOURCE Unable to create rank: Array is not unassigned. **Explanation**

The specification contains a reference to an assigned array. The rank must be created on an unassigned array.

### **Action**

Specify an unassigned array, and then resubmit the task.

## CMUN02243E SOURCE Unable to create or modify logical subsystem **Explanation**

The specification contains an invalid CKD base control unit value.

### Action

Specify a valid value, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02244E SOURCE Logical volume operation failure: invalid data type

### **Explanation**

The storage management console server reports a storage unit microcode-level

### Action

Contact IBM technical support for assistance.

## CMUN02245E SOURCE Unable to create extent pool: invalid extent limit enabled value

### **Explanation**

The specification contains an invalid parameter value. The value for extent limit enabled is neither true nor false.

#### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02246E SOURCE Unable to create extent pool: invalid extent limit

## **Explanation**

The specification contains an invalid parameter value. The value for extent limit is not between 0 and 100.

### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02247E SOURCE Unable to create extent pool: invalid extent threshold

### **Explanation**

The specification contains an invalid parameter value. The value for extent threshold is not between 0 and 100.

### **Action**

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02248E SOURCE Unable to modify extent pool: invalid extent threshold

### **Explanation**

The specification contains an invalid **extent threshold** value.

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02249E SOURCE Unable to create extent pool: invalid extent type

## **Explanation**

The specification contains an invalid extent type.

### **Action**

Specify a valid extent type, and then resubmit the task.

## CMUN02250E SOURCE Unable to create or modify extent pool: invalid user name

### **Explanation**

The specification contains a user name that exceeds the 16-character limit.

### Action

Specify a valid user name, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02251E SOURCE Unable to modify extent pool: invalid extent limit enabled value

### **Explanation**

The specification contains an invalid **extent limit enabled** value.

### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02252E SOURCE Unable to modify extent pool: invalid extent limit

### **Explanation**

The specification contains an invalid extent limit value.

### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02253E SOURCE Unable to start or end service: invalid storage management console ID

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02254E SOURCE Unable to create or modify logical volume: invalid user name

### **Explanation**

The specified user name is longer than the 16-character maximum length.

### Action

Specify a valid user name, and then resubmit the task.

# CMUN02255E SOURCE Unable to create or modify logical subsystem: invalid logical subsystem identifier format **Explanation**

The logical subsystem identifier must be a 4-character hexadecimal number.

#### Action

Specify a valid subsystem identifier, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02256E SOURCE Unable to create or modify logical subsystem: invalid logical subsystem identifier length **Explanation**

The subsystem identifier must be 4 characters long.

#### Action

Specify a valid subsystem identifier, and then resubmit the task.

# CMUN02257E SOURCE Logical subsystem query failure: invalid LSS ID **Explanation**

A logical subsystem ID is a hexadecimal value of the range (0 - FF).

### **Action**

Specify a valid identifier for the logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02258E SOURCE Unable to delete extent pool: ranks are assigned **Explanation**

Ranks are assigned to the extent pool. The extent pool cannot be deleted while ranks are assigned to it.

### Action

Unassign the ranks, and then resubmit the task.

## CMUN02259E SOURCE Unable to start or end service: invalid parameters

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02260E SOURCE Operation failure: invalid RAID type or number of spares

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02261E SOURCE Unable to create extent pool: invalid rank group **Explanation**

The specification contains an invalid rank group.

#### Action

Specify a valid rank group, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02262E SOURCE Unable to create volumes: invalid volume type **Explanation**

The specification contains an invalid volume type. The following volume types are supported, but you might be limited to a subset of these by other factors in your storage definition:

#### CKD base:

- · 3380 cylinder
- 3390 cylinder

CKD single-CU alias

Fixed block base:

- 512-byte block
- · 520-byte block unprotected
- · 520-byte block protected

#### Action

Specify a valid volume type, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02263E SOURCE Unable to create or delete extent pool: local server offline

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

#### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

# CMUN02264E SOURCE Unable to end service: lock still held by other management console

### **Explanation**

Service has been initiated by two storage management consoles. The other management console holds a lock.

#### Action

Release the service intent lock from the other management console, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02265E SOURCE Logical volume operation failure: not supported **Explanation**

The requested operation is not supported. This might be because the specified logical volume is an alias.

### Action

Specify a base logical volume, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02266E SOURCE Unable to modify logical subsystem: not a CKD volume

## **Explanation**

The specification attributes a count-key-data value to a fixed block logical subsystem.

### Action

Change the specification or select a count-key-data logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02267E SOURCE Unable to create or modify logical subsystem: identifier already in use

## **Explanation**

The specification contains a logical subsystem identifier that is already in use.

### Action

Specify a unique identifier for the the logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02268E SOURCE Unable to create or modify logical subsystem: identifier must be nonzero

## **Explanation**

The specification does not contain a logical subsystem identifier, or the identifier is zero. A nonzero identifier is required.

### **Action**

Specify a nonzero identifier for the logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02269E SOURCE Unable to modify logical subsystem: identifier only for CKD

### **Explanation**

The specified subsystem identifier is reserved for count-key-data type logical subsystems. The specified logical subsystem is fixed block and cannot be modified in this manner.

#### Action

Specify a a CKD logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02270E SOURCE Unable to create a new SCSI host port: maximum count reached

### **Explanation**

The maximum number of SCSI host ports have been created. No more SCSI host ports can be created.

### Action

Use an existing SCSI host port or delete an existing SCSI host port, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02271E SOURCE Unable to create SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02272E SOURCE SCSI host port operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02273E SOURCE Unable to modify SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02274E SOURCE Unable to delete SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

# CMUN02275E SOURCE Unable to create logical volume: volume type and data type mismatch

### **Explanation**

The specification contains inconsistent volume type and data type information.

#### Action

Specify consistent volume and data types, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02276E SOURCE Unable to delete rank **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02277E SOURCE Alias volume creation failure: no logical subsystem exists

### **Explanation**

A logical subsystem must exist before multiple alias volumes can be created.

### Action

Create a logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02278E SOURCE Operation failure: name is not unique **Explanation**

The specification contains a name that is already being used.

#### Action

Specify a unique name, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02279E SOURCE Operation failure: unknown storage unit **Explanation**

The specification contains a reference to an unknown storage unit.

#### Action

Specify a valid storage unit, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02280E SOURCE Unable to assign rank to extent pool: The extent pool does not exist.

### **Explanation**

The specification contains a reference to an invalid extent pool.

### Action

Specify a valid extent pool, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02281E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02282E SOURCE Unable to create CKD logical volume: CKD volumes require a CKD logical subsystem.

### **Explanation**

You must create a count-key-data type logical subsystem before you can create count-key-data type volumes.

### **Action**

Create a CKD logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02283E SOURCE Unable to create CKD alias logical volume: no base volume exists.

### **Explanation**

The specification contains a reference to a nonexistent base volume. A count-key-data alias can be created for existing base volumes only.

### Action

Specify a valid base volume that is contained within the same logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02284E SOURCE Logical subsystem operation failure: logical subsystem does not exist.

### **Explanation**

The specification contains a reference to a nonexistent logical subsystem.

Specify an existing logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02285E SOURCE Unable to create rank: array does not exist. **Explanation**

The specification contains a reference to a nonexistent array.

### Action

Specify an existing array, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02286E SOURCE Rank operation failure: extent pool does not exist.

### **Explanation**

The specification contains a reference to a nonexistent extent pool.

### Action

Specify an existing extent pool, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02287E SOURCE Rank operation failure: rank does not exist. **Explanation**

The specification contains a reference to a nonexistent rank.

### Action

Specify an existing rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02288E SOURCE Rank operation failure: rank does not exist. **Explanation**

The specification contains a reference to a nonexistent rank.

### Action

Specify an existing rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02289E SOURCE Rank operation failure: rank does not exist. **Explanation**

The specification contains a reference to a nonexistent rank.

Specify an existing rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02290E SOURCE Unable to create logical volume: extent pool does not exist.

## **Explanation**

The specification contains a reference to a nonexistent extent pool.

### **Action**

Specify an existing extent pool, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02291E SOURCE Unable to start service: device adapter pair is configuring.

### **Explanation**

Service intent cannot be set while a device on the adapter pair is still configuring.

### **Action**

Wait until the device configuration completes, and then resubmit the task.

## CMUN02292E SOURCE XML parse error **Explanation**

The storage management console server reports a storage unit microcode-level error. An xml file cannot be parsed.

### Action

Contact IBM technical support for assistance.

## CMUN02293E SOURCE Operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02294E SOURCE Unable to delete logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

## CMUN02295E SOURCE Unable to delete logical volume. **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

## CMUN02296E SOURCE Unable to delete logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02297E SOURCE Unable to create logical volume: FB volumes must have a data type.

### **Explanation**

The specification for a fixed block logical volume does not contain a data type. Fixed block logical volumes must have one of the following data types:

- 512-byte block
- 520-byte block unprotected
- · 520-byte block protected

### Action

Specify a data type, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02298E SOURCE Unable to create logical volume: FB volumes must have an extent pool.

### **Explanation**

The logical volume specification does not contain an extent pool. Fixed block logical volumes must have an extent pool from which their extents are allocated.

### **Action**

Specify an extent pool, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02299E SOURCE Unable to create logical volume: FB volumes must have a requested capacity.

## **Explanation**

The logical volume specification does not contain a requested capacity.

#### Action

Specify a requested capacity, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02300E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level

#### Action

Contact IBM technical support for assistance.

# CMUN02301E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level

### **Action**

Contact IBM technical support for assistance.

## CMUN02302E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02303E SOURCE Rank operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

# CMUN02304E SOURCE Unable to create array: memory allocation error **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN02305E SOURCE Operation failure: SCSI host port already exists.

## **Explanation**

The specified SCSI host port already exists.

### **Action**

Specify a new SCSI host port, and then resubmit the task.

# CMUN02306E SOURCE Unable to create, modify, or delete logical volume: service intent is set on extent pool. **Explanation**

The extent pool is flagged to be serviced. No operations can be performed on extent pool objects while it is flagged for service.

### Action

Wait until service is completed on the extent pool, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02307E SOURCE Unable to create logical volume **Explanation**

The specification contains an invalid combination of requested capacity, volume type, and data type.

### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02308E SOURCE Query failure: logical subsystem does not exist. **Explanation**

The specification contains a reference to a nonexistent logical subsystem.

### **Action**

Specify an existing logical subsystem, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02309E SOURCE Unable to modify logical volume: volume type and data type mismatch

### **Explanation**

A fixed block type logical volume must have a fixed block data type. A count-key-data type logical volume must have a count-key-data data type.

### Action

Specify a valid data type for the logical volume, and then resubmit the task.

## CMUN02310E SOURCE Unable to add logical volume to volume group **Explanation**

The storage management console server reports a storage unit microcode-level

#### Action

Contact IBM technical support for assistance.

## CMUN02311E SOURCE Unable to create logical subsystem **Explanation**

The storage management console server reports a storage unit microcode-level

### **Action**

Contact IBM technical support for assistance.

# CMUN02312E SOURCE Unable to delete logical subsystem **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02313E SOURCE Unable to delete logical subsystem **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

## CMUN02314E SOURCE Unable to modify logical volume **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02315E SOURCE Unable to modify logical subsystem **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02316E SOURCE Logical subsystem query failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02317E SOURCE Unable to delete CKD base logical volume: alias assigned

### **Explanation**

At least one alias is assigned to the count-key-data base logical volume. Aliases must be deleted before the count-key-data base logical volume can be deleted.

### **Action**

Remove the aliases, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02318E SOURCE Unable to create rank: Too many arrays are specified.

### **Explanation**

The storage management console server reports a storage unit microcode-level error. Only one array can be specified.

### **Action**

Specify one array, and then resubmit the task.

## CMUN02319E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02320E SOURCE Unable to create rank: Service intent is set on the array.

### **Explanation**

An array required for the operation has been flagged to be serviced. The array cannot be used while the service flag is set.

#### Action

Wait until service is completed on the array, and then resubmit the task.

# CMUN02321E SOURCE Unable to repair array: Service intent is set. **Explanation**

The array has been flagged to be serviced. The array cannot be used while the service flag is set.

### Action

Wait until service is completed on the array, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02322E SOURCE Unable to repair array: Service intent is set. **Explanation**

The array has been flagged to be serviced. The array cannot be used while the service flag is set.

#### Action

Wait until service is completed on the array, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02323E SOURCE Unable to assign rank to extent pool: Service intent is set on the storage complex. **Explanation**

The storage complex has been flagged to be serviced. No activities can be performed on objects in the storage complex while the service flag is set.

Wait until service is completed on the storage complex, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02324E SOURCE Unable to assign rank to extent pool: Service intent is set.

### **Explanation**

The rank has been flagged to be serviced. No activities can be performed on the rank while the service flag is set.

#### Action

Wait until service is completed on the rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02325E SOURCE Unable to create rank: not in dual server mode **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

### **Action**

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02326E SOURCE Unable to release rank: Service intent is set. **Explanation**

The rank has been flagged to be serviced. No activities can be performed on the rank while the service flag is set.

### Action

Wait until service is completed on the rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02327E SOURCE Unable to reserve rank: Service intent is set. **Explanation**

The rank has been flagged to be serviced. No activities can be performed on the rank while the service flag is set.

#### Action

Wait until service is completed on the rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02328E SOURCE Unable to unassign rank: Service intent is set. **Explanation**

The rank has been flagged to be serviced. No activities can be performed on the rank while the service flag is set.

#### Action

Wait until service is completed on the rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02329E SOURCE Unable to delete rank: not in dual server mode **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

# CMUN02330E SOURCE Unable to repair array: Service intent is set. **Explanation**

The array has been flagged to be serviced. No activities can be performed on the array while the service flag is set.

#### Action

Wait until service is completed on the array, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02331E SOURCE Unable to delete rank **Explanation**

The storage management console server reports a storage unit device adapter error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02332E SOURCE Unable to delete rank **Explanation**

The storage management console server reports a storage unit device adapter error.

#### Action

## CMUN02333E SOURCE Unable to delete rank: Service intent is set. **Explanation**

The rank has been flagged to be serviced. No activities can be performed on the rank while the service flag is set.

### Action

Wait until service is completed on the rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02334E SOURCE Unable to unfence volume through rank: Service intent is set.

### **Explanation**

The rank has been flagged to be serviced. No activities can be performed on the rank or volumes within the rank while the service flag is set.

### Action

Wait until service is completed on the rank, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02335E SOURCE Unable to create volumes: volume type must be specified

### **Explanation**

No volume type has been specified for the volumes. The following volume types are supported, but you might be limited to a subset of these by other factors in your storage definition:

### CKD base:

- · 3380 cylinder
- · 3390 cylinder

CKD single-CU alias

### Fixed block base:

- · 512-byte block
- 520-byte block unprotected
- · 520-byte block protected

### Action

Specify a valid volume type, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02336E SOURCE Unable to rebuild array **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

# CMUN02337E SOURCE Unable to create or modify logical volume: CKD base logical volume does not exist.

### **Explanation**

The specified logical volume does not exist or it is not a count-key-data base volume.

### **Action**

Create the base logical volume or specify a different base logical volume, and then resubmit the task.

# CMUN02338E SOURCE Delete SCSI host port operation stopped. Previous attempt failed.

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A list of SCSI host ports are specified to be deleted. Because a previous deletion failed, successive deletions in the list have stopped.

### Action

Contact IBM technical support for assistance.

# CMUN02339E SOURCE Delete volume group operation stopped. Previous attempt failed.

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A list of volume groups are specified to be deleted. Because a previous deletion failed, successive deletions in the list have stopped.

### **Action**

Contact IBM technical support for assistance.

# CMUN02340E SOURCE Array site operation failure: The array site is used in another array.

### **Explanation**

The specified array site is used in other array.

### **Action**

Specify an unused array site, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02341E SOURCE Logical subsystem configuration error **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

## CMUN02342E SOURCE Unable to delete last rank. Logical control unit exists.

### **Explanation**

The last rank cannot be deleted because one or more logical control units still exist.

### **Action**

Delete all logical control units, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02343E SOURCE Unable to create logical subsystem: local server offline

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02344E SOURCE Unable to delete logical subsystem: local server offline

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

#### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02345E SOURCE Unable to create logical volume: local server offline

## **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

#### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

# CMUN02346E SOURCE Unable to create logical volume: logical subsystem not in correct state **Explanation**

The storage management console server reports a storage unit microcode-level error. The logical volume cannot be created because its logical subsystem is not in the correct state.

#### Action

Contact IBM technical support for assistance.

## CMUN02347E SOURCE Unable to delete logical volume: local server offline

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

#### Action

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02348E SOURCE Operation failure: logical subsystem not in correct state

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

# CMUN02349E SOURCE Unable to modify logical volume: incorrect state **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

## CMUN02350E SOURCE Logical volume operation failure: incorrect state

## **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

## CMUN02351E SOURCE Logical volume operation failure: Base volume is in incorrect state.

### **Explanation**

The logical volume operation fails because its base logical volume is not in the correct state.

### **Action**

Change the configuration state of the base logical volume, or wait until its configuration completes, and then resubmit the task.

# CMUN02352E SOURCE Operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02353E SOURCE Operation failure

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

# CMUN02354E SOURCE Operation failure

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02355E SOURCE Unable to delete SCSI host port **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02356E SOURCE Unable to create SCSI host port: invalid user host description

### **Explanation**

The SCSI host port specification contains an invalid user host description. The SCSI host port cannot be created.

### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02357E SOURCE Unable to create SCSI host port: invalid user host name

### **Explanation**

The SCSI host port specification contains an invalid user host name. The SCSI host port cannot be created.

### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02358E SOURCE Unable to modify SCSI host port: invalid user host description

### **Explanation**

The SCSI host port specification contains an invalid user host description. The SCSI host port cannot be modified.

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02359E SOURCE Unable to modify SCSI host port: invalid user host name

### **Explanation**

The SCSI host port specification contains an invalid user host name. The SCSI host port cannot be modified.

### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02360E SOURCE Unable to add logical volume to volume group: invalid parameter

## **Explanation**

The operation to add the logical volume to the volume group fails because an invalid parameter is detected.

### Action

Correct the specification, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02361E SOURCE Unable to modify volume group: invalid user name **Explanation**

The volume group cannot be modified because the user name that is provided is invalid.

### Action

Use a valid user name with appropriate permissions, and then resubmit the task.

# CMUN02362E SOURCE Unable to query volume groups: incorrect volume configuration

## **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

# CMUN02363E SOURCE Unable to query volume groups: invalid parameter **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

## CMUN02364E SOURCE Unable to query volume groups: volume does not exist

## **Explanation**

The storage management console server reports a storage unit microcode-level

### Action

Contact IBM technical support for assistance.

# CMUN02365E SOURCE Unable to remove logical volume from volume group: invalid parameter

## **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

## CMUN02366E SOURCE Volume group operation failure: local server offline

### **Explanation**

The storage management console server reports a storage unit microcode-level error. A local server is not online. Microcode initialization might not have completed, or a failover has occurred and one server has not yet restarted.

### **Action**

Monitor system status, and resubmit the task when both servers are online. If the problem persists, contact IBM technical support for assistance.

## CMUN02367E SOURCE Volume group operation failure: incorrect volume configuration

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

## CMUN02368E SOURCE Volume group operation failure: volume does not exist

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02369E SOURCE Volume group operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02370E SOURCE Volume group operation failure: incorrect volume configuration

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02371E SOURCE Volume group operation failure: invalid parameter

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

## CMUN02372E SOURCE Volume group operation failure: volume does not exist

## **Explanation**

The storage management console server reports a storage unit microcode-level

### Action

Contact IBM technical support for assistance.

## CMUN02373E SOURCE Volume group operation failure: invalid parameter

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02374E SOURCE Unable to delete volume group **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02375E SOURCE Volume group operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02376E SOURCE Unable to modify logical volume: invalid data type

### **Explanation**

The logical volume cannot be modified because the specification contains an invalid data type.

#### Action

Specify a valid data type, and the resubmit the task.

## CMUN02377E SOURCE Error: inconsistent alias and base logical volume numbers

### **Explanation**

The first two digits of an alias logical volume number and its base logical volume number must be identical.

#### Action

Specify consistent alias and base logical volume numbers, and then resubmit the

# CMUN02378E SOURCE Error: A volume of this type cannot have an alias volume group.

### **Explanation**

An alias volume group is specified for a volume type that does not support the specification of aliases.

#### Action

Correct the specification, and then resubmit the task.

# CMUN02379E SOURCE Error: A volume of this type cannot have a base logical volume number.

## **Explanation**

A base logical volume number is specified for a volume type that does not support the specification of base logical volumes.

### Action

Correct the specification, and then resubmit the task.

# CMUN02380E SOURCE Unable to create array. Array sites must be in the same loop.

### **Explanation**

Array creation across loops is not supported. The specified array sites are not in the same loop, and an array cannot be created using these array sites.

### Action

Specify arrays that are in the same loop, and then resubmit the task.

## CMUN02381E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

# CMUN02382E SOURCE Unable to repair array **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02383E SOURCE Unable to create, delete, or modify logical subsystem resources. Resource manager unavailable on alternate server.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02384E SOURCE Operation failure: invalid file type **Explanation**

The storage management console server reports a storage unit microcode-level error. A configuation file is not the correct file type.

### Action

Contact IBM technical support for assistance.

## CMUN02385E SOURCE Unable to modify network port: The specified IP address is invalid.

### **Explanation**

The storage management console server reports a storage unit microcode-level error. An invalid IP address is specified.

