

IBM TotalStorage DS8000



Command-Line Interface User's Guide

IBM TotalStorage DS8000



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:

1. 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.

italics 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® TotalStorage™ 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 |
|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <i>IBM® TotalStorage® DS: Command-Line Interface User's Guide</i> | 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® configuration tasks within a Copy Services server group. | SC26-7625 (See Note.) |
| <i>IBM TotalStorage DS8000: Host Systems Attachment Guide</i> | 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.) |
| <i>IBM TotalStorage DS8000: Introduction and Planning Guide</i> | 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 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <i>IBM TotalStorage Multipath Subsystem Device Driver User's Guide</i> | 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 |
| <i>IBM TotalStorage DS8000: User's Guide</i> | This guide provides instructions for setting up and operating the DS8000 and for analyzing problems. | SC26-7623 (See Note.) |
| <i>IBM TotalStorage DS Application Programming Interface Reference</i> | 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 |
| <i>IBM TotalStorage DS8000 Messages Reference</i> | 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 | | |
| <i>z/OS DFSMS Advanced Copy Services</i> | 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 |
| <i>IBM Enterprise Storage Server</i> | 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 |
| <i>Implementing Copy Services On S/390</i> | 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®, 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 |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <i>IBM TotalStorage ESS Implementing Copy Services in an Open Environment</i> | This publication, from the IBM International Technical Support Organization, tells you how to install, customize, and configure Copy Services on UNIX, Windows NT®, Windows 2000, Sun Solaris, HP-UX, Tru64, OpenVMS, and iSeries 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. | SG24-5757 |
| Fibre channel | | |
| <i>Fibre Channel Connection (FICON) I/O Interface: Physical Layer</i> | 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/resourceink/ | SA24-7172 |
| <i>Fibre Transport Services (FTS): Physical and Configuration Planning Guide</i> | This publication provides information about fibre-optic and ESCON-trunking systems. | GA22-7234 |
| <i>IBM SAN Fibre Channel Switch: 2109 Model S08 Installation and Service Guide</i> | This guide describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S08. | SC26-7350 |
| <i>IBM SAN Fibre Channel Switch: 2109 Model S08 User's Guide</i> | 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 |
| <i>IBM SAN Fibre Channel Switch: 2109 Model S16 Installation and Service Guide</i> | 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 |
| <i>IBM SAN Fibre Channel Switch: 2109 Model S16 User's Guide</i> | 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 |
| <i>Implementing Fibre Channel Attachment on the ESS</i> | 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 |
| Open-systems hosts | | |
| <i>ESS Solutions for Open Systems Storage: Compaq AlphaServer, HP, and Sun</i> | 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 |
|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <i>IBM TotalStorage ESS Implementing Copy Services in an Open Environment</i> | 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. | SG24-5757 |
| <i>Implementing Fibre Channel Attachment on the ESS</i> | 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 gives you 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 |
| S/390 and zSeries hosts | | |
| <i>Device Support Facilities: User's Guide and Reference</i> | 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 |
| <i>z/OS Advanced Copy Services</i> | 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 |
| <i>DFSMS/MVS V1: Remote Copy Guide and Reference</i> | This publication provides guidelines for using remote copy functions with S/390 and zSeries hosts. | SC35-0169 |
| <i>Fibre Transport Services (FTS): Physical and Configuration Planning Guide</i> | This publication provides information about fibre-optic and ESCON-trunking systems. | GA22-7234 |
| <i>Implementing ESS Copy Services on S/390</i> | 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, and concurrent copy. This publication describes the functions, prerequisites, and corequisites and describes how to implement each function into your environment. | SG24-5680 |
| <i>ES/9000, ES/3090: IOCP User Guide Volume A04</i> | 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. | GC38-0097 |
| <i>IOCP User's Guide, IBM e(logo)server zSeries 800 and 900</i> | 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: www.ibm.com/servers/resourceLink/ | SB10-7029 |

| Title | Description | Order Number |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <i>IOCP User's Guide, IBM e(logo)server zSeries</i> | This publication describes the Input/Output Configuration Program that supports the zSeries server. This publication is available in PDF format by accessing ResourceLink at the following Web site: www.ibm.com/servers/resourceLink/ | SB10-7037 |
| <i>S/390: Input/Output Configuration Program User's Guide and ESCON Channel-to-Channel Reference</i> | This publication describes the Input/Output Configuration Program that supports ESCON architecture and the ESCON multiple image facility. | GC38-0401 |
| <i>IBM z/OS Hardware Configuration Definition User's Guide</i> | This guide provides conceptual and procedural information to help you use the z/OS Hardware Configuration Definition (HCD) application. It also explains: <ul style="list-style-type: none"> • 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 |
| <i>OS/390: Hardware Configuration Definition User's Guide</i> | 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 |
| <i>OS/390 V2R10.0: MVS System Messages Volume 1 (ABA - ASA)</i> | This publication lists OS/390 MVS™ system messages ABA to ASA. | GC28-1784 |
| <i>Using IBM 3390 Direct Access Storage in a VM Environment</i> | 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 |
| <i>Using IBM 3390 Direct Access Storage in a VSE Environment</i> | 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 |
| <i>Using IBM 3390 Direct Access Storage in an MVS Environment</i> | 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 |
| <i>z/Architecture Principles of Operation</i> | This publication provides a detailed definition of the z/Architecture™. 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 |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <i>IBM OS/390 Hardware Configuration Definition User's Guide</i> | This guide explains how to use the Hardware Configuration Data application to perform the following tasks: <ul style="list-style-type: none"> • 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 | SC28-1848 |
| <i>IBM SAN Fibre Channel Switch: 2109 Model S08 Installation and Service Guide</i> | This guide describes how to install and maintain the IBM SAN Fibre Channel Switch 2109 Model S08. | SC26-7350 |
| <i>IBM SAN Fibre Channel Switch: 2109 Model S08 User's Guide</i> | 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 |
| <i>IBM SAN Fibre Channel Switch: 2109 Model S16 Installation and Service Guide</i> | 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 |
| <i>IBM SAN Fibre Channel Switch: 2109 Model S16 User's Guide</i> | 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 |
| <i>Implementing Fibre Channel Attachment on the ESS</i> | 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 |
| Seascope family | | |
| <i>IBM Enterprise Storage Server</i> | 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 |
| <i>IBM Enterprise Storage Server Performance Monitoring and Tuning Guide</i> | This guide, from the IBM International Technical Support Organization, provides guidance on the best way to configure, monitor, and manage your Enterprise Storage Server to ensure optimum performance. | SG24-5656 |
| <i>IBM Versatile Storage Server: Introduction and Planning Guide</i> | This publication introduces the IBM Versatile Storage Server™ and lists the features you can order. It also provides planning information for both 2105 Models B09 and 100. | GC26-7223 |
| <i>Implementing the IBM Enterprise Storage Server in Your Environment</i> | This publication, from the IBM International Technical Support Organization, can help you install, tailor, and configure the Enterprise Storage Server in your environment. | SG24-5420 |
| Storage management | | |

| Title | Description | Order Number |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <i>Device Support Facilities: User's Guide and Reference</i> | 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. | GC35-0033 |
| <i>IBM TotalStorage Solutions Handbook</i> | 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 systems, and adapters that the storage unit supports | http://www.ibm.com/servers/storage/disk/ds8000/interop.html 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:

- e-mail

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™ server technology that is integrated with the IBM Virtualization Engine™ 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®, and zSeries® 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).

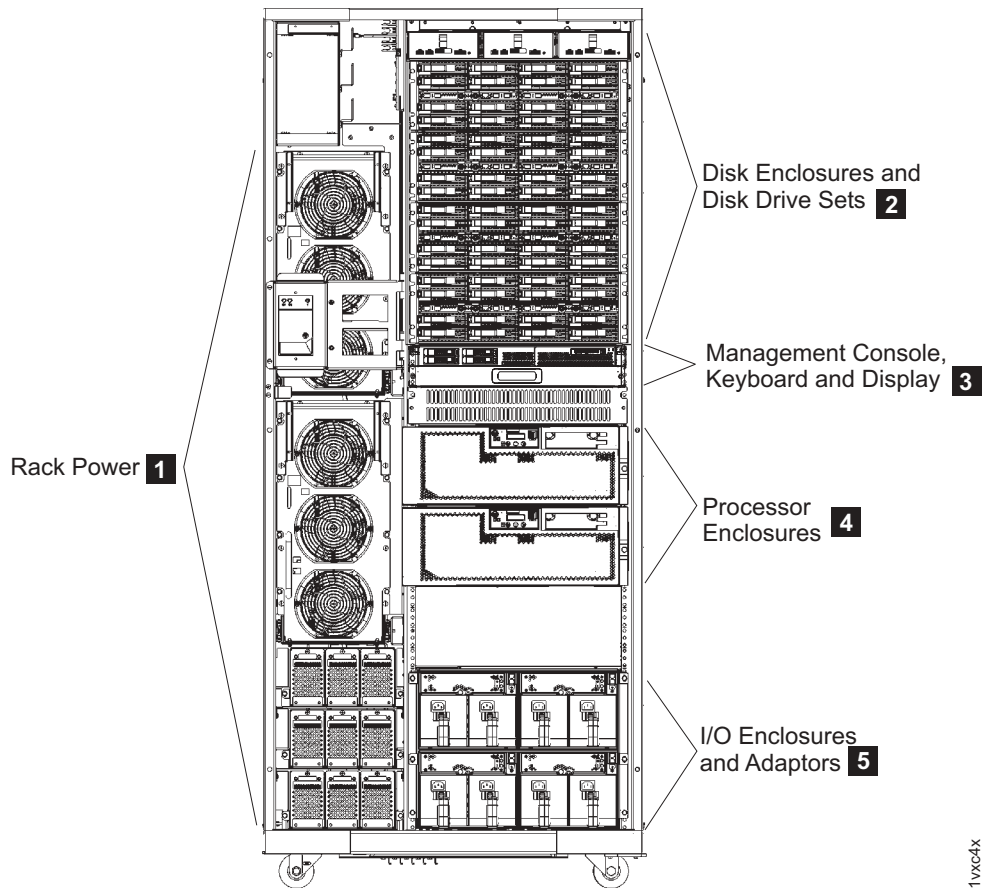
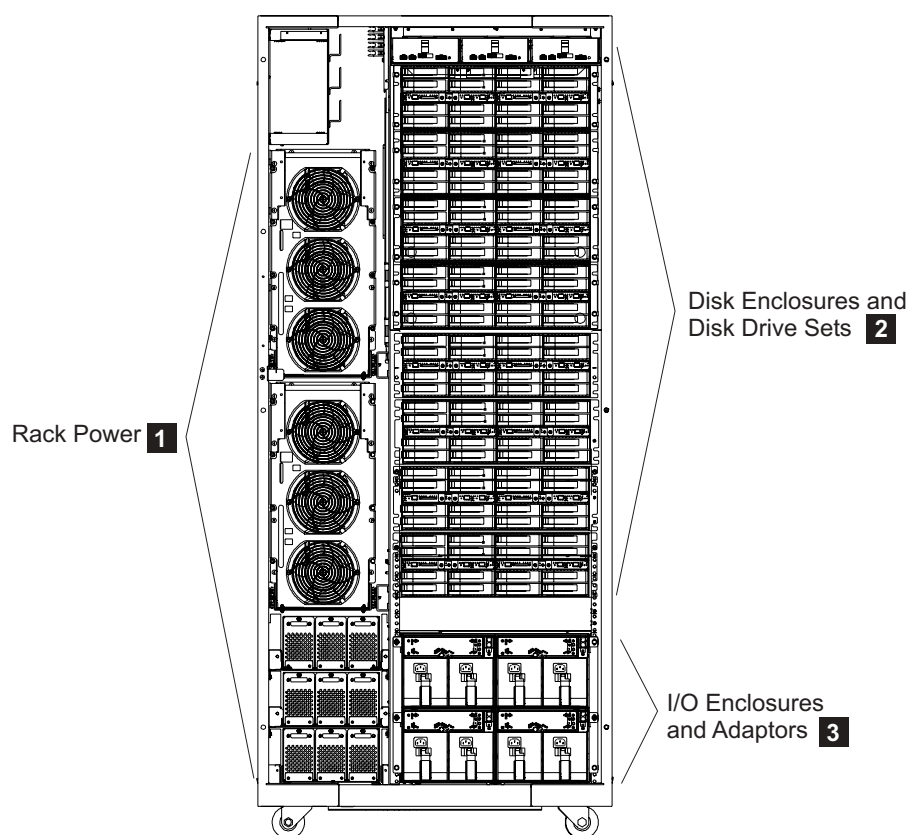


Figure 1. A base model (with front cover off) and its main components

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

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).



1vxc86

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:

1. 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.
2. 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 adaptors 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 adaptors, 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 adaptors and the processors. The adaptors contained in the I/O enclosures can be either device or host adaptors.

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® 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.

