



PS SERIES STORAGE ARRAYS CLI REFERENCE

PS Series Firmware Version 3.3

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Preface

Use the Group Manager command line interface (CLI) to manage a PS Series group—an affordable, scalable storage area network (SAN) that is easy to set up and operate. You can also use the CLI to manage a specific PS Series storage array for maintenance purposes.

For information about using the Group Manager graphical user interface (GUI) to manage a group, see the PS Series *Group Administration* manual.

Audience

This information is for administrators responsible for managing a PS Series group. Administrators are not required to have extensive network or storage system experience. However, it is useful to understand:

- Basic networking concepts
- Current network environment
- Application disk storage requirements

In addition, administrators may find it useful to understand the basic concepts for:

- Network topologies
- RAID configurations
- Disk storage management

Note: Although PS Series documentation provides examples of using PS Series arrays in some common network configurations, detailed information about setting up a network is beyond its scope.

Organization

This manual is organized as follows:

- Chapter 1, *Introduction to the CLI* provides basic introductory information such as: how to access the CLI, how to get online help, and how to enter commands.
- Chapter 2, *Group Management Commands* describes the commands used to perform administration tasks in a group.

- Chapter 3, *Array Management Commands* describes the commands that act on an individual member, not on the group.
- Chapter 4, *Global Commands* describes the global CLI commands that control CLI behavior. Appendix A, *Third-Party Copyrights*, lists the third-party copyrights for software used in the product.

Conventions

Typographical conventions are shown in the following table.

Convention	Usage
fixed width font	Command, parameter, output, file name, link, button, field, URL address, or e-mail address.
bold fixed width	Input to command prompt.
<i>fixed_width italics</i>	Indicates that you replace the variable with a command, parameter, file name, etc.
text1 text2	Indicates that you can choose one of the items presented.
<i>parameter ...</i>	Trailing dots indicate that you can enter multiple parameters on a command line, separated by spaces.
<i>option[, ...]</i>	Trailing dots, preceded by a comma, indicate you can enter multiple variables, separated by commas and <i>no</i> spaces.
[<i>parameter</i>]	Brackets indicate that the item inside the bracket is optional.
. . .	Vertical ellipsis indicates that part of an example is intentionally not shown.

Documentation

For detailed information about PS Series arrays, groups, and volumes, see the following documentation:

- *Release Notes*. Provides the latest information about PS Series arrays.
- *QuickStart*. Describes how to set up the array hardware and create a PS Series group. Be sure to use the manual for your array model.
- *Group Administration*. Describes how to use the Group Manager graphical user interface (GUI) to manage a PS Series group. This manual provides comprehensive information about product concepts and procedures.

- *CLI Reference*. Describes how to use the Group Manager command line interface (CLI) to manage a PS Series group and individual arrays.
- *Hardware Maintenance*. Provides information about maintaining the array hardware. Be sure to use the manual for your array model.
- Online help. In the Group Manager GUI, expand `TOOLS` in the far left panel and then click `Online Help` for help on both the GUI and the CLI. For information on additional help available on the CLI, see *Getting Help on the CLI* on page 1-3.

The *QuickStart* and *Hardware Maintenance* manuals and the *Release Notes* are printed and shipped with the product. They are also located on the PS Series documentation CD-ROM that is shipped with the product, along with the *Group Administration* and *CLI Reference* manuals and the Group Manager online help.

The documentation for the Host Integration Tools for Microsoft® Windows® systems is located on the Host Integration Tools CD-ROM that is shipped with the product.

Localized documentation is available on the localization CD-ROM that is shipped with the product in certain countries.

Technical Support and Customer Service

Dell's support service is available to answer your questions about PS Series arrays. If you have an Express Service Code, have it ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

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- www.dell.ca (Canada only)

You can access Dell Support through the following websites:

- support.dell.com
- support.dell.com/EqualLogic
- support.jp.dell.com (Japan only)
- support.euro.dell.com (Europe only)

1 Introduction to the CLI

The Group Manager command line interface (CLI) provides a comprehensive set of commands for managing a PS Series group. The CLI also enables you to manage individual PS Series arrays for maintenance purposes.

Introductory CLI information includes the following:

- *Accessing the CLI* on page 1-1
- *Command Types* on page 1-2
- *Using the CLI in Scripts* on page 1-2
- *Getting Help on the CLI* on page 1-3
- *Entering CLI Commands* on page 1-4

Accessing the CLI

To access the CLI to manage a group, use one of the following methods:

- **Network connection.** Use telnet or SSH to connect to the group IP address.
- **Serial connection.** If you do not have network access to the group, use the serial cable (or cables) shipped with the array. See the *Hardware Maintenance* manual shipped with your array for more information.

Note: When managing an individual array, you *must* use a serial connection to the array or use telnet or SSH to connect to an IP address assigned to a network interface on the array. Do *not* connect to the group IP address. See *Running Array Management Commands* on page 3-2 for details.

Once connected to the group (or an array), press the <Enter> key and log in to a group administration account (for example, `grpadmin`). You can then enter CLI commands at the command prompt.

The following example shows how to use `telnet` to log in to a group.

Note that the password you enter is not displayed on the screen.

```
$ telnet 182.14.22.123
Connected to 182.14.22.123.
PS Series Storage Arrays
Login: grpadmin
Password:
                Welcome to Group Manager
                Copyright 2001 - 2007 EqualLogic, Inc.
>
```

Command Types

There are three types of CLI commands:

- **Group management commands.** Enable you to manage a group. When you enter group management commands, you can specify subcommands, parameters, and variables as needed.

See Chapter 2, *Group Management Commands*, for detailed information about command formats and examples.

- **Array management commands.** Enable you to perform maintenance tasks on a specific array (for example, updating array firmware). To run these commands, you *must* use a direct serial connection to the array or connect to an IP address assigned to a network interface on the array.

See Chapter 3, *Array Management Commands*, for detailed information about command formats and examples.

- **Global commands.** Can be executed from any level in the CLI to control CLI behavior.

See Chapter 4, *Global Commands*, for detailed information about command formats and examples.

Using the CLI in Scripts

You can also manage a group using scripts that run on a host. Host scripting is supported using the CLI in conjunction with a Perl script. A sample Perl script and module are located in the `tools/eqlscript` directory on the PS Series documentation CD-ROM that is shipped with the product. The directory also includes instructions on using host scripting and examples.

Getting Help on the CLI

To obtain help on a CLI command, type `help` and the command. You can also enter a command and then type a space (required) and a question mark (?), which displays all possibilities for what you can enter next on the command line.

The following examples show both ways of getting help.

```
> help alerts
alerts - Displays and manages event notification methods.
select - Selects an event notification method.
show   - Displays the event notification methods and priorities, if any.

> volume rename ?
<currentname> - Current volume name.

> member select ?
<name> - Name of the member to select.

> member select ps12 ?
cancel-operation - Cancels an in-progress operation.
controller-safe  - Enables or disables controller-safe mode for the
                  selected member. If enabled, operates in write-
                  through mode to ensure data integrity.
def-gateway      - Sets a default gateway for the member.
delay-data-move  - Enables or disables (default) a delay before using
                  member storage until initial RAID verification
                  completes and batteries are fully charged.
description      - Sets a description for the member.
disk             - Displays information about one or more disks or
                  adds disks.
eth              - Selects a network interface to configure, modify,
                  or display.
locate           - Enables or disables blinking of LEDs on front and
                  back panel. Used to locate the member.
low-battery-safe - Enables or disables low-battery-safe mode for the
                  selected member.
pool             - Assigns member to a pool.
raid-policy      - Configures the RAID set.
show            - Displays detailed information about a member or a
                  specific component.

<cr>
```

CLI help messages have two components, as shown in the following example.

```
> member select ?
<name> - Name of the member to select.
```

If the component to the left is in angle brackets (<>), it indicates that you must replace the variable. If the component to the left is not in angle brackets, it indicates that you must specify the parameter itself (and possibly a variable).

Entering CLI Commands

The CLI allows you to abbreviate a command or parameter if the abbreviation uniquely identifies the command or parameter.

For example, the following commands are identical:

```
> volume select dbvoll
> vol sel dbvoll
```

These commands are also identical:

```
> cli-settings displayinMB on
> cli-settings display on
```

In addition, you can press the <Tab> key to automatically complete a command after entering a unique portion of the command. This can be useful in completing long commands or subcommands.

For example,

```
> grp<tab>
```

will be completed as:

```
> grpparams
```

In some cases, you can enter subcommand mode and execute multiple commands within this mode. Subcommand mode simplifies command entry when you are entering repetitive commands on the same component. You can perform multiple modifications to the group, a volume, or a member without entering long repetitive commands. Subcommand mode is available with the `grpparams` command and with all commands that use the `select` subcommand.

For example, you can enter the `grpparams` command without any parameters and press the <Enter> key. At the resulting `grpparams` prompt, enter the desired parameters, pressing the <Enter> key after each one. When you are done, enter the `exit` command to exit subcommand mode.

With commands that use the `select` subcommand, press the <Enter> key after each component selection. You can then enter the desired parameters.

The following is an example of using the `volume create` command to create a volume and then using subcommand mode to specify a description for the volume and change the volume permission to read-only.

```
> volume create dbvol 100
> volume select dbvol
volume dbvol> description "Staff Database"
volume dbvol> read-only
volume dbvol> exit
```

Note: There can be multiple levels of subcommand mode when a command uses multiple `select` subcommands. Use the `exit` command to bring you up one level at a time. Use the `exit all` command to exit subcommand mode.

If you do not want to use subcommand mode, simply specify the information on individual command lines. The following example uses two command lines to specify a description and read-only permission for a volume.

```
> volume select dbvol description "Staff Database"
> volume select dbvol read-only
```

If you are using the CLI to delete a group component, you will be prompted to confirm that you want to execute the command, as shown here:

```
> volume delete dbvol
There are active iSCSI connections to the volume.
Deleting the volume will terminate these connections.
Do you really want to delete the volume? (y/n) [n] y
```

In addition, if you are using the CLI to set or modify a password, you will be prompted to enter the password and then to reenter the password for confirmation, as shown in the following example. The password is not displayed on the screen.

```
> account create newadmin
Enter password:
Retype password:
```

In addition, some commands, such as `reset`, require you to confirm that you want to perform the requested action.

2 Group Management Commands

Information about commands used to manage a PS Series group includes the following:

- Brief description
- Command format
- Subcommands, variables, and parameters (if any)
- Examples

Group management commands are listed in alphabetical order in Table 2-1.

Table 2-1: Group Management Commands

Command	Description
account	Manages administration accounts. See <i>account</i> on page 2-2.
alerts	Manages event notification methods. See <i>alerts</i> on page 2-10.
chapuser	Manages user names and passwords for volume CHAP authentication. See <i>chapuser</i> on page 2-13.
collection	Manages volume collections. See <i>collection</i> on page 2-18.
grpparams	Displays and sets group configuration parameters. See <i>grpparams</i> on page 2-35.
member	Manages the group members. See <i>member</i> on page 2-74.
mrtg-config	Creates a file containing information about the group members and volumes for use with Multi-Router Traffic Grapher (MRTG). See <i>mrtg-config</i> on page 2-92.
partner	Manages the replication partners and replicas in a group. See <i>partner</i> on page 2-94.
pool	Manages the pools in the group. See <i>pool</i> on page 2-139.
show	Displays group configuration. See <i>show</i> on page 2-148.
save-config	Saves the group configuration so it can be restored in the event of a disaster. See <i>save-config</i> on page 2-145.
snapcol	Manages snapshot collections. See <i>snapcol</i> on page 2-163.
volume	Manages volumes, including snapshots and volume replication. See <i>volume</i> on page 2-168.

account

Manages local administration accounts.

There are three types of accounts you can set up:

- A group administrator account has access to and can manage the entire group and all storage pools.
- A pool administrator account can manage only the objects (volume and members) that are in the pool or pools assigned to the account. Pool administrators can also optionally monitor the entire group.
- A monitoring account is a read-only account.

Note: You can also manage administration accounts using external RADIUS servers to perform the authentication. See *grpparams radius-acct-list* on page 2-57 for more information.

Format

`account subcommand`

Subcommands

<code>create</code>	Creates an administration account.
<code>delete</code>	Deletes an account.
<code>select</code>	Displays or modifies an account.
<code>show</code>	Displays all accounts or information about a specific account. Also displays information about accounts that are currently logged in to the group.

account create

Creates an administration account.

Unless you specify pools for the administrator to manage or read-only privilege, the account will be a group administrator account with the ability to manage the entire group and all pools.

When you create an account, you will be prompted for an account password. An account password must be between 3 and 16 alphanumeric characters and is case-sensitive. (Only the first 8 characters are validated).

Format

```
account create account_name [parameter ...]
```

Note: The request for an account password is handled separately from the command line input. You will be prompted for a password and to confirm the password. The password is not displayed on the screen.

Variable

<i>account_name</i>	Account name, up to 64 alphanumeric characters. Valid characters include letters, numbers, dot, hyphen, and underscore. First character must be a letter or number. Names are not case-sensitive. For example, ADMIN and admin are treated as the same name.
---------------------	---

Parameters

<i>description text</i>	Description of the account, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.
<i>permission</i>	Sets the account permission as follows: <ul style="list-style-type: none"> • <code>read-write</code> — (Default). User can log in and change anything in the group or the pool (for a pool administrator). • <code>read-only</code> — User can display group information but cannot change it. • <code>group-read-access</code> — Allows pool administrators to see all the objects (for example, pools, members, and volumes) in the entire group, but change only the objects in their pools.
<code>enable disable</code>	Enables or disables the account.
<i>contact name</i>	Name of the person responsible for the account, up to 64 alphanumeric characters. If the <i>name</i> variable contains spaces, surround it with quotation marks (for example, "M Chen").
<i>email email_address</i>	E-mail address, up to 32 alphanumeric characters, for the person responsible for the account.

<code>phone phone_number</code>	Telephone number, up to 32 alphanumeric characters, for the person responsible for the account.
<code>mobile phone_number</code>	Mobile (cell phone) number, up to 32 alphanumeric characters, of the person responsible for the account.
<code>pool-admin list</code>	Limits this account to manage the pools (and objects therein) specified in the list. Pool names must be separated by commas only (no spaces). To allow the pool administrator to see other objects in the group, also specify the <code>group-read-access</code> parameter.

Examples

The following command creates a group administration account:

```
> account create admin21
Enter password:
Retype password:
Account creation succeeded.
```

The following command creates a pool administration account that can manage the objects in the `default` and `dbase` pools:

```
> account create userbob pool-admin default,dbase
Enter password:
Retype password:
Account creation succeeded.
```

The following command creates a pool administration account that can manage the objects in the `pool2` pool, and can see all other objects in the group:

```
> account create kristen pool-admin pool2 group-read-access
Enter password:
Retype password:
Account creation succeeded.
```

account delete

Deletes an administration account.

Note: You cannot delete the default `grpadmin` account.

Format

```
account delete account_name
```

Variable

<i>account_name</i>	Name of an account.
---------------------	---------------------

Example

The following command deletes the testgroup account:

```
> account delete testgroup
```

```
Do you really want to delete? (y/n) [n] y
Account deletion succeeded.
```

account select

Displays or modifies an account.

You cannot modify the name of an account. Instead, you must delete the account and then add it with the new name.

Format

```
account select account_name parameter ...
```

Variable

<i>account_name</i>	Name of an account.
---------------------	---------------------

Parameters

<i>contact name</i>	Name of the person responsible for the account, up to 64 alphanumeric characters. If the <i>name</i> variable contains spaces, surround it with quotation marks (for example, "M Chen").
<i>description text</i>	Description of the account, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.
<i>disable</i>	Disables the account.

<code>email email_address</code>	E-mail address, up to 32 alphanumeric characters, for the person responsible for the account.
<code>enable</code>	Enables the account.
<code>group-admin</code>	Changes the account to the group administrator permission level (enables the account to manage the group and all pools and objects in the pools).
<code>mobile phone_number</code>	Mobile (cell phone) number, up to 32 alphanumeric characters, for the person responsible for the account.
<code>passwd</code>	<p>Password for the account.</p> <p>Do not enter a password on the command line. Instead, enter a password (and confirmation) when you are prompted. The password must be between 3 and 16 alphanumeric characters and is case-sensitive. (Only the first 8 characters are validated). Neither your password nor your confirmation will be displayed on the screen.</p> <p>If you enter an invalid password, you will be given a chance to correct your entry. If your second entry is still incorrect, the password routine will exit.</p>
<code>phone phone_number</code>	Telephone number, up to 32 alphanumeric characters, for the person responsible for the account.
<code>pool-admin list</code>	Changes the account to the pool administrator permission level, for the specified list of pools. Pool names must be separated by commas only (no spaces).
<code>permission</code>	<p>Sets the account permission as follows:</p> <ul style="list-style-type: none"> • <code>read-write</code> — (Default). User can log in and change anything in the group or the pool (for a pool administrator). • <code>read-only</code> — User can display group information but cannot change it. • <code>group-read-access</code> — Allows pool administrators to see all the objects (for example, pools, members, and volumes) in the entire group, but change only the objects in their pools.
<code>show</code>	Displays detailed information about the account.