### Action

## CMUN02386E SOURCE Unable to modify network port: The specified network is invalid.

### **Explanation**

The storage management console server reports a storage unit microcode-level error. An invalid network is specified.

### Action

Contact IBM technical support for assistance.

# CMUN02387E SOURCE Unable to create array. At least one and no more than two array sites must be specified.

### **Explanation**

You must specify at least one and no more than two array sites when you create RAID5 or RAID10 arrays.

#### Action

Specify one or two array sites, and then resubmit the task.

# CMUN02388E Invalid logical volume size. See the help text for this message for valid sizes.

### **Explanation**

The specified volume size is not supported on all platforms. Supported logical volume sizes are microcode level dependent.

For DS microcode levels 5.0.3 and above:

- Supported Enterprise Storage System (ESS) logical volume sizes range from 0.1 to 982.2 decimal gigabytes (1GB = 10^9 bytes). You can calculate the exact number of 512 byte blocks as INT((INT(GBx10^9/512)+63)/64)x64. The size of the volume that is created on the ESS is identical to the size of the volume that is created on the DS.
- Supported DS logical volume sizes range from 1 to 2048 binary gigabytes (1GB) = 2<sup>30</sup> bytes). This allocation uses the storage capacity of DS systems most efficiently.
- Supported block logical volume sizes range from 1 to 4 binary gigablocks (1 gigablock = 2<sup>30</sup> 512-byte blocks). If a specified size matches a supported DS or ESS logical volume size, the volume is identified as a DS or ESS logical volume, even though it is created by specifying the **blocks** volume type.
- Supported iSeries logical volume sizes are expressed in decimal gigabytes (1GB = 10^9 bytes):

```
A0 (8.6 GB protected)
                             A81 (8.6GB, unprotected)
                              A82 (17.5 GB unprotected)
A02 (17.5 GB protected)
A04 (70.5 GB protected) A84 (70.5 GB unprotected)
A05 (35.1 GB protected) A85 (35.1 GB unprotected)
A06 (141.12 GB protected) A86 (141.12 GB unprotected)
A07 (282.25 GB protected) A87 (282.25 GB unprotected)
```

For DS microcode levels 5.0.1 and 5.0.2, block logical volume sizes must be a multiple of 128, and ESS logical volume sizes must be in the following list:

0.1 (0.1)	0.2 (0.2)	0.3 (0.3)	0.4 (0.4)
0.9 (0.8)	1.0 (0.9)	1.1 (1.0)	1.2 (1.1)
1.7 (1.6)	1.8 (1.7)	1.9 (1.8)	2.0 (1.9)
2.5 (2.3)	2.6 (2.4)	2.7 (2.5)	2.8 (2.6)
3.3 (3.1)	3.4 (3.2)	3.5 (3.3)	3.6 (3.4)
3.7 (3.4)	4.2 (3.9)	4.3 (4.0)	4.4 (4.1)
4.5 (4.2)	5.0 (4.7)	5.1 (4.7)	5.2 (4.8)
5.3 (4.9)	5.8 (5.4)	5.9 (5.5)	6.0 (5.6)
6.1 (5.7)	6.7 (6.2)	6.8 (6.3)	6.9 (6.4)
7.0 (6.5)	7.5 (7.0)	7.6 (7.1)	7.7 (7.2)
7.8 (7.3)	8.3 (7.7)	8.4 (7.8)	8.5 (7.9)
8.6 (8.0)	9.1 (8.5)	9.2 (8.6)	9.3 (8.7)
9.4 (8.8)	10.0 (9.3)	10.1 (9.4)	10.2 (9.5)
10.3 (9.6)	10.8 (10.1)	10.9 (10.2)	11.0 (10.2)
11.1 (10.3)	11.6 (10.8)	11.7 (10.9)	11.8 (11.0)
11.9 (11.1)	12.4 (11.5)	12.5 (11.6)	12.6 (11.7)
12.7 (11.8)	13.3 (12.4)	13.4 (12.5)	13.5 (12.6)
13.6 (12.7)	14.1 (13.1)	14.2 (13.2)	14.3 (13.3)
14.4 (13.4)	14.9 (13.9)	15.0 (14.0)	15.1 (14.1)
15.2 (14.2)	15.7 (14.6)	15.8 (14.7)	15.9 (14.8)
16.0 (14.9)	16.6 (15.5)	16.7 (15.6)	16.8 (15.6)
16.9 (15.7)	17.4 (16.2)	17.5 (16.3)	17.6 (16.4)
17.7 (16.5)	18.2 (17.0)	18.3 (17.0)	18.4 (17.1)
18.5 (17.2)	19.0 (17.7)	19.1 (17.8)	19.2 (17.9)
19.3 (18.0)	19.4 (18.1)	19.9 (18.5)	20.0 (18.6)
20.1 (18.7)	20.2 (18.8)	20.7 (19.3)	20.8 (19.4)
20.9 (19.5)	21.0 (19.6)	21.5 (20.0)	21.6 (20.1)
21.7 (20.2)	21.8 (20.3)	22.3 (20.8)	22.4 (20.9)
22.5 (21.0)	22.6 (21.0)	22.7 (21.1)	23.2 (21.6)
23.3 (21.7)	23.4 (21.8)	23.5 (21.9)	24.0 (22.4)
24.1 (22.4)	24.2 (22.5)	24.3 (22.6)	24.8 (23.1)
24.9 (23.2)	25.0 (23.3)	25.1 (23.4)	25.6 (23.8)
25.7 (23.9)	25.8 (24.0)	25.9 (24.1)	26.0 (24.2)
26.5 (24.7)	26.6 (24.8)	26.7 (24.9)	26.8 (25.0)
27.3 (25.4)	27.4 (25.5)	27.5 (25.6)	27.6 (25.7)
28.1 (26.2)	28.2 (26.3)	28.3 (26.4)	28.4 (26.4)
28.9 (26.9)	29.0 (27.0)	29.1 (27.1)	29.2 (27.2)
29.3 (27.3)	29.8 (27.8)	29.9 (27.8)	30.0 (27.9)
30.1 (28.0)	30.6 (28.5)	30.7 (28.6)	30.8 (28.7)
30.9 (28.8)	31.4 (29.2)	31.5 (29.3)	31.6 (29.4)
31.7 (29.5)	32.3 (30.1)	32.4 (30.2)	32.5 (30.3)
32.6 (30.4)	33.1 (30.8)	33.2 (30.9)	33.3 (31.0)
33.4 (31.1)	33.9 (31.6)	34.0 (31.7)	34.1 (31.8)
34.2 (31.9)	34.7 (32.3)	34.8 (32.4)	34.9 (32.5)
35.0 (32.6)	35.6 (33.2)	35.7 (33.2)	35.8 (33.3)
35.9 (33.4)	36.4 (33.9)	36.5 (34.0)	36.6 (34.1)
36.7 (34.2)	37.2 (34.6)	37.3 (34.7)	37.4 (34.8)
37.5 (34.9) 38.3 (35.7) 39.2 (36.5) 40.0 (37.3) 40.8 (38.0) 41.6 (38.7) 42.5 (39.6)	38.0 (35.4) 38.9 (36.2) 39.7 (37.0) 40.5 (37.7) 41.3 (38.5) 42.2 (39.3)	38.1 (35.5) 39.0 (36.3) 39.8 (37.1) 40.6 (37.8) 41.4 (38.6) 42.3 (39.4)	38.2 (35.6) 39.1 (36.4) 39.9 (37.2) 40.7 (37.9) 41.5 (38.6) 42.4 (39.5)
43.3 (40.3) 44.1 (41.1) 44.9 (41.8) 45.7 (42.6) 46.5 (43.3) 47.3 (44.1)	43.0 (40.0) 43.8 (40.8) 44.6 (41.5) 45.0 (41.9) 45.8 (42.7) 46.6 (43.4) 47.4 (44.1)	43.1 (40.1) 43.9 (40.9) 44.7 (41.6) 45.5 (42.4) 46.3 (43.1) 47.1 (43.9) 47.9 (44.6)	43.2 (40.2) 44.0 (41.0) 44.8 (41.7) 45.6 (42.5) 46.4 (43.2) 47.2 (44.0) 48.0 (44.7)
48.1 (44.8)	48.2 (44.9)	48.3 (45.0)	48.8 (45.4)
48.9 (45.5)	49.0 (45.6)	49.1 (45.7)	49.6 (46.2)
49.7 (46.3)	49.8 (46.4)	49.9 (46.5)	50.4 (46.9)

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104 1 (07 0)	104 0 (07 0)	104 2 (07 1)	104 4 (07 2)
104.1 (97.0)	104.2 (97.0)	104.3 (97.1)	104.4 (97.2)
104.9 (97.7) 105.7 (98.4)	105.0 (97.8)	105.1 (97.9) 105.9 (98.6)	105.2 (98.0) 106.0 (98.7)
105.7 (98.4) 106.1 (98.8)	105.8 (98.5) 106.6 (99.3)	105.9 (98.6) 106.7 (99.4)	106.8 (99.5)
106.9 (99.6)	107.4 (100.0)	107.5 (100.1)	107.6 (100.2)
100.9 (99.0)	108.2 (100.8)	108.3 (100.1)	108.4 (101.0)
108.5 (101.0)	109.1 (101.6)	109.2 (101.7)	109.3 (101.8)
109.4 (101.9)	109.9 (102.4)	110.0 (102.4)	110.1 (102.5)
110.2 (102.6)	110.7 (103.1)	110.8 (103.2)	110.9 (103.3)
111.0 (103.4)	111.5 (103.8)	111.6 (103.9)	111.7 (104.0)
111.8 (104.1)	112.4 (104.7)	112.5 (104.8)	112.6 (104.9)
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113.5 (105.7)	114.0 (106.2)	114.1 (106.3)	114.2 (106.4)
114.3 (106.5)	114.8 (106.9)	114.9 (107.0)	115.0 (107.1)
115.1 (107.2)	115.7 (107.8)	115.8 (107.8)	115.9 (107.9)
116.0 (108.0)	116.5 (108.5)	116.6 (108.6)	116.7 (108.7)
116.8 (108.8) 117.6 (109.5)	117.3 (109.2) 118.1 (110.0)	117.4 (109.3) 118.2 (110.1)	117.5 (109.4) 118.3 (110.2)
117.0 (109.3)	119.0 (110.8)	119.1 (110.1)	119.2 (111.0)
119.3 (111.1)	119.8 (111.6)	119.9 (111.7)	120.0 (111.8)
120.1 (111.9)	120.6 (112.3)	120.7 (112.4)	120.8 (112.5)
120.9 (112.6)	121.4 (113.1)	121.5 (113.2)	121.6 (113.2)
121.7 (113.3)	121.8 (113.4)	122.3 (113.9)	122.4 (114.0)
122.5 (114.1)	122.6 (114.2)	123.1 (114.6)	123.2 (114.7)
123.3 (114.8)	123.4 (114.9)	123.9 (115.4)	124.0 (115.5)
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124.9 (116.3)	125.0 (116.4)	125.1 (116.5)	125.6 (117.0)
125.7 (117.1) 126.5 (117.8)	125.8 (117.2)	125.9 (117.3) 126.7 (118.0)	126.4 (117.7) 127.2 (118.5)
126.5 (117.8) 127.3 (118.6)	126.6 (117.9) 127.4 (118.7)	127.5 (118.7)	128.0 (119.2)
128.1 (119.3)	128.2 (119.4)	128.3 (119.5)	128.4 (119.6)
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129.7 (120.8)	129.8 (120.9)	129.9 (121.0)	130.0 (121.1)
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132.5 (123.4)	133.0 (123.9)	133.1 (124.0)	133.2 (124.1)
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139.9 (130.3)	140.4 (130.8)	140.5 (130.9)	140.6 (130.9)
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                 210.6 (196.1)
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210.1 (195.7)
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210.9	(196.4)		(197.0)	211.6	(197.1)	211.7	(197.2)
211.8 212.6	(197.3) (198.0)	213.1		213.2	(197.8) (198.6)	213.3	(197.9) (198.7)
213.4 214.2	(198.7) (199.5)	213.9 214.8	(199.2) (200.0)	214.0 214.9	(199.3) (200.1)	214.1 215.0	(199.4) (200.2)
215.1 215.9	(200.3) (201.1)	215.6 216.4	(200.8) (201.5)	215.7 216.5	(200.9) (201.6)	215.8 216.6	(201.0) (201.7)
216.7 217.5	(201.8) (202.6)	217.2 218.1	(202.3) (203.1)	217.3 218.2	(202.4) (203.2)	217.4 218.3	(202.5) (203.3)
218.4 219.2	(203.4) (204.1)	218.9		219.0 219.8	(204.0) (204.7)	219.1 219.9	(204.1) (204.8)
220.0	(204.9)	220.5	(205.4)	220.6	(205.4)	220.7	(205.5)
220.8 221.7	(205.6) (206.5)		(206.9)	221.5 222.3	(206.3) (207.0)		(206.4) (207.1)
222.5 223.3	(207.2) (208.0)		(207.7) (208.4)	223.1 223.9	(207.8) (208.5)	223.2 224.0	(207.9) (208.6)
224.1 224.9	(208.7) (209.5)		(208.8) (209.5)	224.7 225.5	(209.3) (210.0)		(209.4) (210.1)
225.7	(210.2) (210.9)	225.8	(210.3) (211.0)	226.3 227.1	(210.8) (211.5)	226.4	(210.9) (211.6)
227.3	(211.7)	227.4	(211.8)	227.5	(211.9)	228.0	(212.3)
	(212.4) (213.2)		(213.3)	228.3 229.1	(212.6) (213.4)		(213.1) (213.8)
229.7 230.5	(213.9) (214.7)		(214.0) (214.8)	229.9 230.7	(214.1) (214.9)	230.4 230.8	(214.6) (214.9)
231.3 232.1	(215.4) (216.2)		(215.5) (216.3)	231.5 232.3	(215.6) (216.3)		(215.7) (216.4)
232.9	(216.9) (217.7)	233.0	(217.0) (217.7)	233.1 233.9	(217.1) (217.8)	233.2	(217.2) (217.9)
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235.7	(218.8) (219.5)	235.4	(220.0)	235.5 236.3	(219.3) (220.1)	235.6	(219.4) (220.2)
236.5 237.4	(220.3) (221.1)	237.1 237.9	(220.8) (221.6)	237.2 238.0	(220.9) (221.7)	237.3 238.1	(221.0) (221.7)
238.2 239.0	(221.8) (222.6)	238.7 239.5	(222.3) (223.1)	238.8 239.6	(222.4) (223.1)	238.9 239.7	(222.5) (223.2)
239.8 240.7	(223.3) (224.2)	240.4 241.2	. ,	240.5 241.3	(224.0) (224.7)	240.6 241.4	(224.1) (224.8)
241.5 242.3	(224.9) (225.7)	242.0		242.1 242.9	(225.5) (226.2)	242.2	(225.6) (226.3)
243.1	(226.4)	243.7	(227.0)	243.8	(227.1)	243.9	(227.1)
244.0 244.8	(227.2) (228.0)	244.5 245.3		244.6 245.4	(227.8) (228.5)		(227.9) (228.6)
245.6 246.4	(229.5)	246.1 247.0	(229.2) (230.0)	246.2 247.1	(229.3) (230.1)	247.2	(229.4) (230.2)
247.3 248.1	(230.3) (231.1)		(230.8) (231.5)	247.9 248.7	(230.9) (231.6)		(231.0) (231.7)
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250.5 251.3	(233.3) (234.0)	250.6	(233.4) (234.1)	251.1	(233.9) (234.6)	251.2	(233.9) (234.7)
252.1	(234.8)	252.2	(234.9)	252.7	(235.3)	252.8	(235.4)
252.9 253.7	(235.5) (236.3)	253.8	(235.6) (236.4)		(235.7) (236.5)	254.4	(236.2) (236.9)
	(237.0) (237.8)	255.4	(237.1) (237.9)	254.7 255.5	(238.0)	256.0	(237.7) (238.4)
256.1 256.9	(238.5) (239.3)		(238.6) (239.3)		(238.7) (239.4)		(238.8) (239.5)
257.7 258.5	(240.0) (240.7)		(240.1) (240.8)	257.9 258.7	(240.2) (240.9)		(240.3) (241.0)
259.3 259.7	(241.5) (241.9)	259.4	(241.6) (242.3)	259.5	(241.7) (242.4)	259.6	(241.8) (242.5)
260.5 261.3	(242.6) (243.4)	261.0	(243.1) (243.8)	261.1 261.9	(243.2)	261.2	(243.3) (244.0)
262.1	(244.1)	262.7	(244.7)	262.8	(244.8)	262.9	(244.8)
	(244.9) (245.7)		(245.4) (246.1)		(245.5) (246.2)		(245.6) (246.3)

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Specify a valid volume size and then resubmit the task.

# CMUN02389E SOURCE Unable to create volume. Not enough extents are available.

### **Explanation**

The volume cannot be created because not enough extents are available in the extent pool. More extents must be added to the extent pool.

### Action

Add more extents to the extent pool, and then resubmit the task.

# CMUN02390E SOURCE Unable to create volume. Not enough extents are available at this time.

### **Explanation**

The volume cannot be created because not enough extents are available. However, freed extents in the extent pool are being reformatted. Enough extents will be available when the reformatting process completes. One terabyte of disk space can be reformatted in approximately four hours.

#### Action

Wait until reformatting completes, and then resubmit the task.

# CMUN02391E SOURCE Unable to delete CKD base volume. Unable to delete or reassign aliases.

## **Explanation**

The storage management console server reports a storage unit microcode-level error. The CKD base volume cannot be deleted because its alias volumes cannot be deleted or reassigned.

#### Action

Delete or reassign the alias volumes first, and then resubmit the task.

## CMUN02392E SOURCE Invalid alias volume group **Explanation**

The specified alias volume group does not exist or is not a FICON/ESCON - MASK type volume group. Volume group 10 is the default valid volume group of this type.

### **Action**

Specify a valid volume group, and then resubmit the task.

# CMUN02393E SOURCE Unable to create or modify CKD alias volume. The base and alias volumes belong to different logical subsystems. **Explanation**

The base and its alias volumes must belong to the same logical subsystem.

### **Action**

Specify base and alias volumes that belong to the same logical subsystem, and then resubmit the task.

# CMUN02394E SOURCE Unable to create or modify CKD alias volume. The maximum number of aliases are already assigned to the base volume. **Explanation**

A maximum of 255 aliases can be assigned to a base volume. The specified base volume already has 255 aliases that are assigned to it.

#### Action

Specify a different base volume, or reassign some of the previously assigned alias volumes, and then resubmit the task.

# CMUN02395E SOURCE Unable to create or modify CKD alias volume. The base volume and alias volume are not in the same volume group. **Explanation**

The base volume and alias volume must be in the same volume group. To create a new alias volume in the volume group, assign the base volume to the volume group, and then create the alias volume in the volume group. To modify an existing alias volume, you must select a base volume that is already in that volume group.

#### Action

Specify a base volume and alias volume that are in the same volume group and then resubmit the task.

# CMUN02396E SOURCE Contact information must be entered before you can invoke call home.

### **Explanation**

Your company name, machine location, ship to country, and contact primary telephone number must be entered before you can invoke the call home task.

#### Action

Use the IBM TotalStorage DS Command-Line Interface setcontactinfo command, or the IBM TotalStorage DS Storage Manager Company information work sheet to enter contact information. Then resubmit the task.

# CMUN02397E SOURCE Unable to delete volume: The volume does not exist.

## **Explanation**

The specified volume cannot be found. Therefore, it cannot be deleted.

#### Action

Specify a different volume to delete.

# CMUN02398E SOURCE Unable to create array. All array sites must be in the same loop.

### **Explanation**

The specified array sites are not in the same adapter loop. All of the array sites for the array must be in the same adapter loop.

#### Action

Specify array sites in the same loop, and then resubmit the task.

# CMUN02399E SOURCE Unable to create array. A RAID5 array can have only one spare.

### **Explanation**

More than one spare is specified for the array. A RAID5 array can have only one spare.

### Action

Specify only one spare for the array, and then resubmit the task.

# CMUN02400E SOURCE Unable to create logical subsystem: invalid address group

### **Explanation**

The specification contains an invalid address group.

#### Action

Specify a valid address group, and then resubmit the task.

# CMUN02401E SOURCE Unable to create logical subsystem: microcode-level error

## **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02402E SOURCE Unable to create rank: failed disk drives detected

### **Explanation**

The specified storage includes failed disk drives. These drives must be replaced before a rank can be created on them.

#### Action

Specify a different array, or ensure that the failed disk drives are replaced. Then resubmit the task.

# CMUN02403E SOURCE Unable to create rank: not a licensed operation **Explanation**

Your current license does not permit you to create the rank.

### Action

Obtain and install the appropriate license key, and then resubmit the task.

# CMUN02404E SOURCE Unable to create rank: maximum number of ranks already created

### **Explanation**

The maximum number of ranks already has been created.

#### Action

Delete unused ranks or install and license more storage capacity. Then resubmit the task.

## CMUN02405E SOURCE Unable to delete rank: Extents on the rank are in use.

### **Explanation**

Extents on the rank are still assigned to a valid volume group. You must delete volumes that use extents on the rank before you can delete the rank.

#### Action

Ensure that no extents from the rank are assigned, and then resubmit the task.

# CMUN02406E SOURCE Internal logical configuration error: Collect a PE package.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Collect a PE package and contact IBM technical support for assistance.