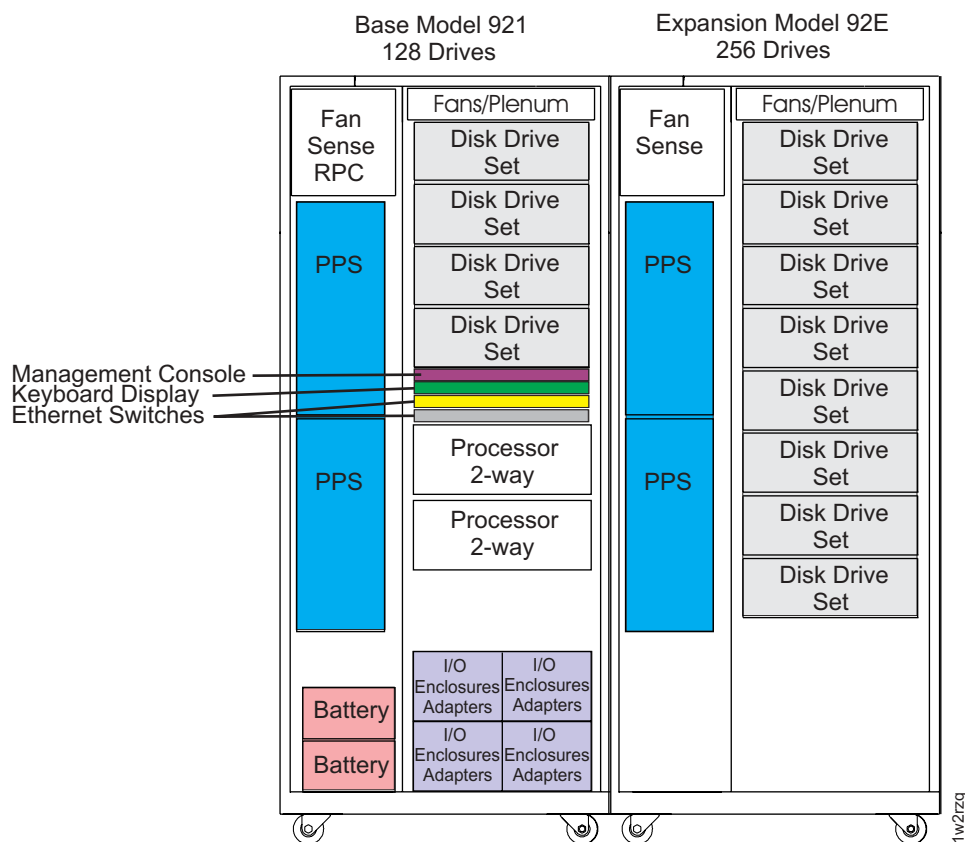


Figure 3. Maximum configuration for Model 921

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.

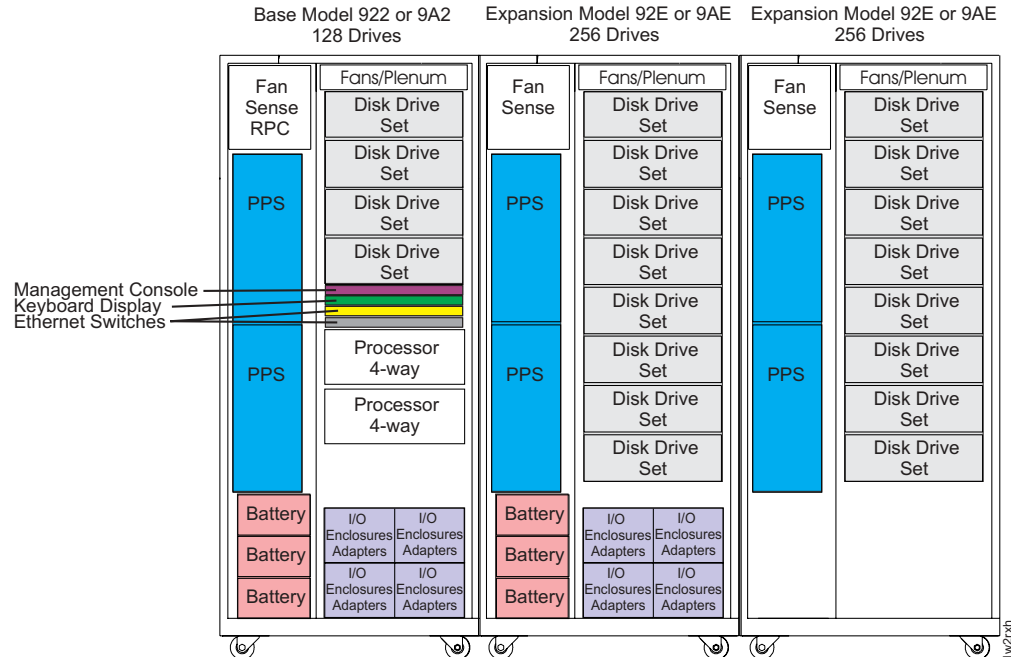


Figure 4. Maximum configuration for Models 922 and 9A2

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 |
| | | 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 | 1 image | None | 4-way | Up to 128 disks (maximum capacity of 38.4 TB) | Up to 256 GB | Up to 16 host adapters |
| | | 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 | 2 images | None | 4-way | Up to 128 disks (maximum capacity of 38.4 TB) | Up to 256 GB | Up to 16 host adapters |
| | | 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.

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

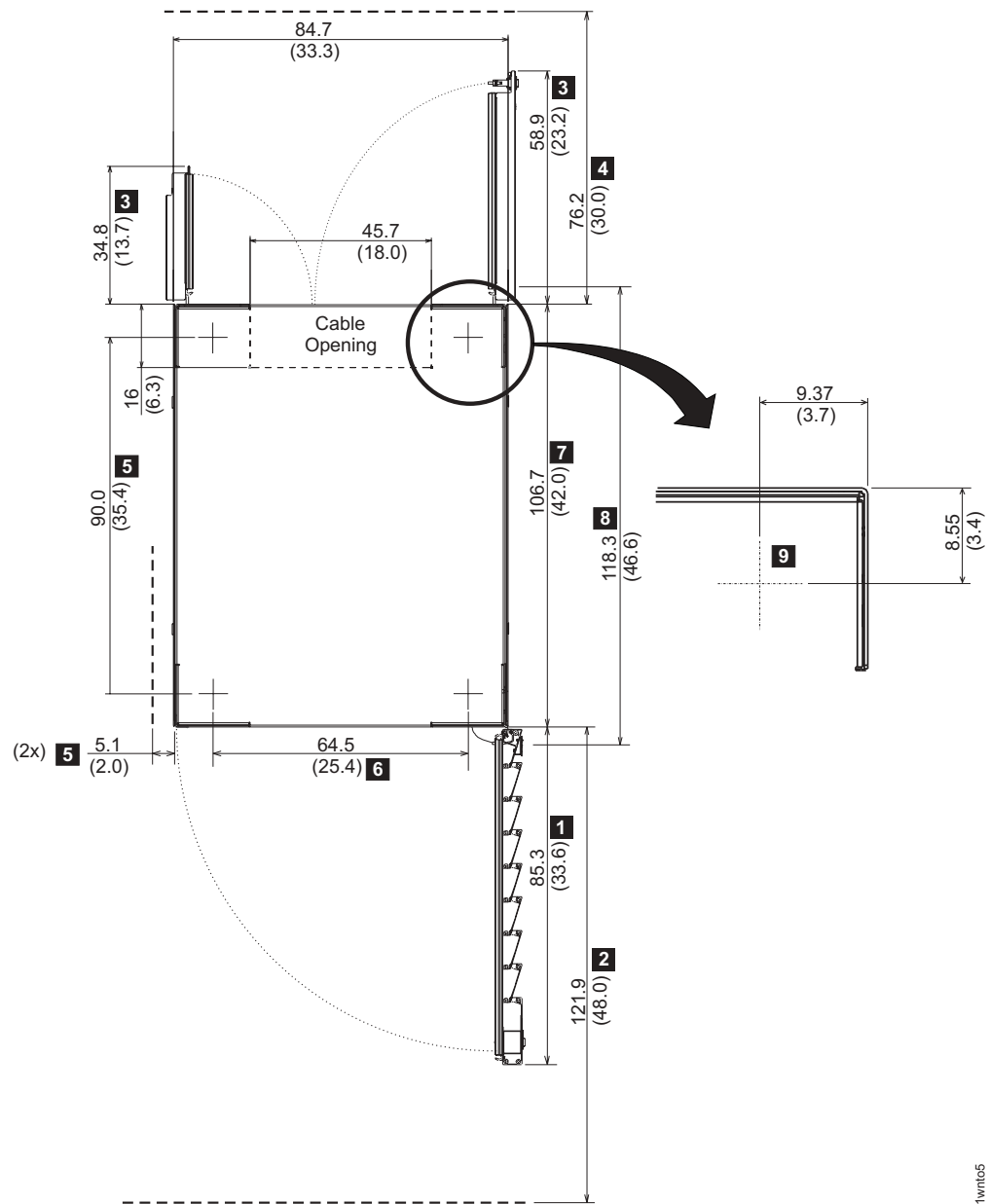


Figure 5. DS8000 physical footprint. Dimensions are in centimeters (inches).

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™ 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®) protocol
- Enterprise Systems Connection Architecture® (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™ servers that run an IBM OS/400® operating system
- IBM eServer i5 servers that run an IBM i5/OS™ operating system
- IBM RS/6000®, pSeries®, eServer p5, RS/6000 SP™, and pSeries SP server that run an IBM AIX® operating system
- IBM zSeries servers that run the Linux™ 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® Windows® 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™)
- z/OS®
- 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) | setsolarisSparc.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 Note: 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: setupaix.bin -console setuplinux.bin -console | setupos.bin -console Note: Where <i>os</i> represents the name of your operating system as shown in the rows above. |

- 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 system.

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.

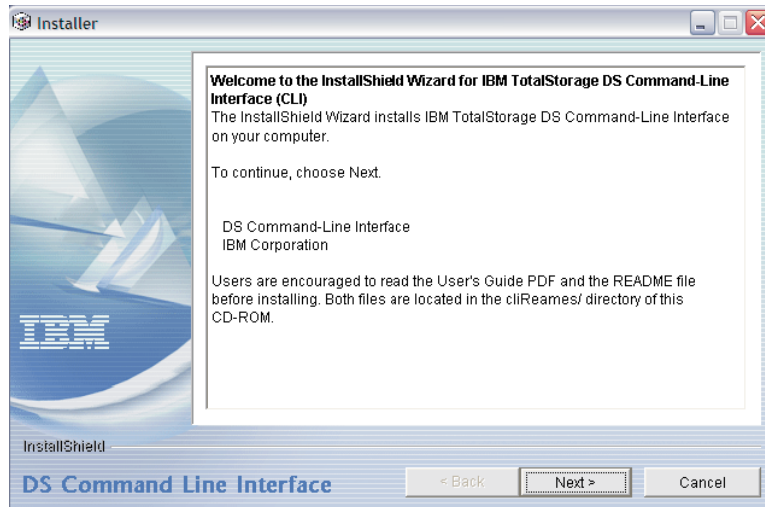
Note:

- 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.

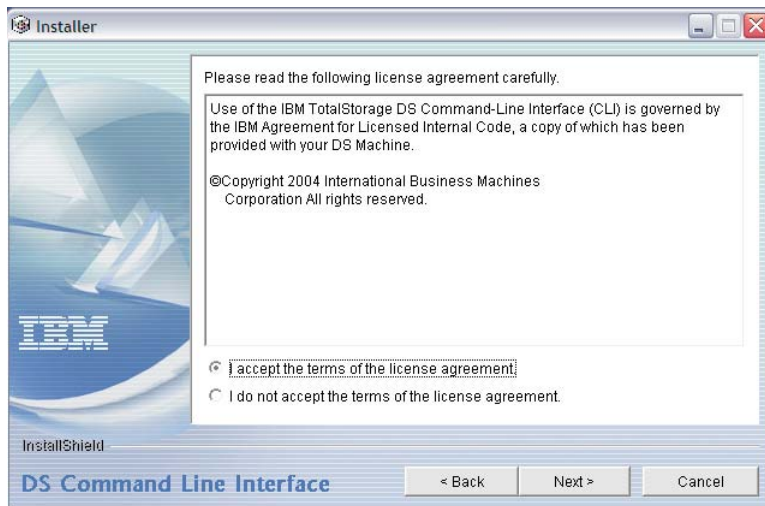
1. Start the setup file that is appropriate for your operating system.

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

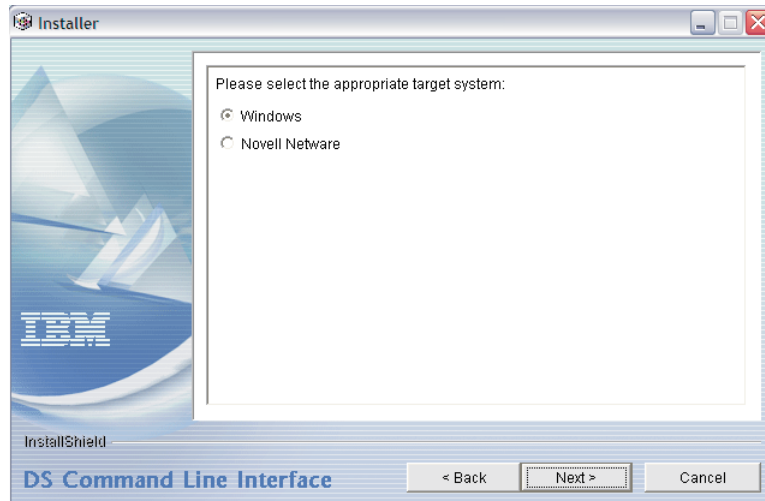
2. The Welcome window is displayed. Click **Next** to continue or **Cancel** to exit the installation.