Examples

The following command modifies the password for the `grpadmin` account:

```
> account select grpadmin passwd
```

```
Enter New Password:
```

```
Retype Password:
```

Passwords are not echoed on the screen.

The following command specifies a description and contact information for an account:

```
> account select monitor
```

```
(account_monitor)> description "admin rd-only account"
```

```
(account_monitor)> email chen@cust.com
```

The following command displays details about the `monitor` account:

```
> account select monitor show
```

```

_____ Account Information _____
Name: monitor                Description: admin rd-only account
Permission: read-only        Status: enable
Contact:                     Email: chen@cust.com
Mobile:                      Phone:
Last-Login: 2007-01-02:12:02:42 Type: local
Privilege: group-admin

```

The following command changes the `monitor` account to be a pool administrator (with read-write permission by default) for the pools `staff` and `sales`:

```
> account select monitor pool-admin staff,sales
```

The following command allows the `pool3admin` account to monitor all other objects in the group (does not change the ability to manage objects in their pools):

```
> account select pool3admin group-read-access enable
```

The following command removes the `group-read-access` permission from the pool administrator account `kristen`:

```
> account select kristen group-read-access disable
```

The account still has read-write access on all objects in its designated pool or pools, but can no longer see other objects in the group.

account show

Displays all administration accounts or information about a specific account.

Specify the `active` parameter to display the accounts currently logged in to the group. For users logged in through the GUI, the `active` parameter also shows the remote IP address of the user and the local IP address (that is, the group or member IP address to which the user is connected).

Format

```
account show [account_name] [active]
```

Variable

<code>account_name</code>	Name of an account.
---------------------------	---------------------

Examples

The following command displays all the administration accounts:

```
> account show
```

```

_____ Local Accounts _____
Name           Permission Privilege   Status   LastLogin
-----
grpadmin       read-write  group-admin enable    2007-01-02:13:20:17
monitor        read-only  group-admin enable    2007-01-02:12:02:42
_____ Radius Accounts _____
Name           Permission Privilege   Status   LastLogin
-----
```

The following command shows the accounts currently logged in to the group:

```
> account show active
```

```

Name      Type      StartTime           Remote IP   Local IP
-----
grpadmin  telnet    2006-03-22:14:36:05
monitor   gui-ssl   2006-03-23:17:16:25  182.12.22.12 182.1.15.2
```

The following command displays details for the `grpadmin` account:

```
> account show grpadmin
```

```
_____ Account Information _____  
Name: grpadmin           Description: Group Manager Admin  
Permission: read-write   Account  
Status: enable          Contact: kabbott@email.com  
Email: groupadmin       Mobile: 603-888-9999  
Phone: 603-555-1234     Last-Login: 2007-01-02:13:20:17  
Type: local             Privilege: group-admin  
_____
```

alerts

Sets the event priorities for e-mail and syslog event notification.

When you enable an event notification method, by default, events with `fatal`, `error`, or `warning` priority result in notification.

To enable e-mail notification, see *grpparams email-notify* on page 2-49. To enable syslog notification, see *grpparams syslog-notify* on page 2-67.

Format

`alerts subcommand`

Subcommands

<code>select</code>	Selects an event notification method.
<code>show</code>	Displays the notification methods and priorities, if any.

alerts select

Specifies one or more event priorities for the selected type of event notification.

You can also use this command to effectively disable e-mail or syslog notification.

Table 2-2 describes event priorities in order of decreasing severity.

Table 2-2: Event Priorities

Priority	Description
<code>fatal</code>	Catastrophic failure that may require immediate administrator intervention or an array restart.
<code>error</code>	Serious failure that should be investigated and may require administrator intervention.
<code>warning</code>	Potential problems in the group. May become an event with <code>error</code> priority if administrator intervention does not occur.
<code>info</code>	Normal operational and transitional events in the group that are of interest to administrators but do not require intervention. Setting this priority can result in a large number of notifications.

Format

```
alerts select method priority priority|show
```

Variable

<i>method</i>	<p>One of the following notification methods:</p> <ul style="list-style-type: none"> • <code>email</code> – E-mail notification. • <code>syslog</code> – Remote syslog notification.
<i>priority filter</i>	<p>Priority of the event messages that result in notification, either <code>info</code>, <code>warning</code>, <code>error</code>, <code>fatal</code>, or <code>none</code>. Separate multiple priorities with commas (and no spaces).</p> <p>Specify <code>none</code> to disable all event notification for the selected method. This allows you to temporarily disable notification for the selected method.</p>

Subcommand

<code>show</code>	Displays the event priorities for the selected method.
-------------------	--

Examples

The following command allows a remote syslog server to receive only events with `error` and `fatal` priorities:

```
> alerts select syslog priority error,fatal
```

The following command displays the event priorities for e-mail notification:

```
> alerts select email show
```

```
Priority is :: warning,error,fatal
```

alerts show

Displays the event priorities that result in e-mail and syslog notification, if enabled.

Format

```
alerts show
```

Example

The following command shows the event priorities for e-mail and syslog notification:

```
> alerts show
```

Notification Method	Priority
-----	-----
Email	warning,error,fatal
SysLog	error,fatal

chapuser

Manages account names and passwords that are used to locally authenticate host (iSCSI initiator) access to volumes.

CHAP (Challenge Handshake Authentication Protocol) can be used to restrict host (iSCSI initiator) access to volumes and snapshots (iSCSI targets). Local CHAP is generally used if you have only a few CHAP users. Performance may be adversely affected if you have more than 100 local CHAP users.

Notes: You can also use an external RADIUS server for initiator authentication, as described in *grpparams radius-auth-list* on page 2-60. This is recommended if you have more than 100 local CHAP users.

If you want to also enable target authentication in which the target is authenticated by the initiator, see *grpparams target-auth-password* on page 2-68 and *grpparams target-auth-username* on page 2-69 for more information.

Format

`chapuser subcommand`

Subcommands

<code>create</code>	Creates a CHAP account.
<code>delete</code>	Deletes a CHAP account.
<code>rename</code>	Renames a CHAP account.
<code>select</code>	Enables, disables, or displays the selected CHAP account.
<code>show</code>	Displays all CHAP accounts or the details of a specific account.

chapuser create

Creates a local CHAP account for iSCSI initiator authentication.

By default, a local CHAP account is enabled. If you do not specify a password, one is automatically generated.

For local CHAP authentication of iSCSI initiators, you must enable this functionality, as described in *grpparams iscsi-local-auth* on page 2-51.

Also, to enable functionality that prevents unauthorized hosts from discovering targets only protected with CHAP, see *grpparams discovery-use-chap* on page 2-46.

After creating a local CHAP account, set up an access control record for the volume to which you want to restrict access and specify the account name. For more information on setting up an access control record, see *volume select access create* on page 2-180.

Format

```
chapuser create name [enable|disable] [password password]
```

Variable

<i>name</i>	CHAP account (user) name, up to 63 alphanumeric characters. CHAP user names are case-sensitive.
-------------	---

Parameters

enable disable	Enables (default) or disables the CHAP account.
passwd <i>password</i>	CHAP account password, up to 255 alphanumeric characters. The password is automatically generated if one is not specified.

Example

The following commands create two local CHAP accounts:

```
> chapuser create hadid password testchappass
```

```
CHAP user creation succeeded.
```

```
> chapuser create tperry disable
```

```
CHAP user creation succeeded.
```

```
Generating password.
```

```
Password is jHZRRBpZxpBZPHBz
```

chapuser delete

Deletes a local CHAP account.

Format

```
chapuser delete name
```

Variable

<i>name</i>	Name of a CHAP account. CHAP user names are case-sensitive.
-------------	---

Example

The following command deletes a local CHAP account:

```
> chapuser delete testchap
Do you really want to delete? (y/n) [n] y
CHAP user deletion succeeded.
```

chapuser rename

Renames a local CHAP account. CHAP user names are case-sensitive.

Format

```
chapuser rename name new_name
```

Variables

<i>name</i>	Name of a CHAP account.
<i>new_name</i>	New name for account, up to 63 alphanumeric characters.

Example

The following command renames a CHAP account:

```
> chapuser rename jchen johnc
```

chapuser select

Modifies or displays the selected local CHAP account.

Format

```
chapuser select name show|parameter
```

Variable

<i>name</i>	Name of a CHAP account. CHAP user names are case-sensitive.
-------------	---

Subcommand

show	Displays details for the selected CHAP account.
------	---

Parameters

enable disable	Enables or disables the selected CHAP account.
passwd [<i>password</i>]	Password for the selected CHAP account, up to 255 alphanumeric characters. If you do not specify a password, a password will be generated automatically.

Example

The following command displays details about the selected CHAP account:

```
> chapuser select testchap show
```

```

_____ ChapUser Information _____
Name: testchap           Password: ZZJZRXP2jRhrXZR
Status: enable

```

chapuser show

Displays all local CHAP accounts or details about a specific account.

Format

```
chapuser show [name]
```

Variable

<i>name</i>	Name of a CHAP account. CHAP user names are case-sensitive.
-------------	---

Examples

The following command displays the local CHAP accounts in the group:

```
> chapuser show
```

Name	Password	Status
-----	-----	-----
guest	0ZBHX0HBXbHPpbxB	enable
tchen	8ZP2b8BZRJP2BBBb	enable

collection

Manages the volume collections in a group. A volume collection is a set of one or more volumes (up to eight) grouped together for the purpose of creating simultaneous snapshots of the volumes in the collection (snapshot collection) or simultaneous replicas of the volumes in the collection (replica collection).

Note: See *snapcol* on page 2-163 for information on creating snapshot collections.

Format

`collection subcommand`

Subcommands

<code>create</code>	Creates a volume collection.
<code>delete</code>	Deletes a volume collection. This will <i>not</i> delete the volumes in the collection.
<code>rename</code>	Renames a volume collection.
<code>select</code>	Enables you to: <ul style="list-style-type: none"> • Add volumes to a volume collection. • Delete volumes from a volume collection. • Modify a volume collection description. • Create and manage replica collections. A replica collection consists of simultaneously-created replicas of the volumes in a volume collection. • Schedule the creation of replica collections or snapshot collections. • Display the contents of a volume collection.
<code>show</code>	Displays all volume collections or detailed information about a specific collection.

collection create

Creates a volume collection in the group.

Format

```
collection create coll_name vol_name[,vol_name,...] [description text]
```

Variables

<i>coll_name</i>	Collection name, up to 64 alphanumeric characters; name can include periods, hyphens, or colons (no underscores). Collection names are not case-sensitive. For example, COLL2 and coll12 are treated as the same name.
<i>vol_name</i>	Name of a volume to be included in the collection. Separate multiple volumes using a comma and no space. Up to eight volumes can be included in a collection.
<i>text</i>	Text for volume collection description, up to 128 alphanumeric characters. If the <i>text</i> variable includes spaces, surround it with quotation marks.

Example

The following command creates a volume collection that includes two volumes:

```
> collection create dbasecol db1,db2 description "Dbase Collection"
```

```
Volume collection creation succeeded.
```

collection delete

Deletes a volume collection. The volumes that make up the collection will *not* be deleted.

Format

```
collection delete coll_name
```

Variable

<i>coll_name</i>	Name of a volume collection.
------------------	------------------------------

Example

The following command deletes a volume collection:

```
> collection delete staffall
```

```
Do you really want to delete the volume collection? (y/n) [n] y
Volume collection deletion succeeded.
```

collection rename

Renames a volume collection.

Format

```
collection rename coll_name new_coll_name
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>new_coll_name</i>	New volume collection name, up to 64 alphanumeric characters.

Example

The following command renames a volume collection:

```
> collection rename hrbase hrcollection
```

collection select

Enables you to select a volume collection and perform these tasks:

- Add volumes to a volume collection.
- Delete volumes from a volume collection.
- Modify a volume collection description.
- Create and manage replica collections. A replica collection consists of simultaneously-created replicas of the volumes in a volume collection.
- Schedule the creation of replica collections or snapshot collections.
- Display the contents of a volume collection.

See *snapcol* on page 2-163 for information on creating snapshot collections.

Format

```
collection select coll_name subcommand | description text
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>text</i>	Description for the volume collection, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.

Subcommands

add	Adds a volume to the volume collection.
delete	Deletes a volume from the volume collection.
description	Adds a description for the collection.
replication	Manages volume collection replication.
schedule	Manages snapshot collection and replica collection schedules.
show	Displays details about the volume collection.

Example

The following command specifies a description for a volume collection:

```
> collection select staffcol description "Manufacturing Staff"
```

collection select add

Adds a volume to the selected volume collection.

Format

```
collection select coll_name add vol_name
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>vol_name</i>	Name of a volume.

Example

The following command adds a volume to a volume collection:

```
> collection select dbcollection add vol3
```

collection select delete

Deletes a volume from the selected volume collection. This does *not* delete the volume.

Format

```
collection select coll_name delete vol_name
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>vol_name</i>	Name of a volume.

Example

The following command deletes a volume from a volume collection:

```
> collection select dbcollection delete vol6
```

```
Do you really want to delete the volume from volume collection? (y/n) [n]y
```

The following command deletes the last volume from a volume collection, and also deletes the collection:

```
> collection select coll-2 delete klavol
```

```
There is only one volume in the volume collection. Deleting this volume from the collection results in deletion of volume collection. Snapcols created using this volume collection will continue to exist. Do you really want to delete the volume from volume collection? (y/n) [n] y
```

collection select replication

Manages the replication of volume collections. A replica collection consists of simultaneously-created replicas of the volumes in a volume collection.

You must configure a partner before you can replicate a collection. See *partner create* on page 2-95. You must also enable replication on each volume in the collection. See *volume select replication* on page 2-187.

You can recover data by cloning an individual replica or promoting a replica set.

Format

```
collection select coll_name replication subcommand
```

Variable

<i>coll_name</i>	Name of a volume collection.
------------------	------------------------------

Subcommands

<code>create-repcol</code>	Creates a replica of this volume collection on a partner.
<code>disable</code>	Disables replication of the volume collection to a partner. If a replication is in process, it cancels the replication (and prompts for verification) and disables replication on the collection.
<code>enable</code>	Enables replication of the volume collection to a partner.
<code>select</code>	Displays information about volume collection replication activity to the selected partner.
<code>show</code>	Displays the replication partners configured for the volume collection or detailed information about volume collection replication activity to a specific partner.

collection select replication create-repcol

Creates a replica collection for the selected volume collection. The replica collection is stored on the specified replication partner.

As with individual volume replication, each volume in the collection must be configured to replicate to the same partner, and the partner must have delegated space to the primary group. See *volume select replication enable* on page 2-191.

In addition, the volume collection itself must have replication enabled, as described in *collection select replication enable* on page 2-25.

Format

```
collection select coll_name replication create-repcol partner_name
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>partner_name</i>	Name of the replication partner that will store the replica collection (the secondary group).

Example

The following command creates a replica collection for the selected volume collection on the partner named `agroup`:

```
> collection select dbcollection replication create-repcol agroup
```

collection select replication disable

Disables replication of the selected volume collection to a replication partner.

Note: Disabling replication for a volume collection does not affect the replication activity for the individual volumes in the collection.

Format

```
collection select coll_name replication disable partner_name
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>partner_name</i>	Name of a replication partner.

Example

The following command disables replicating a volume collection to the partner `bgroup`:

```
> collection select dbcollection replication disable bgroup
```

collection select replication enable

Enables replication of the selected volume collection to a replication partner. You must do this before you can replicate a volume collection. You must also enable replication on each volume in the collection. See *volume select replication* on page 2-187.

Format

```
collection select coll_name replication enable partner_name
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>partner_name</i>	Name of the same partner the volumes in the collection are replicating to.

Example

The following command enables replicating a volume collection to a partner:

```
> collection select dbcollection replication enable agroup
```

collection select replication select show

Displays information about volume collection replication activity to a replication partner.

Format

```
collection select coll_name replication select partner_name show
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>partner_name</i>	Name of a partner to which the volume collection is being replicated.

Example

The following command displays information about volume collection replication activity to a partner:

```
> collection select dbcollection replication select groupb show
```

collection select replication show

Displays the replication partner configured for the volume collection or detailed information about volume collection replication activity to a specific partner.