# CMUN02407E SOURCE Array operation failure: Resource Manager not available on alternate server

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02408E SOURCE Array creation failure: Too many array sites specified.

### **Explanation**

You must specify only one array site when creating RAID5 or RAID10 arrays. Multiple array sites are specified.

### Action

Specify only one array site, and then resubmit the task.

# CMUN02409E SOURCE Rank operation failure: Resource Manager not available on alternate server

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

# CMUN02410E SOURCE Extent pool operation failure: Resource Manager not available on alternate server

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02411E SOURCE Logical volume operation failure: Resource Manager not available on alternate server **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02412E SOURCE Volume group operation failure: Host agent Resource Manager not available on alternate server **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02413E SOURCE SCSI host port operation failure: Host agent Resource Manager not available on alternate server **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

# CMUN02414E SOURCE Unable to create SCSI host port. A colon ":" cannot be used when specifying a SCSI host port.

## **Explanation**

A colon ":" is used in a SCSI host port specification. This character cannot be used in a SCSI host port specification.

#### Action

Omit the colon, and then resubmit the task.

# CMUN02415E SOURCE Unable to modify SCSI host port. A colon ":" cannot be used when specifying a SCSI host port.

## **Explanation**

A colon ":" is used in a SCSI host port specification. This character cannot be used in a SCSI host port specification.

#### Action

Omit the colon, and then resubmit the task.

# CMUN02416E SOURCE Rank repair operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

### Action

Contact IBM technical support for assistance.

# CMUN02417E SOURCE Rank repair operation failure **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02418E SOURCE Rank repair operation failure: At least one array must be in assigned status.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

# CMUN02419E SOURCE Rank repair operation failure: Service intent flag is set.

## **Explanation**

The storage management console server reports a storage unit microcode-level

### Action

Contact IBM technical support for assistance.

# CMUN02420E SOURCE Rank repair operation failure **Explanation**

The storage management console server reports a storage unit microcode-level

#### Action

Contact IBM technical support for assistance.

# CMUN02421E SOURCE Rank repair operation failure: Unable to establish array site communication session.

## **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02422E SOURCE Rank repair operation failure: Unable to retrieve adapter name.

## **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

## CMUN02423E SOURCE Rank repair operation failure: device adapter error

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

Contact IBM technical support for assistance.

# CMUN02424E SOURCE Rank repair operation failure: Multiple ranks exist or the rank is still accessible.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

### **Action**

Contact IBM technical support for assistance.

# CMUN02425E SOURCE Rank repair operation failure: Unable to delete RAID array.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### **Action**

Contact IBM technical support for assistance.

# CMUN02426E SOURCE Rank repair operation failure: Unable to retrieve serial number.

### **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

# CMUN02427E SOURCE Internal logical configuration error: Another configuration is in progress.

### **Explanation**

The storage management console server reports a storage unit microcode-level error. Another configuration process is in progress. Your task cannot be performed at this time.

#### Action

Wait, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02428E SOURCE Unable to create rank. Disks are being formatted.

## **Explanation**

The rank cannot be created until disk reformatting completes.

#### Action

Wait until disk reformatting completes, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN02429E SOURCE A recovery is in progress. Logical configuration commands are blocked.

### **Explanation**

A recovery is in progress. Logical configurations commands are rejected until recovery completes.

#### Action

Wait, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN02430E SOURCE Invalid configuration: The base and alias/map volumes must be in the same volume group.

### **Explanation**

A volume group cannot contain an alias/map volume unless the base volume is also in that group.

### Action

Ensure that the base and alias/map volumes are in the same volume group, and then resubmit the task.

# CMUN02431E SOURCE Invalid configuration: A volume group cannot contain unconfigured logical volumes.

### **Explanation**

A volume group cannot contain an unconfigured volume. One or more of the specified volumes is not in the configured state.

### **Action**

Specify only configured volumes, and then resubmit the task.

# CMUN02432E SOURCE Invalid configuration: volume group and volume type mismatch

### **Explanation**

A FICON ESCON mixed volume group can contain only logical volumes of the following types:

- · count-key-data base
- · count-key-data alias
- · count-key-data map
- 512-byte fixed-block

Specify logical volumes of the correct type, and then resubmit the task.

# CMUN02433E SOURCE Invalid configuration: 512-byte fixed-block volumes must share data.

## **Explanation**

In a FICON ESCON mixed volume group all logical volumes of type 512-byte fixed-block must have data sharing allowed set to true.

#### **Action**

Ensure that all 512-byte fixed-block volumes permit data sharing, and then resubmit the task.

# CMUN02434E SOURCE Invalid configuration: volume group and volume type mismatch

### **Explanation**

A FICON ESCON (not mixed) volume group can contain only logical volumes of the following types: count-key-data base or count-key-data alias.

#### Action

Specify only count-key-data base or count-key-data alias volumes, and then resubmit the task.

# CMUN02435E SOURCE Invalid configuration: volume group and volume type mismatch

### **Explanation**

A SCSI (not mixed) volume group must contain only logical volumes of type 512-byte fixed-block.

#### Action

Specify only 512-byte fixed-block logical volumes, and then resubmit the task.

# CMUN02436E SOURCE Invalid configuration: volume group and volume type mismatch

### **Explanation**

A SCSI mixed volume group must contain only logical volumes of the following

· fixed-block map

- · count-key-data base
- 520-byte fixed-block

Specify only volumes of types fixed-block map, count-key-data base, or 520-byte fixed-block base. Then resubmit the task.

## CMUN02437E SOURCE Invalid configuration: CKD base logical volumes must share data.

### **Explanation**

In a SCSI mixed volume group, all count-key-data base logical volumes must have data sharing allowed set to true.

#### Action

Ensure that all count-key-data base logical volumes permit data sharing, and then resubmit the task.

# CMUN02438E SOURCE Invalid configuration: volume group and volume type mismatch

### **Explanation**

A SCSI520 MASK volume group must contain only logical volumes of type 520-byte fixed block.

#### Action

Specify only 520-byte fixed block logical volumes, and then resubmit the task.

# CMUN02439E SOURCE Unable to create rank. DDM repair is required or in progress.

### **Explanation**

The rank cannot be created because disk drive repair is required or is in progress.

#### **Action**

Wait until the drives have been repaired, and then resubmit the task.

# CMUN03000E SOURCE Operation failure: action cancelled due to lack of resources

## **Explanation**

The storage management console server reports a Copy Services error. The storage unit did not have enough resources to complete the task.

### Action

# CMUN03001E SOURCE Operation failure: action not supported **Explanation**

The storage management console server reports a Copy Services error. The command is not supported by the current microcode.

#### Action

Ensure that the latest version of microcode is installed on your storage unit. Contact IBM technical support for assistance.

# CMUN03002E SOURCE Operation failure: action not supported **Explanation**

The storage management console server reports a Copy Services error. The command is not supported by the current microcode.

#### Action

Ensure that the latest version of microcode is installed on your storage unit. Contact IBM technical support for assistance.

# CMUN03003E SOURCE Copy Services operation failure: currently processing a previously issued Global Mirror command **Explanation**

The task is being rejected because a previously issued task is still being processed.

#### Action

Wait until the first process completes, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN03004E SOURCE Copy Services operation failure: Global Mirror command not properly defined **Explanation**

The storage management console server reports a Copy Services error.

#### Action

Contact IBM technical support for assistance.

# CMUN03005E SOURCE Copy Services operation failure: Global Mirror feature not installed **Explanation**

The Global Mirror feature is not installed on this storage image.

Install and license the feature, and then resubmit the task. Contact IBM technical support for assistance.

# CMUN03006E SOURCE Copy Services operation failure: Global Mirror structures not available

## **Explanation**

A Global Mirror command fails because an internal error occurs or because the storage image is in single cluster mode.

#### Action

Check for hardware errors and ensure that the storage image is in dual cluster mode. If the problem persists, contact IBM technical support for assistance.

# CMUN03007E SOURCE Copy Services operation failure: FlashCopy battery feature not installed

## **Explanation**

The task cannot be initiated because the FlashCopy battery feature is not installed.

### **Action**

Install the FlashCopy battery feature, and then resubmit the task. Contact IBM technical support for assistance.

# CMUN03008E SOURCE Copy Services operation failure: cascading FlashCopy prohibited

#### **Explanation**

A FlashCopy target cannot be a FlashCopy source or the target of another relationship.

#### **Action**

Specify a logical volume that is not a FlashCopy target, and then resubmit the task. Contact IBM technical support for assistance.

# CMUN03009E SOURCE Copy Services operation failure: cascading primary

### **Explanation**

A cascading primary logical volume cannot be in a Global Mirror relationship.

#### **Action**

Specify a logical volume that is not a cascading primary, and then resubmit the task. Contact IBM technical support for assistance.

# CMUN03010E SOURCE Copy Services operation failure: cascading secondary noncascade

### **Explanation**

The specified volume was not established with the cascading option.

#### Action

Specify a volume that has been established with the cascading option, and then resubmit the task. Contact IBM technical support for assistance.

# CMUN03011E SOURCE Copy Services operation failure: cascading secondary synchronous

### **Explanation**

Cascading secondaries cannot be primary volumes in a Metro Mirror relationship.

### Action

Specify a logical volume that is not a cascading secondary, and then resubmit the task. Contact IBM technical support for assistance.

# CMUN03012E SOURCE Remote Mirror and Copy operation failure **Explanation**

The storage management console server reports a Remote Mirror and Copy error. One of the following conditions is occurring:

- · Abnormal conditions exist at the secondary controller.
- · Abnormal conditions exist at the secondary storage unit.
- · The communication paths between the primary and remote controller are not functioning.
- · Communication cannot be established with the secondary control unit.

#### Action

Check for hardware errors and disconnected cables, and follow the recommended service procedure. Check the status of the secondary system. If the problem persists, contact IBM technical support for assistance.

# CMUN03013E SOURCE CKD management is disabled. **Explanation**

Management of count-key-data resources on the storage unit is disabled.

#### Action

# CMUN03014E SOURCE Copy Services operation failure: A microcode code load is in progress.

## **Explanation**

A microcode code load is in progress, and no other activities can take place on the storage unit.

#### Action

Wait until the microcode code load completes, and then resubmit the task.

# CMUN03015E SOURCE Operation failure: consistent copy would be compromised

### **Explanation**

A pause or end Global Mirror fails because the action cannot complete without compromising the consistent copy of the data.

#### Action

Contact IBM technical support for assistance.

# CMUN03016E SOURCE Copy Services feature not installed **Explanation**

The Copy Services feature is not installed on the storage unit.

#### Action

Contact IBM technical support for assistance.

# CMUN03017E SOURCE Copy Services feature not supported. **Explanation**

The storage unit does not support the requested Copy Services feature.

#### Action

Contact IBM technical support for assistance.

# CMUN03018E SOURCE Copy Services server internal error **Explanation**

The storage management console server reports a Copy Services server internal error.

#### Action

## CMUN03019E SOURCE Copy Services operation failure: critical volume mode unavailable

### **Explanation**

Critical volume mode cannot be specified with Global Mirror.

#### Action

Do not specify critical volume mode, and then resubmit the task. Contact IBM technical support for assistance.

## CMUN03020E SOURCE Copy Services operation failure: device not found

### **Explanation**

One of the following might be occurring:

- The request is being issued to an unconfigured logical volume.
- · The request requires at least one configured volume, and no volumes are configured for the logical subsystem.
- An unknown error

#### Action

Ensure that a configured logical volume exists, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN03021E SOURCE Copy Services operation failure: device status cannot be determined

### **Explanation**

A logical volume in the specification is either:

- Unconfigured
- Flagged for service
- In the status cannot be determined state
- · The wrong type

### **Action**

Make the volume or underlying device available, or specify another volume, and then resubmit the task.

## CMUN03022E SOURCE Copy Services operation failure: source is destination

### **Explanation**

The source and destination ports for a path over FCP must be unique. No port can be used as both source and destination.

### **Action**

Specify two distinct ports, and then resubmit the task.

## CMUN03023E SOURCE Copy Services operation failure: ESCON - FCP collision

### **Explanation**

An attempt is being made to establish ESCON paths between two control units with FCP paths that already exist between the control units, or an attempt is being made to establish FCP paths between two control units with ESCON paths that already exist between the control units.

#### Action

Contact IBM technical support for assistance.

## CMUN03024E SOURCE Copy Services operation failure: ESCON - FCP remove collision

## **Explanation**

An attempt is being made to remove ESCON paths between two control units with FCP paths that also exist between the control units, or an attempt is being made to remove FCP paths between two control units with ESCON paths that also exist between the control units.

#### Action

Contact IBM technical support for assistance.

## CMUN03025E SOURCE Copy Services operation failure: storage image not available

### **Explanation**

Communication was the storage image failed.

#### Action

Ensure that the storage image is online and available.

## CMUN03026E SOURCE Copy Services operation failure: storage image not found

### **Explanation**

The storage image was not found in the Copy Services domain.

### **Action**

Properly identify the storage image, and then resubmit the task.

# CMUN03027E SOURCE FlashCopy operation failure: action prohibited by current FlashCopy state **Explanation**

The storage management console server reports a Copy Services error.

Contact IBM technical support for assistance.

## CMUN03028E SOURCE Copy Services operation failure: master process conflict.

### **Explanation**

One of the following is taking place:

- A start or resume Global Mirror command with no modify options is being issued to a storage image on which a master process is running.
- A start or resume Global Mirror command with modify options is being issued. but the parameters do not match the existing configuration.
- A start or resume Global Mirror command with modify options is being issued, but the master process is not paused.

#### Action

Ensure that the master process is not running and that the parameters match. Resubmit the task.

# CMUN03029E SOURCE Copy Services operation failure: invalid failback primary

### **Explanation**

The specified failback primary does not match the existing primary for the volume.

#### Action

Specify the correct primary, and then resubmit the task.

# CMUN03030E SOURCE Copy Services operation failure: failback primary volume not suspended **Explanation**

The Remote Mirror and Copy failback primary volume must be suspended before the task is issued.

#### Action

Suspend the failback primary volume, and then resubmit the task.

# CMUN03031E SOURCE Copy Services operation failure: invalid failover primary site

#### **Explanation**

The specified failover primary site does not match the existing primary site for the volume.

### **Action**

Specify the correct failover primary site, and then resubmit the task.

## CMUN03032E SOURCE Operation failure: invalid failover secondary volume

### **Explanation**

The failover action fails because the volume is not a full duplex Metro Mirror secondary volume.

#### Action

Ensure that the secondary volume is in full duplex mode, and then resubmit the

## CMUN03033E SOURCE Copy Services operation failure: FCP - FICON path collision

### **Explanation**

You are attempting to establish an FCP path on a port with existing FICON logical paths.

### Action

Specify a port with no existing FICON paths, and then resubmit the task.

# CMUN03034E SOURCE Copy Services operation failure: FCP connectivity queries are not supported by the storage image. **Explanation**

FCP connectivity queries are not supported by the storage image.

### **Action**

Contact IBM technical support for assistance.

## CMUN03035E SOURCE Copy Services operation failure: feature not installed

### **Explanation**

The specified feature is not installed.

### Action

License and install the feature, and then resubmit the task.

# CMUN03036E SOURCE Copy Services operation failure: maximum FlashCopy relationships exceeded or initialization in progress **Explanation**

The requested FlashCopy Relationship cannot be established because the maximum number of relationships already are established or because the volume was recently created and is still being initialized to support FlashCopy (Release 5.0.\* only).

If the volume is still being initialized, wait until the initialization completes, and then resubmit the request.

### **Action**

Remove unnecessary relationships or wait until initialization completes, and then resubmit the task.

## CMUN03037E SOURCE Copy Services operation failure: FlashCopy inhibited

### **Explanation**

FlashCopy is inhibited on this volume.

#### Action

Contact IBM technical support for assistance.

# CMUN03038E SOURCE Copy Services operation failure: Volume is already a FlashCopy target.

### **Explanation**

The specified Remote Mirror and Copy secondary volume is already a FlashCopy target. It cannot be used as a target for another relationship.

#### **Action**

Specify a different target logical volume, and then resubmit the task.

# CMUN03039E SOURCE Copy Services operation failure: maximum FlashCopy targets exceeded

### **Explanation**

The maximum number of FlashCopy targets for this source has been exceeded.

#### **Action**

Remove any unwanted targets, and then resubmit the task.

# CMUN03040E SOURCE Copy Services operation failure: maximum relationships exceeded **Explanation**

The maximum number of FlashCopy relationships has been established for this volume. No more relationships can be created.

#### **Action**

Remove any unwanted relationships, and then resubmit the task.

## CMUN03041E SOURCE Copy Services operation failure: already a FlashCopy source

### **Explanation**

A FlashCopy source logical volume cannot be the source of a new relationship, and it cannot be the relationship target logical volume.

#### Action

Specify a different logical volume, and then resubmit the task.

## CMUN03042E SOURCE Copy Services operation failure: already a FlashCopy target

### **Explanation**

The specified target is already a FlashCopy target. A FlashCopy target cannot be the target of a new relationship.

#### Action

Specify a different target logical volume, and then resubmit the task.

## CMUN03043E SOURCE Operation failure: functional code timeout **Explanation**

The storage management console server reports a storage unit microcode-level error. The storage unit does not respond in a satisfactory time period.

### **Action**

Contact IBM technical support for assistance.

## CMUN03044E SOURCE Copy Services operation failure: path not available

### **Explanation**

The conduit logical subsystem does not have a relationship with the FlashCopy primary logical volume.

### **Action**

Specify a different conduit logical subsystem or establish a path, and then resubmit the task.

# CMUN03045E SOURCE Copy Services operation failure: increment failed due to internal error **Explanation**

The relationship cannot be incremented due to an internal error.

Contact IBM technical support for assistance.

## CMUN03046E SOURCE Copy Services operation failure: FlashCopy increment mismatch

### **Explanation**

The increment of a FlashCopy relationship fails because the logical volumes are in relationships with other volumes.

### **Action**

Specify the correct relationship or remove the other relationships, and then resubmit the task.

# CMUN03047E SOURCE Copy Services operation failure: invalid fibre-channel protocol configuration **Explanation**

Fibre-channel protocol paths are specified, but the adapters use fibre-channel arbitrated loop protocol.

### **Action**

Specify compatible path and adapter protocols, and then resubmit the command.

# CMUN03048E SOURCE Copy Services operation failure: invalid FlashCopy target

### **Explanation**

The specified target is a Remote Mirror and Copy or Global Mirror primary volume.

#### Action

Specify a different target, and then resubmit the task.

### CMUN03049E SOURCE Copy Services operation failure: incompatible volumes

### **Explanation**

FlashCopy volumes must be the same capacity, and they must belong to the same logical subsystem.

#### Action

Specify volumes that are the same capacity and are on the same logical subsystem, and then resubmit the task.

# CMUN03050E SOURCE Copy Services operation failure: invalid FlashCopy extent

### **Explanation**

The FlashCopy operation does not allow the specification of extents.

#### Action

Contact IBM technical support for assistance.

## CMUN03051E SOURCE Copy services operation failure: invalid FlashCopy source

### **Explanation**

The FlashCopy source is not the target of the addressed Remote Mirror and Copy pair.

### Action

Specify a different FlashCopy source or a different Remote Mirror and Copy pair, and then resubmit the task.

# CMUN03052E SOURCE Copy Services operation failure: invalid secondary

### **Explanation**

The storage management console server reports a Copy Services error. The secondary volume address is not valid.

### **Action**

Contact IBM technical support for assistance.

## CMUN03053E SOURCE Copy Services operation failure: invalid transition

### **Explanation**

The command attempts to perform an invalid transition between modes.

### **Action**

Contact IBM technical support for assistance.

# CMUN03054E SOURCE Copy Services operation failure: invalid revertible specification **Explanation**

#### Either:

- A FlashCopy establish was specified with the revertible option for a pair that does not exist or is already revertible.
- A FlashCopy withdraw was specified on a pair that is not revertible.

Specify a different pair, and then resubmit the command.

# CMUN03055E SOURCE Copy Services operation failure: session or members not in correct state.

### **Explanation**

The Global Mirror start fails because a session or session members are not in the correct state.

### **Action**

Place the session or members in the correct state, and then resubmit the command.

# CMUN03056E SOURCE Copy Services operation failure: invalid session state for FlashCopy

### **Explanation**

The Global Mirror session is not in the correct state.

#### Action

Contact IBM technical support for assistance.

## CMUN03057E SOURCE Copy Services operation failure: invalid subsystem ID

### **Explanation**

The specified subsystem ID cannot be found.

#### Action

Specify an valid subsystem ID, and then resubmit the task.

# CMUN03058E SOURCE Copy Services Operation failure: invalid WWNN **Explanation**

The primary or secondary worldwide node name is invalid.

### Action

Specify a valid worldwide node name, and then resubmit the task.

## CMUN03059E SOURCE Copy Services operation failure: LSS not found **Explanation**

The logical subsystem was not found in the Copy Services domain.

Specify a valid logical subsystem, and then resubmit the task.

## CMUN03060E SOURCE Copy Services operation failure: logical subsystem mismatch

### **Explanation**

The storage management console server reports a Copy Services error.

#### Action

Contact IBM technical support for assistance.

## CMUN03061E SOURCE Copy Services operation failure: master serial number not defined

### **Explanation**

The storage management console server reports a Copy Services error.

#### **Action**

Contact IBM technical support for assistance.