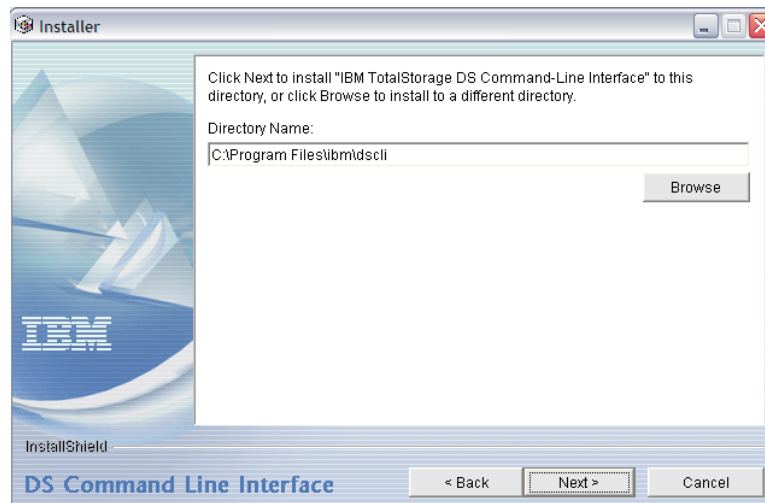
3. The License Agreement window is displayed. Select **"I accept the terms of this license agreement"** to continue. Click **"I do not accept the terms of this license agreement"** or **Cancel** to exit the installation.



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.

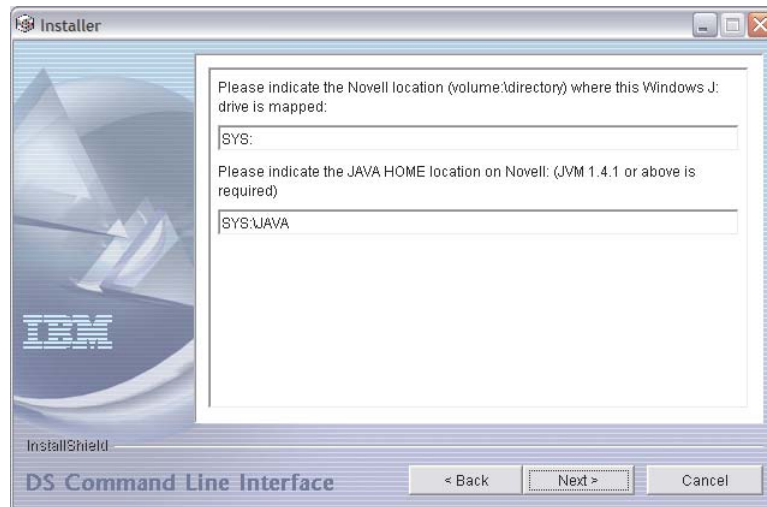


5. The Installation Location window (Windows has been selected as your system) is displayed. If you selected Novell, go to the next step. If you are satisfied with the default directory, click **Next**. If not, type the directory path where you want to install the DS CLI and click **Next**. Try to avoid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

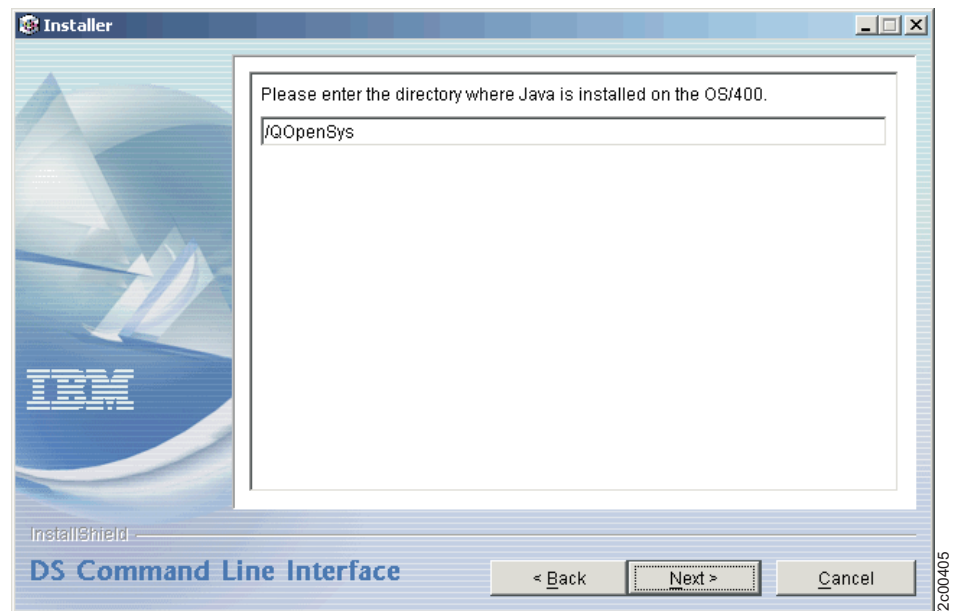


Note: If you are installing onto an OS/400 system, a window asking for the directory where Java is installed on the OS/400 is displayed when you click **Next**. Go to Step 7 on page 31.

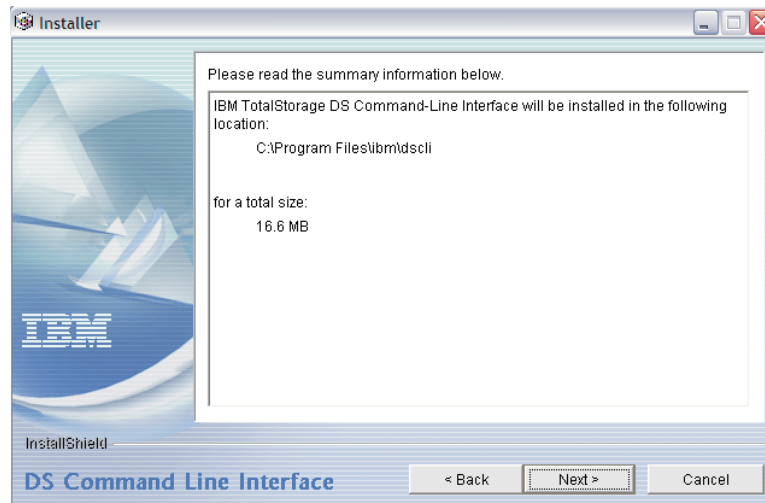
6. The Novell Location window is displayed. Complete the information for where the Windows drive is installed and where JAVA HOME is located. Click **Cancel** if you want to exit the installation.



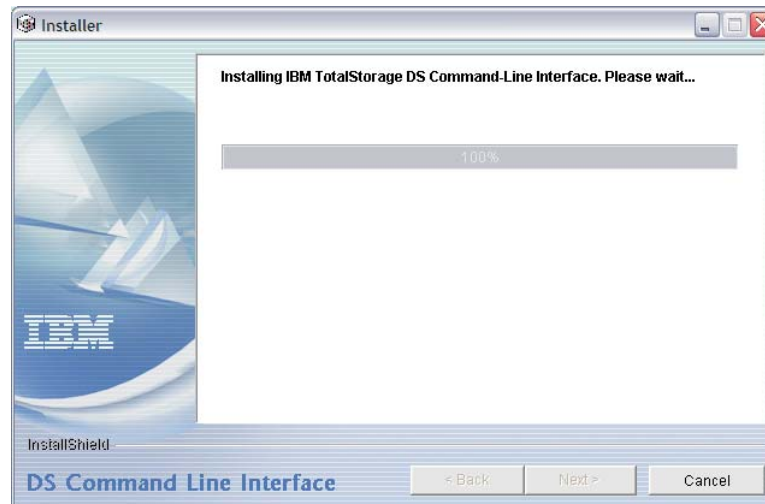
7. The Java directory window for OS/400 is displayed. Insert the directory information. Click **Next** to continue or **Cancel** to exit the installation.



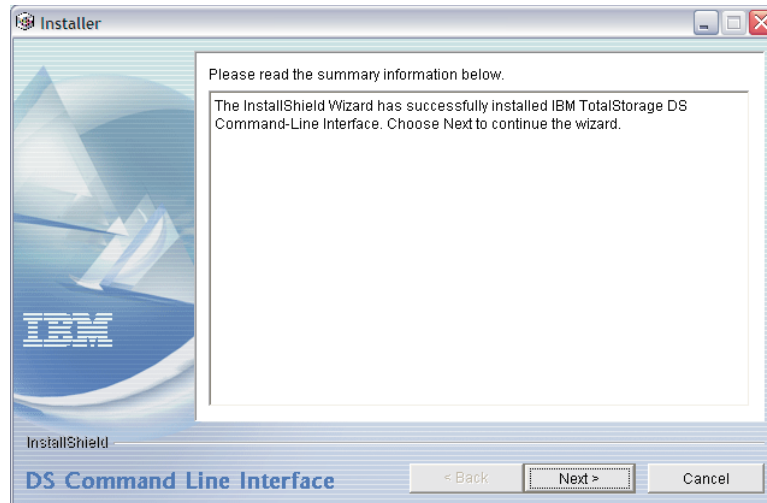
8. The Installation Preview window is displayed. This window displays where the command-line interface will be installed and how much space it will occupy on your drive. Click **Next** to continue or **Cancel** to exit the installation. You can change the installation directory by clicking **Back**.



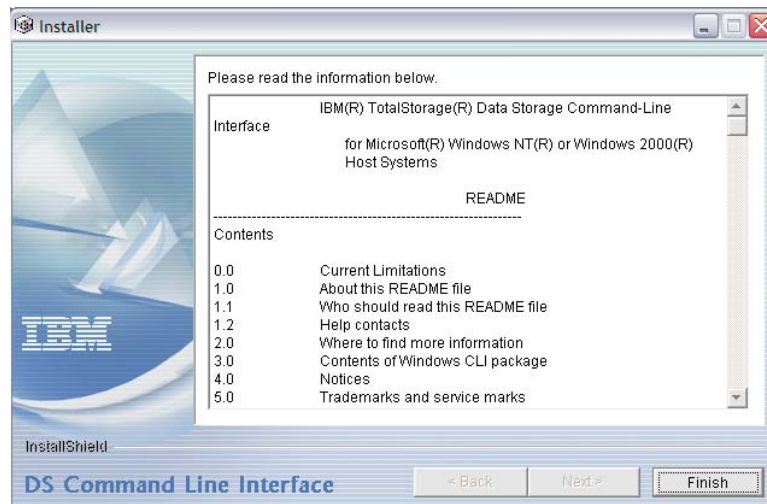
9. The Installation Progress window is displayed. This window displays the progress of the command line interface installation. Click **Next** to continue or **Cancel** to exit the installation.



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>. <exelbinlsh> -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 installation process checks for a version of Java 1.4.1 or higher. If this version of Java is not present the installation process stops.
- 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
 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\dsccli]

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\dsccli

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...

-----|-----|-----|-----|
0% 25% 50% 75% 100%
|||||

-----|-----|-----|-----|
0% 25% 50% 75% 100%
|||||

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 quit 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=device: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™ 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
Backup:        No Backup record
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
File attributes: Allocation: 114282, Extend: 0, Global buffer count: 0
                  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=DQA0:[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/
rtel1.4.2_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 installation 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:

IBMDCLI\$HELP:IBMDCLI_OVR.HLB
IBMDCLI\$HELP:IBMDCLI_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:SYSHUTDOWN.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.

1. 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 IBMDCLI\$STARTUP.COM procedure to the SYSMAN startup database.

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

\$@IBMDCLI\$MANAGER:IBMDCLI\$LOGIN.COM

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

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

\$@IBMDCLI\$MANAGER:IBMDCLI\$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:

1. 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 IBMDCLI`.

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

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 **lssi** 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 topn0t 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.

1. 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: <ul style="list-style-type: none"> • default: Specifies default output. • xml: Specifies XML format. • delim: Specifies columnar format. Columns are delimited with 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. |

Table 3. Profile variables (continued)

| Variable | Description |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| locale | <p>Specifies the language for the output on the local computer.</p> <ul style="list-style-type: none"> • 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 • lt: Lithuanian • lv: Latvian (Lettish) • mk: Macedonian • mr: Marathi • ms: Malay |

Table 3. Profile variables (continued)

| Variable | Description |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| locale, <i>continued</i> | <ul style="list-style-type: none"> 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 | <p>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.</p> <p>Note: The command timeout value can be longer than this value because one command can consist of multiple client/server requests.</p> |
| remotedev | 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 "remotedev" are equivalent to
# "-dev storage_image_ID" and "-remotedev storage_image_ID" command options,
# respectively.
#devid: IBM.2107-AZ12341
#remotedev: IBM.2107-AZ12341

#
# locale
# Default locale is based on user environment.
#locale: en

# Timeout value of client/server synchronous communication in second.
# DSCSI command timeout value may be longer than client/server communication
# timeout value since multiple requests may be made by one DSCSI command
# The number of the requests made to server depends on DSCSI 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)
# "rows" is equivalent to "-r #" 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

# delimiter character for ls 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 **lskey** 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 **lskey** command as follows: **lskey 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 is 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 **lsextentpool** and **mkextentpool** 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 **lsextentpool** and **mkextentpool** if you need additional information about the commands.