Format

```
collection select coll_name replication show [partner_name]
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>partner_name</i>	Name of the partner to which the volume collection is being replicated.

Example

The following command displays information about the replication partners configured for the volume collection:

```
> collection select dbcollection replication show
```

collection select schedule

Manages schedules for creating simultaneous snapshots or replicas of the volumes in a volume collection (that is, a snapshot collection or a replica collection, respectively).

Format

```
collection select coll_name schedule [subcommands]
```

Variable

<i>coll_name</i>	Name of a volume collection.
------------------	------------------------------

Subcommands

create	Creates a schedule.
delete	Deletes a schedule.
rename	Renames a schedule.

select	Modifies, enables, disables, or displays details about a schedule.
show	Displays all schedules or details about a specific schedule.

collection select schedule create

Sets up a schedule for creating snapshot collections or replication collections for the selected volume collection.

Note: Using a schedule can result in the creation of many snapshots or replicas. To control the number of snapshots or replicas, use the `max-keep` command parameter when creating a schedule. In addition, the size of the snapshot reserve limits the number of snapshots you can create for a volume, and the replica reserve limits the number of replicas you can create for a volume.

For each schedule, you must specify:

- Schedule name
- Schedule type
- Time to start creating the snapshots or replicas
- Partner name (only for replication collection schedules)

Optionally, you can specify other parameters, depending on the schedule type. To specify more than one parameter, separate them with commas and no spaces.

Format

```
collection select coll_name schedule create sched_name parameter
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>sched_name</i>	Schedule name, up to 64 alphanumeric characters.

Parameters

enable disable	Enables (default) or disables the schedule.
----------------	---

<code>end-date mm/dd/yy</code>	Month, day, and year that the schedule will stop. The default is no ending date.
<code>end-time hh:mm[AM PM]</code>	Time when the schedule will stop creating a sequence of snapshot or replicas collections. Use 24-hour time or specify AM or PM. Applicable only to schedules of type <code>daily</code> .
<code>frequency nmins nhour[s]</code>	Interval between the creation of snapshot or replica collections, in minutes or hours (for example: <code>5mins</code> , <code>1hour</code> , <code>2hours</code>). Applicable only to schedules of type <code>hourly</code> and <code>daily</code> .
<code>max-keep n</code>	Maximum number of snapshot or replica collections created from the schedule to retain (from 1 to 512). The default is 10. If you reach the maximum limit, the oldest snapshot or replica collection created from the schedule will be deleted before another is created.
<code>partner partner_name</code>	Name of the partner that will store replica collections created through the schedule. Required for replication schedules.
<code>read-write read-only</code>	Permission for snapshots created from the schedule. The default is <code>read-write</code> .
<code>repeat-interval ndays</code>	Number of days between the creation of snapshot or replica collections. Applicable only to schedules of type <code>daily</code> .
<code>start-date mm/dd/yy</code>	Month, day, and year that the schedule will start. The default is the day that the schedule was created (or the following day, if the starting time has passed).
<code>start-time hh:mm[AM PM]</code>	Time when the schedule will start creating snapshot or replica collections. Use 24-hour time or specify AM or PM. Required.
<code>type schedule_type</code>	Type of schedule, either <code>once</code> , <code>hourly</code> , or <code>daily</code> . Required.

Examples

The following command sets up a schedule called `dailydbsch` that creates a replica collection of volume collection `dblcol` on partner `psgroup2`, every day at 11:30 PM:

```
> collection select dblcol schedule create dailydbsch type daily
start-time 11:30PM repeat-interval 1days partner psgroup2
```

Schedule creation succeeded.

The following command sets up a schedule called `mailsch` that creates a snapshot collection of volume collection `mailcol` every day, every 2 hours, from 7:00AM to 8:00PM:

```
> collection select mailcol schedule create mailsch type daily
start-time 07:00AM end-time 20:00 frequency 2hours repeat-interval 1days
```

Schedule creation succeeded.

collection select schedule delete

Deletes a snapshot collection or replication collection schedule for the selected volume collection.

Deleting a schedule does not effect snapshot collections or replica collections created by the schedule.

Format

```
collection select coll_name schedule delete sched_name
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>sched_name</i>	Name of a schedule.

Example

The following command deletes the `backupday` schedule:

```
> collection select staffcol schedule delete backupday
```

```
Do you really want to delete? (y/n) [n] y
Schedule deletion succeeded.
```

collection select schedule rename

Renames a snapshot or replication schedule for the selected volume.

Format

```
collection select coll_name schedule rename sched_name new_sched_name
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>sched_name</i>	Name of a schedule.
<i>new_sched_name</i>	New schedule name, up to 64 alphanumeric characters.

Example

The following command renames a schedule:

```
> collection select staffcol schedule rename back2 daily2
```

collection select schedule select

Modifies a snapshot or replication collection schedule or displays details about a schedule.

To specify more than one parameter, separate them with commas and no spaces.

Note: You cannot modify the partner for a replication collection schedule. Instead, delete the schedule and then create a new schedule with the desired partner.

Format

```
collection select coll_name schedule select sched_name show|parameter
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>sched_name</i>	Name of a schedule.

Parameters

<code>enable disable</code>	Enables or disables the schedule.
<code>end-date mm/dd/yy</code>	Month, day, and year that the schedule will stop.
<code>end-time hh:mm[AM PM]</code>	Time when the schedule will stop creating a sequence of snapshot or replicas collections. Use 24-hour time or specify AM or PM. Applicable only to schedules of type <code>daily</code> .
<code>frequency nmins nhour[s]</code>	Interval between the creation of snapshot or replica collections, in minutes or hours (for example: 5mins, 1hour, 2hours). Applicable only to schedules of type <code>hourly</code> and <code>daily</code> .
<code>max-keep n</code>	Maximum number of snapshot or replica collections created from the schedule to retain (from 1 to 512). The default is 10. If you reach the maximum limit, the oldest snapshot or replica collection created from the schedule will be deleted before another is created.
<code>read-write read-only</code>	Permission for snapshots created from the schedule.
<code>repeat-interval ndays</code>	Number of days between the creation of snapshot or replica collections. Applicable only to schedules of type <code>daily</code> .
<code>start-date mm/dd/yy</code>	Month, day, and year that the schedule will start.
<code>start-time hh:mm[AM PM]</code>	Time when the schedule will start creating snapshot or replica collections. Use 24-hour time or specify AM or PM.
<code>type schedule_type</code>	Type of schedule, either <code>once</code> , <code>hourly</code> , or <code>daily</code> .

Examples

The following command changes the time that snapshot collections of volume collection `staffcol` are created with the schedule `backup`:

```
> collection select staffcol schedule select backup start-time 10:15PM
```

The following command displays details about a replication collection schedule:

```
> collection select db2 schedule select hourly6 show
```

```

_____ Volume Collection Schedule Information _____
Name: hourly6                               Type: hourly
AccessType: 1                               Start-Date: 05/17/06
End-Date: None                             Start-Time: 12:00AM
End-Time: 12:00AM                          Frequency: 6hours
Repeat-Interval:                           Max-Keep: 10
NextCreation: Wed May 17 18:00:00          Desired Status: enable
      2006                                  Status: enable

```

collection select schedule show

Displays the snapshot and replication collection schedules for the selected volume collection or displays details about a specific schedule.

Format

```
collection select coll_name schedule show [sched_name]
```

Variables

<i>coll_name</i>	Name of a volume collection.
<i>sched_name</i>	Name of a schedule.

Example

The following command displays the snapshot and replication collection schedules for the volume collection dbcol:

```
> collection select dbcol schedule show
```

```

Name      Interval  DateRange      TimeRange  Frequency  NextCreate
-----
hour4     hourly    04/28/04-None  12:00AM   5mins     Fri May 5
                                           14:10:00
                                           2006
_____ Replication Schedules _____
Name      Interval  DateRange      TimeRange  NextCreate  Partner
-----
repdaily  daily     05/03/04-None  10:00PM   Fri May 5   betal
                                           22:00:00 2006

```

collection select show

Displays the volumes in the selected volume collection.

Format

```
collection select coll_name show
```

Variable

<i>coll_name</i>	Name of a volume collection.
------------------	------------------------------

Example

The following command displays the volumes in a volume collection:

```
> collection select coll1 show
```

```

_____ Volume Collection Information _____
Name: coll1                               Description:
Type: replica                             NoOfSnapcols: 11
ReplicationPartner: group2

```

```

_____ Volumes _____

```

Name	Size	Snapshots	Status	Permission	Connections
dbvol2	40GB	16	offline	read-write	0
exchangevol	100GB	14	online	read-write	0

```

_____ Schedules _____

```

Name	Interval	DateRange	TimeRange	Frequency	NextCreate
coll1-sna ps	daily	04/04/07-None	12:00AM-12:00AM		Thu Apr 26 00:00:00 2007

```

_____ Replication Schedules _____

```

Name	Interval	DateRange	TimeRange	NextCreate	Partner
coll1-sch ed	daily	04/04/07-None	12:00AM-12:00AM	Thu Apr 26 00:00:00 2007	group2

Snapcols			
Name	Snapshots	Collection	Schedule
coll1-2007-04-04-16:50:02.101	2/2	coll1	
coll1-2007-04-15-00:00:00.120	2/2	coll1	coll1-snaps
coll1-2007-04-16-00:00:01.121	2/2	coll1	coll1-snaps
coll1-2007-04-17-00:00:01.124	2/2	coll1	coll1-snaps
coll1-2007-04-18-00:00:00.125	1/1	coll1	coll1-snaps
coll1-2007-04-19-00:00:00.128	1/1	coll1	coll1-snaps
coll1-2007-04-21-00:00:00.129	1/1	coll1	coll1-snaps
coll1-2007-04-22-00:00:00.132	1/1	coll1	coll1-snaps
coll1-2007-04-23-00:00:00.133	1/1	coll1	coll1-snaps
coll1-2007-04-24-00:00:00.134	1/1	coll1	coll1-snaps
coll1-2007-04-25-00:00:00.135	1/1	coll1	coll1-snaps

collection show

Displays all the volume collections in the group or detailed information about a specific collection.

Format

```
collection show [coll_name]
```

Variable

<i>coll_name</i>	Name of a volume collection.
------------------	------------------------------

Example

The following command displays all the volume collections in the group:

```
> collection show
```

Name	NoOfVolumes	NoOfSnapcols
hrcollection	2	0
dbcol	3	2

grpparams

Displays or sets group parameters.

Notes: If a parameter accepts multiple values (for example, multiple IP addresses), you must separate each value with a comma and no space.

Group parameters that set volume defaults apply only to new volumes.

Format

```
grpparams subcommand | parameter
```

Subcommands

<code>show [list-parameter]</code>	Displays all group parameters and their values or the values of a specific list parameter: isns-server-list, smtp-server-list, email-list, radius-auth-list, syslog-server-list, ntp-server-list, or radius-acct-list.
<code>snmp show subcommand</code>	Displays and sets SNMP configuration parameters, including trap destinations.

Parameters

<code>cliaccess-ssh enable disable</code>	Enables (default) or disables CLI access through SSH.
<code>cliaccess-telnet enable disable</code>	Enables (default) or disables CLI access through telnet.
<code>conn-balancing enable disable</code>	Enables (default) or disables iSCSI connection load balancing across group members.
<code>date mm/dd/yy</code>	Group date (month, day, and year).
<code>def-iscsi-alias yes no</code>	Group-wide default that determines whether the volume's iSCSI target alias (public name) is set to the internal volume name by default. Also applies to volume snapshots. Default is yes.
<code>def-language language</code>	Group language. Only English is supported in the current release.

<code>def-snap-depletion action</code>	<p>Group-wide default for the action to take when the snapshot reserve is exceeded:</p> <ul style="list-style-type: none"> • <code>delete-oldest</code> (default—delete the oldest snapshots) • <code>volume-offline</code> (set the volume and its snapshots offline) <p>Applies only to new volumes.</p>
<code>def-snap-reserve n%</code>	<p>Group-wide default for the amount of space, as a percentage of the volume size, to reserve for volume snapshots. Applies only to new volumes.</p> <p>Default is 100%.</p>
<code>def-snap-warn n%</code>	<p>Group-wide default for the threshold at which an alarm is generated because the amount of free reserved snapshot space has fallen below this value (as a percentage of total reserved snapshot space). Applies only to new volumes.</p> <p>Default is 10%.</p>
<code>def-thin-growth-max</code>	<p>Group-wide default for the maximum percentage of the volume size that can be in use for a new thin-provisioned volume. When in-use space reaches this limit, the volume will be set offline.</p> <p>Default is 100%.</p>
<code>def-thin-growth-warn</code>	<p>Group-wide default for the percentage of the volume size that, when reached by in-use space, generates a warning alarm and event message for a new thin-provisioned volume.</p> <p>Default is 60%.</p>
<code>description text</code>	<p>Group description, up to 64 alphanumeric characters. If the <code>text</code> variable contains spaces, surround it with quotation marks.</p>
<code>disallow-downgrades</code>	<p>Disallows PS Series firmware downgrades on all members in the group. This prevents a group from reverting to a previous firmware version.</p>
<code>discovery-use-chap enable disable</code>	<p>Enables or disables (default) functionality that prevents unauthorized hosts from discovering targets that are only authenticated with CHAP.</p>

<code>email-contact email_address</code>	Enables your array support provider and the specified local address to receive E-Mail Home notification of firmware updates and hardware failures.
<code>email-from email_address</code>	E-mail address to be used as the “From” address in e-mail notification messages. Up to 128 alphanumeric characters.
<code>email-list email_addresses</code>	One to five e-mail addresses to receive event notification.
<code>email-notify enable disable</code>	Enables or disables (default) e-mail notification.
<code>group-ipaddress ip_address</code>	Group IP address.
<code>info-messages enable disable</code>	Enables (default) or disables broadcasting live, real-time informational messages to the console and the Group Events window in the GUI.
<code>iscsi-local-auth enable disable</code>	When authenticating host iSCSI access to volumes, enables (default) or disables using local CHAP accounts. If enabled, the local accounts will be checked before any RADIUS accounts.
<code>iscsi-radius-auth enable disable</code>	Enables or disables (default) the use of external RADIUS authentication servers for authenticating host iSCSI access to volumes.
<code>isns-server-list ip[:port]</code>	One to three IP addresses (with optional port) for iSNS servers.
<code>location text</code>	Physical location of the group, up to 64 alphanumeric characters. If the <code>text</code> variable contains spaces, surround it with quotation marks. Default is <code>default</code> .
<code>login-radius-acct enable disable</code>	Enables or disables (default) the use of external RADIUS accounting servers for tracking group administration accounts that are authenticated with external RADIUS authentication servers.
<code>login-radius-attr enable disable</code>	Enables (default) or disables requiring a RADIUS authentication server to supply the <code>EQL-Admin</code> attribute when authenticating group administration accounts.
<code>login-radius-auth enable disable</code>	Enables or disables (default) the use of external RADIUS authentication servers for authenticating group administration accounts.

<code>name <i>group_name</i></code>	Group name, identifies the group, especially for expansion and replication purposes.
<code>ntp-server-list <i>ip[:port]</i></code>	One to three IP addresses (with optional port) for NTP servers.
<code>passwd</code>	Password required to add members to the group. Do not specify the password on the command line. You will be prompted for it.
<code>perf-balancing enable disable</code>	Enables (default) or disables performance balancing.
<code>radius-acct-list <i>ip[:port]</i></code>	One to three IP addresses (with optional port) for RADIUS accounting servers.
<code>radius-acct-retries <i>n</i></code>	Number of times the group will try to contact a RADIUS accounting server after the first attempt fails. The default is 1 retry.
<code>radius-acct-secrets <i>secrets</i></code>	One to three secrets (separated by commas and no spaces) for RADIUS accounting servers.
<code>radius-acct-timeout <i>n</i></code>	Number of seconds the group will wait for a RADIUS accounting server to respond. The default is 2 seconds.
<code>radius-auth-list <i>ip[:port]</i></code>	One to three IP addresses (with optional port) for external RADIUS authentication servers.
<code>radius-auth-retries <i>n</i></code>	Number of times the group will try to contact a RADIUS authentication server after the first attempt fails. The default is 1 retry.
<code>radius-auth-secrets <i>secrets</i></code>	One to three secrets (separated by commas and no spaces) for RADIUS authentication servers. The order and number of secrets must be the same as those on the RADIUS authentication servers. The maximum secret length is 63 characters.
<code>radius-auth-timeout <i>n</i></code>	Number of seconds the group will wait for a RADIUS authentication server to respond. The default is 2 seconds.
<code>show [<i>list-parameter</i>]</code>	Displays one of the following lists: <code>isns-server-list</code> , <code>smtp-server-list</code> , <code>email-list</code> , <code>radius-auth-list</code> , <code>syslog-server-list</code> , <code>ntp-server-list</code> , or <code>radius-acct-list</code> .

<code>smtp-server-list ip[:port]</code>	One to three IP addresses (with optional port) for SMTP (Simple Mail Transfer Protocol) servers.
<code>snmp [subcommand]</code>	Manages SNMP (Simple Network Management Protocol) behavior for the group.
<code>syslog-notify enable disable</code>	Enables or disables remote syslog notification.
<code>syslog-server-list ip[:port]</code>	One to three IP addresses for remote syslog event logging.
<code>target-auth-password password</code>	CHAP password for target authentication.
<code>target-auth-username name</code>	CHAP user name for target authentication.
<code>time hh:mm:ss</code>	Group time.
<code>timezone time_zone</code>	Time zone, using a country/city designation, or a three character abbreviation (deprecated). The default is America/New_York.
<code>vss-vds [subcommand]</code>	Manages access control records for Microsoft® service access to the group.
<code>webaccess enable disable</code>	Enables (default) or disables standard Web access (port 80) to the GUI.
<code>webaccess-noencrypt enable disable</code>	Enables (default) or disables the ability to use a Web connection to the GUI that is not encrypted with SSL. For example, to <i>require</i> encryption, specify <code>disable</code> .

grpparams cliaccess-ssh

Enables (default) or disables the use of SSH to access the group or a group member, and to use the CLI.

Format

```
grpparams cliaccess-ssh enable | disable
```

Example

The following command disables SSH access:

```
> grpparams cliaccess-ssh disable
```

grpparams cliaccess-telnet

Enables (default) or disables the use of telnet to access the group or a group member, and to use the CLI.

Format

```
grpparams cliaccess-telnet enable | disable
```

Example

The following command disables telnet access:

```
> grpparams cliaccess-telnet disable
```

grpparams conn-balancing

Enables (default) or disables iSCSI connection load balancing across group members.

Format

```
grpparams conn-balancing enable | disable
```

Example

The following command disables connection load balancing:

```
> grpparams conn-balancing disable
```

grpparams date

Sets the date for the group members.

Format

```
grpparams date mm/dd/yy
```

Variable

<i>mm/dd/yy</i>	Month (mm), day of month (dd), and year (yy).
-----------------	---

Example

The following command sets the date for the group members:

```
> grpparams date 04/24/05
```

grpparams def-iscsi-alias

Specifies whether volumes will automatically use the volume name as the iSCSI target alias (*yes*, the default).

If you disable this capability (*no*), you must manually specify an alias for a volume if you want one. (It is not required that you use an alias.) Changing the group-wide setting will not affect existing volumes.

You can override the group-wide setting for a specific volume by using the `volume create` command or the `volume select` command.

Format

```
grpparams def-iscsi-alias yes | no
```

Example

The following command specifies that the volume name *not* be used automatically as the iSCSI target alias.