## CMUN03062E SOURCE Copy Services operation failure: maximum masters exceeded

### **Explanation**

A start or resume Global Mirror command was received by a subordinate that already has the maximum number (32) of masters.

#### **Action**

Contact IBM technical support for assistance.

# CMUN03063E SOURCE Copy Services operation failure: sequence number and session ID mismatch

#### **Explanation**

The specified sequence numbers do not match the master and subordinate sequence numbers for the session ID.

### **Action**

Specify different sequence numbers or a different session ID, and then resubmit the task.

## CMUN03064E SOURCE Copy Services operation failure: mixed adapters specified

### **Explanation**

You must specify either all ESCON paths or all FCP paths. ESCON and FCP paths cannot be mixed within the same command.

#### Action

Specify paths of the same type, and then resubmit the command.

## CMUN03065E SOURCE Copy Services operation failure: volumes not a Remote Mirror and Copy pair **Explanation**

The operation references logical volumes that are not a Remote Mirror and Copy pair.

#### Action

Specify a valid Remote Mirror and Copy pair, and then resubmit the task.

# CMUN03066E SOURCE Copy Services operation failure: no volume zero on secondary logical subsystem

**Explanation** 

The storage management console server reports a Copy Services error.

#### Action

Contact IBM technical support for assistance.

## CMUN03067E SOURCE Copy Services operation failure: configuration does not exist

### **Explanation**

The specified configuration does not exist or the specified logical subsystem is incorrect.

### Action

Ensure that the correct pair and the correct logical subsystem are specified, and then resubmit the task.

# CMUN03068E SOURCE Copy Services operation failure: not ready for resync

### **Explanation**

Both the source and target volumes must be suspended before they can be resynchronized.

Suspend the volumes, and then resubmit the task.

## CMUN03069E SOURCE Pair capacity mismatch **Explanation**

The capacity of a target volume must be greater than or equal to the size of the source volume. The target volume is too small.

#### **Action**

Specify a target volume that is larger than or equal to the size of the source volume, and then resubmit the task.

## CMUN03070E SOURCE Copy Services operation failure: pairs remain **Explanation**

The path cannot be removed because Remote Mirror and Copy pairs are currently using the path.

#### Action

Remove the Remote Mirror and Copy pairs, and then resubmit the task.

## CMUN03071E SOURCE Copy Services operation failure: invalid parameter

### **Explanation**

The storage management console server reports a Copy Services error.

#### Action

Contact IBM technical support for assistance.

## CMUN03072E SOURCE Copy Services operation failure: invalid track **Explanation**

The storage management console server reports a Copy Services error. A defective track has been accessed.

### Action

Contact IBM technical support for assistance.

## CMUN03073E SOURCE Copy Services operation failure: path establish failed

### **Explanation**

The storage management console server reports a Copy Services error. The path establish task failed. The path is in an unknown state.

Contact IBM technical support for assistance.

# CMUN03074E SOURCE Copy Services operation failure: maximum number of device adapter paths exceeded **Explanation**

The attempt to establish the path fails because there can be no more than 4 paths from a single local adapter and no more than 8 paths to any attached adapter.

### **Action**

Specify volumes on another device adapter, or remove other existing paths that use volumes on the adapter. Resubmit the task.

## CMUN03075E SOURCE Copy Services operation failure: path timeout **Explanation**

The storage management console server reports a Copy Services error. Communication to the secondary timed out.

#### **Action**

Contact IBM technical support for assistance.

## CMUN03076E SOURCE Operation failure: path type mismatch **Explanation**

ESCON and FCP paths cannot be established over the same hardware. A path of the other type already exists.

#### Action

Contact IBM technical support for assistance.

## CMUN03077E SOURCE Copy Services operation failure: pinned data **Explanation**

A Remote Mirror and Copy establish pair action is being issued against a logical volume that is suspended with pinned data. A relationship cannot be established using a suspended logical volume that has pinned data.

### **Action**

Consider carefully before you discard pinned data. You might want to specify a different logical volume. Place both logical volumes in the simplex state, and then resubmit the task.

## CMUN03078E SOURCE Copy Services operation failure: pinned data **Explanation**

A Remote Mirror and Copy or FlashCopy pair action is being issued against a logical volume that has pinned data. A relationship cannot be established using a logical volume with pinned data.

#### Action

Consider carefully before you discard pinned data. You might want to specify a different logical volume. Place both logical volumes in the simplex state, and then resubmit the task.

## CMUN03079E SOURCE Copy Services operation failure: copy pending **Explanation**

The attempt to suspend a volume fails because the pair is still copy pending. The volume cannot be suspended because data changes are not consistent between the source and target volumes.

#### Action

Contact IBM technical support for assistance.

## CMUN03080E SOURCE Copy Services: recovery command rejected **Explanation**

The command to establish a relationship pair in failover or failback mode is being rejected because the pair is already in the requested state.

### **Action**

None.

## CMUN03081E SOURCE Copy Services operation failure: secondary command invalid

### **Explanation**

The storage management console server reports a Copy Services error. A command that is not allowed on a secondary device is being issued to the secondary device.

#### Action

Contact IBM technical support for assistance.

## CMUN03082E SOURCE Copy Services operation failure: Global Mirror invalid transition

### **Explanation**

The storage management console server reports a Copy Services error. An invalid transition between modes is being attempted. A transition from Global Mirror to any mode other than synchronous mode is not allowed.

Contact IBM technical support for assistance.

## CMUN03083E SOURCE Copy Services operation failure: preexisting Remote Mirror and Copy pair **Explanation**

The storage management console server reports a Copy Services error. The action conflicts with an existing Remote Mirror and Copy pair that is established on the logical volumes.

#### Action

Contact IBM technical support for assistance.

## CMUN03084E SOURCE Copy Services operation failure: busy **Explanation**

The storage management console server reports a Copy Services error. Copy Services is too busy to accept commands.

### Action

Resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN03085E SOURCE Copy Services operation failure: maximum number of FlashCopy relationships exceeded **Explanation**

The maximum number of FlashCopy relationships has been established already.

### Action

Remove unnecessary relationships, and then resubmit the command.

# CMUN03086E SOURCE Copy Services operation failure: volume already in FlashCopy relationship **Explanation**

One or both of the volumes specified in the FlashCopy pair is already in a FlashCopy relationship. Volumes can participate in only one FlashCopy relationship at a time.

### Action

Specify a different volume, and then resubmit the task.

## CMUN03087E SOURCE Copy Services operation failure: reverse bitmap non-zero

### **Explanation**

The storage management console server reports a Copy Services error. The target volume bitmap is not all zeros.

#### Action

Contact IBM technical support for assistance.

## CMUN03088E SOURCE Copy Services operation failure: secondary error **Explanation**

The storage management console server reports a Copy Services error. An error on the secondary is causing the command to fail. The secondary controller cache might not be enabled or nonvolatile storage might not be available.

### **Action**

Contact IBM technical support for assistance.

## CMUN03089E SOURCE Copy Services operation failure: session already open

### **Explanation**

The specified session is already open for the logical subsystem or the maximum number of sessions allowed has been reached.

### Action

Contact IBM technical support for assistance.

## CMUN03090E SOURCE Copy Services operation failure: session command not defined

### **Explanation**

The storage management console server reports a Copy Services error. The submitted session command was not properly defined.

#### Action

Contact IBM technical support for assistance.

## CMUN03091E SOURCE Copy Services operation failure: session members not defined

### **Explanation**

The storage management console server reports a Copy Services error. The submitted session members are not defined.

Specify valid logical volumes for the session members, and then resubmit the task.

## CMUN03092E SOURCE Copy Services operation failure: session not open

### **Explanation**

The session that is specified for member management is not open.

#### Action

Open the session, and then resubmit the task.

## CMUN03093E SOURCE Copy Services operation failure: invalid session number

### **Explanation**

The specified session number is invalid. A session number is an integer between 1 and 255 inclusive.

#### Action

Specify a valid session number, and then resubmit the task.

# CMUN03094E SOURCE Operation failure: status cannot be determined. **Explanation**

Status cannot be determined for one of the following reasons:

- · Unable to locate the global subsystem status tracks
- Unable to establish the status of a Remote Mirror and Copy pair or a DASD fast write volume
- Unable to access the RAID rank that the data is stored on
- · Unable to access a directory for a subsystem
- · Unable to synchronize the volume with data in the nonvolatile store

### Action

Contact IBM technical support for assistance.

# CMUN03095E SOURCE Copy Services operation failure: subordinate count out of range

#### **Explanation**

The storage management console server reports a Copy Services error. The specified subordinate count is out of range. The subordinate count must be between 0 and 16 inclusive.

#### Action

Contact IBM technical support for assistance.

## CMUN03096E SOURCE Copy Services operation failure: target online **Explanation**

The target volume is online to a host.

#### Action

Take the target volume offline, and then resubmit the task.

## CMUN03097E SOURCE Copy Services operation failure: target reserved **Explanation**

The target is reserved.

#### Action

Contact IBM technical support for assistance.

## CMUN03098E SOURCE Copy Services operation failure: topology missing paths

### **Explanation**

Paths do not exist for specified topology.

#### Action

Contact IBM technical support for assistance.

# CMUN03099E SOURCE Copy Services operation failure: VM minidisk **Explanation**

The storage management console server reports a Copy Services error. FlashCopy failed because the volumes are managed by VM minidisk.

#### Action

Contact IBM technical support for assistance.

## CMUN03100E SOURCE Copy Services operation failure: volume in session

### **Explanation**

The specified volume is already associated with a session.

### Action

Specify a different volume, and then resubmit the task.

## CMUN03101E SOURCE Copy Services operation failure: volume in use **Explanation**

The storage management console server reports a Copy Services error.

Contact IBM technical support for assistance.

## CMUN03102E SOURCE Copy Services operation failure: volume inaccessible

### **Explanation**

FlashCopy failed because the volumes are in the inaccessible or offline state.

#### Action

Make the volumes accessible, and then resubmit the command.

## CMUN03103E SOURCE Copy Services operation failure: volume long busy

### **Explanation**

One of the volumes is in the long busy state. This might be because the volume is already participating in a Global Mirror relationship.

#### **Action**

Specify a volume that is available, and then resubmit the task.

# CMUN03104E SOURCE Copy Services operation failure: source and target volume mismatch

**Explanation** 

The capacity of the source volume must be less than or equal to the capacity of the target volume, and the volumes must be the same type.

### Action

Specify compatible volumes, and then resubmit the task.

## CMUN03105E SOURCE Copy Services operation failure: volume not restorable

### **Explanation**

The volume is not in a persistent FlashCopy relationship with a completed background copy.

#### Action

Contact IBM technical support for assistance.

## CMUN03106E SOURCE Copy Services operation failure: volume reserved **Explanation**

The storage management console server reports a Copy Services error. The volume is already reserved.

Contact IBM technical support for assistance.

## CMUN03107E SOURCE Copy Services operation failure: volumes in session

### **Explanation**

The session cannot be closed because volumes still exist in the session.

#### Action

Remove the session members, and then resubmit the task.

## CMUN03108E SOURCE Copy Services operation failure: volumes not found

## **Explanation**

The storage management console server reports a Copy Services error. The volumes cannot be found in the Copy Services domain.

#### Action

Specify known volumes, and then resubmit the task.

# CMUN03109E SOURCE Copy Services operation failure: volumes not simplex

### **Explanation**

Both the source and target volumes must be in the simplex state before you can establish a relationship pair.

#### Action

Place both the source and target volumes in the simplex state, and then resubmit the task.

## CMUN03110E SOURCE Copy Services operation failure: warm start occurred

### **Explanation**

A warm start occurred on the storage image while this action was running. The action might or might not have completed.

#### **Action**

Contact IBM technical support for assistance.

# CMUN03111E SOURCE Copy Services operation failure: writes prohibited by suspend

### **Explanation**

Writes are prohibited. The volume is suspended.

#### Action

Remove the volume from the **suspended** state, and then resubmit the task.

# CMUN03112E SOURCE Copy Services operation failure: Global Mirror consistency cannot be maintained.

### **Explanation**

The storage management console server reports a Copy Services error. Consistency cannot be maintained. A paused increment activity has timed out, or another problem has caused the volume to be in an incorrect state.

### Action

Contact IBM technical support for assistance.

## CMUN03113E SOURCE Operation failure: CKD base required **Explanation**

A count-key-data base device is required for this operation. A count-key-data alias is specified.

### Action

Specify a CKD base device, and then resubmit the task.

# CMUN03114E SOURCE Unable to establish FlashCopy with fast reverse restore: previous FRR

### **Explanation**

A FlashCopy with fast reverse restore (FRR) cannot be established if a FlashCopy with FRR is still in progress or if one has recently completed.

### **Action**

Wait, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN03115E SOURCE Performance statistics cannot be accumulated: LSS not configured

### **Explanation**

A logical subsystem must be configured before performance statistics can be requested. No logical subsystem is configured.

Configure the logical subsystem, and then resubmit the task.

# CMUN03116E SOURCE Performance statistics cannot be accumulated: resource not configured

### **Explanation**

The rank, extent pool, or I/O port to be queried for performance statistics is not configured.

### **Action**

Configure the resource, and then resubmit the task.

# CMUN03117E SOURCE Unable to establish FlashCopy or Remote Mirror and Copy pair. A FlashCopy initialization is in progress. **Explanation**

The pair cannot be established until intialization completes.

#### Action

Wait until initialization completes, and then resubmit the task.

# CMUN03118E SOURCE Copy Services error: Intervention is required. **Explanation**

One of the following conditions exists:

- · The addressed device is in CE mode.
- The addressed device is not ready.
- · The volume configuration of the addressed device is incorrect.

#### Action

Ensure that the volume is ready, that it is not flagged to be serviced, and that it is correctly configured. If the problem persists, contact IBM technical support for assistance.

# CMUN03119E SOURCE Hardware error: An unusual hardware condition originates in the channel, drive, or storage unit. **Explanation**

The storage management console server reports a hardware error.

#### Action

Contact IBM technical support for assistance.

## CMUN04000E SOURCE Operation failure: Copy Services server failure **Explanation**

The storage management console server reports an internal error. The Copy Services server is failing.

#### Action

Contact IBM technical support for assistance.

## CMUN04001E SOURCE Operation failure **Explanation**

The storage management console server reports an internal error.

### Action

Contact IBM technical support for assistance.

## CMUN04002E SOURCE Operation failure: internal error **Explanation**

The storage management console server reports a storage unit microcode-level error.

#### Action

Contact IBM technical support for assistance.

## CMUN04003E SOURCE Operation failure: internal error **Explanation**

The storage management console server reports an internal error.

#### Action

Contact IBM technical support for assistance.

## CMUN04004E SOURCE Operation failure: invalid parameters **Explanation**

The storage management console server reports an internal error.

#### Action

Check the format, type, and number of parameters, and then resubmit the task. If the problem persists, contact IBM technical support for assistance

## CMUN04005E SOURCE Operation failure: node agent 0 fails **Explanation**

The storage management console server reports a storage unit microcode-level error. An agent is not running on a processor card.

Contact IBM technical support for assistance.

## CMUN04006E SOURCE Operation failure: node agent 1 fails **Explanation**

The storage management console server reports a storage unit microcode-level error. An agent is not running on a processor card.

#### **Action**

Contact IBM technical support for assistance.

## CMUN04007E SOURCE Operation failure: resource not found **Explanation**

The storage management console server reports an internal error.

### Action

Contact IBM technical support for assistance.

## CMUN04008E SOURCE Operation failure **Explanation**

The storage management console server reports an internal error.

#### Action

Contact IBM technical support for assistance.

## CMUN04009E SOURCE Operation failure: unknown **Explanation**

The storage management console server reports an internal error.

#### Action

Contact IBM technical support for assistance.

## CMUN05000E SOURCE Operation failure: alternate busy **Explanation**

The storage management console server reports a storage unit microcode-level error. The alternate repository is being updated and is not available.

### Action

Wait, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

# CMUN05001E SOURCE Operation failure: duplicate user name in alternate repository

### **Explanation**

The storage management console server reports an internal security error.

#### Action

Contact IBM technical support for assistance.

## CMUN05002E SOURCE Operation failure: duplicate user name in local repository

### **Explanation**

The storage management console server reports an internal security error.

### Action

Contact IBM technical support for assistance.

### CMUN05003E SOURCE Operation failure: alternate communication failure

### **Explanation**

The storage management console server reports an internal security error.

#### Action

Contact IBM technical support for assistance.

## CMUN05004E SOURCE Operation failure: group not found in alternate repository

### **Explanation**

The storage management console server reports an internal security error.

#### Action

Contact IBM technical support for assistance.

# CMUN05005E SOURCE Operation failure: group not found in local repository

### **Explanation**

The storage management console server reports an internal security error.

#### Action

Contact IBM technical support for assistance.

# CMUN05006E SOURCE Operation failure: invalid user account name **Explanation**

A user account name must be supplied.

#### Action

Specify a valid user account name, and then resubmit the task.

## CMUN05007E SOURCE Operation failure: local busy **Explanation**

The storage management console server reports a storage unit microcode-level error. The local repository is being updated and is not available.

### Action

Wait, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN05008E SOURCE Operation failure **Explanation**

The storage management console server reports an internal security error.

### Action

Contact IBM technical support for assistance.

## CMUN05009E SOURCE Operation failure: maximum number of accounts reached on alternate repository **Explanation**

The number of user accounts on the alternate repository is at the maximum allowed. No more accounts can be created.

### Action

Increase the limit or remove unused accounts, and then resubmit the task.

# CMUN05010E SOURCE Operation failure: maximum number of accounts reached on local repository

### **Explanation**

The number of user accounts on the local repository is at the maximum allowed. No more accounts can be created.

#### Action

Increase the limit or remove unused accounts, and then resubmit the task.

## CMUN05012E SOURCE Operation failure: incorrect password format **Explanation**

The password that you specified does not meet password format requirements. Passwords must contain at least 5 alphabetic characters, and at least one numeric character, with an alphabetic character in the first and last positions. Passwords are limited to a total of 16 characters. The user name can not be part of the password. The minimum number of unique new passwords that must be used before an old password can be reused is four.

#### **Action**

Specify a valid password, and then resubmit the task.

## CMUN05013E SOURCE Operation failure: password same as previous password

### **Explanation**

A user account password cannot be used again.

#### Action

Specify a password that has not been used previously, and then resubmit the task.

## CMUN05014E SOURCE Operation failure: alternate repository not accessible

### **Explanation**

The storage management console server reports an internal security error.

#### Action

Contact IBM technical support for assistance.

## CMUN05015E SOURCE Operation failure: local repository not accessible

### **Explanation**

The storage management console server reports an internal security error.

#### Action

Contact IBM technical support for assistance.

## CMUN05016E SOURCE Operation failure: request timed out **Explanation**

The storage management console server reports an internal security error. A security request is timing out. The alternate repository might not be responding.

Contact IBM technical support for assistance.

## CMUN05017E SOURCE Operation failure: internal error in alternate repository

### **Explanation**

The storage management console server reports an internal security error.

#### Action

Contact IBM technical support for assistance.

## CMUN05018E SOURCE Operation failure: internal error in local repository

## **Explanation**

The storage management console server reports an internal security error.

### Action

Contact IBM technical support for assistance.

# CMUN05019E SOURCE Operation failure: settings entry not found in alternate repository

### **Explanation**

The storage management console server reports an internal security error.

### Action

Contact IBM technical support for assistance.

# CMUN05020E SOURCE Operation failure: settings entry not found in local repository

### **Explanation**

The storage management console server reports an internal security error.

### Action

Contact IBM technical support for assistance.

# CMUN05021E SOURCE Operation failure: user not found in alternate repository

### **Explanation**

The specified user name cannot be found in the alternate repository.

Specify a valid user name, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN05022E SOURCE Operation failure: user not found in local repository

### **Explanation**

The specified user name cannot be found in the local repository.

### **Action**

Specify a valid user name, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN06000E SOURCE Operation failure: unable to connect **Explanation**

The storage management console server reports an internal service advisor error. A code load fails, possibly because of a communication failure.

#### **Action**

Check for cabling and hardware problems, and follow the recommended service procedure. If the problem persists, contact IBM technical support for assistance.

## CMUN06001E SOURCE Operation failure: unable to copy code **Explanation**

The service advisor is unable to copy the code bundle to the storage unit.

### Action

This problem might be temporary. Ensure that there is network connectivity to the storage unit. Verify that you can log in to the storage unit and that no other administrators are attempting to copy code or activate a code load. If the problem persists, contact IBM technical support for assistance.

## CMUN06002E SOURCE Operation failure: unable to copy log files **Explanation**

The storage management console server reports an internal service advisor error.

#### **Action**

Contact IBM technical support for assistance.

# CMUN06003E SOURCE Operation failure: unable to copy PE package **Explanation**

The storage management console server reports an internal service advisor error.

Contact IBM technical support for assistance.

# CMUN06004E SOURCE Operation failure: unable to copy SA logs to the PE package

### **Explanation**

The storage management console server reports an internal service advisor error.

#### Action

Submit the command from the storage management console with administrator authority. If the problem persists, then re-install the storage management console server software. If the problem still persists, contact IBM technical support for assistance.

## CMUN06005E SOURCE Operation failure: unable to copy state save **Explanation**

The storage management console server reports an internal service advisor error.

### Action

Contact IBM technical support for assistance.

## CMUN06006E SOURCE Operation failure: unable to create PE package **Explanation**

The storage management console server reports an internal service advisor error. The storage unit might not have sufficient disk space available.