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

```
dscli> mkextentpool -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.
```

3. Repeat step 1 for rank group 1, if needed.
4. Continue to repeat the **mkextentpool** 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 **lsextentpool** command when you are done making the extent pools. Use the **-l** parameter to display a full report for the extent pools that are assigned to the storage unit.

```
dscli> lsextentpool -l
```

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 **lsarraysite** 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 **lsarraysite** and **mkarray** commands.

1. Create a list of array site IDs for all installed array sites with the status "unassigned" by issuing the following lsarraysite 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.
3. 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 S10`
 Repeat this command until all "unassigned" array sites have been assigned to an array.

Note:

- 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:

1. 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 (OI1) 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 lsLSS 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 ll 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> lsioport -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 `lsportprof` 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

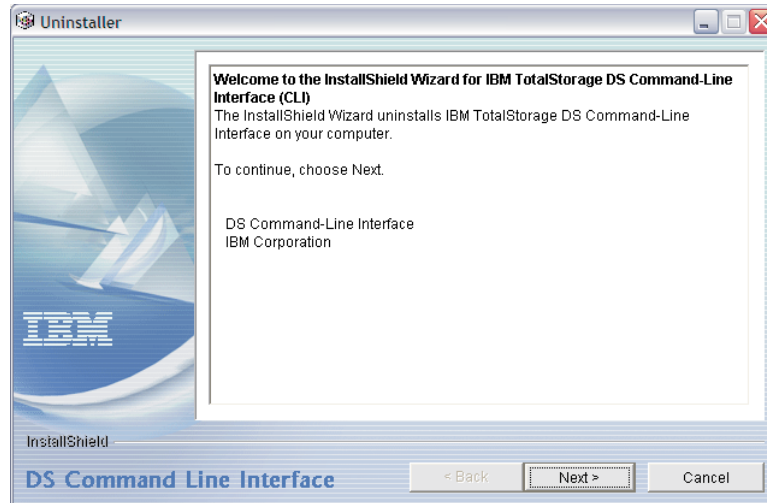
Use the graphical mode to remove the DS CLI from your system when DS CLI is installed on a Windows, Novell, or UNIX system.

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.

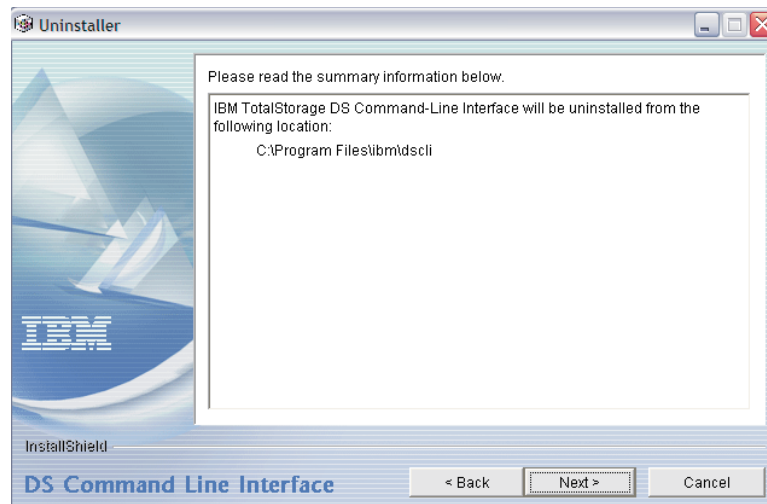
You use the Add/Remove Programs facility of the Windows operating system to remove the DS CLI from your system. When you have processed the uninstall

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

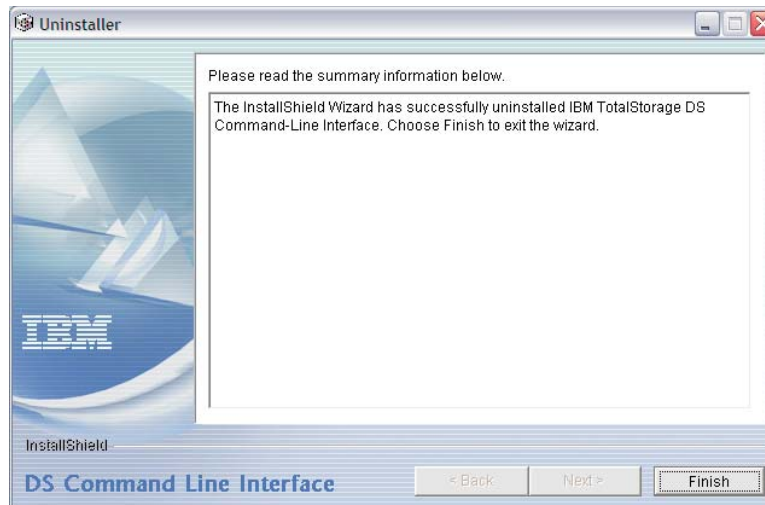
1. Navigate to your Control Panel and open the Add/Remove program facility.
2. Scroll the list of currently installed programs and click the listing for DS CLI.
3. Click the **Change/Remove** button and the Welcome window for the Uninstaller is displayed.



4. 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, HP-UX, 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.
1. 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.<exe|sh|bin> -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 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\dsccli

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® (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 **lshostvol** command. However, with adjustments, these devices can be displayed when you issue the **lshostvol** 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\$DGA_n. Therefore, LUN 0 devices on OpenVMS are a special device type, different from disk devices.

The DS CLI **lshostvol** 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 **lshostvol** 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 **lshostvol** command displays only the disk devices. You can use the OpenVMS logical name **IBMDSCCLI\$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 **IBMDCLI\$STARTUP.COM** defines the logical name **IBMDCLI\$SHOW_GG_DEVICES** as Y. If you want to suppress \$1\$GGAn CCL devices in the lshostvol 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 **IBMDCLI\$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 **IBMDCLI\$STARTUP.COM** defines the logical name **IBMDCLI\$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 **SYSS\$COMMON:[SYSHLP]HELPLIB.HLB** and the system messages database **SYSS\$COMMON:[SYSHLP]MSGHLP\$LIBRARY.MSGHLP\$DATA**. If you choose this option, the module **IBMDCLI** 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=IBMDCLI** command. Additionally, the login procedure **IBMDCLI\$MANAGER:IBMDCLI\$LOGIN.COM** activates the message section file **IBMDCLI\$SYSTEM:IBMDCLI_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 **IBMDCLI\$HELP**:

IBMDCLI_Ovr.hlp

A help library containing one module with the top-level key **IBMDCLI**. 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.

IBMDCLI_Messages.msghlp\$data

A message help data file with messages for facility IBMDCLI. 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 **IBMDCLI\$MANAGER:IBMDCLI\$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 **IBMDCLI\$JRE**. This setup is according to HP guidelines. The login procedure **IBMDCLI\$MANAGER:IBMDCLI\$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 **IBMDCLI\$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: `IBMDCLI$JRE:[LIB]Java$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, *lsarraysite* 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 *lsuser*, do not require a command parameter, because a default value of *all* is always assumed. For some commands, like *lsarraysite*, 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, *lsrank* 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



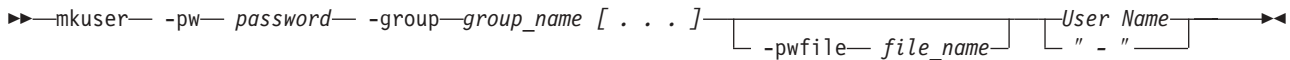
Begins on the left with double arrowheads (>>) and ends on the right with two arrowheads facing each other (><). If a diagram is longer than one line, each line to be continued ends with a single arrowhead (>) and the next line begins with a single arrowhead. Read the diagrams from left-to-right, top-to-bottom, following the main path line.

Keyword



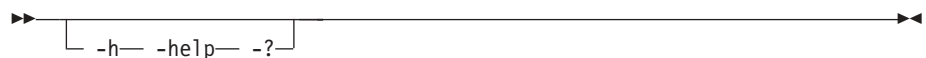
Represents the name of a command, flag, parameter, or argument. A keyword is not in italics. Spell a keyword exactly as it is shown in the syntax diagram.

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.

| 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 | Type | 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 | Type | 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. |

|
|
|
|
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|
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|
|
|

| Command | Type | 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 | Type | 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. |
| lsaddressgrp | storage configuration | The lsaddressgrp command displays a list of address groups for a storage image and status information for each address group in the list. |
| lsarray | storage configuration | The lsarray command displays a list of arrays in a storage image and status information for each array in the list. |
| lsarraysite | storage configuration | The lsarraysite command displays a list of array sites and status information for each array site in the list. |
| lsavailpprcport | Copy Services | The lsavailpprcport 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. |
| lsckdvol | storage configuration | 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. |

| Command | Type | Description |
|---------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lsda | field-replaceable unit information | The lsda 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. |
| lsddm | field-replaceable unit information | The lsddm command displays a list of device drive modules (DDMs) and status information for each DDM in the list. |
| lshba | field-replaceable unit information | The lshba command displays a list of storage image host bus adapter (HBA) field replaceable units (FRUs) and status information for each FRU in the list. |
| lsxtpool | storage configuration | The lsxtpool command displays a list of extent pools in a storage image and status information on each extent pool in the list. |
| lsfbvol | storage configuration | The lsfbvol command displays a list of fixed block volumes in a storage image and status information for each volume in the list. |
| lsflash | Copy Services | The lsflash command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list. |
| lsframe | physical enclosure information | The lsframe command displays a list of frame enclosures for a storage image. |
| lshostconnect | I/O port and host connect configuration | The lshostconnect command displays a list of host connections for a storage image and the status information for each host connection in the list. |
| lshosttype | I/O port and host connect configuration | The lshosttype 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. |
| lshostvol | I/O port and host connect configuration | The lshostvol command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs. |
| lsioport | I/O port and host connect configuration | The lsioport 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 | Type | Description |
|---------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lskey | application key and version | The lskey 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. |
| lslcu | storage configuration | The lslcu command displays a list of logical control units (LCUs) for a storage image and status information for each logical control unit in the list. |
| lsslss | storage configuration | The lsslss command displays a list of logical subsystems (LSSs) for a storage image and status information for each logical subsystem in the list. |
| lsportprof | I/O port and host connect configuration | The lsportprof command displays a list of port profiles that are supported on a storage image and their recommended address discovery and logical block size values. |
| lspprc | Copy Services | The lspprc 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. |
| lspprcpath | Copy Services | The lspprcpath command displays a list of existing remote mirror and copy (formerly PPRC) path definitions. |
| lsrank | storage configuration | The lsrank command displays a list of defined ranks in a storage image and status information for each rank. |
| lsremoteflash | Copy Services | The lsremoteflash command displays a list of FlashCopy relationships and status information for each FlashCopy relationship in the list. |
| lsserver | storage image configuration | The lsserver 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 | Type | Description |
|-------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| lsession | Copy Services | The lsession command displays a list of Global Mirror sessions for a logical subsystem (LSS) and information regarding the volumes of each session in the list. |
| lssi | storage image configuration | The lssi 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 lsavaioprcport and mkpprcpath commands. |
| lstgenc1 | physical enclosure information | The lstgenc1 command displays a list of storage enclosures and status information for each enclosure in the list. |
| lssu | storage unit configuration | The lssu 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. |
| lsuser | user account and security | The lsuser command returns a list of storage image user account names and access authority levels. |
| lsvolgrp | storage configuration | The lsvolgrp 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 | Type | 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 | Type | 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 <i>-at src</i> parameter option or the <i>-at 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 | Type | Description |
|-------------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| resyncflash | Copy Services | The resyncflash command (formerly called inclash 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 | Type | 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 | Type | 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 -unconditional parameter must be specified when designating a single volume otherwise an error occurs and the command process fails. |

| Command | Type | 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. Note: |
| 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 | Type | 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. |
| showiport | I/O port and host connect configuration | The showiport 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 lsavailpprcport 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 | Type | 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 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 ls type (for example, lsuser, lskey, lsserver) commands and the help (setoutput) command. |

| Flag | Parameters | Description |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -r | <i>number</i> | 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, lsuser, lskey, lsserver) 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 | <i>char</i> | 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 off | Turns the header on or off. The default is on. |
| -bnr | on off | Turns the banner on or off. The default is on. |
| -v | [on 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, lsioport, lskey) 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: on/off | 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 | <p>Specifies the output format for list commands.</p> <p>Specify one of the following formats:</p> <ul style="list-style-type: none"> • default: Specifies default output. • xml: Specifies XML format. • delim: Specifies columnar format. Columns are delimited with the character that you must specify with the delim variable. • stanza: Specifies a horizontal table. <p>This variable is equivalent to command option -fmt. The command option -fmt overrides this default value.</p> |
| 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 | <p>Specifies the language for the output on the local computer.</p> <ul style="list-style-type: none"> • 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 • lt: Lithuanian • lv: Latvian (Lettish) • mk: Macedonian • mr: Marathi • ms: Malay |