```
> grpparams def-iscsi-alias no
```

grpparams def-language

Sets the language for the group.

For the current release, English is the only supported language.

Format

```
grpparams def-language language
```

Variable

<code>language</code>	Sets the language for the group.
-----------------------	----------------------------------

Example

```
grpparams def-language english
```

grpparams def-snap-depletion

Specifies the group-wide default for new volumes for the action to take when the reserved snapshot space for a volume is exceeded.

The following actions are possible:

- Delete the oldest snapshot until enough space is recovered (default)
- Set the volume and its snapshots offline

Changing the group-wide setting will not affect existing volumes.

You can override the group-wide setting for a specific volume by using the `volume create` command or the `volume select` command.

Format

```
grpparams def-snap-depletion delete-oldest|volume-offline
```

Example

The following command sets the group-wide default to set volumes and their snapshots offline when the reserved snapshot space has been depleted:

```
> grpparams def-snap-depletion volume-offline
```

grpparams def-snap-reserve

Specifies the group-wide default for new volumes for the amount of space, as a percentage of the volume reserve, to reserve for volume snapshots.

The default is 100% of the volume reserve.

Changing the group-wide setting will not affect existing volumes.

You can override the group-wide setting for an individual volume by using the `volume create` command or the `volume select` command.

Format

```
grpparams def-snap-reserve n%
```

Variable

<code>n</code>	Percentage of the volume reserve to reserve for snapshots.
----------------	--

Example

The following command sets the group-wide default for reserved snapshot space to 120% of the volume reserve. Note that you must specify the percent sign.

```
> grpparams def-snap-reserve 120%
```

grpparams def-snap-warn

Specifies the group-wide default for new volumes for the threshold at which an alarm is generated because the amount of free reserved snapshot space has fallen below this threshold, defined as a percentage of the total reserved snapshot space.

The default is 10% of the total reserved snapshot space for a volume.

Changing the group-wide setting will not affect existing volumes.

You can override the group-wide setting for an individual volume by using the `volume create` command or the `volume select` command.

Format

```
grpparams def-snap-warn n%
```

Variable

<code>n</code>	Percentage of reserved space for the threshold. If free reserved space falls below this value, a warning is generated.
----------------	--

Example

The following command sets the group-wide default for free snapshot space warning threshold to 20% of the reserved space:

```
> grpparams def-snap-warn 20%
```

grpparams def-thin-growth-max

Specifies the group-wide default for new thin-provisioned volumes for the maximum percentage of the volume size that can be in use. When in-use space reaches this value, the volume will be set offline.

The default is 100%.

Changing the group-wide setting will not affect existing volumes.

You can override this value on a specific thin-provisioned volume by using the `volume create` command or the `volume select thin-growth-max` command.

Format

```
grpparams def-thin-growth-max n%
```

Variable

<i>n</i>	Maximum percentage of the volume size that can be in use for a thin-provisioned volume.
----------	---

Example

The following command sets the group-wide default to 90% for the maximum percentage of the volume size that can be in use for a thin-provisioned volume:

```
grpparams def-thin-growth-max 90%
```


grpparams def-thin-growth-warn

Specifies the group-wide default for new thin-provisioned volumes for the in-use space warning limit. When the in-use space reaches this value, as a percentage of volume size, a warning is generated.

The default is 60%.

Changing the group-wide setting will not affect existing volumes.

You can override this value on a specific thin-provisioned volume by using the `volume create` command or the `volume select thin-growth-warn` command.

Format

```
grpparams def-thin-growth-warn n%
```

Variable

<i>n</i>	Percentage of the volume size that, when reached by in-use space, generates a warning alarm and event message for a thin-provisioned volume.
----------	--

Example

The following command sets the group-wide default for the in-use space warning limit to 75% of the volume size:

```
grpparams def-thin-growth-warn 75%
```

grpparams description

Sets the group description.

Format

```
grpparams description text
```

Variable

<i>text</i>	Group description, up to 64 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.
-------------	---

Example

The following command specifies a group description:

```
> grpparams description "Testing Group"
```

grpparams disallow-downgrades

Prevents group members from reverting to a previous PS Series firmware version.

You *must* run this command if the group was updated to PS Series Firmware Version 3.2 or higher, and:

- You want to use the new features that are not supported in previous versions
- A replication partner is running Version 3.2 or higher and using the new features

This command can be used only once on a group, is applied to all the members, and cannot be reversed. If you later try to use the `update` command (see *update* on page 3-17) to install a previous firmware version on a member, the operation will fail.

Be sure you are connected to the group IP address when running this command.

Format

```
grpparams disallow-downgrades
```

Example

The following command prevents all the group members from returning to a firmware version earlier than V3.2.

```
> grpparams disallow-downgrades
```

grpparams discovery-use-chap

Discovery, or auto-discovery, involves an iSCSI initiator requesting from a target portal a list of valid targets and making those targets available for use by the initiator. To prevent hosts from discovering targets for which they are not authorized, enable the `discovery-use-chap` parameter (disabled by default). Otherwise, initiators that support discovery will attempt to log in to the target, even if they do not have the right access

credentials, resulting in a large number of events logged in the group and an inefficient use of resources.

For example, if enabled, only hosts with the correct CHAP credentials can discover targets that are only authenticated with CHAP. If disabled, unauthorized hosts can discover targets that use only CHAP for host authentication.

Format

```
grpparams discovery-use-chap enable | disable
```

Example

The following command prevents unauthorized hosts from discovering volumes that are only authenticated with CHAP:

```
> grpparams discovery-use-chap enable
```

grpparams email-contact

Enables E-Mail Home, which allows your array support provider and the specified local address to receive notification of firmware updates and hardware failures.

Note that you must specify an SMTP server or e-mail relay for any type of e-mail notification, as described in *grpparams smtp-server-list* on page 2-65. You can also specify a sender address for the notification messages, as described in *grpparams email-from* on page 2-48.

Format

```
grpparams email-contact email_address
```

Example

The following example enables E-Mail Home and allows the specified e-mail address to receive notification, in addition to your array support provider:

```
> grpparams email-contact me@myemail.com
```

grpparams email-from

Specifies the e-mail address to be used as the “From” address in e-mail notification messages generated by the group, including E-Mail Home notification, to prevent e-mail programs from rejecting the notification messages.

See *grpparams email-contact* on page 2-47, *grpparams email-list* on page 2-48, *grpparams email-notify* on page 2-49, and *grpparams smtp-server-list* on page 2-65 for more information about setting up event notification.

Format

```
grpparams email-from email_from
```

Variable

<i>email_from</i>	E-mail address of the sender.
-------------------	-------------------------------

Example

The following command specifies an e-mail address to be used as the “From” address in e-mail event notification messages:

```
> grpparams email-from admin@cust.com
```

grpparams email-list

Specifies one to five e-mail addresses to receive e-mail notification of events.

When you enable e-mail notification, by default, events with *fatal*, *error*, or *warning* priority result in notification, unless you specify different priorities with the *alerts* command, as described in *alerts* on page 2-10.

To receive e-mail event notification, you must also enable e-mail notification and specify an SMTP server or e-mail relay. See *grpparams email-notify* on page 2-49 and *grpparams smtp-server-list* on page 2-65 for more information. In addition, you can specify a sender address for the notification messages, as described in *grpparams email-from* on page 2-48.

Format

```
grpparams email-list email_addresses
```

Variable

<i>email_addresses</i>	One to five addresses, separated by a comma and no space. If you want to change any of the e-mail addresses, you must re-enter all the addresses on the command line.
------------------------	---

Example

The following command specifies two e-mail addresses to receive notification of events:

```
> grpparams email-list admin8@cust.com,jdt@mymail.com
```

grpparams email-notify

Enables or disables (default) e-mail notification.

To receive e-mail event notification, you must also specify one or more e-mail addresses to receive messages and an SMTP server or e-mail relay. See *grpparams email-list* on page 2-48 and *grpparams smtp-server-list* on page 2-65 for more information. In addition, you can specify a sender address for the notification messages, as described in *grpparams email-from* on page 2-48.

Format

```
grpparams email-notify enable | disable
```

Example

The following command enables e-mail notification:

```
> grpparams email-notify enable
```

grpparams group-ipaddress

Specifies the group IP address, which is used for group administration and host access to volumes.

If you modify the group IP address and the group is configured as a replication partner, be sure the replication partner is notified of the change. In other words, be sure the IP address stored on the replication partner is changed to match the new group IP address.

Note: Modifying the group IP address will disconnect group management sessions and iSCSI discovery sessions. If you modify the group IP address and initiators are configured statically with the group IP address, you may need to update the iSCSI initiators with the new information. However, if initiators are finding targets dynamically (for example, through iSNS), they should be able to rediscover the targets.

You must have network connectivity between the system running the initiator and the subnet containing the group IP address to perform discovery and log in to a target.

Format

```
grpparams group-ipaddress ip_address
```

Variable

<i>ip_address</i>	Group IP address.
-------------------	-------------------

Example

The following command modifies the IP address for the group:

```
> grpparams group-ipaddress 10.12.13.144
```

grpparams info-messages

Enables (default) or disables displaying live, real-time informational messages on the console and in the GUI Events window.

Messages with `INFO` priority describe normal operational and transitional events in the group. Typically, these messages are of interest to administrators but do not require intervention.

Displaying live informational messages may result in the logging of a large amount of data to the console and GUI Events window.

Format

```
grpparams info-messages disable | enable
```

Example

The following command disables displaying informational messages to the console and GUI Events window:

```
> grpparams info-messages disable
```

grpparams iscsi-local-auth

Enables (the default) or disables using local CHAP accounts to authenticate host (iSCSI initiator) access to volumes and snapshots (iSCSI targets). If enabled, the local CHAP accounts will be queried before any external RADIUS authentication servers.

To set up local CHAP accounts in the group, see *chapuser* on page 2-13.

Note: You can also use RADIUS servers to authenticate iSCSI initiator access to volumes. See *grpparams iscsi-radius-auth* on page 2-51.

Format

```
grpparams iscsi-local-auth enable | disable
```

Example

The following command disables the use of local CHAP accounts:

```
> grpparams iscsi-local-auth disable
```

grpparams iscsi-radius-auth

Enables or disables (the default) the use of RADIUS authentication servers for authenticating host (iSCSI initiator) access to volumes or Microsoft service access to the group.

Note: You can also set up local CHAP accounts in the group to authenticate iSCSI initiator access to volumes, as described in *chapuser* on page 2-13.

You can set up target authentication in addition to initiator authentication, as described in *grpparams target-auth-password* on page 2-68 and *grpparams target-auth-username* on page 2-69. Using both initiator and target authentication is called mutual authentication.

For information about specifying external RADIUS servers for authenticating host access to volumes, see *grpparams radius-auth-list* on page 2-60.

You can also specify that the group check local CHAP accounts before checking external RADIUS servers. See *grpparams iscsi-local-auth* on page 2-51 for more information.

Format

```
grpparams iscsi-radius-auth enable | disable
```

Example

The following command enables the use of RADIUS authentication servers for authenticating host iSCSI access to volumes:

```
> grpparams iscsi-radius-auth enable
```

grpparams isns-server-list

Specifies one to three IP addresses (with an optional port number) for iSNS (Internet Storage Name Service) servers.

An iSNS server can facilitate the automated discovery, management, and configuration of iSCSI devices and other devices on a TCP/IP network.

If you want to change any of the servers in the iSNS server list, you must re-enter all the IP addresses on the command line.

Format

```
grpparams isns-server-list ip_address[:port]
```

Variable

<i>ip_address[:port]</i>	One to three IP addresses, separated by a comma and no space, and optional port. The default port number is 3205.
--------------------------	---

Example

The following command sets two group iSNS servers:

```
> grpparams isns-server-list 10.11.12.13:3200,145.15.1.107
```


grpparams location

Specifies the physical location of the group, up to 64 alphanumeric characters.

The default location is `default`.

Format

```
grpparams location text
```

Variable

<i>text</i>	Group location, up to 64 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.
-------------	--

Example

The following command specifies a group location:

```
> grpparams location "Boston, 2nd floor lab"
```

grpparams login-radius-acct

Enables or disables (the default) the use of RADIUS accounting servers for tracking the activity of group administration accounts that are authenticated using RADIUS authentication servers.

To use RADIUS accounting, you must also enable RADIUS authentication for accounts, as described in *grpparams login-radius-auth* on page 2-54. For information about specifying RADIUS accounting servers, see *grpparams radius-acct-list* on page 2-57.

Format

```
grpparams login-radius-acct enable | disable
```

Example

The following command enables the use of RADIUS accounting servers:

```
> grpparams login-radius-acct enable
```

grpparams login-radius-attr

Enables (the default) or disables requiring a RADIUS authentication server to supply the EQL-Admin attribute when authenticating group administration accounts.

See *grpparams login-radius-auth* on page 2-54 for information about enabling RADIUS authentication for group administration accounts.

Note: See the PS Series *Group Administration* manual for information about additional RADIUS attributes that you can configure.

Format

```
grpparams login-radius-attr enable|disable
```

Example

The following command requires the RADIUS authentication server to supply the EQL-Admin attribute when authenticating group administration accounts:

```
> grpparams login-radius-attr enable
```

grpparams login-radius-auth

Enables or disables (the default) the use of RADIUS authentication servers for authenticating group administration accounts. Additionally, you can enable accounting to track the activity of accounts authenticated with RADIUS, as described in *grpparams login-radius-acct* on page 2-53.

Note: You can set up group administration accounts locally in the group, as described in *account* on page 2-2.

For information about specifying external RADIUS authentication servers, see *grpparams radius-auth-list* on page 2-60.

In addition, you can specify that the RADIUS authentication server supply the EQL-Admin attribute for security purposes, as described in *grpparams login-radius-attr* on page 2-54.

Format

```
grpparams login-radius-auth enable|disable
```

Example

The following command enables the use of RADIUS authentication servers for authenticating group administration accounts:

```
> grpparams login-radius-auth enable
```

grpparams name

Modifies the group name.

Modifying the group name does not disconnect current connections to the group.

If you modify the group name and the group is configured as a replication partner, be sure to also change the group name stored on the replication partner to match the new name.

Format

```
grpparams name group_name
```

Variable

<i>group_name</i>	Group name for administrative purposes, up to 54 alphanumeric characters and hyphens. The first character must be a letter. Used to identify the group for the purposes of adding new members or setting up replication.
-------------------	--

Example

The following command modifies the group name:

```
> grpparams name psg1
```

grpparams ntp-server-list

Sets one to three IP addresses (with an optional port number) for Network Time Protocol (NTP) servers.

Using an NTP server enables all group members to have a consistent time.

If you want to change any of the servers in the NTP server list, you must re-enter all the IP addresses on the command line.

Format

```
grpparams ntp-server-list ip_address[:port]
```

Variable

<code>ip_address[:port]</code>	One to three IP addresses, separated by a comma and no space, and optional port. The default port number is 123.
--------------------------------	--

Example

The following command specifies two NTP servers for the group:

```
> grpparams ntp-server-list 10.25.35.50:250,10.25.40.77
```

grpparams passwd

Specifies the password required when you add a member to a group.

The original password for adding members was set when the group was created.

Do not specify a password on the command line. After entering the `grpparams passwd` command, you will be prompted for the new password. Neither your password nor your password confirmation will be echoed on the screen.

The password must be between 3 and 16 alphanumeric characters and is case-sensitive. Do not specify an existing user or account password.

If you enter an invalid password, you will be given a chance to correct your entry. If your second entry is still incorrect, the password routine will exit, and you must re-enter the command.

Format

```
grpparams passwd
```

Example

The following command specifies a new password for adding a group member:

```
> grpparams passwd
Password for adding members:
Retype password:
Password has been changed.
```

grpparams perf-balancing

Enables (default) or disables RAID performance balancing. When enabled, the group will place volume data on members that have the optimal RAID level for the volume, based on the volume's performance metrics and historical I/O pattern.

Note: Performance load balancing occurs only after a period of time during which the group will monitor the volume's performance and I/O pattern. Over time, volume data *may* be moved across members.

Format

```
grpparams perf-balancing enable|disable
```

Example

The following command disables performance balancing in the group:

```
> grpparams perf-balancing disable
```

grpparams radius-acct-list

Specifies one to three IP addresses (with optional port number) for external RADIUS accounting servers that are used to track group administration accounts that are also authenticated with RADIUS. The servers are contacted in the order specified.

To enable RADIUS accounting, see *grpparams login-radius-acct* on page 2-53.

You may want to specify secrets (passwords) for the RADIUS accounting servers, as described in *grpparams radius-acct-secrets* on page 2-59.

In addition, you can specify retry and timeout values for contacting RADIUS accounting servers. See *grpparams radius-acct-retries* on page 2-58 and *grpparams radius-acct-timeout* on page 2-60 for more information.

Format

```
grpparams radius-acct-list ip_address[:port]
```

Variable

<i>ip_address[:port]</i>	<p>One to three IP addresses, separated by commas but no spaces, and optional port. If you do not want to use the default RADIUS server port (1812), also specify a port.</p> <p>The order in which you specify the IP addresses is the order in which they will be used. If you want to change any of the servers in the list, you must re-enter all the IP addresses.</p>
--------------------------	---

Example

The following command specifies two RADIUS accounting servers:

```
> grpparams radius-acct-list 10.25.35.52:1820,10.25.44.123
```

grpparams radius-acct-retries

Specifies the number of times the group will try to contact a RADIUS accounting servers after the first attempt fails. Once the retry limit has been reached, the group will consider the server unavailable. If there is another accounting server configured, the group will then attempt to contact that server.

For example, when a user attempts to log into a group administration account, the group will try to contact a RADIUS authentication server. Then—if the account is authenticated—the group will try to contact an accounting server. If there is no response from the initial attempt within the time limit set by the *radius-acct-timeout* parameter, the group will retry contacting the server the number of times specified by the *radius-acct-retries* parameter.

To specify RADIUS accounting servers, see *grpparams radius-acct-list* on page 2-57.

Format

```
grpparams radius-acct-retries n
```

Variable

<i>n</i>	Number of times the group will try to contact a RADIUS accounting server after the initial attempt fails. The default is 1 retry.
----------	---

Example

The following command specifies that the group attempt to contact a RADIUS accounting server two times after the initial attempt fails:

```
> grpparams radius-acct-retries 2
```

grpparams radius-acct-secrets

Specifies secrets (passwords) for the external RADIUS accounting servers that are used to track group administration accounts that are authenticated with a RADIUS authentication server.

To specify RADIUS accounting servers, see *grpparams radius-acct-list* on page 2-57.

Format

```
grpparams radius-acct-secrets secrets
```

Variable

<i>secrets</i>	<p>One to three secrets (passwords), up to 63 characters each, separated by commas and no spaces.</p> <p>The order in which you specify the secrets must correspond to the configured accounting servers. That is, the first secret will be associated with the first server specified with the <code>radius-acct-list</code> parameter, as described in <i>grpparams radius-acct-list</i> on page 2-57. The second secret will be associated with the second server, and so on.</p>
----------------	--

Example

The following command specifies secrets for two RADIUS accounting servers:

```
> grpparams radius-acct-secrets gofish2,lin2006
```

grpparams radius-acct-timeout

Specifies the number of seconds the group will wait for a RADIUS accounting server to respond before timing out.

For example, when a user attempts to log into a group administration account, the group will try to contact a RADIUS authentication server. Then—if the account is authenticated—the group will try to contact a RADIUS accounting server. If the server does not respond within the timeout period, the attempt at contact will fail. Depending on the value of the `radius-acct-retries` parameter, the group may retry contacting the server.

To specify RADIUS accounting servers, see *grpparams radius-acct-list* on page 2-57.

Format

```
grpparams radius-acct-timeout n
```

Variable

<i>n</i>	Number of seconds to wait for a response from a RADIUS accounting server. The default is 2 seconds.
----------	---

Example

The following command specifies that the group wait 3 seconds for a RADIUS accounting server to respond:

```
> grpparams radius-acct-timeout 3
```

grpparams radius-auth-list

Specifies one to three IP addresses (with optional port number) for external RADIUS authentication servers. These servers can be used to authenticate host (iSCSI initiator) access to volumes through CHAP, authenticate group administration accounts, or authenticate Microsoft service access to the group. The servers are contacted in the order specified.

To enable RADIUS authentication for host access to volumes, see *grpparams iscsi-radius-auth* on page 2-51. To enable RADIUS authentication for group administration accounts, see *grpparams login-radius-auth* on page 2-54.

You may want to specify secrets (passwords) for the authentication servers, as described in *grpparams radius-auth-secrets* on page 2-62.

In addition, you can specify retry and timeout values for the servers. See *grpparams radius-auth-retries* on page 2-61 and *grpparams radius-auth-timeout* on page 2-63 for more information.

Note: After you have configured the group to use a RADIUS authentication server for host access to volumes, you can create an access control record for the volume to which you want to restrict access and in the record specify a CHAP account name that corresponds to an account on the RADIUS server. For more information on setting up access control records, see *volume select access create* on page 2-180.

Format

```
grpparams radius-auth-list ip_address[:port]
```

Variable

<i>ip_address[:port]</i>	<p>One to three IP addresses, separated by commas but no spaces, and optional port. If you do not want to use the default RADIUS server port (1812), also specify a port.</p> <p>The order in which you specify the IP addresses is the order in which they will be used. If you want to change any of the servers in the list, you must re-enter all the IP addresses.</p>
--------------------------	---

Example

The following command specifies two RADIUS authentication servers:

```
> grpparams radius-auth-list 10.25.35.52:1820,10.25.44.123
```

grpparams radius-auth-retries

Specifies the number of times the group will try to contact a RADIUS authentication server after the first attempt fails. Once the retry limit has been reached, the group will consider the server unavailable. If there is another authentication server configured, the group will then attempt to contact that server.

For example, when a host (iSCSI initiator) attempts to connect to a volume (or a user attempts to log into an administration account), the group will try to contact a RADIUS

authentication server. If there is no response from the initial attempt within the time limit specified by the `radius-auth-timeout` parameter, the group will retry contacting the server the number of times specified by the `radius-auth-retries` parameter.

To specify RADIUS authentication servers, see *grpparams radius-auth-list* on page 2-60.

Format

```
grpparams radius-auth-retries n
```

Variable

<i>n</i>	Number of times the group will try to contact a RADIUS authentication server after the initial attempt fails. The default is 1 retry.
----------	---

Example

The following command specifies that the group attempt to contact a RADIUS authentication server two times after the initial attempt fails:

```
> grpparams radius-auth-retries 2
```

grpparams radius-auth-secrets

Specifies secrets (passwords) for the external RADIUS authentication servers that are used to authenticate host access to volumes, authenticate group administration accounts, or authenticate Microsoft service access to the group.

To specify RADIUS authentication servers, see *grpparams radius-auth-list* on page 2-60.

Format

```
grpparams radius-auth-secrets secrets
```

Variable

<i>secrets</i>	<p>One to three secrets (passwords), up to 63 characters each, separated by commas and no spaces.</p> <p>The order in which you specify the secrets must correspond to the configured authentication servers. That is, the first secret will be associated with the first server specified with the <code>radius-auth-list</code> parameter. The second secret will be associated with the second server, and so on.</p>
----------------	--

Example

The following command specifies secrets for two RADIUS authentication servers:

```
> grpparams radius-auth-secrets bigboy1,chen1492
```

grpparams radius-auth-timeout

Specifies the number of seconds the group will wait for a RADIUS authentication server to respond before timing out.

For example, when a host attempts to connect to a volume (or a user attempts to log into an administration account), the group will try to contact a RADIUS authentication server. If the server does not respond within the timeout period, the attempt at contact will fail. Depending on the value of the `radius-auth-retries` parameter, the group may retry contacting the server.

To specify RADIUS authentication servers, see *grpparams radius-auth-list* on page 2-60.

Format

```
grpparams radius-auth-timeout n
```

Variable

<i>n</i>	Number of seconds to wait for a response from a RADIUS authentication server. The default is 2 seconds.
----------	---

Example

The following command configures the group to wait 3 seconds for a RADIUS authentication server to respond:

```
> grpparams radius-auth-timeout 3
```

grpparams show

Displays the current values of all the group parameters or a specific list parameter.

Format

```
grpparams show [list-parameter]
```

Variable

<i>list-parameter</i>	One of the following list parameters: <ul style="list-style-type: none">• isns-server-list• smtp-server-list• email-list• radius-auth-list• syslog-server-list• ntp-server-list• radius-acct-list
-----------------------	---

Examples

The following command displays an IP address for a remote syslog server:

```
> grpparams show syslog-server-list
```

```
Syslog Server List :: 182.1.12.144
```

The following command shows the values of the group parameters:

```
> grpparams show
```

```

_____ Group Information _____
Name: group1                               Group-IpAddress: 111.19.106.140
Def-Snap-Reserve: 100%                     Def-Snap-Warn: 10%
Def-Snap-Depletion: delete-oldest          Def-Thin-Growth-Warn: 60%
Def-Thin-Growth-Max: 100%                 DateAndTime: Wed May 2 14:50:28 2007
TimeZone: America/New_York                Description:
Def-Iscsi-Prefix:                          Def-Iscsi-Alias: yes
  iqn.2001-05.com.equallogic               Info-Messages: enabled
Webaccess: enabled                         Webaccess-noencrypt: enabled
Cliaccess-SSH: enabled                     Cliaccess-Telnet: enabled
Email-Notify: enabled                     Syslog-Notify: enabled
iSNS-Server-List:                          Email-List: kabbott@company.com
NtpServers:                                Sntp-Server-List: 123.77.32.4
Syslog-Server-List: 111.23.4.56            Target-Auth-UserName:
Target-Auth-Password:                      pRJXHpjz2XbPBB2B
  Rxr2RJPxhHPXjXBX                       Email-From: kabbott@company.com
Location: default                          Conn-Balancing: enabled
Discovery-Use-Chap: disabled               Email-Contact:
Perf-balancing: enabled                     Disallow-Downgrades: yes

```

```

_____ Radius Information _____
radius-auth-list:                          login-radius-auth: disabled
radius-auth-retries: 1                     radius-auth-timeout: 2secs
login-radius-acct: disabled                 radius-acct-retries: 1
radius-acct-timeout: 2secs                  iscsi-radius-auth: disabled
iscsi-local-auth: enabled                   radius-acct-list:
login-radius-attr: enabled                  radius-auth-secrets:
radius-acct-secrets:

```

```

_____ Snmp Information _____
read-only-comms: public                     read-write-comms:
trap-community: SNMP-trap                   snmp-managers:

```

grpparams smtp-server-list

Sets one to three IP addresses (with an optional port number) for SMTP (Simple Mail Transfer Protocol) servers or e-mail relays used for e-mail event notification.

If you want to change any of the servers in the SMTP server list, you must re-enter all the IP addresses on the command line.

Note: To set up e-mail notification, you must also specify one or more e-mail addresses to receive the e-mail and enable e-mail event notification. See *grpparams email-list* on page 2-48 and *grpparams email-notify* on page 2-49 for more information. In addition, you can specify a sender address for the notification messages, as described in *grpparams email-from* on page 2-48.

Format

```
grpparams smtp-server-list ip_address[:port]
```

Variable

<i>ip_address[:port]</i>	One to three IP addresses, each separated by a comma and no space, and optional port. The default port number is 125.
--------------------------	---

Example

The following command specifies an SMTP server for the group:

```
> grpparams smtp-server-list 12.34.167.25
```

grpparams snmp

Displays and sets SNMP (Simple Network Management Protocol) configuration parameters, such as community strings and trap destinations.

Format

```
grpparams snmp show|parameter
```

Parameters

<i>read-only-comms string</i>	One or more read-only community strings, separated by commas and no spaces, used by the SNMP agent to authenticate SNMP requests.
<i>read-write-comms string</i>	One or more read-write community strings, separated by commas and no spaces, used by the SNMP agent to authenticate SNMP requests.
<i>snmp-managers string</i>	One or more SNMP managers, separated by commas and no spaces, that can set and receive SNMP traps.
<i>trap-community string</i>	Community string used by the SNMP agent when sending traps.

trap-destinations <i>ips</i>	Up to five IP addresses, separated by commas and no spaces, to which the SNMP agent sends traps.
------------------------------	--

Example

The following command displays the current SNMP community strings and trap destination:

```
> grpparams snmp show
```

```

_____ Snmp Information _____
read-only-comms:                read-write-comms:
trap-community: SNMP-trap       snmp-managers:

```

grpparams syslog-notify

Enables or disables (default) event logging to remote syslog servers.

When you enable syslog notification, by default, events with *fatal*, *error*, or *warning* priority result in notification, unless you specify different priorities with the *alerts* command, as described in *alerts* on page 2-10.

Note: To use syslog notification, you must also specify IP addresses for the syslog servers, as described in *grpparams syslog-server-list* on page 2-67.

Format

```
grpparams syslog-notify enable | disable
```

Example

The following command enables syslog notification:

```
> grpparams syslog-notify enable
```

grpparams syslog-server-list

Sets one to three IP addresses (with an optional port number), separated by commas and no spaces, for remote servers that will log events to a remote syslog-style log file.

The servers must be configured to accept remote log files. The default port number is 514 (UDP).

Note: To use syslog notification, you must also enable syslog notification, as described in *grpparams syslog-notify* on page 2-67.

If you want to change any of the servers in the syslog server list, you must re-enter all the IP addresses on the command line.

Format

```
grpparams syslog-server-list ip_addresses[:port]
```

Variable

<i>ip_addresses[:port]</i>	One to three IP addresses, separated by commas and no spaces, and optional port.
----------------------------	--

Example

The following command specifies an IP address for a remote server:

```
> grpparams syslog-server-list 12.34.567.89:510
```

grpparams target-auth-password

Specifies a CHAP password to be used for target authentication, which allows the volume (iSCSI target) to be authenticated by the host (iSCSI initiator).

Note: You must also specify the target authentication user name, as described in *grpparams target-auth-username* on page 2-69.

You cannot use target authentication without also setting up initiator authentication, as described in *chapuser* on page 2-13 and *grpparams cliaccess-ssh* on page 2-39. Using both initiator and target authentication is called mutual authentication.

Format

```
grpparams target-auth-password password
```

Variable

<i>password</i>	Password, up to 255 alphanumeric characters. If you specify an empty string between quotation marks, the password will be generated automatically.
-----------------	--

Example

The following command specifies a password to be used for target authentication:

```
> grpparams target-auth-password jjbaset29
```

The following command specifies automatic password generation:

```
> grpparams target-auth-password ""
```

Generating password.

New Password is PXXpb8pZ8PBJH2Pp

grpparams target-auth-username

Specifies a CHAP user name to be used for target authentication, which allows the volume (iSCSI target) to be authenticated by the host (iSCSI initiator).

Note: You must also specify the target authentication password, as described in *grpparams target-auth-password* on page 2-68.

You cannot use target authentication without also setting up initiator authentication, as described in *chapuser* on page 2-13 and *grpparams cliaccess-ssh* on page 2-39. Using both initiator and target authentication is called mutual authentication.

Format

```
grpparams target-auth-username name
```

Variable

<i>name</i>	User name, up to 255 alphanumeric characters.
-------------	---

Example

The following command specifies a user name for target authentication:

```
> grpparams target-auth-username target1492
```

grpparams time

Sets the time for the group.

Format

```
grpparams time hh:mm:ss
```

Variable

<i>hh:mm:ss</i>	Time in 24-hour format: hours (hh), minutes (mm), and seconds (ss).
-----------------	---

Example

The following command sets the group time to 1:46 PM:

```
> grpparams time 13:46:00
```

grpparams timezone

Sets the time zone for the group, using a country and city designation or a three-letter abbreviation (deprecated).

The default is America/New_York.

Format