### Action

Contact IBM technical support for assistance.

## CMUN06007E SOURCE Operation failure: results list is empty **Explanation**

The storage management console server reports an internal service advisor error.

### Action

Contact IBM technical support for assistance.

## CMUN06008E SOURCE Operation failure: console server exception returned to SA

### **Explanation**

The storage management console server reports an internal service advisor error.

Contact IBM technical support for assistance.

# CMUN06009E SOURCE Operation failure: unable to retrieve list of field-replacable units

### **Explanation**

The storage management console server reports an internal service advisor error.

#### Action

Contact IBM technical support for assistance.

## CMUN06010E SOURCE Operation failure: unable to retrieve list of network ports

### **Explanation**

The storage management console server reports an internal service advisor error.

#### Action

Contact IBM technical support for assistance.

# CMUN06011E SOURCE Operation failure: unable to retrieve password **Explanation**

The storage management console server reports an internal service advisor error.

### Action

Contact IBM technical support for assistance.

# CMUN06012E SOURCE Operation failure: unable to retrieve list of storage servers

### **Explanation**

The storage management console server reports an internal service advisor error.

### **Action**

Contact IBM technical support for assistance.

## CMUN06013E SOURCE Operation failure: unable to retrieve software version

### **Explanation**

The storage management console server reports an internal service advisor error.

#### Action

Contact IBM technical support for assistance.

## CMUN06014E SOURCE Operation failure: unable to retrieve trace service

### **Explanation**

The storage management console server reports an internal service advisor error.

#### Action

Contact IBM technical support for assistance.

## CMUN06015E SOURCE Operation failure: unable to extract Jar file for package bundle

### **Explanation**

The storage management console server reports an internal service advisor error. The code load bundle that was downloaded to the storage management console is corrupted.

#### Action

Download a new copy of the code bundle and try again. If the problem persists, contact IBM technical support for assistance.

## CMUN06016E SOURCE Operation failure: file or directory not found **Explanation**

The storage management console server reports an internal service advisor error.

### Action

Ensure that the destination and source directories on the storage management console are valid. If the problem persists, contact IBM technical support for assistance.

## CMUN06017E SOURCE Operation failure: FTP failure **Explanation**

The storage management console server reports an internal service advisor error. Problem determination data cannot be sent to IBM using file transfer protocol.

#### Action

- 1. Ensure that all the files in directory %MR1750 SM HOME%\send2IBM are valid and can be transferred by FTP.
- 2. Ensure that network connectivity and firewall access is available.
- 3. Attempt to resend the data again.
- 4. If the problem persists, contact IBM technical support for assistance.

# CMUN06018E SOURCE Unable to activate code load: incompatible hardware and code versions **Explanation**

Code load cannot be activated on the storage unit. The hardware on the storage unit is not compatible with the code bundle that you are attempting to load.

#### Action

Ensure that the engineering change level of the storage unit and the code bundle version level are compatible, and then try again. If the hardware and code versions should be compatible, contact IBM technical support for assistance.

# CMUN06019E SOURCE Unable to activate code load: incompatible software version in package bundle **Explanation**

Code load cannot be activated on the storage unit. The bundle version and the current storage unit software version are incompatible for concurrent code load.

#### **Action**

Either perform a non concurrent code load or choose a bundle level that is compatible with the microcode version that is currently running on the storage unit. If you still cannot activate the code load, contact IBM technical support for assistance.

## CMUN06020E SOURCE Operation failure: invalid code bundle **Explanation**

The storage management console server reports an internal service advisor error. The code bundle that was copied to the storage management console is not valid.

#### Action

Download a new copy of the code bundle and try again. If the problem persists, contact IBM technical support for assistance.

# CMUN06021E SOURCE Operation failure: invalid file or directory **Explanation**

The storage management console server reports an internal service advisor error.

- Environment variables might not be set properly.
- · This command can be run from the storage management console only.

#### Action

- 1. Submit the command from the storage management console with administrator authority.
- 2. If the problem persists, then re-install the storage management console server software.
- 3. If the problem still persists, contact IBM technical support for assistance.

## CMUN06022E SOURCE Operation failure: unable to load code bundle **Explanation**

The storage management console server reports an internal service advisor error. The storage management console server software installation might have failed or the code bundle might be invalid.

#### Action

- 1. Download a new copy of the code bundle and try again.
- 2. If the problem persists, then re-install the storage management console server software.
- 3. If the problem persists, contact IBM technical support for assistance.

## CMUN06023E SOURCE Operation failure: unable to mark state save **Explanation**

The storage management console server reports an internal service advisor error.

#### Action

Contact IBM technical support for assistance.

## CMUN06024E SOURCE Operation failure: possible invalid code bundle **Explanation**

The storage management console server reports an internal service advisor error. The code bundle might not be valid.

#### Action

Download a new copy of the code bundle and try again. If the problem persists, contact IBM technical support for assistance.

# CMUN06025E SOURCE Operation failure: unable to open file **Explanation**

The storage management console server reports an internal service advisor error.

### **Action**

Contact IBM technical support for assistance.

## CMUN06026E SOURCE Operation failure: an external utility does not run

### **Explanation**

The utility might not run for one of the following reasons:

- The utility invoked by the service advisor does not exist or the utility has been moved.
- You are not invoking the utility from the storage management console.
- The storage management console server software installation failed.

- 1. Ensure that the **PUTTY** command is installed properly and its location is specified in the **PATH** environment variable.
- 2. Ensure that %MR1750\_SM\_HOME%\bin is specified in the PATH environment variable.
- 3. Run the command from the storage management console with administrator authority.
- 4. If the problem persists, then re-install the storage management console server software.
- 5. If the problem still persists, contact IBM technical support for assistance.

## CMUN06027E SOURCE Operation failure: thread interupted **Explanation**

The storage management console server reports an internal service advisor error. The program is interrupted for an unknown reason.

#### Action

Contact IBM technical support for assistance.

## CMUN06028E SOURCE Operation failure: timeout **Explanation**

The storage management console server reports an internal service advisor error. The program times out before it completes.

#### Action

This might be a temporary problem. Resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN06029E SOURCE Operation failure: unknown operating system **Explanation**

The storage management console server reports an internal service advisor error. An unknown operating system is detected.

### **Action**

Install the storage management console server on a supported operating system. If the problem persists, contact IBM technical support for assistance.

## CMUN06030E SOURCE Operation failure: environment variable not found

### **Explanation**

The service advisor relies on environment variables that are initialized when the storage management console server software is installed. The storage management console server software installation might have failed.

Submit the command from the storage management console. If the problem persists, then re-install the storage management console server software. If the problem still persists, contact IBM technical support for assistance.

## CMUN06031E SOURCE Operation failure: unable to compress all files to zip file

### **Explanation**

The storage management console server reports an internal service advisor error.

#### Action

Contact IBM technical support for assistance.

## CMUN80000E Storage management console server unavailable **Explanation**

The storage management console server cannot be reached over the TCP/IP network. The server might not be enabled, a network problem might exist, or the server might be refusing connections because too many clients are connected.

#### Action

Ensure the network is functioning properly and the server is enabled. If too many clients are connected, wait until the server has fewer clients. Resubmit the task.

# CMUN80001E An error occurs while communicating with the storage management console server.

### **Explanation**

This message is displayed only if a specific storage management console server error is not available. The problem might be temporary, due to heavy network traffic, or it might be a more serious condition.

#### Action

Check network traffic to determine if unusual workloads exist. Check for network adapter hardware errors, configuration changes, or address changes. Resubmit the task. If the problem persists, contact IBM technical support.

# CMUN80002E The client code is not at the same version level as the storage management console server code.

### **Explanation**

The client and storage management console server code are at different version levels. This can cause miscommunication between the client and server.

#### Action

Ensure that both client and server code are at the same version level.

## CMUN80003E Information for this resource cannot be retrieved. **Explanation**

The query for information for this resource cannot run. No specific information about the cause of the failure is available.

#### Action

Ensure that the correct version of software has been installed. If the problem persists, contact IBM technical support.

## CMUN80004E The resource cannot be created. **Explanation**

You attempting to create a resource, but an error occurs and the creation cannot be committed. No specific information about the cause of the failure is available.

#### Action

Ensure that the correct version of software has been installed. Resubmit the task. If the problem persists, contact IBM technical support.

## CMUN80005E An error occurs while committing configuration changes. **Explanation**

You are attempting to configure a resource, but an error occurs and the configuration cannot be committed. No specific information about the cause of the failure is available.

#### Action

Ensure that the correct version of software has been installed. Resubmit the task. If the problem persists, contact IBM technical support.

# CMUN80006E The information for this resource cannot be retrieved. **Explanation**

The query for information on extent usage for the resource cannot run. No specific information about the cause of the failure is available.

### **Action**

Ensure that the correct version of software has been installed. Resubmit the task, If the problem persists, contact IBM technical support.

## CMUN80007E Information for this resource cannot be retrieved. **Explanation**

No specific information about the cause of the failure is available.

Ensure that the correct version of software has been installed. Resubmit the task. If the problem persists, contact IBM technical support.

## CMUN80008E Unknown error **Explanation**

While querying for data or committing changes, an error of unknown origin occurs. No specific information about the cause of the failure is available.

### Action

Ensure that the correct version of software has been installed. Resubmit the task. If the problem persists, contact IBM technical support.

## CMUN80009E The attributes specified for the resource are not valid.

### **Explanation**

You are attempting to create or modify a resource and the system detects one or more attributes that are not valid for that resource.

#### **Action**

Ensure that the resource attributes are valid, and then resubmit the task.

# CMUN80010E You are not authorized to perform this action through the storage management console.

### **Explanation**

You are attempting to perform an action for which you have no authorization.

### Action

Contact your system administrator to change your authorization level. Resubmit the task.

# CMUN80011E The connection cannot be made because authentication information is invalid.

### **Explanation**

The authentication information is invalid.

#### Action

Ensure that correct authentication information is entered. Resubmit the task.

# CMUN80012E The IP address of the host cannot be determined. **Explanation**

The IP address cannot be determined for the host name that you entered.

Provide the correct host name and IP address, and then resubmit the task.

## CMUN80013E Task execution failure: timeout **Explanation**

The storage management console server reports a timeout error because the storage management console server or the storage image cannot complete the submitted task within the expected time period.

#### Action

Wait until the server or storage unit is less busy. Resubmit the task.

Note: If your task involved storage unit configuration changes, first check to see if the task was partially completed before the failure occurred.

## CMUN80014E Invalid parameter **Explanation**

The storage management console server reports one or more invalid parameters in the specification.

#### Action

Ensure that the format and data type of the specified parameters are correct. Resubmit the task.

## CMUN80015E Resource not found **Explanation**

The storage management console server cannot find the specified resource.

#### Action

Ensure that the resource is configured on the storage complex and is specified correctly in the task. Resubmit the task.

## CMUN80016E The storage management console server reports an internal error.

### **Explanation**

The storage management console server reports an internal error.

#### **Action**

Ensure that the correct version of the server software has been installed. Resubmit the task. If the problem persists, call technical support.

## CMUN80017E SOURCE Copy Services communications error **Explanation**

While communicating with the Copy Services server, the storage management console server reported an error

### Action

This might be a temporary problem due to unusually high network traffic. Resubmit the task. If the problem persists, call technical support.

## CMUN80018E SOURCE Authentication failure: Your account is locked. **Explanation**

The storage management console server reports an authentication failure. Your account is locked. Access will be denied until the account is unlocked by an administrative user.

### Action

Ask your system administrator to unlock your account using the user administration panels. If you are the system administrator, you must use the security recovery utility.

## CMUN80019E SOURCE Authentication failure: The security database is not accessible.

## **Explanation**

The storage management console server reports an authentication failure. The security database is not accessible.

### Action

Contact IBM technical support for assistance.

## CMUN80020E SOURCE Authentication failure: invalid password **Explanation**

The storage management console server reports an authentication failure. The specified password is invalid.

## Action

Specify a valid password, and then resubmit the task.

## CMUN80021E SOURCE Authentication failure: Unable to connect to type 2105 machine.

## **Explanation**

The storage management console server reports an authentication failure that occurs while you are trying to connect to a machine type 2105 Enterprise Storage Server. Your user name and password might not be correctly defined on the 2105, or the user name and password that you supplied might be incorrect.

### Action

Ensure that the user name and password that you specify are correctly defined on the type 2105 system, and then resubmit the task. If the problem persists, contact IBM technical support for assistance.

## CMUN80022E SOURCE Authentication failure: Your password has expired.

## **Explanation**

The storage management console server reports an authentication failure. Your password has expired. You must change your password now.

### Action

Enter your expired password, and then change your password to a new password.

## CMUN80023E SOURCE Authentication failure: Nonexistent account. **Explanation**

The storage management console server reports an authentication failure. The specified user account does not exist.

### **Action**

Ask your system administrator to create this account and ensure that it is registered in the security database, or log in using a different user name.

## CMUN80024E SOURCE Authorization failure: You are not authorized to run this task.

## **Explanation**

The storage management console server reports an authentication failure. You are not authorized to run the task.

## Action

Ask your system administrator to grant you the necessary permissions to run the task, and then resubmit the task.

## CMUN80025E SOURCE Rank creation denied. This rank would exceed the installed LMC feature key enablement. Delete all references to this rank.

## **Explanation**

The installed license machine code does not permit the creation of additional ranks. Your request to create a rank is denied. A reference to this uncreated rank is visible to make the request and denial history available. This reference can be deleted.

## Action

Delete the rank reference. Obtain a license for additional ranks, and then resubmit the task.

## **Accessibility**

Accessibility features provide users who have disabilities with the ability to successfully access information and use technology.

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully.

### **Features**

These are the major accessibility features in the IBM TotalStorage DS8000 information:

- You can use screen-reader software and a digital speech synthesizer to hear what is displayed on the screen. IBM Home Page Reader version 3.0 has been tested.
- · You can operate features using the keyboard instead of the mouse.

## Navigating by keyboard

You can use keys or key combinations to perform operations and initiate menu actions that can also be done through mouse actions. You can navigate the IBM TotalStorage DS8000 information from the keyboard by using the shortcut keys for your browser or Home Page Reader. See your browser Help for a list of shortcut keys that it supports. See the following Web site for a list of shortcut keys supported by Home Page Reader: http://www-306.ibm.com/able/solution\_offerings/keyshort.html

## Accessing the publications

You can find HTML versions of the IBM TotalStorage DS8000 information at the following Web site:

http://www.ehone.ibm.com/public/applications/publications/cgibin/pbi.cgi

You can access the information using IBM Home Page Reader 3.0.

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## Glossary

This glossary includes terms for the IBM TotalStorage and other Resiliency Family products.

This glossary includes selected terms and definitions from:

- The American National Standard Dictionary for Information Systems, ANSI X3.172–1990, copyright 1990 by the American National Standards Institute (ANSI), 11 West 42nd Street, New York, New York 10036. Definitions derived from this book have the symbol (A) after the definition.
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This glossary uses the following cross-reference forms:

**See** Refers the reader to one of two kinds of related information:

- A term that is the expanded form of an abbreviation or acronym. This expanded form of the term contains the full definition.
- · A synonym or more preferred term

### See also

Refers the reader to one or more related terms

### Contrast with

Refers the reader to a term that has an opposite or substantively different meaning.

## **Numerics**

- 750 A model of the Enterprise Storage Server featuring a 2-way processor with limited physical storage capacity. This model can be updated to the model 800.
- 800 A model of the Enterprise Storage Server featuring a standard processor or an optional Turbo processor. The Model 800 supports RAID 5, RAID 10, and 15000 rpm drives. Model 800 supersedes Model F20.
- The machine type for the IBM
  TotalStorage DS6000 series. Models for the DS6000 include the 511 and EX1.
- 2105 The machine number for the IBM TotalStorage Enterprise Storage Server. Models of the Enterprise Storage Server are expressed as the number 2105 followed by "Model <xxx>", such as 2105 Model 800. The 2105 Model 100 is an Enterprise Storage Server expansion enclosure that is typically referred to simply as the Model 100.
- 2107 The machine type for the IBM
  TotalStorage DS8000 series. Models for
  the DS8000 series include the base units
  921, 922 and 9A2 and expansion units
  92E and 9AE.
- 3390 The machine number of an IBM disk storage system. The Enterprise Storage Server, when interfaced to IBM zSeries hosts, is set up to appear as one or more 3390 devices, with a choice of 3390-2, 3390-3, or 3390-9 track formats.
- 3990 The machine number of an IBM control
- 7133 The machine number of an IBM disk storage system. The Model D40 and 020 drawers of the 7133 can be installed in the 2105-100 expansion enclosure of the ESS.

### Α

#### access

- 1) To obtain the use of a computer resource.
- 2) In computer security, a specific type of interaction between a subject and an object that results in flow of information from one to the other.

### access-any mode

One of the two access modes that can be set for the storage unit during initial configuration. It enables all fibre-channel-attached host systems with no defined access profile to access all logical volumes on the storage unit. With a profile defined in DS Storage Manager for a particular host, that host has access only to volumes that are assigned to the WWPN for that host. See also pseudo host and worldwide port name.

- ACK See request for acknowledgment and acknowledgment.
- agent A program that automatically performs some service without user intervention or on a regular schedule. See also subagent.
- alert A message or log that a storage unit generates as the result of error event collection and analysis. An alert indicates that a service action is required.

### allegiance

For zSeries, a relationship that is created between a device and one or more channel paths during the processing of certain conditions. See also implicit allegiance, contingent allegiance, and reserved allegiance.

### allocated storage

The space that is allocated to volumes but not yet assigned. Contrast with assigned storage.

## American National Standards Institute (ANSI)

An organization of producers, consumers, and general interest groups that establishes the procedures by which accredited organizations create and maintain voluntary industry standards in the United States. (A)

## **Anonymous**

In the DS Storage Manager, the label on an icon that represents all connections that are using fibre-channel adapters

between the storage unit and hosts but are not completely defined to the storage unit. See also anonymous host, pseudo host, and access-any mode.

### anonymous host

Synonym for *pseudo host*. Contrast with Anonymous and pseudo host.

- ANSI See American National Standards Institute.
- **APAR** See authorized program analysis report. (GC)
- API See application programming interface.

### application programming interface

An interface that allows an application program that is written in a high-level language to use specific data or functions of the operating system or another program.

### arbitrated loop

A fibre-channel topology that enables the interconnection of a set of nodes. See also point-to-point connection and switched fabric.

- An ordered collection, or group, of array physical devices (disk drive modules) that is used to define logical volumes or devices. In the storage unit, an array is a group of disks that the user designates to be managed by the RAID technique. See also redundant array of independent disks.
- **ASCII** (American National Standard Code for Information Interchange) The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including parity check), that is used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters. (A) Some organizations, including IBM, have used the parity bit to expand the basic code set.

### assigned storage

The space that is allocated to a volume and that is assigned to a port.

## authorized program analysis report (APAR)

A request for correction of a defect in a current release of an IBM-supplied program. (GC)

### availability

The degree to which a system or resource is capable of performing its normal function. See *data availability*.

В

bay The physical space that is used for installing SCSI, ESCON, and fibre-channel host adapter cards. The DS8000 has four bays, two in each cluster. See also service boundary.

bit 1) Either of the digits 0 or 1 when used in the binary numeration system. (T)

2) The storage medium required to store a single binary digit. See also *byte*.

 block A string of data elements recorded or transmitted as a unit. The elements may be characters, words, or physical records.
 (T)

A group of consecutive bytes used as the basic storage unit in fixed-block architecture (FBA). All blocks on the storage device are the same size (fixed size). See also *fixed-block architecture* and *data record*.

byte 1) A group of eight adjacent binary digits that represent one EBCDIC character.

2) The storage medium required to store eight bits. See also *bit*.

C

cache A special-purpose buffer storage, smaller and faster than main storage, used to hold a copy of instructions and data obtained from main storage and likely to be needed next by the processor. (T)

### cache fast write

A form of the fast-write operation in which the storage server writes the data directly to cache, where it is available for later destaging.

### cache hit

An event that occurs when a read operation is sent to the cluster, and the requested data is found in cache. Contrast with *cache miss*.

### cache memory

Memory, typically volatile memory, that a storage server uses to improve access times to instructions or data. The cache memory is typically smaller and faster than the primary memory or storage medium. In addition to residing in cache memory, the same data also resides on the storage devices in the storage unit.

#### cache miss

An event that occurs when a read operation is sent to the cluster, but the data is not found in cache. Contrast with cache hit.

#### call home

A communication link established between the DS8000 and a service provider. The DS8000 can use this link to place a call to IBM or to another service provider when it requires service. With access to the machine, service personnel can perform service tasks, such as viewing error logs and problem logs or initiating trace and dump retrievals. See also *heartbeat* and *remote technical assistance information network*.

#### cascading

1) Connecting network controllers to each other in a succession of levels to concentrate many more lines than a single level permits.

2) In high-availability cluster multiprocessing (HACMP), cascading pertains to a cluster configuration in which the cluster node with the highest priority for a particular resource acquires the resource if the primary node fails. The cluster node relinquishes the resource to the primary node upon reintegration of the primary node into the cluster.

#### catcher

A server that service personnel use to collect and retain status data that an DS8000 sends to it.

**CCR** See channel command retry.

**CCW** See channel command word.

**CD** See compact disc.

**CEC** See computer-electronic complex.

### channel

For zSeries, the part of a channel subsystem that manages a single I/O interface between a channel subsystem and a set of control units.