Table 4. Profile variables (continued)

| Variable | Description |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| locale, <i>continued</i> | <ul style="list-style-type: none"> 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 | <p>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.</p> <p>Note: The command timeout value can be longer than this value because one command can consist of multiple client/server requests.</p> |
| 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 "remotedev" are equivalent to
# "-dev storage_image_ID" and "-remotedev storage_image_ID" command options,
# respectively.
#devid: IBM.2107-AZ12341
#remotedev: IBM.2107-AZ12341

#
# locale
# Default locale is based on user environment.
#locale: en

# Timeout value of client/server synchronous communication in second.
# DSCSI command timeout value may be longer than client/server communication
# timeout value since multiple requests may be made by one DSCSI command
# The number of the requests made to server depends on DSCSI 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)
# "rows" is equivalent to "-r #" 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

# delimiter character for ls 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
```

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 | lsserver | Like the 2105, a 2107 storage image contains one pair of servers. A 2107 storage image can contain two storage images. |
| list volumespace | lsxextpool, showextpool, lsrank, showrank, lsarray, showarray, showarraysite | See Note 1. |
| create volumespace | mkextpool, mkarray, mkrank | |
| delete volumespace | rkrank, rarray, rmextpool | |
| list diskgroup | lsarraysite, 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 | lsoport, showioport | <p>Like 2105, the 2107 supports fibre-channel and ESCON ports. The 2107 does not support parallel SCSI ports.</p> <p>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.</p> <p>The 2107 CLI lsoport 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.</p> <p>For 2107, a I/O adapter card is assigned to a storage image.</p> |
| set port | setioport | See Note 2. |
| list volume | lsfbvol, lsckdvol | See Note 3. |
| create volume | mkfbvol, mkckdvol | |
| set volume | chfbvol, chckdvol | |
| list pav | lsckdvol, showckdvol | |
| create pav | mkckdvol | |
| delete pav | rmckdvol | |
| list volumeaccess | lsvolgrp, showvolgrp | See Note 4. |
| create volumeaccess | mkvolgrp, chvolgrp | |
| delete volumeaccess | rmvolgrp | |
| list hostconnection | lshostconnect, showhostconnect | <p>The 2105 and 2107 CLI commands are essentially the same, except that the 2107 commands include the volume group ID parameter.</p> <p>For 2107, the hostconnect commands concern SCSI-FCP host port connections to ESS I/O ports that are configured for SCSI-FCP and “identified” access mode.</p> |
| create hostconnection | mkhostconnect | |
| delete hostconnection | rmhostconnect | |
| set hostconnection | chhostconnect, managehostconnect | |
| list log | Not applicable. | -- |
| list featurecode | lsuser, mkuser, rmuser, chuser, lsrpc, lsstgencf | 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 communication functions are implemented in the 2107 as attributes of the storage complex object. The 2107 CLI chsp and showsp commands provide methods to view, set, and modify the remote communication attributes. The 2107 does not support the pager remote communication function. |
| set remotesupport | chsp | |
| show email | showsp | |
| create email | chsp | |
| delete email | chsp | |
| set email | chsp | |
| show pager | Not applicable. | |
| 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 | lshostvol | The lshostvol 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 | lsflash, lspprc | 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 | -- |
| <p>Note 1</p> <p>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.</p> <p>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.</p> <p>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.</p> | | |

| Enterprise Storage Server machine type 2105 command | DS8000 machine type 2107 command | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------|
| <p>Note 2</p> <p>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.</p> <p>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.</p> <p>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.</p> | | |
| <p>Note 3</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> | | |

| Enterprise Storage Server machine type 2105 command | DS8000 machine type 2107 command | Description |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------|
| <p>Note 4</p> <p>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.</p> <p>The volume group construct also exists in the 2105 internal code, but the construct is not externalized by the 2105 Specialist or CLI commands.</p> <p>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.</p> <p>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.</p> | | |

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 | bkgndcopy | 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 | cap | 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 | conopsrctd | 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 | EClvl | 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) | xtndlbztimeout | 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 |
|-----------------------|----------------|------------------------------------------------------------------------------------------------------|
| l'mACopy | imacpy | Indicates Yes if the l'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. |

| Output field name | Abbreviation | Description |
|-------------------------|---------------|----------------------------------------------------------------------------------------------------------|
| MRPD interval | MRPDintvl | Number of days between dial home to report machine-reported product data (MRPD). This interval can be 0. |
| MTS | MTS | 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 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 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 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 | Status of persistent FlashCopy, either enabled or disabled. |
| Persistent cache (MB) | pcache | Amount of persistent cache memory 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. |
| Port | port | I/O 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 | PPRCcntroprec | Remote mirror and copy (formerly PPRC) I/O control operations. |
| PPRC control operations sent | PPRCcntroplsent | 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 | proplex | 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 | tgtreadd | 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. |
| Timeout active copy recording | timeoutactcpyrec | -- |
| 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. |
| Type | 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. |

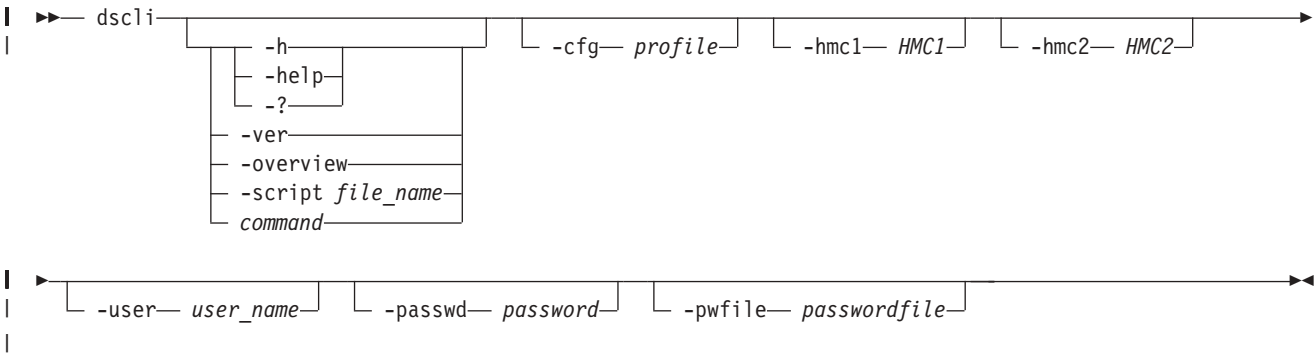
Framework command

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

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."



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

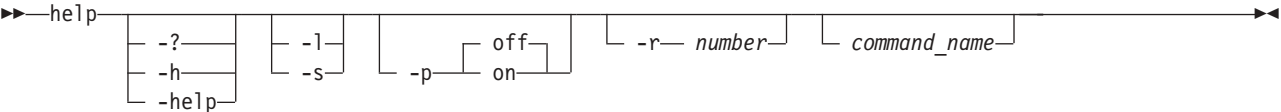
dscli>exit

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.

-l 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

```
#dsccli>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

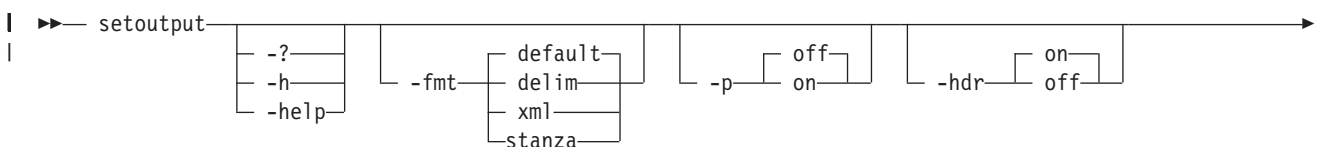
```
dscli>quit
```

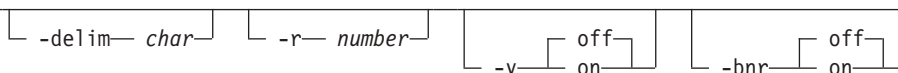
Out of interactive mode

```
#
```

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.





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.

stanza

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
=====
Off     -      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 **lsrank** command to designate the rank being queried.

```
dscli> setoutput -fmt delim -delim ,
dscli> lsrank -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,extpoolID,stgtype
=====
R0,-,Unassigned,Normal,A0,5,-,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 **lsrank** command to designate the unassigned rank being queried.

```
dscli> setoutput -fmt xml
dscli> lsrank -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>

```

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 **lsrank** 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

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

```

>> chpass [ -expire number ] [ -fail number ] <<

```

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

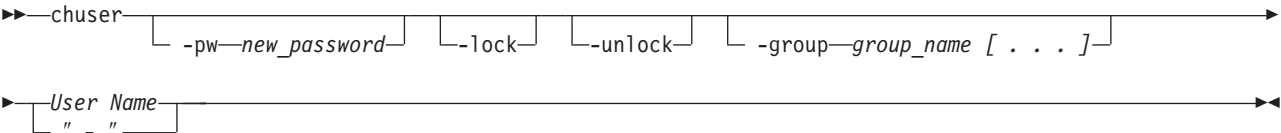
dscli>chpass -expire 20 -fail 0

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 name.

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.
```

lsuser

The lsuser 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 lsuser command**

```
dscli>lsuser
```

The resulting output

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 file.
- 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\dsccli\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.

```
►►—mkuser— -pw— password— -group—group_name [ . . . ]—User Name—►►
                        [ " _ " ]
```

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 use 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.

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
Y
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 5
```

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.

►► — showuser — User_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: <ul style="list-style-type: none">• 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.

```
►► applykey [-key key [...]] [-file file_name] [storage_image_ID] ►►
```

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

```
dsccli>applykey -file keys.xml IBM.2107-75FA120
```

Iskey

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.

►► — Iskey — *storage_image_ID* —►►
 " _ "

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

```
dsccli>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)

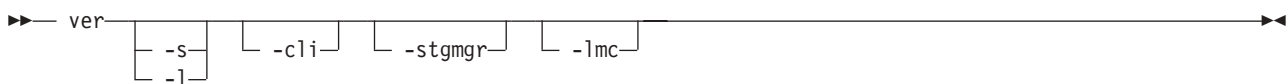
Specifies the capacity of the specified license feature for this image (quantity is displayed in terabytes).

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.
- l** (Optional) The -l displays the versions of the command line interface, Storage Manager, and licensed machine code. You cannot use the -l 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 -l
```

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

```

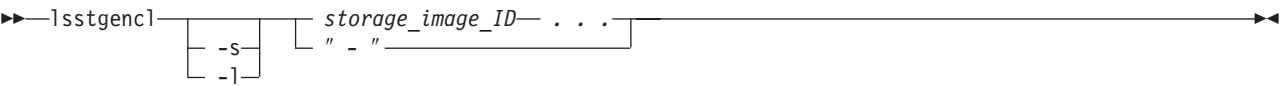
Physical enclosure information commands

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.

lsstgenc1

The lsstgenc1 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 -l and the -s parameters together.
- l (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 **lsstgenc1** command using the -l 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 lsstgenc1 command

dscli>lsstgenc1 -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 | Cap | 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.

Enclnum

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: "Uttt.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:

- eeeeeee = 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

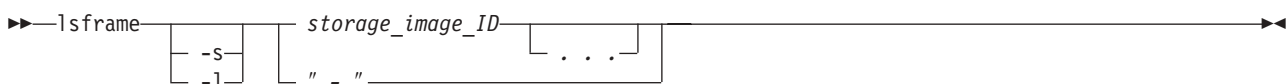
Specifies the number of storage devices installed in this storage enclosure.

Cap Specifies the capacity of DDMs in the storage enclosure.

RPM Specifies the RPM of the DDMs in the storage enclosure.

lsframe

The lsframe command displays a list of frame enclosures for a storage image.



Parameters

-s Displays the rack enclosure ID. You cannot use the -l and the -s flags together.

-l Displays default output and the frame enclosure location. You cannot use the -l 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 lsframe command

```
dsccli>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 U`ttt.mmm.ppsssss`.

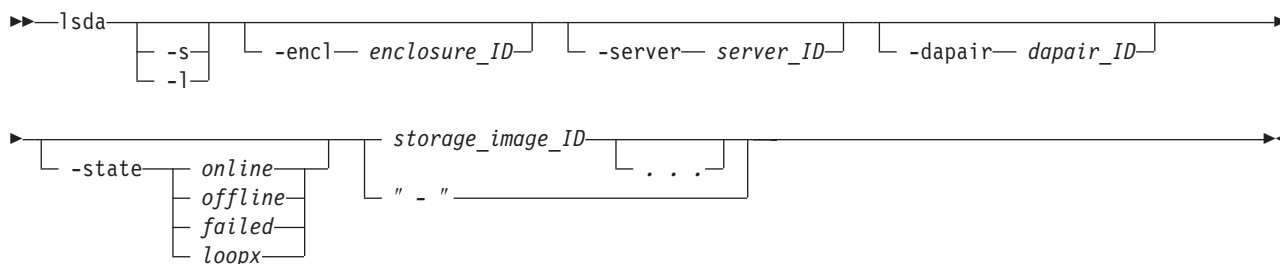
Field replaceable unit information commands

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.

lsda

The lsda 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 -l and the -s parameters together.
- l** (Optional) Displays the same output as the default output. You cannot use the -l 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 lsda command

```
dsccli>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 Identifies 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 *U*ttt.mmm.ppsssss.