```
grpparams timezone zone
```

Variable

<i>zone</i>	Time zone. To see a list of time zones, use the following command: > grpparams timezone ?
-------------	--

Example

The following command sets the timezone for the group to Pacific Time for North America (the U.S.):

```
> grpparams timezone America/Los_Angeles
```

grpparams vss-vds

Manages access control records for Microsoft service access to the group, including Volume Shadow Copy Service (VSS) and Virtual Disk Service (VDS).

When you create an access control record, the record is automatically assigned an identification number. Use this number to manage the record with the CLI.

Note: If you are using CHAP to authenticate access to the group, you will have to set up a CHAP account either locally, as described in *chapuser* on page 2-13, or on a RADIUS server that is known to the group, as described in *grpparams radius-auth-list* on page 2-60.

The Windows server that is running the Microsoft service must be configured with a matching CHAP user name and password. You can use the Remote Setup Wizard to set these credentials. See the Host Integration Tools documentation for more information.

Format

```
grpparams vss-vds access [subcommand] | show
```

Subcommands

<code>create [<i>parameter</i>]</code>	Creates an access control record for Microsoft service access to the group.
<code>delete <i>id</i></code>	Deletes the specified Microsoft service access control record.
<code>select <i>id</i> [<i>parameter</i>]</code>	Displays or modifies a Microsoft service access control record.
<code>show</code>	Displays information about all Microsoft service access control records.

Parameters

<code>username <i>chap_name</i></code>	<p>CHAP account name (up to 128 characters) to which access is restricted. The name must match a local CHAP account or an account on an external RADIUS server that is known to the group.</p> <p>You must also specify the <code>authmethod chap</code> parameter for CHAP authentication.</p>
--	---

<code>ipaddress ip_address</code>	<p>IP address to which access is restricted. An asterisk (*) in any of the four parts of an IP address is interpreted as a wildcard character; that is, any value is accepted for that 8-bit field.</p> <p>For example, specify *. *. *. * for unrestricted host access (not recommended except for testing).</p>
<code>initiator name</code>	<p>Name of the iSCSI initiator to which group access is restricted.</p> <p>For example:</p> <pre>iqn.2000-05.com.qlogic.qla-4000.sn00044</pre>
<code>authmethod chap none</code>	<p>Specifies whether the record uses CHAP authentication (<code>chap</code>) to restrict Microsoft service access to the group. The default is <code>none</code>; CHAP authentication is not used.</p> <p>You must also specify the username <code>chap_name</code> parameter for CHAP authentication.</p>
<code>show</code>	Displays details about the selected access control record.

Example

The following command creates a Microsoft service access control record that restricts group access to hosts that supply the correct CHAP user name and password:

```
# grpparams vss-vds access create authmethod chap username adm32
```

grpparams webaccess

Enables (default) or disables the use of standard HTTP Web connections (through port 80) to the group manager GUI.

If you want to restrict GUI access to Web connections that are secured with SSL, see *grpparams webaccess-noencrypt* on page 2-73.

Format

```
grpparams webaccess enable | disable
```

Example

The following command disables standard Web access to the GUI:

```
> grpparams webaccess disable
```

grpparams webaccess-noencrypt

Enables (the default) or disables requiring access to the GUI through a Web connection that is not encrypted with SSL.

If enabled, SSL encryption is not required. If you want to *require* GUI access only through Web connections that are secured with SSL encryption, disable `webaccess no-encrypt` and install the Java plug-in with SSL on the host running the Web browser. Also, you must select the checkbox next to `Encrypt` communication in the GUI login dialog box.

Format

```
grpparams webaccess-noencrypt enable | disable
```

Example

The following command specifies that you can access the GUI *only* through a Web connection that is secured with SSL encryption:

```
> grpparams webaccess-noencrypt disable
```

member

Manages group members.

Note: You cannot use member disk space for volumes until you choose a RAID policy for the member, as described in *member select* on page 2-76.

Format

member *subcommand*

Subcommands

delete	Removes a member from the group.
rename	Renames a member.
select	Displays or modifies a member configuration, including the network configuration, pool assignment, and RAID policy for the member.
show	Displays information about all the group members or a specific member.

member delete

Removes a member from its assigned pool and the group and resets the array to its factory defaults. Resetting an array eliminates any group, member, and volume configuration information on the array.

When you remove a member, volume, snapshot, and replication data located on the member is moved (vacated) to the remaining pool members, with no impact on availability.

If the remaining pool members do not have enough free space to store the data from the member being removed, you cannot perform the operation. Increase the capacity of the remaining members until there is enough free space to store the data and retry the operation.

The time to complete a member removal depends on the amount of volume data that must be moved.

You can cancel the member delete operation if it has not completed.

Notes: You cannot remove the only member of a group. You also cannot remove a member if it is the last member in a pool that contains volumes. You must move the volumes to a different pool before you can remove the member.

You cannot remove more than one member at a time.

To check member status, use the `member show` command. While volume data is moving to other members, the member status is `vacating-in-progress`. When complete, the member no longer appears in the `member show` output.

In rare cases, you may need to remove a member that is offline (for example, if the member has experienced a catastrophic failure and is no longer operational). When you remove an offline member, an error message will appear stating that the vacate has failed; that is, the member's data could not be moved to the remaining pool members. When prompted, you must confirm that you still want to remove the member. Then, the offline member will be removed.

Format

```
member delete member_name
```

Variable

<i>member_name</i>	Name of a member.
--------------------	-------------------

Example

The following command removes a member from its assigned pool and the group:

```
> member delete member16
```

```
Do you really want to delete the member? (y/n) [n] y
Member deletion succeeded.
```

member rename

Renames a member.

Format

```
member rename member_name new_member_name
```

Variables

<code>member_name</code>	Name of a member.
<code>new_member_name</code>	New member name, up to 64 alphanumeric characters.

Example

The following command changes the name of a member to `memstaff2`:

```
> member rename memlab1 memstaff2
```

member select

Displays or modifies the configuration of the selected member, including the network configuration, RAID policy, and the pool to which the member is assigned. You can also cancel an in-progress member operation, such as a member delete (vacate) operation.

Format

```
member select member_name subcommand | parameter...
```

Variable

<code>member_name</code>	Name of a member.
--------------------------	-------------------

Subcommands

<code>disk select show</code>	Displays information about all member disks or the selected disk, or clears a disk with <code>foreign</code> status.
<code>eth select show</code>	Configures or modifies the selected network interface or displays the network configuration for the member.
<code>show [component]</code>	Displays detailed information about the member or the specified member component: <code>connections</code> , <code>controllers</code> , <code>disks [n]</code> , <code>enclosure</code> , <code>eths [n]</code> , <code>version</code> , or <code>volumes</code> .

Parameters

<code>cancel-operation op_id</code>	Cancels an in-progress move or delete operation. Use the <code>member select show</code> command to obtain the operation's ID number.
-------------------------------------	---

<code>controller-safe enable disable</code>	Enables or disables (default) controller-safe mode for the member. The default (disable) is the recommended setting.
<code>def-gateway ip_address</code>	Default gateway for the member.
<code>delay-data-move enable disable</code>	<p>Enables or disables (default) functionality that delays using the member storage space until the initial RAID verification completes and batteries are fully charged.</p> <ul style="list-style-type: none"> • If disabled (the default, recommended option), the member space will be used immediately. However, member performance will not be optimal while the RAID verification is in progress. • If enabled, the member space will not be used until the verification completes and the batteries are charged. <p>Note: You can enable <code>delay-data-move</code> only when setting the member RAID policy for the first time (see the <code>raid-policy</code> parameter). You can disable the functionality at any time. However, once disabled, you cannot re-enable this functionality.</p>
<code>description text</code>	Description for the member, up to 128 alphanumeric characters. If the <code>text</code> variable contains spaces, surround it with quotation marks.
<code>locate enable disable</code>	<p>Enables or disables the flashing of array LEDs for the purpose of locating the array.</p> <p>Flashing stops automatically after two hours.</p>
<code>low-battery-safe enable disable</code>	Enables (default) or disables low-battery-safe mode for the selected member. The default (enable) is the recommended setting. Disabling low-battery-safe mode is not recommended because of the risk of data loss if an array loses power.
<code>pool pool_name</code>	<p>Assigns the member to a pool. Note that moving a member from one pool to another can be a lengthy operation, because volume data on the member must be moved to the remaining pool members. The data movement will compete with user I/O for computational and network bandwidth.</p> <p>You can cancel a move operation.</p> <p>Only one member at a time can be moved into or out of a pool.</p>

<code>raid-policy policy</code>	<p>Sets the RAID policy for the member, either <code>raid5</code>, <code>raid10</code>, <code>raid50</code>, <code>raid10-nospares</code>, or <code>raid50-nospares</code>. (The no-spare policies are not available through the Group Manager GUI.)</p> <p>Note: For the highest availability, choose a RAID policy that includes spare disks, which are used automatically if a disk fails.</p> <p>The <i>first</i> time you set the RAID policy for a member, you can also enable functionality that delays using the member space until the initial RAID verification completes and the batteries are fully charged. See the <code>delay-data-move</code> parameter above.</p> <p>Once you set a member RAID policy, only the following conversions are supported:</p> <ul style="list-style-type: none"> • <code>raid10</code> to <code>raid50</code> or <code>raid5</code> • <code>raid50</code> to <code>raid5</code> • <code>raid10-nospares</code> to <code>raid50-nospares</code> <p>When you change the RAID policy, the member's RAID status will be <code>expanding</code>. The new disk space will be unavailable until the conversion completes.</p>
---------------------------------	---

Examples

The following command sets the RAID policy for a member for the first time:

```
> member select memlab2 raid-policy raid50
```

The following command assigns a member to the `staffpool`:

```
> member select memlab2 pool staffpool
```

member select disk select clear-label

Clears the label on the selected disk.

If a disk was previously installed in a different array or removed and then reinstalled in the same array, it will have a `foreign` status. The disk will not be incorporated into a RAIDset either as a spare or for expansion purposes until you clear the label. If you have inadvertently inserted the drive into the array, remove it immediately.

Format

```
member select member_name disk select disk clear-label
```

Variables

<i>member_name</i>	Name of a member.
<i>disk</i>	Disk slot number (0 to 13).

Example

The following command clears the label on a disk in slot 0:

```
> member select memlab2 disk select 0 clear-label
```

member select disk select show

Displays detailed information about the selected disk.

Format

```
member select member_name disk select disk show
```

Variables

<i>member_name</i>	Name of a member.
<i>disk</i>	Disk slot number (0 to 13).

Example

The following command displays detailed information about the disk in slot 0:

```
> member select memlab2 disk select 0 show
```

```

_____ Disk Information _____
Slot: 0                               Status: online
Model: MODELINFOXX                   Revision: 3.AEG
Size: 698.64GB                        Errors: 0

```

member select disk show

Displays information about the disks in the selected member.

Format

```
member select member_name disk show
```

Variable

<i>member_name</i>	Name of a member.
--------------------	-------------------

Examples

The following command displays information about the member disks on a PS5000 array with SAS disks:

```
> member select mem02 disk show
```

Slot	Type	Model	Size	Status	Errors
0	SAS	MODELINFO	34.25GB	online	0
1	SAS	MODELINFO	34.25GB	online	0
2	SAS	MODELINFO	34.25GB	online	0
3	SAS	MODELINFO	34.25GB	online	0
4	SAS	MODELINFO	34.25GB	online	0
5	SAS	MODELINFO	34.25GB	online	0
6	SAS	MODELINFO	34.25GB	online	0
7	SAS	MODELINFO	34.25GB	online	0
8	SAS	MODELINFO	34.25GB	online	0
9	SAS	MODELINFO	34.25GB	online	0
10	SAS	MODELINFO	34.25GB	online	0
12	SAS	MODELINFO	34.25GB	online	0
13	SAS	MODELINFO	34.25GB	online	0
14	SAS	MODELINFO	34.25GB	online	0
15	SAS	MODELINFO	34.25GB	online	0

member select eth select

Configures or modifies the selected network interface.

To configure a network interface, you must specify an IP address and netmask (subnet mask).

Note: To enable the interface (allow it to handle network traffic), specify the `up` parameter in a separate step.

If network problems occur, group members may lose the ability to communicate with each other over the network. In this situation, some management operations are not allowed—for example, you cannot change the IP address assigned to an isolated member's network interface.

If the group gets into a state where members lose communication, identify the network problems that caused it and fix them. This will restore the group to normal full operation, including network communication.

Format

```
member select member_name eth select port parameter ...
```

Variables

<i>member_name</i>	Name of a member.
<i>port</i>	Port number of the network interface (0, 1, or 2). For example, specify 0 for <code>eth0</code> .

Parameters

<code>description</code> <i>text</i>	Description for the network interface, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks. Note: Must be specified on a separate command line from the other parameters.
<code>ipaddress</code> <i>ip_address</i>	IP address for the network interface.
<code>netmask</code> <i>mask_ip</i>	Netmask address (subnet mask) for the network interface.
<code>up down</code>	Enables (<code>up</code>) or disables (<code>down</code>) the interface for I/O traffic. Note: Must be specified on a separate command line from the other parameters.

Examples

The following commands configure the `eth1` network interface and then enable it:

```
> member select m5
(member_m5)> eth select 1 ipaddress 131.22.3.8 netmask 255.255.255.0
> member select m5 eth select 1 up
```

The following command adds a description to the `eth1` network interface:

```
> member select m5 eth select 1 description Eth-1
```

The following command disables the `eth2` network interface:

```
> member select memlab2 eth select 2 down
```

member select eth select show

Displays the configuration of the selected network interface.

Format

```
member select member_name eth select port show
```

Variables

<i>member_name</i>	Name of a member.
<i>port</i>	Port number of the network interface that you want to modify or configure (0, 1, or 2). For example, specify 2 for <code>eth2</code> .

Example

The following command displays the configuration for `eth0`:

```
> member select member7 eth select 0 show
```

```
_____ Eth Information _____
Name: eth0                               Status: up
Changed: Tue Jun 13 16:33:39 2006        Type: ethernet-csmacd
DesiredStatus: up                        Mtu: 9000
Speed: 1000000000                        HardwareAddress: 00:09:8A:01:4A:6D
IpAddress: 182.19.1.47                   NetMask: 255.255.255.0
Description: Eth-0
```

member select eth show

Displays the configuration of the network interfaces on the selected member.

Format

```
member select member_name eth show
```

Variable

<i>member_name</i>	Name of a member.
--------------------	-------------------

Example

The following command displays information about the network interfaces on a member:

```
> member select member7 eth show
```

Name	ifType	ifSpeed	Mtu	IpAddress	Status	Errors
----	-----	-----	----	-----	-----	-----
eth0	ethernet-csmacd	10000000	1500	182.19.1.47	down	0
eth1	ethernet-csmacd	10000000	1500	182.19.1.48	down	0
eth2	ethernet-csmacd	1000000000	9000	182.19.1.49	up	0

member select show

Displays detailed information about a group member, including member status and RAID status, or a member component.

The hardware information displayed depends on the array model.

Format

```
member select member_name show [component]
```

Variables

<i>member_name</i>	Name of a member.
<i>component</i>	Member component for which you want information, either connections, controllers, disks [<i>n</i>], enclosure, eths [<i>n</i>], version, or volumes. Specify version for information about the versions for the member hardware components.

Examples

The following command displays detailed member information:

```
> member select memlab2 show
```

```

_____ Member Information _____
Name: member2                      Status: online
TotalSpace: 0MB                     UsedSpace: 0MB
SnapSpace: 0MB                      Description:
Def-Gateway: 121.22.0.1             Serial-Number: OICU812
Disks: 14                            Spares: 2
Controllers: 2                       CacheMode: write-back
Connections: 0                       RaidStatus: verifying
RaidPercentage: 62%                 LostBlocks: false
HealthStatus: normal                 LocateMember: disable
Controller-Safe: disabled            Low-Battery-Safe: enabled
Version: V3.3.0                      Delay-Data-Move: enable
Pool: pool2                           Raid-policy: raid50
_____