### channel command retry (CCR)

For zSeries, the protocol used between a channel and a control unit that enables the control unit to request that the channel reissue the current command.

### channel command word (CCW)

For zSeries, a data structure that specifies an I/O operation to the channel subsystem.

### channel path

For zSeries, the interconnection between a channel and its associated control units.

### channel subsystem

For zSeries, the part of a host computer that manages I/O communication between the program and any attached control units.

## channel-subsystem image

For zSeries, the logical functions that a system requires to perform the function of a channel subsystem. With ESCON multiple image facility (EMIF), one channel subsystem image exists in the channel subsystem for each logical partition (LPAR). Each image appears to be an independent channel subsystem program, but all images share a common set of hardware facilities.

CKD See count key data.

See command-line interface. See also CLI Copy Services command-line interface.

### cluster

1) A partition capable of performing all DS8000 functions. With two clusters in the DS8000, any operational cluster can take over the processing of a failing cluster.

2) In the AIX operating system, a group of nodes within a complex.

### cluster processor complex (CPC)

The unit within a cluster that provides the management function for the DS8000. It consists of cluster processors, cluster memory, and related logic.

### command-line interface (CLI)

An interface provided by an operating system that defines a set of commands and enables a user (or a script-like language) to issue these commands by typing text in response to the command prompt (for example, DOS commands or UNIX shell commands). See also Copy Services command-line interface.

## compact disc

An optically read disc, typically storing approximately 660 MB. CD-ROM (compact disc read-only memory) refers to the read-only format used to distribute DS8000 code and documentation.

### compression

- 1) The process of eliminating gaps, empty fields, redundancies, and unnecessary data to shorten the length of records or blocks.
- 2) Any encoding that reduces the number of bits used to represent a given message or record. (GC)

## computer-electronic complex (CEC)

The set of hardware facilities associated with a host computer.

### concurrent copy

A facility on a storage server that enables a program to make a backup of a data set while the logical volume remains available for subsequent processing. The data in the backup copy is frozen at the point in time that the server responds to the request.

### concurrent installation of licensed internal

Process of installing licensed internal code on a DS8000 while applications continue to run.

### concurrent maintenance

Service that is performed on a unit while it is operational.

### concurrent media maintenance

Service performed on a disk drive module (DDM) without losing access to the data.

## configure

In storage, to define the logical and physical configuration of the input/output (I/O) subsystem through the user interface that the storage unit provides for this function.

### consistency group

A group of volumes participating in FlashCopy relationships in a logical subsystem, across logical subsystems, or across multiple storage units that must be kept in a consistent state to ensure data integrity.

### consistency group interval time

The value in seconds that indicates the length of time between the formation of consistency groups.

### consistent copy

A copy of a data entity (a logical volume, for example) that contains the contents of the entire data entity at a single instant in time.

### console

A user interface to a server, for example, the interface provided on a personal computer. See also IBM TotalStorage Management Console.

## contingent allegiance

For zSeries, a relationship that is created in a control unit between a device and a channel when the channel accepts unit-check status. The allegiance causes the control unit to guarantee access; the control unit does not present the busy status to the device. The allegiance enables the channel to retrieve sense data that is associated with the unit-check status on the channel path associated with the allegiance.

## control path

The route that is established from the master storage unit to the subordinate storage unit when more than one storage unit participates in a Global Mirror session. If there is only one storage unit (the master) in the Global Mirror session, no control path is required.

## control unit (CU)

- 1) A device that coordinates and controls the operation of one or more input/output devices, and synchronizes the operation of such devices with the operation of the system as a whole.
- 2) For zSeries, a storage server with ESCON or OEMI interfaces. The control unit adapts a native device interface to an I/O interface that a zSeries host system supports.
- 3) The portion of the storage unit that supports the attachment of emulated count key data devices over ESCON, FICON, or OEMI interfaces. See also cluster.

### control-unit image

For zSeries, a logical subsystem that is

accessed through an ESCON I/O interface. One or more control-unit images exist in each control unit. Each image appears as an independent control unit, but all control-unit images share a common set of hardware facilities. The DS8000 can emulate 3990-3, TPF, 3990-6, or 2105 control units.

## control-unit-initiated reconfiguration (CUIR)

A software mechanism that the DS8000 uses to request that an operating system of a zSeries host verify that one or more subsystem resources can be taken offline for service. The DS8000 can use this process to automatically vary channel paths offline and online to facilitate bay service or concurrent code installation. Depending on the operating system, support for this process might be model dependent, might depend on the IBM TotalStorage Enterprise Storage Server Subsystem Device Driver, or might not exist.

### **Coordinated Universal Time (UTC)**

The international standard of time that is kept by atomic clocks around the world.

## **Copy Services**

A collection of optional software features, with a Web-browser interface, used for configuring, managing, and monitoring data-copy functions.

### Copy Services CLI

See Copy Services command-line interface.

## **Copy Services client**

Software that runs on each DS8000 cluster in the Copy Services server group and that performs the following functions:

- Communicates configuration, status and connectivity information to the Copy Services server
- Performs data-copy functions on behalf of the Copy Services server

## Copy Services command-line interface (Copy Services CLI)

The command-line interface software that is provided with DS8000 Copy Services and used for invoking Copy Services functions from host systems attached to the DS8000. See also command-line interface.

## Copy Services server

A cluster that the Copy Services administrator designates to perform the DS8000 Copy Services functions.

## Copy Services server group

A collection of user-designated DS8000 clusters participating in Copy Services functions that a designated, active, Copy Services server manages. A Copy Services server group is also called a Copy Services domain.

### count field

The first field of a count key data (CKD) record. This eight-byte field contains a four-byte track address (CCHH). It defines the cylinder and head that are associated with the track, and a one-byte record number (R) that identifies the record on the track. It defines a one-byte key length that specifies the length of the record's key field (0 means no key field). It defines a two-byte data length that specifies the length of the record's data field (0 means no data field). Only the end-of-file record has a data length of zero.

## count key data (CKD)

For zSeries, a data-record format employing self-defining record formats in which each record is represented by up to three fields: a count field that identifies the record and specifies its format, an optional key field that identifies the data area contents, and an optional data field that typically contains the user data. For CKD records on the storage unit, the logical volume size is defined in terms of the device emulation mode (3390 or 3380 track format). The count field is always 8 bytes long and contains the lengths of the key and data fields, the key field has a length of 0 to 255 bytes, and the data field has a length of 0 to 65 535 or the maximum that will fit on the track. See also data record.

CPC See cluster processor complex.

CRC See cyclic redundancy check.

CU See control unit.

**CUIR** See control-unit initiated reconfiguration.

## custom volume

A volume in count-key-data (CKD) format that is not a standard volume, which means that it does not necessarily present the same number of cylinders and capacity to its assigned logical control unit as provided by one of the following standard zSeries volume types: 3390-2, 3390-3, 3390-9, 3390-2 (3380-track mode), or 3390-3 (3380-track mode). See also count-key-data, interleave, standard volume, and volume.

CUT See Coordinated Universal Time.

## cyclic redundancy check (CRC)

A redundancy check in which the check key is generated by a cyclic algorithm. (T)

## cylinder

A unit of storage on a CKD device with a fixed number of tracks.

D

DA See device adapter. See also IBM Serial Storage adapter.

## daisy chain

See serial connection.

**DASD** See direct access storage device.

## DASD fast write (DFW)

A function of a storage server in which active write data is stored in nonvolatile cache, thus avoiding exposure to data loss.

### data availability

The degree to which data is available when needed, typically measured as a percentage of time that the system would be capable of responding to any data request (for example, 99.999% available).

## data compression

A technique or algorithm used to encode data such that the encoded result can be stored in less space than the original data. The original data can be recovered from the encoded result through a reverse technique or reverse algorithm. See also compression.

## **Data Facility Storage Management Subsystem** (DFSMS)

An operating environment that helps automate and centralize the management of storage. To manage storage, DFSMS provides the storage administrator with control over data class, storage class, management class, storage group, and automatic class selection routine definitions.

#### data field

The optional third field of a count key data (CKD) record. The count field specifies the length of the data field. The data field contains data that the program writes.

#### data record

The basic unit of zSeries storage on a DS8000, also known as a count-key-data (CKD) record. Data records are stored on a track. The records are sequentially numbered starting with 0. The first record, R0, is typically called the track descriptor record and contains data that the operating system normally uses to manage the track. See also count-key-data and fixed-block architecture.

### data set FlashCopy

For zSeries hosts, a feature of FlashCopy that indicates how many partial volume FlashCopy relationships are active on a volume.

## data sharing

The ability of multiple host systems to concurrently utilize data that they store on one or more storage devices. The storage unit enables configured storage to be accessible to any, or all, attached host systems. To use this capability, the host program must be designed to support data that it is sharing.

DDM See disk drive module.

### **DDM** group

See disk pack.

## dedicated storage

Storage within a storage unit that is configured such that a single host system has exclusive access to the storage.

### demote

To remove a logical data unit from cache memory. A storage server demotes a data unit to make room for other logical data units in the cache or because the logical data unit is not valid. The storage unit must destage logical data units with active write units before they can be demoted. See also destage.

### destage

To move data from an online or higher priority to an offline or lower priority

device. The storage unit stages incoming data into cache and then destages it to disk.

#### device

For zSeries, a disk drive.

### device adapter (DA)

A physical component of the DS8000 that provides communication between the clusters and the storage devices. The DS8000 has eight device adapters that it deploys in pairs, one from each cluster. Device adapter pairing enables the DS8000 to access any disk drive from either of two paths, providing fault tolerance and enhanced availability.

### device address

For zSeries, the field of an ESCON device-level frame that selects a specific device on a control-unit image.

### device ID

The unique two-digit hexadecimal number that identifies the logical device.

### device interface card

A physical subunit of a storage cluster that provides the communication with the attached device drive modules.

### device number

For zSeries, a four-hexadecimal-character identifier, for example 13A0, that the systems administrator associates with a device to facilitate communication between the program and the host operator. The device number is associated with a subchannel.

### device sparing

A subsystem function that automatically copies data from a failing device drive module to a spare device drive module. The subsystem maintains data access during the process.

**DFS** See distributed file service.

#### **DFSMS**

See Data Facility Storage Management Subsystem.

### direct access storage device (DASD)

- 1) A mass storage medium on which a computer stores data.
- 2) A disk device.

### disk cage

A container for disk drives. Each disk cage supports eight disk packs (64 disks).

### disk drive

Standard term for a disk-based nonvolatile storage medium. The DS8000 uses hard disk drives as the primary nonvolatile storage media to store host data.

## disk drive module (DDM)

A field replaceable unit that consists of a single disk drive and its associated packaging.

### disk drive module group

See disk pack.

## disk pack

A group of disk drive modules (DDMs) installed as a unit in a DDM bay.

## disk group

A collection of 4 disk drives that are connected to the same pair of IBM Serial Storage adapters and can be used to create a RAID array. A disk group can be formatted as count key data or fixed block, and as RAID or non-RAID, or it can be left unformatted. A disk group is a logical assemblage of disk drives. Contrast with disk pack.

## distributed file service (DFS)

A service that provides data access over IP networks.

DNS See domain name system.

### domain

- 1) That part of a computer network in which the data processing resources are under common control.
- 2) In TCP/IP, the naming system used in hierarchical networks.
- 3) A Copy Services server group, in other words, the set of clusters the user designates to be managed by a particular Copy Services server.

### domain name system (DNS)

In TCP/IP, the server program that supplies name-to-address translation by mapping domain names to internet addresses. The address of a DNS server. is the internet address of the server that hosts the DNS software for the network.

### dotted decimal notation

A convention used to identify IP

addresses. The notation consists of four 8-bit numbers written in base 10. For example, 9.113.76.250 is an IP address that contains the octets 9, 113, 76, and 250.

#### drawer

A unit that contains multiple device drive modules and provides power, cooling, and related interconnection logic to make the device drive modules accessible to attached host systems.

drive

- 1) A peripheral device, especially one that has addressed storage media. See also disk drive module.
- 2) The mechanism used to seek, read, and write information on a storage medium.

### **DS8000**

See IBM TotalStorage DS8000.

## **DS8000 Batch Configuration tool**

A program that automatically configures a DS8000. The configuration is based on data that IBM service personnel enter into the program.

### **DS Storage Manager**

See IBM TotalStorage DS Storage Manager.

## duplex

- 1) Regarding Copy Services, the state of a volume pair after Remote Mirror and Copy has completed the copy operation and the volume pair is synchronized.
- 2) In general, pertaining to a communication mode in which data can be sent and received at the same time.

### dynamic sparing

The ability of a storage server to move data from a failing disk drive module (DDM) to a spare DDM while maintaining storage functions.

### F

- E10 The predecessor of the F10 model of the Enterprise Storage Server. See also F10.
- E20 The predecessor of the F20 model of the Enterprise Storage Server. See also F20.

### **EBCDIC**

See extended binary-coded decimal interchange code.

EC See engineering change.

**ECKD** See extended count key data.

### eight pack

See disk pack.

## electrostatic discharge (ESD)

An undesirable discharge of static electricity that can damage equipment and degrade electrical circuitry.

## emergency power off (EPO)

A means of turning off power during an emergency, usually a switch.

See ESCON multiple image facility. **EMIF** 

### enclosure

A unit that houses the components of a storage subsystem, such as a control unit, disk drives, and power source.

### end of file

A coded character recorded on a data medium to indicate the end of the medium. On a count-key-data direct access storage device, the subsystem indicates the end of a file by including a record with a data length of zero.

## engineering change (EC)

An update to a machine, part, or program.

## Enterprise Systems Architecture/390 (ESA/390)

An IBM architecture for mainframe computers and peripherals. Processor systems that follow the ESA/390 architecture include the ES/9000® family. See also z/Architecture.

## **Enterprise Systems Connection (ESCON)**

1) A zSeries computer peripheral interface. The I/O interface uses zSeries logical protocols over a serial interface that configures attached units to a communication fabric.

2) A set of IBM products and services that provide a dynamically connected environment within an enterprise.

**EPO** See emergency power off.

ERDS See error-recording data set.

**ERP** See error recovery procedure.

## error-recording data set (ERDS)

On zSeries hosts, a data set that records data-storage and data-retrieval errors. A

service information message (SIM) provides the error information for the ERDS.

### error recovery procedure (ERP)

Procedures designed to help isolate and, where possible, to recover from errors in equipment. The procedures are often used in conjunction with programs that record information on machine malfunctions.

### **ESA/390**

See Enterprise Systems Architecture/390.

**ESCD** See *ESCON director*.

### **ESCON**

See Enterprise System Connection.

#### **ESCON** channel

A zSeries channel that supports ESCON protocols.

### **ESCON director (ESCD)**

An I/O interface switch that allows the interconnection of multiple ESCON interfaces in a distributed-star topology.

## **ESCON** host systems

zSeries hosts that attach to the DS8000 with an ESCON adapter. Such host systems run on operating systems that include MVS, VSE, TPF, or versions of VM.

### **ESCON** multiple image facility (EMIF)

For zSeries, a function that enables LPARs to share an ESCON channel path by providing each LPAR with its own channel-subsystem image.

### **EsconNet**

In the DS Storage Manager, the label on a pseudo host icon that represents a host connection that uses the ESCON protocol and that is not completely defined on the DS8000. See also pseudo host and access-any mode.

**ESD** See electrostatic discharge.

### eserver

See IBM e(logo)server.

### **ESSNet**

See IBM TotalStorage Enterprise Storage Server Network.

## extended binary-coded decimal interchange code (EBCDIC)

An IBM-developed coding scheme used to represent various alphabetic, numeric, and

special symbols with a coded character set of 256 eight-bit codes.

## extended count key data (ECKD)

An extension of the count key data (CKD) architecture.

extent A continuous space on a disk that is occupied by or reserved for a particular data set, data space, or file. The unit of increment is a track. See also multiple allegiance and parallel access volumes.

### extent pool

A groups of extents. See also extent.

## F

**fabric** In fibre-channel technology, a routing structure, such as a switch, receives addressed information and routes to the appropriate destination. A fabric can consist of more than one switch. When multiple fibre-channel switches are interconnected, they are said to be cascaded.

### failback

Pertaining to a cluster recovery from failover following repair. See also failover.

## failover

Pertaining to the process of transferring all control to a single cluster when the other cluster in the storage unit fails. See also cluster and failback.

## fast write

A write operation at cache speed that does not require immediate transfer of data to a disk drive. The subsystem writes the data directly to cache, to nonvolatile storage, or to both. The data is then available for destaging. A fast-write operation reduces the time an application must wait for the I/O operation to complete.

**FBA** See fixed-block architecture.

FC See *feature code*. **Note**: *FC* is a common abbreviation for fibre channel in the industry, but the DS8000 customer documentation library reserves FC for feature code.

FC-AL See Fibre Channel-Arbitrated Loop.

FCP See fibre-channel protocol. **FCS** See fibre-channel standard.

# feature code (FC)

A code that identifies a particular orderable option and that is used by service personnel to process hardware and software orders. Individual optional features are each identified by a unique feature code.

### fibre channel

A data-transmission architecture based on the ANSI Fibre Channel standard, which supports full-duplex communication. The DS8000 supports data transmission over fiber-optic cable through its fibre-channel adapters. See also fibre-channel protocol and fibre-channel standard.

### Fibre Channel-Arbitrated Loop (FC-AL)

An implementation of the Fibre Channel standard that uses a ring topology for the communication fabric. Refer to American National Standards Institute (ANSI) X3T11/93-275. In this topology, two or more fibre-channel end points are interconnected through a looped interface.

## fibre-channel connection (FICON)

A fibre-channel communications protocol designed for IBM mainframe computers and peripherals.

## fibre-channel protocol (FCP)

A protocol used in fibre-channel communications with five layers that define how fibre-channel ports interact through their physical links to communicate with other ports.

## Fibre-Channel standard (FCS)

An ANSI standard for a computer peripheral interface. The I/O interface defines a protocol for communication over a serial interface that configures attached units to a communication fabric. The protocol has two layers. The IP layer defines basic interconnection protocols. The upper layer supports one or more logical protocols (for example, FCP for SCSI command protocols and SBCON for zSeries command protocols). Refer to American National Standards Institute (ANSI) X3.230-199x. See also fibre-channel protocol.

## fibre-channel topology

An interconnection topology supported on fibre-channel adapters. See also point-to-point connection, switched fabric, and arbitrated loop.

#### **FICON**

See fibre-channel connection.

### **FiconNet**

In the DS Storage Manager, the label on a pseudo host icon that represents a host connection that uses the FICON protocol and that is not completely defined on the DS8000. See also pseudo host and access-any mode.

### field replaceable unit (FRU)

An assembly that is replaced in its entirety when any one of its components fails. In some cases, a field replaceable unit might contain other field replaceable units. (GC)

FIFO See first-in-first-out.

## File Transfer Protocol (FTP)

In TCP/IP, an application protocol used to transfer files to and from host computers. See also Transmission Control Protocol/Internet Protocol.

#### firewall

A protection against unauthorized connection to a computer or a data storage system. The protection is usually in the form of software on a gateway server that grants access to users who meet authorization criteria.

## first-in-first-out (FIFO)

A queuing technique in which the next item to be retrieved is the item that has been in the gueue for the longest time. (A)

### fixed-block architecture (FBA)

An architecture for logical devices that specifies the format of and access mechanisms for the logical data units on the device. The logical data unit is a block. All blocks on the device are the same size (fixed size). The subsystem can access them independently.

### fixed-block device

An architecture for logical devices that specifies the format of the logical data units on the device. The logical data unit is a block. All blocks on the device are the same size (fixed size); the subsystem can access them independently. This is the required format of the logical data units for host systems that attach with a SCSI or fibre-channel interface. See also fibre channel and small computer systems interface.

### **FlashCopy**

An optional feature of the DS8000 that can make an instant copy of data, that is, a point-in-time copy of a volume.

### FlashCopy relationship

A mapping of a FlashCopy source volume and a FlashCopy target volume that allows a point-in-time copy of the source volume to be copied to the target volume. FlashCopy relationships exist from the time that you initiate a FlashCopy operation until the storage unit copies all data from the source volume to the target volume or until you delete the FlashCopy relationship, if it is persistent.

FRU See field replaceable unit.

FTP See File Transfer Protocol.

## full duplex

See duplex.

## fuzzy copy

A function of the Global Copy feature wherein modifications to the primary logical volume are performed on the secondary logical volume at a later time. The original order of update is not strictly maintained. See also Global Copy.

G

GB See gigabyte.

GDPS See Geographically Dispersed Parallel Sysplex.

## **Geographically Dispersed Parallel Sysplex** (GDPS)

A zSeries multisite application-availability solution.

### gigabyte (GB)

A gigabyte of storage is 10<sup>9</sup> bytes. A gigabyte of memory is 2<sup>30</sup> bytes.

## **Global Copy**

An optional capability of the DS8000 remote mirror and copy feature that maintains a fuzzy copy of a logical volume on the same DS8000 or on another DS8000. In other words, all modifications that any attached host performs on the primary logical volume are also performed on the secondary logical volume at a later point in time. The original order of update is not strictly maintained. See also Remote Mirror and Copy and Metro Mirror.

#### **Global Mirror**

An optional capability of the DS8000 remote mirror and copy feature that provides a 2-site extended distance remote copy. Data that is written by the host to the storage unit at the local site is automatically maintained at the remote site. See also Metro Mirror and Remote Mirror and Copy.

group In DS8000 documentation, a nickname for two different kinds of groups, depending on the context. See disk pack or Copy Services server group.