The DA FRU location format is *P*n-*C*n where *P*n indicates the Planner number (1) and *C*n 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.

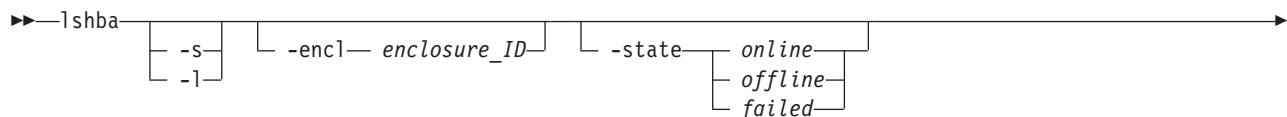
An even numbered DA pair ID indicates the first DA pair in an I/O enclosure pair. An odd numbered DA pair ID indicates the second DA pair in an IO enclosure pair.

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.



► `storage_image_ID` . . . |

" _ "

Parameters

-s (Optional) Displays HBA FRU IDs. You cannot use the **-l** and the **-s** parameters together.

-l (Optional) Displays the default output plus the HBA feature code and interface IDs. You cannot use the **-l** 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 lshba command

```
dsccli>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:

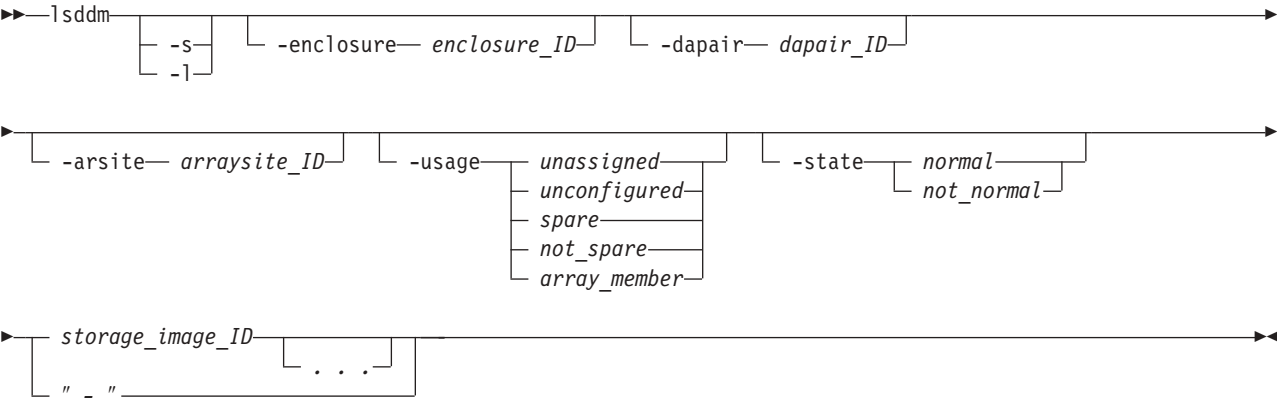
- ID** Identifies the unique identifier of the HBA FRU.
- State** Identifies the current availability state of the specified HBA FRU.
- Loc** Identifies the I/O enclosure and the HBA FRU location.
The I/O enclosure location format is *U*ttt.mmm.pppsssss.
The HBA FRU location format is *P*n-*C*n where *P*n indicates the Planner number (1) and *C*n 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.
- l** (Optional) Displays the default output. You cannot use the -s and -l 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 **lsddm** command using the **-l** 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 lsddm 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.

loc Specifies the storage enclosure and DDM location. DDM location format is “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 of 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.

Verifying

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.

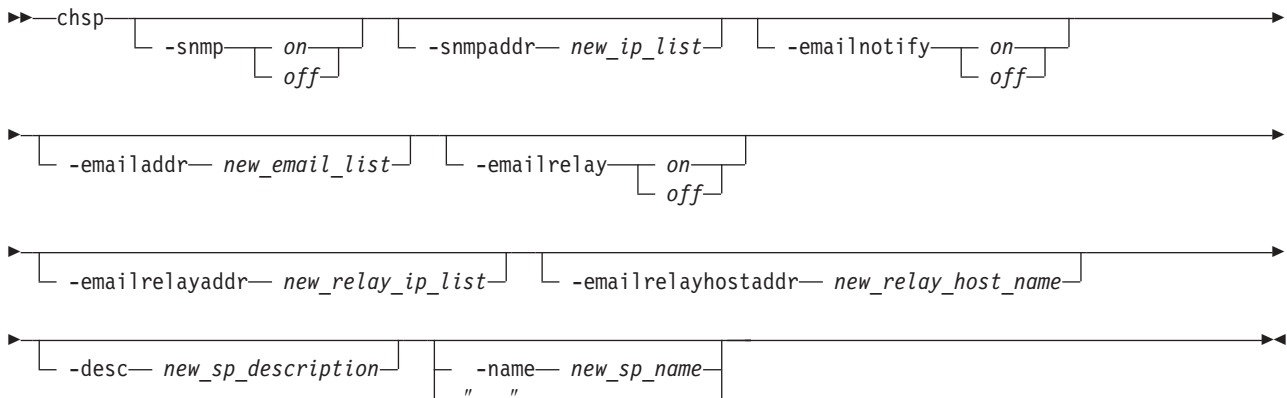
Storage complex configuration commands

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.

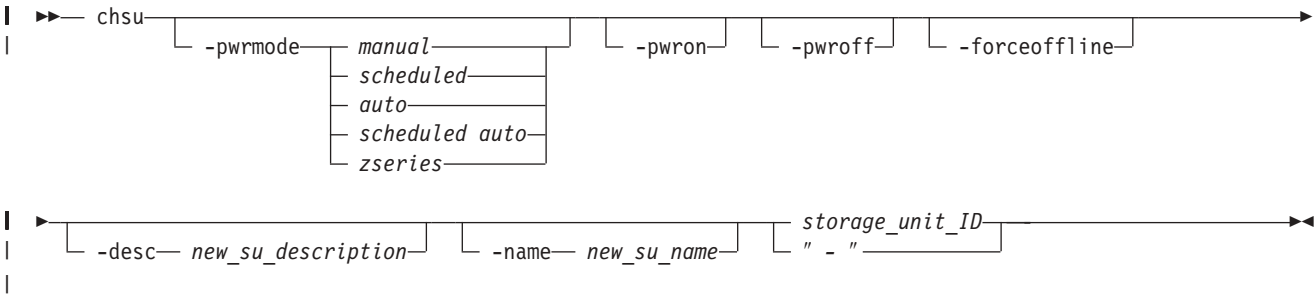
Storage unit configuration commands

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.

zseries

Specifies that the power control mode is set to zSeries remote power control.

-pwron

(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.

-pwroff

(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
```

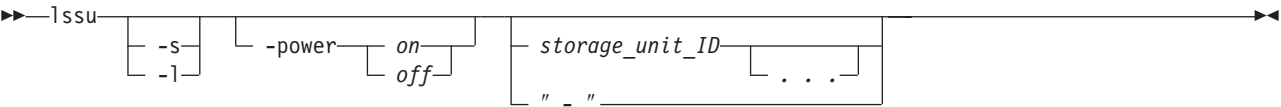
The resulting output

```
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

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 -l and the -s parameters together.
- l (Optional) Displays default output and remote mode with scheduled power-on and power-off times, and the storage unit description. You cannot use the -l 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 -l 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>Issu -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 | 3007ACF3012399E0 | On | Local | Test |
| SU 2 | IBM.2107-75FA120 | 921 | 3007ACF3045699E0 | On | Local | Production |
| SU 3 | IBM.2107-75FA130 | 921 | 3007ACF3078999E0 | 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:

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.

Desc Specifies the user-defined description for the listed storage unit. This value is displayed as a null (-) if no description has been assigned.

showsu

The showsu command displays detailed properties of an individual storage unit.

►►—shows—storage_unit_ID—►►
" _ "

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>shows -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 |
|-------------------------|---------------------------------------|----------------------|-------|--------------------------|----------------------|
| My Stor- age Unit | This is my DS Stor- age Unit | IBM.2107- 75FA120 | 921 | 3007ACF 3012399 E0 | One I/O interface |

| 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.

Desc 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

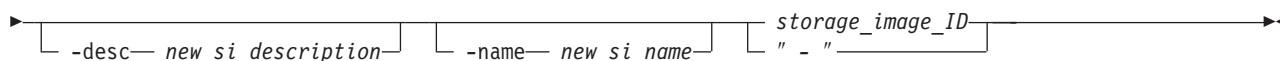
This section contains commands that are used to configure a storage image.

Use the following commands to configure a storage image and show storage image information.

chsi

The chsi command modifies a storage image. You can use it to set characteristics such as online or offline state, name, and description.

```
➤ chsi [-state online | offline] [-essnetcs y | n] [-volgrp volume_group_ID]
```



Parameters

-state *online* | *offline*

(Optional) Sets a new, requested state for the storage image. Either online or offline.

-essnetcs *y* | *n*

(Optional) Enables or disables the storage complex ESSNet user interface to invoke Copy Services operations for the storage image. *y* (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
```

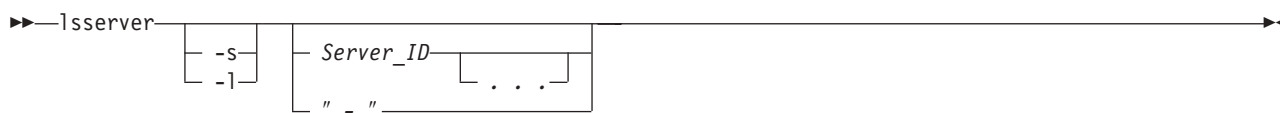
The resulting output

```
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.
- l (Optional) Displays the default output plus the state. You cannot use the -l 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 lsserver command

```
dscli>lsserver -l
```

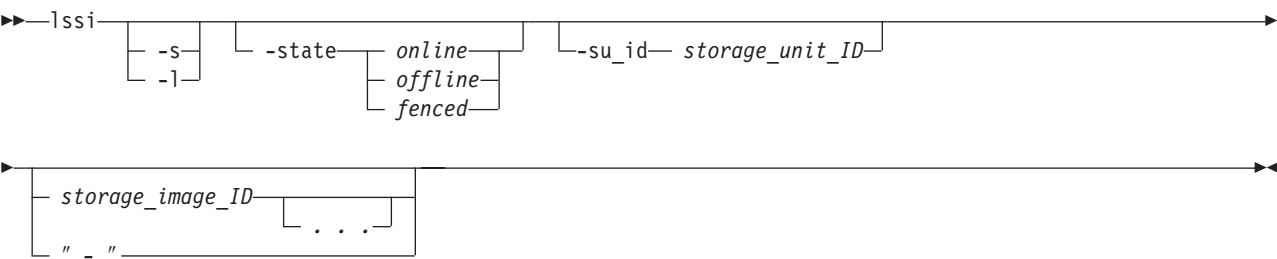
The resulting output

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

ID LPAR ID LPAR Name Power Control SFI
State LIC Version MCP Version Bundle Version
IBM.2107-75FA120/00 - - -
Online - - -
IBM.2107-75FA120/01 - - -
Online - - -
```

lssi

The lssi 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 lsavailpprport and mkpprcpath commands.



Parameters

- s (Optional) Displays storage image IDs. You cannot use the -l and the -s flags together.
- l (Optional) Displays the default output, ESSNet, volume group, and storage image description. You cannot use the -l 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 lssi 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 lsavailprcport and mkpprcpath commands.

```
▶▶—showsi—┐ 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

-l (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 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 **lsioport** command

```
dscli>lsioport -fullid -l
```

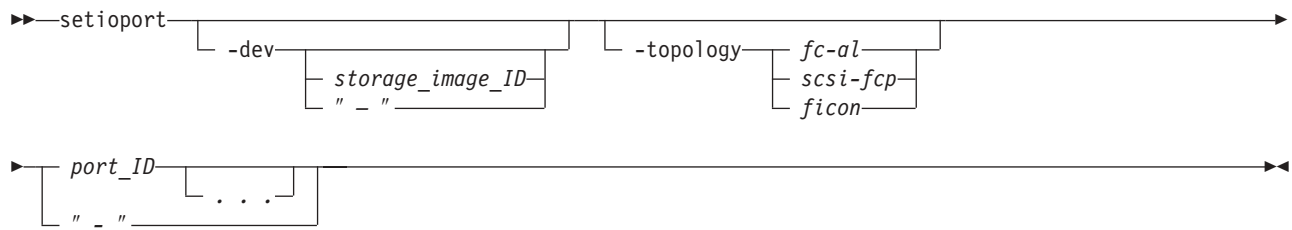
The resulting output

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

```
ID      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.


```
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
```

```
ID IBM.2107-75FA120/I0112
Date 10/11/04 02:23:47
byteread (FICON/ESCON) 10000
bytewrit (FICON/ESCON) 10000
Reads (FICON/ESCON) 10000
Writes (FICON/ESCON) 10000
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
Writes (SCSI) 10000
timeread (SCSI) 10000
timewrite (SCSI) 10000
```

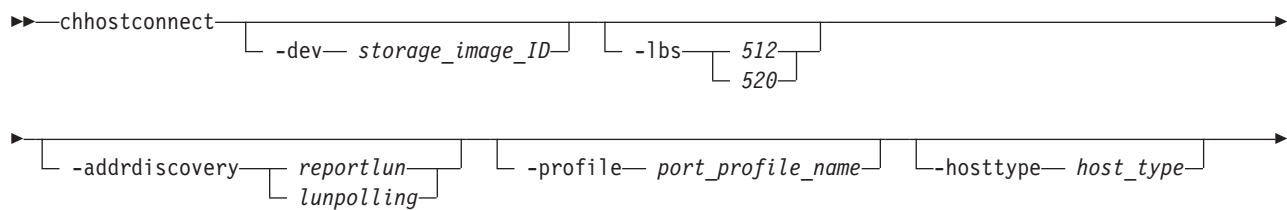
Host connection commands

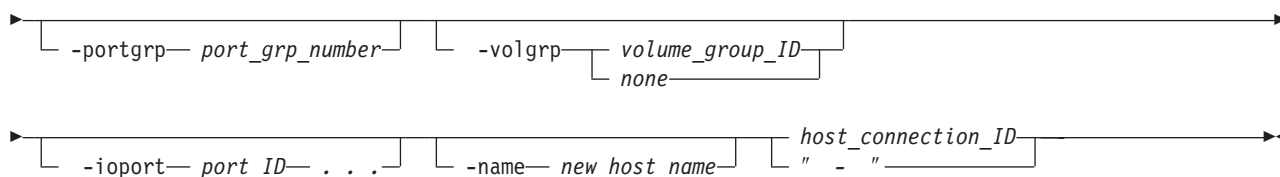
This section contains commands that are used to configure host connections and to display host connection information.