Н

HA See host adapter.

**HACMP** 

See High-Availability Cluster Multi-Processing.

## hard disk drive (HDD)

- 1) A storage medium within a storage server used to maintain information that the storage server requires.
- 2) A mass storage medium for computers that is typically available as a fixed disk (such as the disks used in system units of personal computers or in drives that are external to a personal computer) or a removable cartridge.

### hardware service manager (HSM)

An option on an AS/400 or iSeries host that enables the user to display and work with system hardware resources and to debug input-output processors (IOP), input-output adapters (IOA), and devices.

See Hardware Configuration Data. HCD

HDA See head and disk assembly.

HDD See hard disk drive.

**hdisk** An AIX term for storage space.

## head and disk assembly (HDA)

The portion of an HDD associated with the medium and the read/write head.

### heartbeat

A status report sent at regular intervals from the DS8000. The service provider uses this report to monitor the health of the call home process. See also call home, heartbeat call home record, and remote technical assistance information network.

#### heartbeat call home record

Machine operating and service information sent to a service machine. These records might include such information as feature code information and product logical configuration information.

### hierarchical storage management

- 1) A function in storage management software, such as Tivoli Storage Management or Data Facility Storage Management Subsystem/MVS (DFSMS/MVS), that automatically manages free space based on the policy that the storage administrator sets.
- 2) In AS/400 storage management, an automatic method to manage and distribute data between the different storage layers, such as disk units and tape library devices.

## **High-Availability Cluster Multi-Processing** (HACMP)

Software that provides host clustering, so that a failure of one host is recovered by moving jobs to other hosts within the cluster.

## high-speed link (HSL)

A hardware connectivity architecture that links system processors to system input/output buses and other system units.

### home address

A nine-byte field at the beginning of a track that contains information that identifies the physical track and its association with a cylinder.

hop Interswitch connection. A hop count is the number of connections that a particular block of data traverses between source and destination. For example, data traveling from one hub over a wire to another hub traverses one hop.

host See host system.

## host adapter

A physical subunit of a storage server that provides the ability to attach to one or more host I/O interfaces.

### host name

The Internet address of a machine in the network. The host name can be entered in the host definition as the fully qualified domain name of the attached host system, such as mycomputer.city.company.com, or

as the subname of the fully qualified domain name, for example, mycomputer. See also host system.

## host processor

A processor that controls all or part of a user application network. In a network, the processing unit in which the data communication access method resides. See also host system.

### host system

A computer, either of the mainframe (for example, zSeries) or of the open-systems type, that is connected to the DS8000. zSeries hosts are connected to the DS8000 through ESCON interfaces. Open-systems hosts are connected to the DS8000 by SCSI or fibre-channel interfaces.

## hot plug

Pertaining to the ability to add or remove a hardware facility or resource to a unit while power is on.

HSL See high-speed link.

HSM See hierarchical storage management or Hardware Service Manager.

ı

**i5/OS** The IBM operating system that runs the IBM i5/OS and e(logo)Server i5 server families of servers.

### IBM e(logo)server

The IBM brand name for a series of server products that are optimized for e-commerce. The products include the iSeries, pSeries, xSeries, and zSeries.

### IBM product engineering (PE)

The third-level of IBM service support. Product engineering is composed of IBM engineers who have experience in supporting a product or who are knowledgeable about the product.

## IBM Serial Storage adapter

A physical adapter based on the IBM Serial Storage architecture. IBM Serial Storage adapters connect disk drive modules to DS8000 clusters.

## IBM TotalStorage

The brand name used to identify storage products from IBM, including the IBM TotalStorage DS8000. See also IBM

TotalStorage DS8000 and IBM TotalStorage DS Storage Manager.

## IBM TotalStorage DS8000

A member of the IBM TotalStorage Resiliency Family of storage servers and attached storage devices (disk drive modules). The DS8000 delivers high-performance, fault-tolerant storage and management of enterprise data, affording access through multiple concurrent operating systems and communication protocols. High performance is provided by multiple symmetrical multiprocessors, integrated caching, RAID support for the disk drive modules, and disk access through a high-speed serial storage architecture interface.

## IBM TotalStorage DS CLI

The command-line interface (CLI) that is specific to the DS8000.

## IBM TotalStorage DS Storage Manager (DS **Storage Manager**)

Software with a Web-browser interface for configuring the DS8000.

## **IBM TotalStorage Enterprise Storage Server Network (ESSNet)**

A private network providing Web browser access to the Enterprise Storage Server. IBM installs the ESSNet software on an IBM workstation called the IBM TotalStorage ESS Master Console. supplied with the first ESS delivery.

## IBM TotalStorage Management Console (MC)

An IBM workstation that acts as the focal point for configuration, Copy Services management, and maintenance for the DS8000 . It includes a Web browser that provides links to the user interface. including the DS Storage Manager and the DS8000 Copy Services.

## IBM TotalStorage Multipath Subsystem Device Driver (SDD)

Software that is designed to support the multipath configuration environments of the DS8000. The SDD resides in a host system with the native disk device driver.

## **IBM TotalStorage Resiliency Family**

A set of hardware and software features and products, as well as integrated software and services that are available on theIBM TotalStorage DS8000 and the

IBM TotalStorage Enterprise Storage Server, Models 750 and 800.

image See storage image.

IML See initial microcode load.

## implicit allegiance

In Enterprise Systems Architecture/390, a relationship that a control unit creates between a device and a channel path when the device accepts a read or write operation. The control unit guarantees access to the channel program over the set of channel paths that it associates with the allegiance.

## initial microcode load (IML)

The action of loading microcode for a computer into that computer's storage.

## initial program load (IPL)

The action of loading software into a computer, typically an operating system that controls the computer.

#### initiator

A SCSI device that communicates with and controls one or more targets. Contrast with target.

**i-node** The internal structure in an AIX operating system that describes the individual files in the operating system. It contains the code, type, location, and owner of a file.

### input/output (I/O)

Pertaining to (a) input, output, or both or (b) a device, process, or channel involved in data input, data output, or both.

## input/output configuration data set

A configuration definition built by the I/O configuration program (IOCP) and stored on disk files associated with the processor controller.

### interleave

To automatically create two striped partitions across the drives in a RAID-5 array, both of which use the count-key-data (CKD) record format.

## Internet Protocol (IP)

In the Internet suite of protocols, a protocol without connections that routes data through a network or interconnecting networks and acts as an intermediary between the higher protocol layers and the physical network. The upper layer supports one or more logical protocols (for example, a SCSI-command protocol and a zSeries command protocol). Refer to ANSI X3.230-199x. The IP acronym is the IP in TCP/IP. See also Transmission Control Protocol/Internet Protocol.

### invalidate

To remove a logical data unit from cache memory because it cannot support continued access to the logical data unit on the device. This removal might be the result of a failure within the storage server or a storage device that is associated with the device.

I/O See input/output.

### I/O adapter (IOA)

An input-output adapter on the PCI bus.

### **IOCDS**

See input/output configuration data set.

IOCP See I/O Configuration Program.

### I/O Configuration Program (IOCP)

A program that defines to a system all the available I/O devices and channel paths.

### I/O device

An addressable read and write unit, such as a disk drive device, magnetic tape device, or printer.

### I/O interface

An interface that enables a host to perform read and write operations with its associated peripheral devices.

## I/O Priority Queueing

A facility in the Workload Manager of zSeries that enables the system administrator to set priorities for queueing I/Os from different system images. See also multiple allegiance and parallel access volume.

### I/O processor (IOP)

Controls input-output adapters and other devices.

### I/O sequential response time

The time an I/O request is queued in processor memory waiting for previous I/Os to the same volume to complete.

IOSQ See I/O sequential response time.

IP See Internet Protocol.

IPL See initial program load.

### **iSeries**

An IBM e(logo)server product that emphasizes integration. It is the successor to the AS/400 family of servers.

J

## Java Virtual Machine (JVM)

A software implementation of a central processing unit (CPU) that runs compiled Java code (applets and applications). (GC)

JVM See Java Virtual Machine.

K

KB See kilobyte.

### key field

The second (optional) field of a count key data record. The key length is specified in the count field. The key length determines the field length. The program writes the data in the key field and uses the key field to identify or locate a given record. The subsystem does not use the key field.

## kilobyte (KB)

- 1) For processor storage, real, and virtual storage, and channel volume, 2<sup>10</sup> or 1024 bytes.
- 2) For disk storage capacity and communications volume, 1000 bytes.

### Korn shell

Interactive command interpreter and a command programming language.

**KPOH** See thousands of power-on hours.

L

LAN See local area network.

## last-in first-out (LIFO)

A queuing technique in which the next item to be retrieved is the item most recently placed in the queue. (A)

**LBA** See *logical block address*.

LCU See logical control unit.

### least recently used (LRU)

1) The algorithm used to identify and make available the cache space that contains the least-recently used data.

2) A policy for a caching algorithm that chooses to remove from cache the item that has the longest elapsed time since its last access.

**LED** See *light-emitting diode*.

LMC See licensed machine code.

## licensed machine code (LMC)

Microcode that IBM does not sell as part of a machine, but licenses to the customer. LMC is implemented in a part of storage that is not addressable by user programs. Some IBM products use it to implement functions as an alternate to hard-wired circuitry.

LIFO See last-in first-out.

## light-emitting diode (LED)

A semiconductor chip that gives off visible or infrared light when activated.

### link address

On an ESCON interface, the portion of a source or destination address in a frame that ESCON uses to route a frame through an ESCON director. ESCON associates the link address with a specific switch port that is on the ESCON director. Equivalently, it associates the link address with the channel subsystem or control unit link-level functions that are attached to the switch port.

### link-level facility

The ESCON hardware and logical functions of a control unit or channel subsystem that allow communication over an ESCON write interface and an ESCON read interface.

### local area network (LAN)

A computer network located on a user's premises within a limited geographic area.

### local e-mail

An e-mail configuration option for storage servers that are connected to a host-system network that does not have a domain name system (DNS) server.

### logical address

On an ESCON interface, the portion of a source or destination address in a frame used to select a specific channel-subsystem or control-unit image.

### logical block address (LBA)

The address assigned by the DS8000 to a sector of a disk.

### logical control unit (LCU)

See control-unit image.

### logical data unit

A unit of storage that is accessible on a given device.

### logical device

The facilities of a storage server (such as the DS8000) associated with the processing of I/O operations directed to a single host-accessible emulated I/O device. The associated storage is referred to as a logical volume. The logical device is mapped to one or more host-addressable units, such as a device on a zSeries I/O interface or a logical unit on a SCSI I/O interface, such that the host initiating I/O operations to the I/O-addressable unit interacts with the storage on the associated logical device.

### logical partition (LPAR)

For zSeries, a set of functions that create the programming environment in which more than one logical partition (LPAR) is established on a processor. An LPAR is conceptually similar to a virtual machine environment except that the LPAR is a function of the processor. Also, the LPAR does not depend on an operating system to create the virtual machine environment.

### logical path

- 1) The relationship between a channel image and a control-unit image that designates the physical path to be used for device-level communications between these images. The logical path is established as part of the channel and control-unit initialization procedures by the exchange of link-level frames.
- 2) With the Remote Mirror and Copy feature, the relationship between a source logical subsystem (LSS) and a target LSS that is created over a physical path through the interconnection fabric that is used for Remote Mirror and Copy functions. An LSS is a primary control unit, which performs the functions of a channel image.

### logical subsystem (LSS)

A topological construct that consists of a

group of up to 256 logical devices. A DS8000 can have up to 16 CKD-formatted logical subsystems (4096 CKD logical devices) and also up to 16 fixed-block logical subsystems (4096 fixed-block logical devices). The logical subsystem facilitates configuration of the DS8000 and might have other implications relative to the operation of certain functions. There is a one-to-one mapping between a CKD logical subsystem and a zSeries control-unit image.

For zSeries hosts, a logical subsystem represents a logical control unit (LCU). Each control-unit image is associated with only one logical subsystem. See also control-unit image.

### logical unit

In open systems, a logical disk drive.

### logical unit number (LUN)

In the SCSI protocol, a unique number that is used on a SCSI bus to enable it to differentiate between separate devices, each of which is a logical unit.

### logical volume

The storage medium that is associated with a logical disk drive. A logical volume typically resides on one or more storage devices. The DS8000 administrator defines this unit of storage. The logical volume, when residing on a RAID-formatted array, is spread over the drives in the array.

## logical volume manager (LVM)

A set of system commands, library routines, and other tools that allow the user to establish and control logical volume storage. The LVM maps data between the logical view of storage space and the physical disk drive module.

## longitudinal redundancy check (LRC)

- 1) A method of error checking during data transfer that involves checking parity on a row of binary digits that are members of a set that forms a matrix. Longitudinal redundancy check is also called a longitudinal parity check.
- 2) A mechanism that the DS8000 uses for locating errors. The LRC checks the data as it progresses from the host, through theDS8000 controller, into the device adapter, and to the array.

### longwave laser adapter

A connector that is used between a host and the DS8000 to support longwave fibre-channel communication.

loop The physical connection between a pair of device adapters in the DS8000. See also device adapter.

**LPAR** See *logical partition*.

LRC See longitudinal redundancy check.

LRU See least recently used.

LSS See logical subsystem.

LUN See logical unit number.

LVM See logical volume manager.

M

## machine level control (MLC)

A database that contains the EC level and configuration of products in the field.

## machine reported product data (MRPD)

Product data gathered by a machine and sent to a destination such as an IBM support server or RETAIN. These records might include such information as feature code information and product logical configuration information.

### mainframe

A computer, usually in a computer center, with extensive capabilities and resources to which other computers may be connected so that they can share facilities. (T)

## maintenance analysis procedure (MAP)

A hardware maintenance document that gives an IBM service representative a step-by-step procedure for tracing a symptom to the cause of a failure.

### management console

See IBM TotalStorage Management Console.

### Management Information Base (MIB)

- 1) A collection of objects that can be accessed by means of a network management protocol. (GC)
- 2) The MIB record conforms to the Open Systems Interconnection (OSI) standard defined by the International Organization for Standardization (ISO) for the exchange of information. See also *simple network* management protocol.

MAP See maintenance analysis procedure.

### master storage unit

The physical unit that controls the creation of consistency groups in a Global Mirror session. The master storage unit sends commands to subordinate storage units. A storage unit can be a master for only one Global Mirror session. Contrast with subordinate storage unit.

### maximum consistency group drain time

The value in seconds that indicates the maximum time that writes from the local site are delayed to the remote site while the current consistency group is being formed at the remote site. When this time is exceeded, the current attempt to form a consistency group is ended and another attempt is started. If this time is exceeded five times, this maximum time is ignored on the next attempt to form a consistency group. The default value is the larger of four minutes or two times the consistency group interval time if this value is set to zero.

### maximum coordination time

The value in milliseconds that indicates the maximum time that is allowed for host I/O to be delayed during the coordination of the primary volumes of an Global Mirror session. The default is 50 milliseconds if this value is set to zero.

MB See megabyte.

MC See IBM TotalStorage Management Console.

See Micro Channel architecture. MCA

MDM See Multiple Device Manager.

### mean time between failures (MTBF)

- 1) A projection of the time that an individual unit remains functional. The time is based on averaging the performance, or projected performance, of a population of statistically independent units. The units operate under a set of conditions or assumptions.
- 2) For a stated period in the life of a functional unit, the mean value of the lengths of time between consecutive failures under stated conditions. (I) (A)

## medium

For a storage unit, the disk surface on which data is stored.

## megabyte (MB)

- 1) For processor storage, real and virtual storage, and channel volume, 220 or 1 048 576 bytes.
- 2) For disk storage capacity and communications volume, 1 000 000 bytes.

### **Metro Mirror**

A function of a storage server that maintains a consistent copy of a logical volume on the same storage server or on another storage server. All modifications that any attached host performs on the primary logical volume are also performed on the secondary logical volume. See also Remote Mirror and Copy and Global Copy.

MES See miscellaneous equipment specification.

MIB See management information base.

### Micro Channel architecture (MCA)

The rules that define how subsystems and adapters use the Micro Channel bus in a computer. The architecture defines the services that each subsystem can or must provide.

## **Microsoft Internet Explorer (MSIE)**

Web browser software manufactured by Microsoft.

### migration

The replacement of a system or subsystem with a different type of system or subsystem, such as replacing a SCSI host adapter with a fibre-channel host adapter. In the context of data migration regarding the DS8000, the transfer of data from one storage unit to another, such as from a 3390 to the DS8000.

MIH See missing-interrupt handler.

### mirrored pair

Two units that contain the same data. The system refers to them as one entity.

### mirroring

In host systems, the process of writing the same data to two disk units within the same auxiliary storage pool at the same

## miscellaneous equipment specification (MES)

IBM field-installed change to a machine.

## missing-interrupt handler (MIH)

An MVS and MVS/XA facility that tracks

I/O interrupts. MIH informs the operator and creates a record whenever an expected interrupt fails to occur before a specified elapsed time is exceeded.

MLC See machine level control.

### mobile solutions terminal (MoST)

The mobile terminal used by service personnel.

### mode conditioning patch cable

A cable that converts a single-mode signal from a longwave adapter into a light signal that is appropriate for multimode fibre. Another mode conditioning patch cable is required at the terminating end of the multimode fibre to convert the signal back to a single-mode signal for a longwave adapter.

### Model 100

A 2105 Model 100, often simply referred to as a Mod 100, is an expansion enclosure for the Enterprise Storage Server. See also 2105.

**MoST** See mobile solutions terminal.

MRPD See machine reported product data.

MSA See multiport serial adapter.

MSIE See Microsoft Internet Explorer.

MTBF See mean time between failures.

### **Multipath Subsystem Device Driver**

See IBM TotalStorage DS8000 Multipath Subsystem Device Driver.

## multiple allegiance

A DS8000 hardware function that is independent of software support. This function enables multiple system images to concurrently access the same logical volume on the DS8000 as long as the system images are accessing different extents. See also extent and parallel access volumes.

### Multiple Device Manager (MDM)

A component of the IBM TotalStorage Productivity Center that allows administrators to configure, manage, and monitor the performance of SAN storage devices from a single console.

### multiple relationship FlashCopy

An option of the DS8000 that creates backup copies from one source to multiple targets by simultaneously establishing multiple FlashCopy relationships.

## multiple virtual storage (MVS)

Implies MVS/390, MVS/XA, MVS/ESA, and the MVS element of the zSeries operating system.

### multiplex

The action of transmitting simultaneously.

### multiport serial adapter (MSA)

An adapter on the IBM TotalStorage Management Console that has multiple ports to which aDS8000 can be attached.

### multiprocessor

A computer that includes two or more processors that have common access to a main storage. For the DS8000, the multiprocessors operate in parallel.

MVS See multiple virtual storage.

### Ν

### name server

A server that stores names of the participating DS8000 clusters.

## **Netfinity**

IBM Intel-processor-based server; predecessor to the IBM xSeries server.

## **Netscape Navigator**

Web browser software manufactured by Netscape.

### network manager

A program or group of programs that is used to monitor, manage, and diagnose the problems of a network. (GC)

node The unit that is connected in a fibre-channel network. A DS8000 is a node in a fibre-channel network.

### non-RAID

A disk drive set up independently of other disk drives and not set up as part of a disk pack to store data using the redundant array of disks (RAID) data-striping methodology.

### nonremovable medium

A recording medium that cannot be added to or removed from a storage device.

### nonvolatile storage (NVS)

Memory that stores active write data to avoid data loss in the event of a power loss.

**NVS** See nonvolatile storage.

### 0

octet In Internet Protocol addressing, one of the four parts of a 32-bit integer presented in dotted decimal notation. See also *dotted* 

decimal notation.

**OEMI** See original equipment manufacturer's information.

## open system

A system whose characteristics comply with standards made available throughout the industry and that therefore can be connected to other systems complying with the same standards. Applied to the DS8000, such systems are those hosts that connect to the DS8000 through SCSI or FCP protocols. See also *small computer system interface* and *fibre-channel protocol*.

### organizationally unique identifier (OUI)

An IEEE-standards number that identifies an organization with a 24-bit globally unique assigned number referenced by various standards. OUI is used in the family of 802 LAN standards, such as Ethernet and Token Ring.

# original equipment manufacturer's information (OEMI)

A reference to an IBM guideline for a computer peripheral interface. The interface uses ESA/390 logical protocols over an I/O interface that configures attached units in a multidrop bus topology.

### OS/390

The IBM operating system that includes and integrates functions that many IBM software products (including the MVS operating system) previously provided for the IBM S/390 family of enterprise servers.

**OUI** See organizationally unique identifier.

#### Ρ

**panel** The formatted display of information that appears on a display screen.

## parallel access volume (PAV)

An advanced function of the DS8000 that enables OS/390 and z/OS systems to issue concurrent I/O requests against a count key data logical volume by

associating multiple devices of a single control-unit image with a single logical device. Up to eight device addresses can be assigned to a PAV. The PAV function enables two or more concurrent write operations to the same logical volume, as long as the write operations are not to the same extents. See also *extent*, *I/O Priority Queueing*, and *multiple allegiance*.

parity A data checking scheme used in a computer system to ensure the integrity of the data. The RAID implementation uses parity to re-create data if a disk drive fails.

### path group

In zSeries architecture, a set of channel paths that are defined to a control unit as being associated with a single logical partition (LPAR). The channel paths are in a group state and are online to the host. See also *logical partition*.