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 lspportprof 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 lspportprof 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 lspportprof 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 lshosttype 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
```

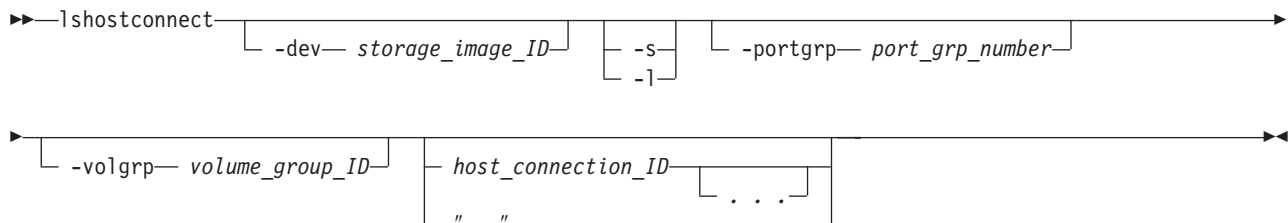
The resulting output

```
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.
```

lshostconnect

The lshostconnect 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 -l and -s flags together.

-l (Optional) Displays the default output and your description for each host connection in the list. You cannot use the -l 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 shortened 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 lshostconnect command using the -l parameter.

Invoking the lshostconnect 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 | Addrdiscovery |
|----------------|--------------------|------------------|----------|-----|---------------|
| My host port 1 | IBM.2107-75FA120/1 | 3007ACF30A2399E0 | Unknown | 512 | reportLUN |
| My host port 2 | IBM.2107-75FA120/2 | 3007ACF30A2399E1 | Unknown | 512 | reportLUN |
| My host port 3 | IBM.2107-75FA120/3 | 3007ACF30A2399E2 | Unknown | 512 | reportLUN |
| My host port 4 | IBM.2107-75FA120/4 | 3007ACF30A2399E3 | 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.

lshostvol

The lshostvol command displays the mapping of host device names or volume names to machine type 2105, 2107, and 1750 volume IDs.

►► lshostvol ◀◀

Parameters

There are no parameters for this command.

Additional notes

The **lshostvol** 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 lshostvol command

```
dscli>lshostvol
```

The resulting output

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

| Device/Volume Name | Volume ID | Vpath Name |
|---------------------|-----------------------|------------|
| my_vol_01,my_vol_04 | IBM.2107-75DA110/175D | vpath01 |
| my_vol_02,my_vol_05 | IBM.2107-75EA120/175E | vpath02 |
| my_vol_03,my_vol_06 | IBM.2107-75FA130/175F | vpath03 |
| my_vol_07,my_vol_09 | IBM.2105-29239/119E | vpath04 |
| my_vol_08,my_vol_10 | IBM.2105-29239/119F | vpath05 |

lspportprof

The **lspportprof** 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.

```
➤— lspportprof — [ storage_image_ID ] —————➤
                   " _ "
                   └──────────────────┘
```

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 lspportprof command

```
dscli>lspportprof IBM.2107-75FA120
```

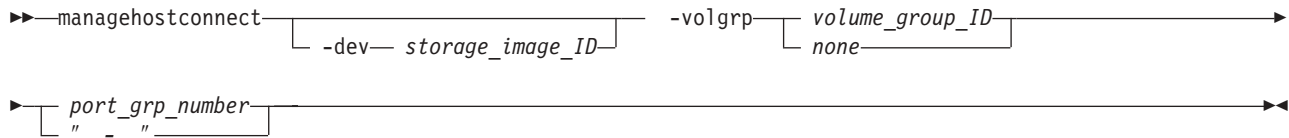
The resulting output

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

Name 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
```

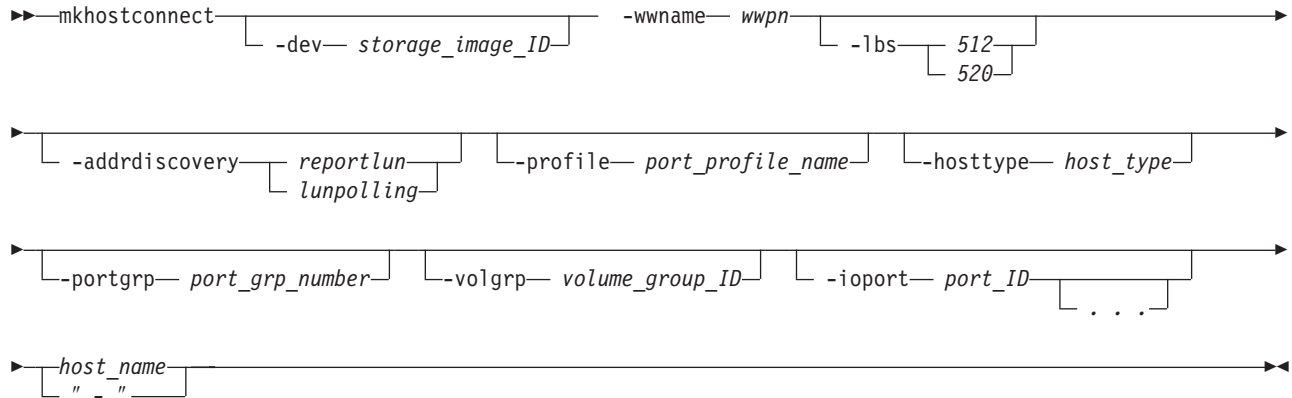
The resulting output

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 lsportprof 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 lshosttype 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.

```

>>— rmhostconnect — [ -dev— storage_image_ID ] [ -quiet ] [ " - " host_connection_ID ] —>>

```

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

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.

lshosttype

The lshosttype 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.

```
➤➤ lshosttype -type volumeGroup_type ➤➤
    -s
    -l
```

Parameters

-s (Optional) Displays the host types only. You cannot use the -l and -s parameters together.

-l (Optional) Displays the default output for the specified host type. You cannot use the -l 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 lshosttype 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.

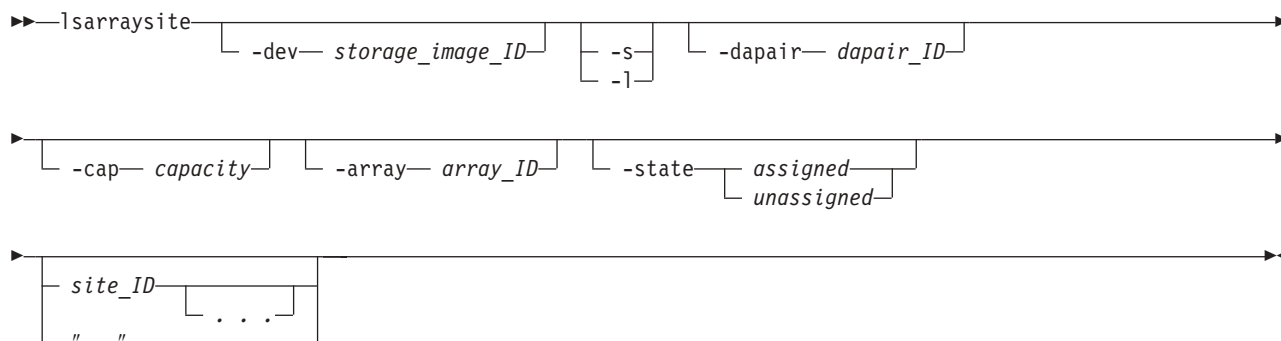
Array site specific commands

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.



Parameters

-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.

-l (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 "A".

-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 **lsarraysite** command using the **-l**

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 `lsarraysite` 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 ⁹ B) | 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 (10⁹ 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.

State 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.

```

▶▶ showarraysite [-dev storage_image_ID] site_ID ▶▶

```

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 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 array site.

State

Identifies the array site state. An unassigned array site is available to be defined as an array.

Array

Identifies, if any, the array ID that this assigned array site is assigned to. The ID is prefixed by the letter A.

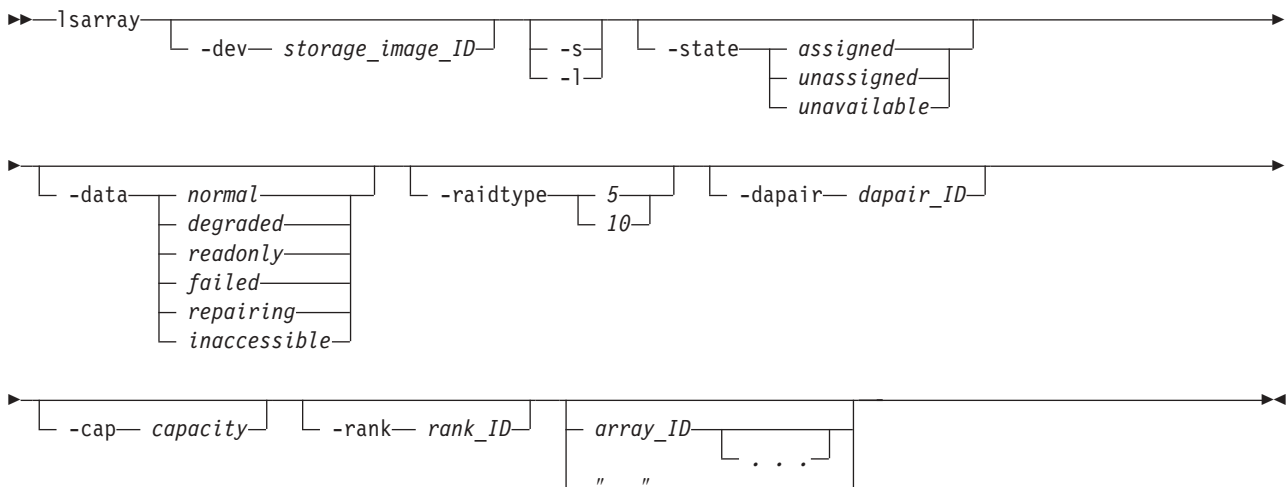
Array specific commands

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.

lsarray

The lsarray command displays a list of arrays in a storage image and status information for each array in the list.



| 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

Array Specifies the array number. The array number starts with an A prefix, followed by a four digit decimal number, no leading zeros (for example, A44).

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 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 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 exist:

- 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 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 (10⁹ Byte)

Indicates the minimum disk capacity (10⁹ Byte) of the storage devices (DDMs) in this array.

mkarray

The mkarray command creates arrays.

```

▶▶—mkarray—┬── -dev— storage_image_ID ┬── -raidtype—┬── 5 ┬── -arsite— array_site ┬──▶
              └──┬── 10 ┘

```


Example (2107)

Invoking the mkrank command

```
dsccli>mkrank -dev IBM.2107-75FA120 -array A44 -stgtype fb
```

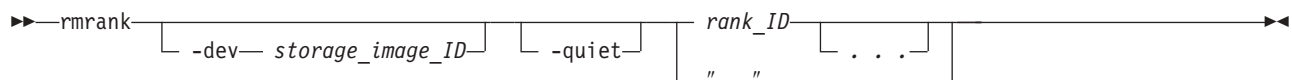
The resulting output

```
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 has been removed. Using the **lsarray** 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.

-quiet

(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

```
dsccli>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
```

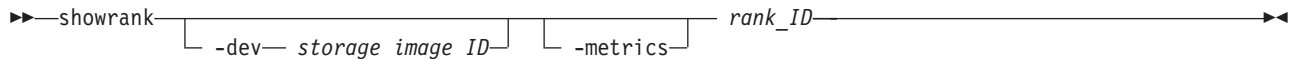
```
Are you sure you want to delete rank R23? [y/n]: Y
```

```
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

```
dsccli>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

```

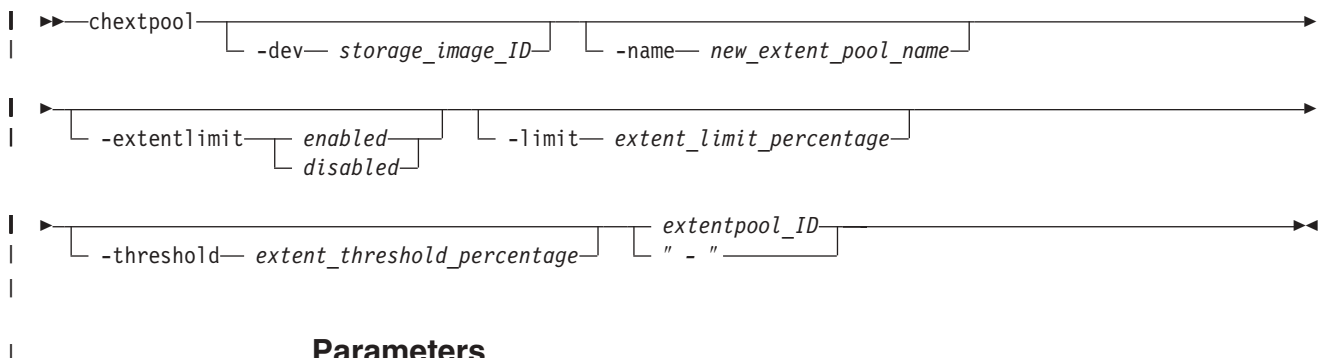
Extent pool specific commands

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.



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.

| **-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_percentage*
 | (Optional) Specifies the maximum value of the percentage of allocated real
 | extents that are allowed in this extent pool.

| **-threshold** *extent_threshold_percentage*
 | (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

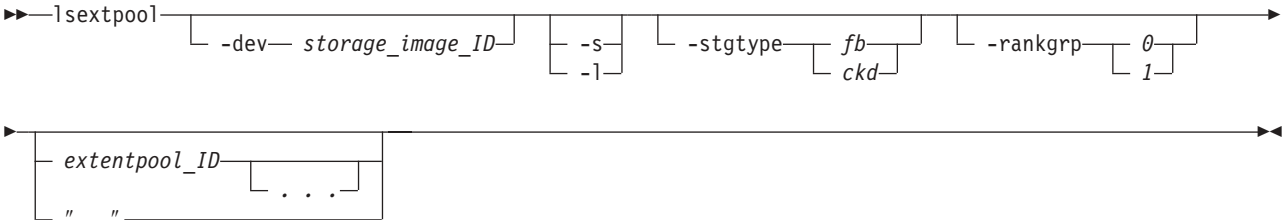
dscli>chextpool -name host_4_extpool IBM.2107-75FA120/P21

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.

lsextentpool

The lsextentpool 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.
- l** (Optional) Displays default output plus additional attributes that are identified as long output. You cannot use the -l 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 P.

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 **lsxtpool** command using the **-l** 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 lsxtpool command

```
dscli>lsxtpool -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

below

Specifies that the %Extents Available is less than the extent threshold

full

Specifies that the %Extents Available is 0.

availstor (2^30 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

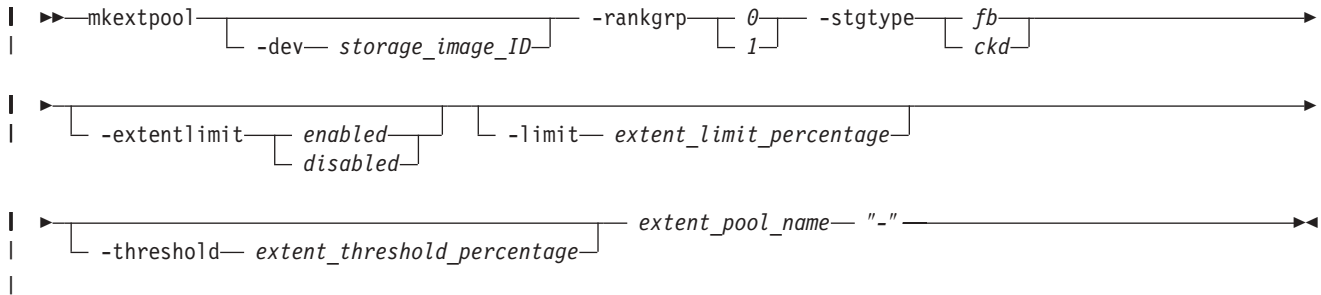
Identifies the number of logical volumes that have been configured from the designated extent pool.

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:

- 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 chrnk 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_percentage*

(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_percentage*

(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.

```
➤—rmextpool—┐└─ -dev— storage_image_ID—┐└─ -quiet—┐└─ extentpool_ID—┐└─ . . . ┐└─ " _ " ┐└─
```

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.

```
➤— showextpool —┬─ -dev— storage_image_ID ┬─ -metrics ┬─ " - " extentpool_ID ──➤
```

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 | totlstor (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

totlstor (2^30 Bytes)

Specifies the amount of storage associated with the extent pool, in gigabytes.

availstor (2^30 Bytes)

Specifies the available storage for the designated extent pool, in gigabytes.

resvdstor (2^30 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.

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 | real extext | real allocext | real extconv |
|-------------------------------|----------------------|----------------|----------------|------------------|-----------------|
| IBM.2107- 75FA120 /P101 | 10/11/04 02:23:47 | 10000 | 10000 | 10000 | 10000 |

| dyreloc source | dyreloc 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

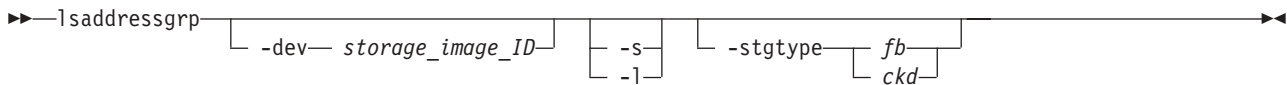
Address group specific commands

This section contains commands that are used to display address group information.

Use the following commands to display address group information.

lsaddressgrp

The lsaddressgrp 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.

-l (Optional). Displays the default output. You cannot use the -l 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 lsaddressgrp command

```
dsccli>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
  
```

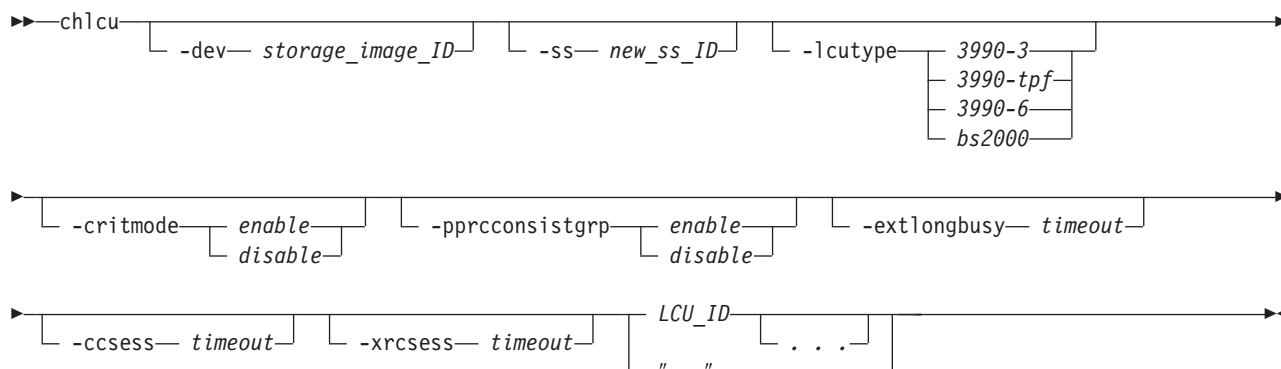
Logical control unit specific commands

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.

-pprconsistgrp *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

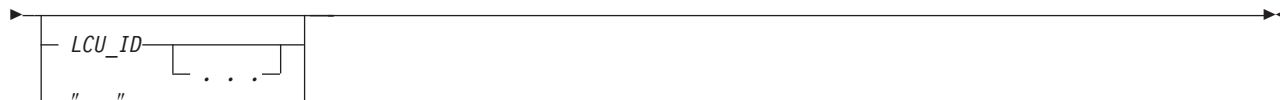
```
Sun Aug 11 02:23:49 PST 2004 IBM DS CLI Version: 5.0.0.0 DS: IBM.2107-75FA120
```

```
LCU 00 successfully modified.
LCU 01 successfully modified.
...
LCU 0F successfully modified.
```

lslcu

The lsclu command displays a list of logical control units (LCUs) for a storage image and status information for each logical control unit in the list.

```
➤➤—lslcu—┬── -dev— storage_image_ID ┬── -s ┬── -addrgrp— address_group ──┐
          └── -l ───────────────────────────────────────────────────────────┘
```



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 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.

-l (Optional). Use this parameter to display the default output. You cannot use the **-l** 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 **lslcu** command

```
dscli>lslcu -dev IBM.2107-75FA120 -l
```

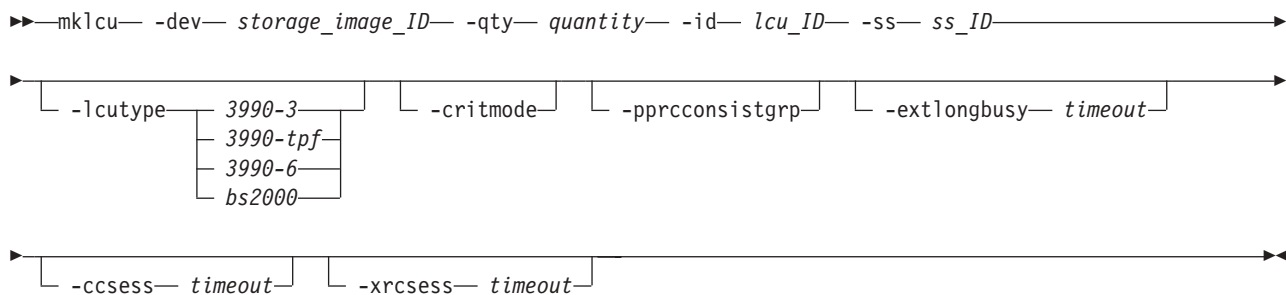
The resulting output

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

```
ID   Group addrgrp configvol's subsys
conbasetype
IBM.2107-75FA120/10 0 0   256           8010
3990-6
IBM.2107-75FA120/11 1 0   256           8011
3990-6
IBM.2107-75FA120/12 0 0   256           8012
3990-6
IBM.2107-75FA120/13 1 0   256           8013
3990-6
```

mklcu

The **mklcu** command creates a logical control unit (LCU) in a storage image.



Parameters

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 *lcu_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.

-pprcconsistgrp

(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.
```

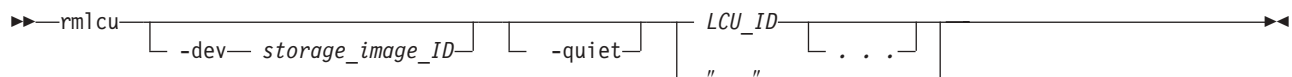
```
LCU 81 successfully created.
```

```
...
```

```
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).

```
➤➤—showlcu—┬──-dev— storage_image_ID—┬──LCU_ID—┬──┐
               │                               │       │
               └──" "──┘                       └──" "──┘
```

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
pprconsistgrp Disabled
xtndlbztimeout (secs) 120
ccsessttimeout (secs) 300
xrcsessttimeout (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.

```
▶▶—chckdvol—┬──────────────────────────────────┬───name── new_volume_name──┬── volume_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 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

```
dsccli>chckdvol -dev IBM.2107-75FA120 -name my_volume_#d 0100
```

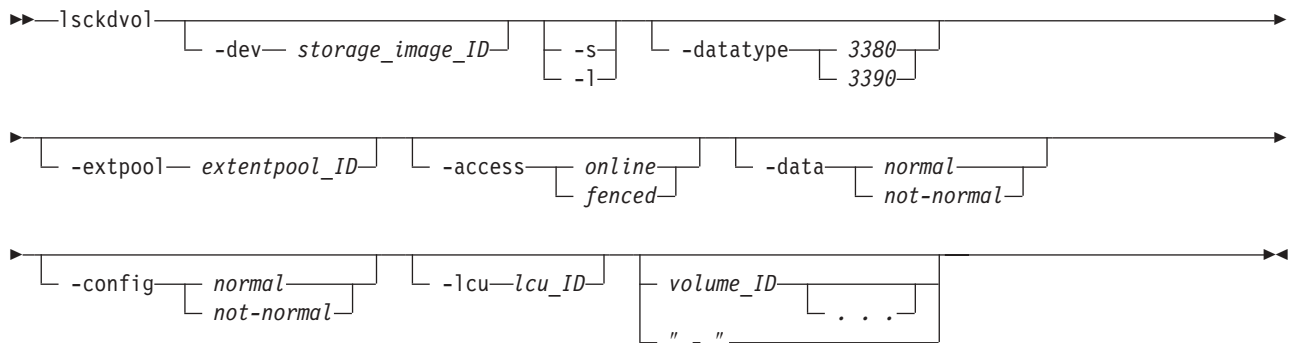
The resulting output

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.

lsckdvol

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.

-l (Optional) Displays default output plus additional attributes that are identified as long output. You cannot use the -l 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.