## path group identifier

In zSeries architecture, the identifier that uniquely identifies a given logical partition (LPAR). The path group identifier is used in communication between the LPAR program and a device. The identifier associates the path group with one or more channel paths, thereby defining these paths to the control unit as being associated with the same LPAR. See also logical partition.

PAV See parallel access volume.

**PCI** See peripheral component interconnect.

PDU See protocol data unit.

**PE** See *IBM* product engineering.

## peripheral component interconnect (PCI)

An architecture for a system bus and associated protocols that supports attachments of adapter cards to a system backplane.

## persistent FlashCopy

A state where a FlashCopy relationship remains indefinitely until the user deletes it. The relationship between the source and target volumes is maintained after a background copy completes.

### physical path

A single path through the I/O interconnection fabric that attaches two units. For Copy Services, this is the path from a host adapter on one DS8000

(through cabling and switches) to a host adapter on anotherDS8000.

## pinned data

Data that is held in cache until either an error condition is corrected and it can be moved to disk storage or until the data is discarded by a host command. Pinned data conditions can only occur on an ESS Model 800 during fast-write or dual-copy functions.

## point-in-time copy

A FlashCopy option that creates an instantaneous view of original source data at a specific moment in time.

### point-to-point connection

A fibre-channel topology that enables the direct interconnection of ports. See also arbitrated loop and switched fabric.

port A physical connection on a host adapter to the cable that connects the DS8000 to hosts, switches, or another DS8000. The DS8000 uses SCSI and ESCON host adapters that have two ports per adapter, and fibre-channel host adapters that have one port. See also ESCON, fibre channel, host adapter, and small computer system interface.

POST See power-on self test.

### power-on self test (POST)

A diagnostic test that servers or computers run when they are turned on.

### predictable write

A write operation that can cache without knowledge of the existing format on the medium. All write operations on FBA DASD devices are predictable. On CKD DASD devices, a write operation is predictable if it does a format write operation for the first data record on the track.

## primary control unit

The DS8000 to which a Remote Mirror and Copy primary device is physically attached.

### processor complex

A partition of a storage server that is capable of performing all defined functions of the storage server. Multiple processor complexes provide redundancy.

## product engineering

See IBM product engineering.

### program

On a computer, a generic term for software that controls the operation of the computer. Typically, the program is a logical assemblage of software modules that perform multiple related tasks.

## program-controlled interruption

An interruption that occurs when an I/O channel fetches a channel command word with the program-controlled interruption flag on.

## program temporary fix (PTF)

A temporary solution to, or bypass of, a problem diagnosed by IBM as the result of a defect in a current unaltered release of a licensed program. (GC)

### promote

To add a logical data unit to cache memory.

## protected volume

In AS/400, a disk storage device that is protected from data loss by RAID techniques. An AS/400 host does not mirror a volume configured as a protected volume, while it does mirror all volumes configured as unprotected volumes. The DS8000, however, can be configured to indicate that an AS/400 volume is protected or unprotected and give it RAID protection in either case.

### protocol data unit (PDU)

A unit of data specified in the protocol of a given layer and consisting of protocol control information for the layer and, possibly, user data for the layer.

### **pSeries**

The product name of an IBM e(logo)server product that emphasizes performance. It is the successor to the RS/6000 family of servers.

## pseudo host

A host connection that is not explicitly defined to the DS8000 and that has access to at least one volume that is configured on the DS8000. The FiconNet pseudo host icon represents the FICON protocol. The EsconNet pseudo host icon represents the ESCON protocol. The pseudo host icon labelled Anonymous represents hosts connected through the FCP protocol. *Anonymous host* is a commonly used synonym for *pseudo host*.

The DS8000 adds a pseudo host icon only when it is set to access-any mode. See also access-any mode.

PTF See program temporary fix.

#### **PV Links**

Short for Physical Volume Links, an alternate pathing solution from Hewlett-Packard that provides for multiple paths to a volume, as well as static load balancing.

### R

**R0** See track-descriptor record.

rack See enclosure.

**RAID** See *redundant array of independent disks*. RAID is also commonly expanded to redundant array of *inexpensive* disks. See also *array*.

### RAID 5

A type of RAID that optimizes cost-effective performance while emphasizing use of available capacity through data striping. RAID 5 provides fault tolerance for up to two failed disk drives by distributing parity across all the drives in the array plus one parity disk drive. The DS8000 automatically reserves spare disk drives when it assigns arrays to a device adapter, RAID 10, and redundant array of independent disks.

## **RAID 10**

A type of RAID that optimizes high performance while maintaining fault tolerance for up to two failed disk drives by striping volume data across several disk drives and mirroring the first set of disk drives on an identical set. The DS8000 automatically reserves spare disk drives when it assigns arrays to a device adapter pair (DA pair). See also device adapter, RAID 5, and redundant array of independent disks.

### random access

A mode of accessing data on a medium in a manner that requires the storage device to access nonconsecutive storage locations on the medium.

**rank** One or more arrays that are combined to create a logically contiguous storage space.

### redundant array of independent disks (RAID)

A methodology of grouping disk drives for managing disk storage to insulate data from a failing disk drive.

## refresh FlashCopy target volume

An option (previously called *incremental FlashCopy*) of the DS8000 that creates a point-in-time data copy without copying an entire volume for each point-in-time copy.

## **Remote Mirror and Copy**

A feature of a storage server that constantly updates a secondary copy of a logical volume to match changes made to a primary logical volume. The primary and secondary volumes can be on the same storage server or on separate storage servers. See also *Global Mirror*, *Metro Mirror* and *Global Copy*.

# remote technical assistance information network (RETAIN)

The initial service tracking system for IBM service support, which captures heartbeat and call-home records. See also *support* catcher and support catcher telephone number.

### **REQ/ACK**

See request for acknowledgment and acknowledgment.

# request for acknowledgment and acknowledgment (REQ/ACK)

A cycle of communication between two data transport devices for the purpose of verifying the connection, which starts with a request for acknowledgment from one of the devices and ends with an acknowledgment from the second device. The REQ and ACK signals help to provide uniform timing to support synchronous data transfer between an initiator and a target. The objective of a synchronous data transfer method is to minimize the effect of device and cable delays.

## reserved allegiance

For zSeries, a relationship that is created in a control unit between a device and a channel path, or path group, when the device completes a Sense Reserve command. The allegiance causes the control unit to guarantee access (that is, busy status is not presented) to the device. Access is over the set of channel paths that are associated with the

allegiance; access is for one or more channel programs until the allegiance ends.

### **RETAIN**

See remote technical assistance information network.

### S

S/390 IBM enterprise servers based on Enterprise Systems Architecture/390 (ESA/390). S/390 is the currently accepted shortened form of the original name System/390.

### S/390 storage

Storage arrays and logical volumes that are defined as connected to S/390 servers. This term is synonymous with count-key-data storage.

**SAID** See system adapter identification number.

**SAM** See sequential access method.

SAN See storage area network.

### **SBCON**

See Single-Byte Command Code Sets Connection.

### screen

The physical surface of a display device upon which information is shown to users.

**SCSI** See *small computer system interface*.

### SCSI device

A disk drive connected to a host through an I/O interface using the SCSI protocol. A SCSI device is either an initiator or a target. See also *initiator* and *small computer system interface*.

#### SCSI-FCP

Synonym for fibre-channel protocol, a protocol used to transport data between an open-systems host and a fibre-channel adapter on an DS8000. See also fibre-channel protocol and small computer system interface.

## SCSI host systems

Host systems that are attached to the DS8000 with a SCSI interface. Such host systems run on UNIX, i5/OS, Windows NT, Windows 2000, or Novell NetWare operating systems.

### **SCSI ID**

A unique identifier assigned to a SCSI

device that is used in protocols on the SCSI interface to identify or select the device. The number of data bits on the SCSI bus determines the number of available SCSI IDs. A wide interface has 16 bits, with 16 possible IDs.

SDD See IBM Subsystem Multipathing Device Driver.

### secondary control unit

The DS8000 to which a Remote Mirror and Copy secondary device is physically attached.

## self-timed interface (STI)

An interface that has one or more conductors that transmit information serially between two interconnected units without requiring any clock signals to recover the data. The interface performs clock recovery independently on each serial data stream and uses information in the data stream to determine character boundaries and inter-conductor synchronization.

### sequential access

A mode of accessing data on a medium in a manner that requires the storage device to access consecutive storage locations on the medium.

## sequential access method (SAM)

An access method for storing, deleting, or retrieving data in a continuous sequence based on the logical order of the records in the file.

### serial connection

A method of device interconnection for determining interrupt priority by connecting the interrupt sources serially.

**server** A host that provides certain services to other hosts that are referred to as clients.

A functional unit that provides services to one or more clients over a network. (GC)

### service boundary

A category that identifies a group of components that are unavailable for use when one of the components of the group is being serviced. Service boundaries are provided on the DS8000, for example, in each host bay and in each cluster.

### service clearance

The area that is required to open the service covers and to pull out components for servicing.

### service information message (SIM)

A message sent by a storage server to service personnel through an zSeries operating system.

### service personnel

A generalization referring to individuals or companies authorized to service the DS8000. The terms *service provider*, *service representative*, and *IBM service support representative* (*SSR*) refer to types of service personnel. See also *service support representative*.

### service processor

A dedicated processing unit that is used to service a storage unit.

### service support representative (SSR)

Individuals or a company authorized to service the DS8000. This term also refers to a service provider, a service representative, or an IBM service support representative (SSR). An IBM SSR installs the DS8000.

SES SCSI Enclosure Services.

### session

A collection of volumes within a logical subsystem that are managed together during the creation of consistent copies of data. All volumes in a session must transfer their data successfully to the remote site before the increment can be called complete.

SFP Small form factor pluggables.

### shared storage

Storage that is configured so that multiple hosts can concurrently access the storage. The storage has a uniform appearance to all hosts. The host programs that access the storage must have a common model for the information on a storage device. The programs must be designed to handle the effects of concurrent access.

### shortwave laser adapter

A connector that is used between host and DS8000 to support shortwave fibre-channel communication.

**SIM** See *service information message*.

### Simple Network Management Protocol (SNMP)

In the Internet suite of protocols, a network management protocol that is used to monitor routers and attached networks. SNMP is an application layer protocol. Information on devices managed is defined and stored in the application's Management Information Base (MIB). (GC) See also management information base.

### simplex volume

A volume that is not part of a FlashCopy, XRC, or PPRC volume pair.

## Single-Byte Command Code Sets Connection (SBCON)

The ANSI standard for the ESCON I/O interface.

## small computer system interface (SCSI)

A standard hardware interface that enables a variety of peripheral devices to communicate with one another. (GC)

### smart relay host

A mail relay or mail gateway that has the capability to correct e-mail addressing problems.

SMIT See System Management Interface Tool.

SMP See symmetrical multiprocessor.

**SNMP** See Simple Network Management Protocol.

### **SNMP** agent

A server process that resides on a network node and is responsible for communicating with managers regarding that node. The node is represented as a managed object, which has various fields or variables that are defined in the appropriate MIB.

### **SNMP** manager

A managing system that runs a managing application or suite of applications. These applications depend on Management Information Base (MIB) objects for information that resides on the managed system. Managers generate requests for this MIB information, and an SNMP agent on the managed system responds to these requests. A request can either be the retrieval or modification of MIB information.

## software transparency

Criteria applied to a processing

environment that states that changes do not require modifications to the host software in order to continue to provide an existing function.

### source device

One of the devices in a dual-copy or remote-copy volume pair. All channel commands to the logical volume are directed to the source device. The data on the source device is duplicated on the target device. See also target device.

spare A disk drive on the DS8000 that can replace a failed disk drive. A spare can be predesignated to allow automatic dynamic sparing. Any data preexisting on a disk drive that is invoked as a spare is destroyed by the dynamic sparing copy process.

### spatial reuse

A feature of serial storage architecture that enables a device adapter loop to support many simultaneous read/write operations. See also serial storage architecture.

SSID See subsystem identifier.

SSR See service support representative.

### stacked status

For zSeries, the condition when the control unit is in a holding status for the channel, and the last time the control unit attempted to present the status, the channel responded with the stack-status control.

## stage operation

The operation of reading data from the physical disk drive into the cache.

## staging

To move data from an offline or low-priority device back to an online or higher priority device, usually on demand of the system or on request of the user.

### standard volume

A volume that emulates one of several zSeries volume types, including 3390-2, 3390-3, 3390-9, 3390-2 (3380-track mode), or 3390-3 (3380-track mode), by presenting the same number of cylinders and capacity to the host as provided by the native zSeries volume type of the same name.

STI See self-timed interface.

### storage area network

A network that connects a company's heterogeneous storage resources.

## storage capacity

The amount of data that a storage medium can hold; usually expressed in kilobytes, megabytes, or gigabytes.

### storage complex

A configuration of one or more storage units that is managed by a management

## storage device

A physical unit that provides a mechanism to store data on a given medium such that it can be subsequently retrieved. See also disk drive module.

### storage extent

The minimum contiguous range of storage on a physical storage device, array, or rank that can be allocated to a local volume

### storage image

A partitioning of a storage unit that provides emulation of a storage server with one or most storage devices that provides storage capability to a host computer. You can configure more than one storage image on a storage unit.

### storage server

A physical unit that manages attached storage devices and provides an interface between them and a host computer by providing the function of one or more logical subsystems. The storage server can provide functions that the storage device does not provide. The storage server has one or more clusters.

### storage unit

A physical unit that consists of a storage server that is integrated with one or more storage devices that provide storage capability to a host computer.

### storage unit identifier

A unique identifier for a storage unit that consists of a manufacturer, a model number, a type number, a plant of manufacture, and a sequence number.

### striping

A technique that distributes data in bit, byte, multibyte, record, or block increments across multiple disk drives.

## subagent

An extension to an SNMP agent that permits a user to dynamically add, or in some cases replace, additional management variables in the local MIB, thereby providing a means of extending the range of information that network managers can access. See also agent.

### subchannel

A logical function of a channel subsystem associated with the management of a single device.

## subordinate storage unit

The physical unit that receives commands from the master storage unit and is specified when a Global Mirror session is started. The subordinate storage unit forms consistency groups and performs other Global Mirror processing. A subordinate storage unit can be controlled by only one master storage unit. Contrast with *master storage unit*.

### subsystem identifier (SSID)

A number that uniquely identifies a logical subsystem within a computer installation.

### support catcher

See catcher.

### support catcher telephone number

The telephone number that connects the support catcher server to the DS8000 to receive a trace or dump package. See also *support* catcher and remote technical assistance information network.

### switched fabric

A fibre-channel topology in which ports are interconnected through a switch. Fabric switches can also be interconnected to support numerous ports on a single network. See also arbitrated loop and point-to-point connection.

### symmetrical multiprocessor (SMP)

An implementation of a multiprocessor computer consisting of several identical processors configured in a way that any subset of the set of processors is capable of continuing the operation of the computer. TheDS8000 contains four processors set up in SMP mode.

## synchronous write

A write operation whose completion is indicated after the data has been stored on a storage device.

### System/390

See S/390.

## system adapter identification number (SAID)

The unique identification number that is automatically assigned to each DS8000 host adapter for use by Copy Services.

### System Management Interface Tool (SMIT)

An interface tool of the AIX operating system for installing, maintaining, configuring, and diagnosing tasks.

### **System Modification Program**

A program used to install software and software changes on MVS systems.

Т

TAP See Telocator Alphanumeric Protocol.

target A SCSI device that acts as a subordinate to an initiator and consists of a set of one or more logical units, each with an assigned logical unit number (LUN). The logical units on the target are typically I/O devices. A SCSI target is analogous to a zSeries control unit. See also small computer system interface.

### target device

One of the devices in a dual-copy or remote-copy volume pair that contains a duplicate of the data that is on the source device. Unlike the source device, the target device might only accept a limited subset of data. See also source device.

TB See terabyte.

TCP/IP

See Transmission Control Protocol/Internet Protocol.

### **Telocator Alphanumeric Protocol (TAP)**

An industry standard protocol for the input of paging requests.

### terabyte (TB)

- 1) Nominally, 1 000 000 000 000 bytes, which is accurate when speaking of bandwidth and disk storage capacity.
- 2) For DS8000 cache memory, processor storage, real and virtual storage, a terabyte refers to 240 or 1 099 511 627 776 bytes.

### terminal emulator

A function of the management console that allows it to emulate a terminal.

### thousands of power-on hours (KPOH)

A unit of time used to measure the mean time between failures (MTBF).

### time sharing option (TSO)

An operating system option that provides interactive time sharing from remote terminals.

### **TotalStorage**

See IBM TotalStorage.

**TPF** See transaction processing facility.

track A unit of storage on a CKD device that can be formatted to contain a number of data records. See also home address, track-descriptor record, and data record.

### track-descriptor record (R0)

A special record on a track that follows the home address. The control program uses it to maintain certain information about the track. The record has a count field with a key length of zero, a data length of 8, and a record number of 0. This record is sometimes referred to as R0.

## transaction processing facility (TPF)

A high-availability, high-performance IBM operating system, designed to support real-time, transaction-driven applications. The specialized architecture of TPF is intended to optimize system efficiency, reliability, and responsiveness for data communication and database processing. TPF provides real-time inquiry and updates to a large, centralized database, where message length is relatively short in both directions, and response time is generally less than three seconds. Formerly known as the Airline Control Program/Transaction Processing Facility (ACP/TPF).

## **Transmission Control Protocol (TCP)**

A communications protocol used in the Internet and in any network that follows the Internet Engineering Task Force (IETF) standards for internetwork protocol. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It uses the Internet Protocol (IP) as the underlying protocol.

## **Transmission Control Protocol/Internet** Protocol (TCP/IP)

1) A combination of data-transmission

protocols that provide end-to-end connections between applications over interconnected networks of different types.

2) A suite of transport and application protocols that run over the Internet Protocol. (GC) See also Internet Protocol and Transmission Control Protocol.

#### transparency

See software transparency.

TSO See time sharing option.

#### turbo processor

A faster multiprocessor that has six processors with common access to the main storage.

#### U

**UFS** UNIX filing system.

#### **Ultra-SCSI**

An enhanced small computer system interface.

#### unconfigure

To delete the configuration.

#### unit address

For zSeries, the address associated with a device on a given control unit. On ESCON interfaces, the unit address is the same as the device address. On OEMI interfaces, the unit address specifies a control unit and device pair on the interface.

#### unprotected volume

An AS/400 term that indicates that the AS/400 host recognizes the volume as an unprotected device, even though the storage resides on a RAID-formatted array and is, therefore, fault tolerant by definition. The data in an unprotected volume can be mirrored. Also referred to as an unprotected device.

#### upper-layer protocol

The layer of the Internet Protocol (IP) that supports one or more logical protocols (for example, a SCSI-command protocol and an ESA/390 command protocol). Refer to ANSI X3.230-199x.

See Coordinated Universal Time. UTC

#### virtual machine facility

A virtual data processing machine that appears to the user to be for the exclusive

use of that user, but whose functions are accomplished by sharing the resources of a shared data processing system. An alternate name for the VM/370 IBM operating system.

#### vital product data (VPD)

Information that uniquely defines the system, hardware, software, and microcode elements of a processing system.

**VM** The root name of several IBM operating systems, such as VM/XA, VM/ESA, VM/CMS, and z/VM. See also virtual machine facility.

#### volume

For zSeries, the information recorded on a single unit of recording medium. Indirectly, it can refer to the unit of recording medium itself. On a nonremovablemedium storage device, the term can also indirectly refer to the storage device associated with the volume. When multiple volumes are stored on a single storage medium transparently to the program, the volumes can be referred to as logical volumes.

#### volume group

A collection of either physical or logical volumes.

#### volume label

A unique identifier that a user assigns to a logical volume.

**VPD** See vital product data.

#### **VSE/ESA**

An IBM operating system, the letters of which represent virtual storage extended/enterprise systems architecture.

#### W

#### weight distribution area

The area that is required to distribute the weight of the storage unit.

#### worldwide node name (WWNN)

A unique 64-bit identifier for a host that contains a fibre-channel port. See also worldwide port name.

#### worldwide port name (WWPN)

A unique 64-bit identifier associated with a fibre-channel adapter port. It is assigned in an implementation- and

protocol-independent manner. See also worldwide node name

#### write hit

A write operation in which the requested data is in the cache.

#### write penalty

The performance impact of a classical RAID-5 write operation.

#### **WWNN**

See worldwide node name.

#### **WWPN**

See worldwide port name.

### X

#### **xSeries**

The product name of an IBM e(logo)server product that emphasizes industry-standard server scalability and self-managing server technologies. It is the successor to the Netfinity family of servers.

#### Z

#### z/Architecture

An IBM architecture for mainframe computers and peripherals. The IBM e(logo)server zSeries family of servers uses the z/Architecture architecture. It is the successor to the S/390 and 9672 family of servers. See also iSeries.

z/OS An operating system for the IBM e(logo)server product line that supports 64-bit real storage.

#### z/OS Global Mirror

A function of a storage server that assists a control program to maintain a consistent copy of a logical volume on another storage unit. All modifications of the primary logical volume by any attached host are presented in order to a single host. The host then makes these modifications on the secondary logical volume. This function was formerly called extended remote copy or XRC.

#### **z**Series

An IBM e(logo)server family of servers that emphasizes near-zero downtime.

IBM enterprise servers based on z/Architecture.

#### zSeries storage

Storage arrays and logical volumes that are defined in the DS8000 as connected to zSeries servers.

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