_____ Health Status Details _____

Critical conditions::
None

Warning conditions::
None

_____

_____ Operations InProgress _____

ID StartTime                      Progress Operation Details
-----

```

The member status (Status field) is shown in Table 2-3.

Table 2-3: Member Status

Status	Description
online	Member is a functioning member of the group. However, a member may experience a failure but still function in the group. Check the member health status for more information.
online, moving	Member is moving to a different pool. The time to move a member depends on the amount of data that must be moved from the member to the remaining pool members.
offline	Member was shut down or experienced a failure. Note: If a member fails, you must quickly identify and correct the problem.
vacating-in-progress	Member is in the process of moving volume data to the remaining group members prior to being removed from a pool and the group. The time to remove a member depends on the amount of data that must be moved from the member to the remaining pool members.
vacated	Member has successfully moved its data to the remaining pool members prior to being removed from the group.

The RAID status (`RaidStatus` field) is shown in Table 2-4.

Table 2-4: RAID Status

Status	Description
ok	Disk array has successfully initialized and performance is normal.
expanding	Disk array is expanding (for example, because additional disks have been installed or the RAID level is changing from RAID 10 to RAID 50).
verifying	Disk array is initializing (for example, when the member's RAID policy is set).
degraded	A RAID set is degraded (for example, because a disk has failed and there is no spare to replace it). If the RAID level is RAID 5 or RAID 50, performance may be impaired. Note: If the RAID status is degraded, immediately identify and replace any failed disks. It is recommended that spare disks be installed and functioning in an array.

Table 2-4: RAID Status (Continued)

Status	Description
reconstructing	<p>Disk array is reconstructing data on a disk (for example, because a disk has failed and a spare is being used to replace it). During reconstruction, performance may decline. After reconstruction, performance will return to normal, unless a RAID set is degraded.</p> <p>Note: If the RAID status is <code>reconstructing</code>, immediately identify and replace any failed disks. It is recommended that spare disks be installed and functioning in an array.</p>
failed	<p>Multiple disk failures in a RAID 1 set or RAID 5 set have caused the disk array to fail. The member will be set offline.</p> <p>Note: If the RAID status is <code>failed</code>, contact your array support provider.</p>
catastrophic loss	<p>Disk array has lost group metadata or user data. The array will not initialize and an error message will appear on the console at regular intervals.</p> <p>Note: If the RAID status is <code>catastrophic loss</code>, contact your array support provider.</p> <p>See the <code>clearlostdata</code> command in Chapter 3 for more information about catastrophic data loss.</p>

The following command displays detailed information about the control modules in an array:

```
> member select member1 show controllers
```

```

_____ Controller Information _____
SlotID: 0                               Status: active
Model: 70-0111                           BatteryStatus: ok
ProcessorTemperature: 66                  ChipsetTemperature: 34
LastBootTime: 2007-04-24:15:10:02        SerialNumber: RMS8330800010ED
Manufactured: 0407                       ECOLevel: C00
CM Rev.: R05                              FW Rev.: V3.3.0
NVRAM Battery: good                      BootRomVersion: 4.4.6
BootRomBuildDate: Fri Dec 15 01:46:38
    EST 2006

SlotID: 1                               Status: secondary
Model: 70-0111                           BatteryStatus: ok
ProcessorTemperature: 62                  ChipsetTemperature: 34
LastBootTime: 2007-04-24:15:10:19        SerialNumber: RMS8330800010DB

```

```

Manufactured: 0407          ECOLevel: C00
CM Rev.: R05              FW Rev.: V3.3.0
NVRAM Battery: good      BootRomVersion: 4.4.6
BootRomBuildDate: Fri Dec 15 01:46:38
EST 2006

```

Cache Information

```

CacheMode: write-back      Controller-Safe: disabled
Low-Battery-Safe: enabled

```

The following command displays the disks installed in a member.

```
> member select mem1 show disks
```

Slot	Type	Model	Size	Status	Errors
0	SATA	MODELINFOXX	698.64GB	online	0
1	SATA	MODELINFOXX	698.64GB	online	0
2	SATA	MODELINFOXX	698.64GB	online	0
3	SATA	MODELINFOXX	698.64GB	online	0
4	SATA	MODELINFOXX	698.64GB	online	0
5	SATA	MODELINFOXX	698.64GB	online	0
6	SATA	MODELINFOXX	698.64GB	online	0
7	SATA	MODELINFOXX	698.64GB	online	0
8	SATA	MODELINFOXX	698.64GB	online	0
9	SATA	MODELINFOXX	698.64GB	online	0
10	SATA	MODELINFOXX	698.64GB	online	0
11	SATA	MODELINFOXX	698.64GB	online	0
12	SATA	MODELINFOXX	698.64GB	spare	0
13	SATA	MODELINFOXX	698.64GB	spare	0

The following command displays information about the disk in slot 0:

```
> member select mem1 show disks 0
```

Disk Information

```

Slot: 0                    Status: online
Model: MODELINFOXX        Revision: 3.AEG
Size: 698.64GB           Errors: 0

```

The following command displays information about the member enclosure (temperature sensors, fans, and power supplies):

```
> member select mem1 show enclosure
```

Temperature Sensors			
Name	Value	Normal Range	Status
Control module 0 processor	66	10-90	normal
Control module 0 chipset	34	10-45	normal
Control module 1 processor	62	10-90	normal
Control module 1 chipset	34	10-45	normal
Control module 0 SAS Controller	62	10-110	normal
Control module 0 SAS Expander	68	10-110	normal
Control module 0 SES Enclosure	35	10-45	normal
Control module 1 SAS Controller	63	10-110	normal
Control module 1 SAS Expander	67	10-110	normal

Fans			
Name	Speed	Normal Range	Status
Power Cooling Module 0 Fan 0	4950	2100-5200	normal
Power Cooling Module 0 Fan 1	4800	2100-5200	normal
Power Cooling Module 1 Fan 0	4770	2100-5200	normal
Power Cooling Module 1 Fan 1	4770	2100-5200	normal

Power Supplies		
Name	Status	FanStatus
Power Cooling Module 0	on	not-applicable
Power Cooling Module 1	on	not-applicable

The following command displays information about the network ports in an array:

```
> member select mem1 show eths
```

Name	ifType	ifSpeed	Mtu	IpAddress	Status	Errors
eth0	ethernet-csmacd	1000000000	9000	111.22.106.141	up	0
eth1	ethernet-csmacd	10000000	1500		down	0
eth2	ethernet-csmacd	10000000	1500		down	0

The following command displays information about the status of Ethernet port 0:

```
> member select mem1 show eth 0
```

```

----- Eth Information -----
Name: eth0                               Status: up
Changed: Tue Apr 24 15:10:25 2007        Type: ethernet-csmacd
DesiredStatus: up                        Mtu: 9000
Speed: 1000000000                        HardwareAddress: 00:09:8A:02:1A:1D
IpAddress: 111.22.106.141                NetMask: 255.255.0.0
Description:
-----

```

The following command displays the component version information for an array:

```
> member select mem1 show version
```

Component	Part#	Rev	SN	ECO
Backplane	62532	NA	ABC123456789100	NA
PCM0	64362	NA	XYZ456123987123	NA
PCM1	64362	NA	XYZ441654321321	NA
CM0	70-0101	R02	Z000095	C05
CM1	70-0101	R02	Z000076	C07

```

----- Disks -----
Slot Type      Model                      Revision Serial Number
-----
0   SAS        MODELINFO                  0103   SERLP53000NM
1   SAS        MODELINFO                  0103   SERLP53000TV
2   SAS        MODELINFO                  0103   SERLP5300126
3   SAS        MODELINFO                  0103   SERLP5300142
4   SAS        MODELINFO                  0103   SERLP530013M
5   SAS        MODELINFO                  0103   SERLP530013V
6   SAS        MODELINFO                  0103   SERLP53000TA
7   SAS        MODELINFO                  0103   SERLP5300122
8   SAS        MODELINFO                  0103   SERLP530013F
9   SAS        MODELINFO                  0103   SERLP53000UR
10  SAS        MODELINFO                  0103   SERLP530013D
12  SAS        MODELINFO                  0103   SERLP53000SU
13  SAS        MODELINFO                  0103   SERLP5300139
14  SAS        MODELINFO                  0103   SERLP53000Y8
15  SAS        MODELINFO                  0103   SERLP53000SN

```

The following command displays the volumes with data on a member:

```
> member select mem1 show volumes
```

Volume Name	Contribution
-----	-----
dbase2	60GB
staff29	80.01GB
mailex	10GB
emailstaff	2.01GB
v0	5.01GB
v2	10GB
db3	15GB

member show

Displays information about all the group members or a specific member, including any in-progress operation, such as removing a member from the group or moving a member to a different pool.

The hardware information displayed depends on the array model.

Format

```
member show [member_name] [-poolinfo]
```

Variable

<i>member_name</i>	Name of a member.
--------------------	-------------------

Examples

The following command displays all members in the group:

```
> member show
```

Name	Status	Version	Disks	Capacity	FreeSpace	Connections
-----	-----	-----	-----	-----	-----	-----
member1	online	V3.3.0	16	6248.76GB	5332.29GB	14

The following command displays member pool information.

```
> member show -poolinfo
```

Name	Status	Version	Disks	Capacity	FreeSpace	Connections	Pool
member1	online	V3.3.0	16	6248.76GB	5332.29GB	14	default

The following command displays detailed information about a specific member:

```
> member show lab2
```

```

_____ Member Information _____
Name: m01                               Status: online
TotalSpace: 2231.48GB                   UsedSpace: 100GB
SnapSpace: 0MB                           Description:
Def-Gateway: 162.17.192.1                Serial-Number: B001234
Disks: 14                                 Spares: 2
Controllers: 2                           CacheMode: write-back
Connections: 0                            RaidStatus: ok
RaidPercentage: 0%                       LostBlocks: false
HealthStatus: normal                     LocateMember: disable
Controller-Safe: disabled                 Low-Battery-Safe: enabled
Version: V3.3.0                           Delay-Data-Move: disable
Pool: default                             Raid-policy: raid50

```

```

_____ Health Status Details _____
Critical conditions::
None

Warning conditions::
None

```

```

_____ Operations InProgress _____
ID StartTime          Operation Details
-----

```

For an explanation of the member status conditions and RAID status conditions, respectively, see Table 2-3 on page 2-85, and Table 2-4 on page 2-85.

mrtg-config

Creates a file containing the information necessary to run Multi-Router Traffic Grapher (MRTG), a third-party performance monitoring utility, on a system with access to the PS Series group.

The MRTG utility collects data from the PS Series group about the I/O, latency, and throughput for the members and volumes in the group. It uses the member and volume index numbers (stored in the MIB tables) for the group objects.

The `mrtg-config` command retrieves the index numbers and enters them in a file it creates, called `mrtg.cfg` by default. You can optionally specify a different name for the file. The command also creates an HTML file, called `index.html`, that you can view in a browser, to see graphs of the performance data for the members and volumes.

Use `ftp` or `scp` to retrieve the configuration and HTML files from the group and copy them to a system that you will use to view the HTML file. See the `diag` command on page 3-5 for information on retrieving files from an array using the `ftp` or `scp` utility.

On the system, you can then run a Perl script that invokes MRTG and populates the graph data.

Format

```
mrtg-config [-verbose] [-nocr] [file]
```

Variable

<i>file</i>	Optional name for the configuration file. By default, the file is named <code>mrtg.cfg</code> .
-------------	---

Options

<code>-verbose</code>	Displays the configuration file to the screen as it is created.
<code>-nocr</code>	Use on UNIX systems. Uses the <code>\n</code> newline character when creating the configuration file instead of the default <code>\r\n</code> character for Windows systems.

Example

The following example creates an MRTG configuration file with the default name:

```
> mrtg-config  
  
Mrtg configuration saved to mrtg.cfg  
Generating html file.  
Index file saved to index.html  
You can retrieve the files using ftp or scp.
```

The following example creates an MRTG configuration file named for the group (group1):

```
kagroup> mrtg-config group1_mrtg.cfg  
  
Mrtg configuration saved to group1_mrtg.cfg  
Generating html file.  
Index file saved to index.html  
You can retrieve the files using ftp or scp.
```

partner

Establishes and manages the replication partners for a group.

Replicating volume data from one group to another enables you to protect the data from catastrophic failures. A replica represents the contents of a volume at a specific point in time. A replica set represents the set of replicas for a volume.

There are various options for replication configurations. You can configure one group to store replicas from the other group, or you can configure both groups to store replicas from each other. Also, you can configure centralized replication, which means that multiple groups replicate to another group.

The two groups involved in any given volume replication operation are called replication partners. Each group plays a role in the replication operation:

- The group where the original volume resides is called the primary group. The direction of the replication is outbound from the primary group.
- The group where the volume replicas are stored is called the secondary group. The direction of the replication is inbound to the secondary group. If a disaster destroys the primary group, the secondary group administrator can recover volume data by cloning a replica or promoting a replica set.

Configuring volume replication is a three-part process:

1. **Establish a replication partnership between two groups.** Log in to each group and configure the other group as a replication partner. The group that will act as the secondary group in the replication operation (that is, the group that will be storing replicas) must delegate space to the primary group.
2. **Enable a volume for replication.** Log in to the primary group. For each volume you want to replicate, select the volume and specify the replication partner that will store the replicas, the amount of space on the primary group to reserve for tracking volume changes during replication and, optionally, for retaining the failback snapshot (local replication reserve), and the portion of delegated space on the secondary group to reserve for storing the replicas (replica reserve).

Also specify the method of transferring the first volume replica (manual using the Manual Transfer Utility or automatic over the network), and whether to keep the failback snapshot for the volume.

If replicating a volume collection, you must also enable the collection for replication.

3. **Create a replica at the current time or set up a replica schedule.** The first replica is a complete copy of the volume data and will consume 100% of the volume size from the replica reserve on the secondary group. Subsequent replicas contain only changes to the volume since the first replica.

For detailed information on replication, see the PS Series *Group Administration* manual.

Format

`partner subcommand`

Subcommands

<code>create</code>	Creates a partner.
<code>delete</code>	Deletes an existing partner.
<code>rename</code>	Renames a partner.
<code>select</code>	Displays and modifies a partner configuration and enables you to manage inbound and outbound replica sets and replicas.
<code>show</code>	Displays information about all configured partners.

partner create

Establishes a replication partnership between two groups.

Notes: The `partner create` command must be run on both the primary group and the secondary group in order to establish a replication relationship.

Before configuring a partner, be sure that all members of both groups have network connectivity.

To establish a replication partnership between the group on which you are running the `partner create` command and another group (the partner), you must specify on the command line:

- Partner group name and IP address.
- Passwords for mutual authentication. Replication between groups cannot occur until the reciprocal passwords are set on both groups.
- If the group will be storing replicas from the partner, the amount of group pool space to delegate to the partner. Delegated space is automatically reserved from free pool space and can only be used to store replica sets from the partner. When you configure a volume to replicate to a partner, you specify the portion of delegated space to allocate to the volume's replica set (the replica reserve).

The amount of space to delegate to a partner depends on the number of the partner volumes being replicated to the group and the replica reserve for each volume. For example, if two volumes are being replicated and they each require a replica reserve of 4GB, then you must delegate at least 8GB to the partner. The replica reserve requirement for each volume depends on the volume size, in addition to the amount and rate of change to the volume between subsequent replication operations.

Communication between two groups configured as replication partners is not established until the first time replication is enabled on a volume or a replication is attempted. Therefore, keep in mind the following:

- You will not know if partner password or configuration problems exist until the first time replication is enabled on a volume. If you receive a login error message, check the reciprocal passwords on the partners and make sure they match.
- Delegated space will not be visible in the CLI until the first time replication is attempted on a volume.
- If you increase the size of a replicated volume, the secondary group will not recognize the change until the next replication attempt.

After creating a replication partnership between two groups, you can log in to the group where the volume resides (the primary group) and enable replication on the volume. See *volume select replication enable* on page 2-191. Then, you can create replicas.

Format

```
partner create partner_name ipaddress ip_address [parameter...]
```

Variable

<code>partner_name</code>	Group name of the partner.
---------------------------	----------------------------

Parameters

<code>contact_name</code>	Name of the person responsible for the partner, up to 64 alphanumeric characters. If the name variable contains spaces, surround it with quotation marks (for example, “M Chen”).
<code>description_text</code>	Description for the partner, up to 64 alphanumeric characters. If the <code>text</code> variable contains spaces, surround it with quotation marks.
<code>email_email_address</code>	E-mail address, up to 64 alphanumeric characters, for the person responsible for the partner.
<code>inbound-password password</code>	<p>Password for group authentication of the partner, up to 255 alphanumeric characters. If not specified, the password is generated automatically.</p> <p>The partner group administrator must specify this exact password with the <code>outbound-password</code> parameter.</p>
<code>ipaddress ip_address</code>	Group IP address of the partner.
<code>mobile mobile_number</code>	Mobile phone number (up to 32 characters) for the person responsible for the partner.
<code>phone phone_number</code>	Telephone number (up to 32 characters) for the person responsible for the partner.
<code>outbound-password password</code>	<p>Password for partner authentication of the group, up to 255 alphanumeric characters.</p> <p>The partner group administrator must specify this exact password with the <code>inbound-password</code> parameter.</p>
<code>pool-delegated pool</code>	Pool from which delegated space will be consumed. The default is the <code>default</code> pool.
<code>space-delegated size[GB]</code>	<p>Delegated space for storing partner replica sets. Size is assumed to be in megabytes (MB) unless you explicitly specify gigabytes (GB). You can specify size with any of the following suffixes: m, mb, MB, g, gb, GB.</p> <p>Delegated space is immediately consumed from free space either in the default pool or the pool specified with the <code>pool-delegated</code> parameter.</p>

Example

The following commands create a partnership between two groups, AGroup and CGroup. AGroup (primary group) is replicating volumes to CGroup (secondary group).

The following command is run on AGroup:

```
AGroup> partner create CGroup ipaddress 182.1.2.18 inbound-password
goforit outbound-password bigtime
```

```

_____ Partner Information _____
Name: CGroup                      IPAddress: 182.1.2.18
Space-Received: OMB              Space-Received-Used: OMB
Outbound-Password: *****      OutboundDesiredStatus: enabled
Description:                      Space-Delegated: OMB
Space-Delegated-Used: OMB        Inbound-Password: *****
InboundDesiredStatus: enabled    Contact:
Email:                           Phone:
Mobile:                           Pool-Delegated: default
_____
```

The following command is run on CGroup:

```
CGroup> partner create AGroup ipaddress 182.9.2.116 space-delegated 200GB
inbound-password bigtime outbound-password goforit
```

```

_____ Partner Information _____
Name: AGroup                      IPAddress: 182.9.2.116
Space-Received: OMB              Space-Received-Used: OMB
Outbound-Password: goforit       OutboundDesiredStatus: enabled
Description:                      Space-Delegated: 200GB
Space-Delegated-Used: OMB        Inbound-Password: bigtime
InboundDesiredStatus: enabled    Contact:
Email:                           Phone:
Mobile:                           Pool-Delegated: default
_____
```

partner delete

Breaks the relationship between the group and a replication partner.

Before deleting a partner, you must pause any inbound replication from the partner to the group, as described in *partner select inbound-pause* on page 2-108.

Note: If you delete a replication partner, and the group is storing replicas from the deleted partner, the partner's replicas will also be deleted, freeing delegated space.

However, if you delete a replication partner that is storing replicas from the group, the group's replicas will remain on the partner and can be accessed from the partner.

Format

```
partner delete partner_name
```

Variable

<i>partner_name</i>	Group name of partner.
---------------------	------------------------

Example

The following command deletes the partner `psgroup2`:

```
> partner delete psgroup2
```

```
Deleting partner results in deletion of all inbound replicaset
associated with this partner. Do you really want to delete the
partner? (y/n) [n] y
Partner deletion succeeded.
```

partner rename

Renames a replication partner.

Rename a replication partner only if the partner's group name has changed.

Format

```
partner rename name new_name
```

Variables

<i>name</i>	Current partner name.
<i>new_name</i>	New name of the partner.

Example

The following command renames a partner:

```
> partner rename group2 staffgroup2
```

partner select

Enables you to select a replication partner and perform the following tasks:

- Display a partner configuration
- Modify a partner configuration
- Manage inbound replication from the partner to the group
- Manage outbound replication from the group to the partner

Format

```
partner select partner_name subcommand | parameter
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Subcommands

failback-replicaset	Manages a failback replica set in the group, enabling you to promote a failback replica set, move it to another pool, cancel an operation, or show details.
inbound-pause	Pauses (temporarily suspends) replication from the partner to the group.
inbound-repcol	Manages the partner replica collections stored in the group, including deleting replica collections and displaying replicas in a collection.
inbound-repcolset	Manages the partner replica collection sets stored in the group, including deleting replica collection sets and displaying the replica collections in a replica collection set.
inbound-replicaset	Manages the partner replica sets stored in the group, including displaying, deleting, and cloning replicas and promoting replica sets.
inbound-resume	Resumes suspended replication from the partner to the group.
outbound-pause	Pauses (temporarily suspends) all replication from the group to the partner.

<code>outbound-repcol</code>	Manages the group replica collections stored on the partner, including deleting replica collections and displaying replicas in a collection.
<code>outbound-repcolset</code>	Manages the group replica collection sets stored on the partner, including deleting replica collection sets and displaying replica collections in a replica collection set.
<code>outbound-replicaset</code>	Manages the group replica sets stored on the partner, including displaying and deleting replicas.
<code>outbound-resume</code>	Resumes suspended replication from the group to the partner.
<code>show [-poolinfo]</code>	Displays partner configuration information. With <code>-poolinfo</code> , displays the name of the pool in which space is delegated for this partner.

Parameters

<code>contact name</code>	Name of the person responsible for the partner, up to 64 alphanumeric characters. If the <code>name</code> variable contains spaces, surround it with quotation marks (for example, "M Chen").
<code>description text</code>	Description of the partner, up to 64 alphanumeric characters. If the <code>text</code> variable contains spaces, surround it with quotation marks.
<code>email email_address</code>	E-mail address, up to 32 alphanumeric characters, for the person responsible for the partner.
<code>inbound-password password</code>	Password for partner authentication, up to 255 alphanumeric characters. If not specified, the password is generated automatically. Be sure the partner group administrator makes the reciprocal change to the <code>outbound-password password</code> parameter.
<code>ipaddress ip_address</code>	Group IP address of the partner. Be sure this matches the actual IP address of the partner group.
<code>mobile mobile_number</code>	Mobile phone number, up to 32 alphanumeric characters, for the person responsible for the partner.
<code>outbound-password password</code>	Password for group authentication, up to 255 alphanumeric characters. Be sure the partner group administrator makes the reciprocal change to the <code>inbound-password password</code> parameter.

<code>phone phone_number</code>	Telephone number, up to 32 alphanumeric characters, for the person responsible for the partner.
<code>space-delegated size[GB]</code>	Delegated space for storing partner replicas. Size is assumed to be megabytes (MB) unless you explicitly specify gigabytes (GB). You can specify size with any of the following suffixes: m, mb, MB, g, gb, or GB. Delegated space is immediately consumed from free pool space.

Example

The following command modifies the partner's inbound password:

```
> partner select group10 inbound-password goforit
```

partner select failback-replicaset

Manages a failback replica set stored in the group, enabling you to promote a failback replica set to the original volume, move it to a different pool, cancel a pool move operation, or show details. A failback replica set is created by demoting a replicated volume.

Format

```
partner select partner_name failback-replicaset subcommand
```

Variables

<code>partner_name</code>	Group name of the partner to which the volume was replicated.
---------------------------	---

Subcommands

<code>select</code>	Selects a failback replica set so you can manage it.
<code>show</code>	Displays information about the failback replica set.

Example

The following command displays the failback replica sets in the group:

```
> partner select group2 failback-replicaset show
```

Name	ReservedSpace	FreeSpace	Replicas	Status
dbvol2	80GB	36.98GB	21	ready
vol5	2.01GB	1.01GB	3	ready
uservol8	40.01GB	20GB	4	ready
clonevol1	16.03GB	8.01GB	0	ready

partner select failback-replicaset select

Selects a failback replica set stored in the group, enabling you to promote it to the original volume, change its pool, cancel an in-progress operation, convert it to an inbound replica set, or display its information.

Format

```
partner select partner_name failback-replicaset select set_name
subcommand
```

Variables

<i>partner_name</i>	Group name of the partner to which the volume was replicated.
<i>set_name</i>	Name of a failback replica set in the group.

Subcommands

<code>cancel-operation <i>op_id</i></code>	Cancels the in-progress pool change operation indicated by the specified identification number.
<code>delete-failback</code>	Converts a failback replica set to an inbound replica set, making the operation permanent. This disables the ability to promote the failback replica set to the original volume. You cannot delete a failback replica set until you convert it.
<code>pool <i>pool_name</i></code>	Moves the replica set to the specified pool. If you later promote the failback replica set, the resulting volume will be located in the new pool.

promote	Promotes the failback replica set to a volume, returning it to its original state. You must pause inbound replication before you can promote a failback replica set.
show	Displays information about the failback replica set.

partner select failback-replicaset select cancel-operation

Cancels an in-progress pool change operation for a failback replica set in the group.

Format

```
partner select partner_name failback-replicaset select set_name
cancel-operation op_id
```

Variables

<i>partner_name</i>	Group name of the partner to which the volume was replicated.
<i>set_name</i>	Name of a failback replica set in the group.
<i>op_id</i>	Identification number for the operation to cancel. Obtain the number by using the command <i>partner select failback-replicaset select</i> , described on page 2-103.

Example

The following commands display the identification number of a pool move operation in progress and then cancel the operation:

```
> partner select group2 failback-replicaset select dbvol2 show
```

```
.
.
.
```

```
_____ Operations InProgress _____
```

```
ID StartTime          Progress Operation Details
1  2007-04-30:15:42:38  Moving from pool default to pool pool2
```

```
.
.
.
```

```
> partner select group2 failback-replicaset select dbvol2 cancel-operation 1
```

partner select failback-replicaset select delete-failback

Converts a failback replica set to an inbound replica set, making the demote operation permanent and disabling the ability to promote the failback replica set to the original volume.

You must first convert a failback replica set to an inbound replica set before you can delete it.

Format

```
partner select partner_name failback-replicaset select set_name
delete-failback
```

Variables

<i>partner_name</i>	Group name of the partner to which the volume was replicated.
<i>set_name</i>	Name of a failback replica set in the group.

Example

The following example converts a failback replica set to an inbound replica set:

```
> partner select group2 failback-replicaset select vol3 delete-failback
```

Failback replica set 'vol3' has been successfully converted to a replica set with failback deleted.

partner select failback-replicaset select pool

Changes the pool assignment for a failback replica set. If you later promote the failback replica set, the resulting volume will be located in the specified pool.

If the original replicated volume was in a pool other than the pool containing the space delegated to the partner, and you demoted the volume to a failback replica set, you must move the failback replica set to the pool with the delegated space before you can promote it.

Format

```
partner select partner_name failback-replicaset select set_name pool
pool_name
```

Variables

<i>partner_name</i>	Group name of the partner to which the volume was replicated.
<i>set_name</i>	Name of a failback replica set in the group.
<i>pool_name</i>	Name of the pool to which you want to move the failback replica set.

Example

The following example moves a failback replica set to pool2:

```
> partner select group2 failback-replicaset select vol5 pool pool2
```

partner select failback-replicaset select promote

Promotes a failback replica set stored in the group to the original volume.

You must pause inbound replication from the partner, and demote the recovery volume on the partner, before you can promote the failback replica set to the original volume.

If you want to maintain failback on the volume, you must replicate the volume to establish the new failback baseline.

Format

```
partner select partner_name failback-replicaset select set_name
promote
```

Variables

<i>partner_name</i>	Group name of the partner to which the volume was replicated.
<i>set_name</i>	Name of a failback replica set in the group.

Example

The following commands pause inbound replication from the partner and promote a failback replica set to its original volume:

```
> partner select group2 inbound-pause
```

```
> partner select group2 failback-replicaset select vol6 promote
```

Failback replica set promotion succeeded. In order to establish a failback baseline, a new replica will be created.

The promoted volume is offline. You must set it online to use it. See *volume select* on page 2-174 for more information.

In addition, to re-establish a failback baseline, you should replicate the volume immediately. See *volume select replication create-replica* on page 2-188.

partner select failback-replicaset select show

Displays detailed information about a failback replica set stored in the group.

Format

```
partner select partner_name failback-replicaset select set_name show
```

Variables

<i>partner_name</i>	Group name of the partner to which the volume was replicated.
<i>set_name</i>	Name of a failback replica set in the group.

Example

The following command displays detailed information about a failback replica set:

```
> partner select group2 failback-replicaset select vol3 show
```

```

_____ Inbound ReplicaSet Information _____
Name:      vol3                               PrimaryIscsiName:
FailbackSize: 60.03GB
iqn.2001-05.com.equallogic:0-8a0906-
Pool: default                                98cfc1902-5bcb2fb8154461ab-vol3
Size: 20GB                                     ReservedSpace: 40.01GB
FreeSpace: 20GB                               Replicas: 4
Status: ready                                 First-Manual-Xfer: disabled
StartingTime: None                            Thin-Provision: disabled
Thin-Min-Reserve: 0%                          Thin-Growth-Warn: 0%
Thin-Growth-Max: 0%                           Type: failback
Type: not-replicated

```

Inbound-Replicas			
Name	TimeStamp	Size	Status
vol3-2007-04-09-18:09:26.42	Mon Apr 9 18:09:26 2007	20GB	ready
vol3-2007-04-09-18:10:49.43	Mon Apr 9 18:10:49 2007	20GB	ready
vol3-2007-04-11-12:52:02.52	Wed Apr 11 12:52:02 2007	20GB	ready
vol3-2007-04-11-12:58:08.53	Wed Apr 11 12:58:08 2007	20GB	ready

Operations InProgress		
ID	StartTime	Progress Operation Details

partner select inbound-pause

Pauses (temporarily stops) inbound replication data transfer from the partner to the group.

Format

```
partner select partner_name inbound-pause
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Example

The following command pauses replication data transfer from the partner to the group:

```
> partner select psgroup2 inbound-pause
```

partner select inbound-repcol

Enables you to select a partner and manage the partner replica collections stored in the group, including deleting an inbound replica collection and displaying the replicas in a collection.

Note: You cannot delete the most recent replica, or the only replica in a set.

Format

```
partner select partner_name inbound-repcol subcommand
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Subcommands

<code>delete repcol</code>	Deletes an inbound replica collection being stored in the group. This deletes the replicas in the collection. You must pause inbound replication from the partner before deleting an inbound replica collection. See <i>partner select inbound-pause</i> on page 2-108.
<code>select repcol show</code>	Selects a partner's replica collection and displays the replicas in the collection
<code>show [custom]</code>	Displays the partner's replica collections stored in the group. Specify <i>custom</i> to display custom replica collections.

Examples

The following command displays a partner's replica collections stored in the group:

```
> partner select psgroup2 inbound-repcol show
```

```
Name                               ReplicasAtCreation Replicas Inbound-repcolset
-----
vc1.1-2006-03-10-10:40:05.461 2          2          vc1.1
vc1.1-2006-03-10-10:43:04.462 2          2          vc1.1
```

The following command displays the replicas in an inbound replica collection:

```
> partner select psgroup2 inbound-repcol select
vc1.1-2006-03-10-10:49:04.464 show
```

```
_____ Inbound-repcol Information _____
Name: vc1.1-2006-03-10-10:49:04.464 Description: Replica collection
Creation Time: 2006-03-10:10:49:04 NoofReplicasAtCreation: 2
CurrentNofReplicas: 2                Inbound-repcolset: vc1.1
```

```

_____ Inbound-replicas _____
Name                               TimeStamp   Size      Status
-----
v1.1-2006-03-10-10:49:04.921 2006-03-10: 1MB      ready
10:49:04
v2.1-2006-03-10-10:49:04.922 2006-03-10: 1MB      ready
10:49:04

```

The following command deletes an inbound replica collection:

```
> partner select psgroup2 inbound-repcol delete repcol
vc1.1-2006-03-10-10:22:04.465
```

Inbound replica collection deletion succeeded.

partner select inbound-repcolset

Manages the partner replica collection sets stored in the group, including deleting replica collection sets and displaying the replica collections in a replica collection set.

Format

```
partner select partner_name inbound-repcolset subcommand
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Subcommands

<code>delete repcolset</code>	Deletes an inbound replica collection set from the group. This deletes the replicas in the collection.
<code>select repcolset show</code>	Selects a partner's replica collection set and displays the replica collections in the set
<code>show</code>	Displays the partner's replica collection sets stored in the group.

Examples

The following command displays a partner's replica collection sets stored in the group:

```
> partner select psgroup2 inbound-repcolset show
```

Name	Inbound-replicaset	Inbound-repcols
vc1.1	2	2

The following command displays the replica collections in an inbound replica collection set:

```
> partner select psgroup2 inbound-repcolset select vc1.1 show
```

```

_____ Inbound-repcolset Information _____
Name: vc1.1           Description: vc1-replica-collection
NoOfRepCols: 2

_____ Inbound-replicaset _____
Name      ReservedSpace FreeSpace   Replicas Status
-----
v1.1      16MB           15MB       2         in-progress
v2.1      16MB           15MB       2         in-progress

```

The following command deletes an inbound replica collection set:

```
> partner select psgroup2 inbound-repcolset delete vc1.1
```

```

It is strongly recommended that you perform this operation with caution
and only in the event of a disaster at the group where the original volume
collection resides. Are you sure you want to delete the inbound-replica
collection set? (y/n) [n] y

```

partner select inbound-replicaset

Enables you to select a partner and perform the following tasks:

- Display the inbound replica sets stored on the current group
- Display the replicas in an inbound replica set
- Delete an inbound replica set
- Promote an inbound replica set to a volume, temporarily or permanently
- Clone an inbound replica
- Delete an inbound replica

Format

```
partner select partner_name inbound-replicaset subcommand
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Subcommands

delete	Deletes a partner's inbound replica set stored in the group.
select	Selects a partner's replica set in order to display the replicas in the replica set, clone a replica, delete a replica, or promote the replica set.
show	Displays the partner's replica sets stored in the group.

partner select inbound-replicaset delete

Selects a partner and deletes an inbound replica set stored in the group.

Be careful when deleting a replica set that belongs to a partner, because this will delete the partner's replicas, and the partner will not be able to recover the data that was in those replicas.

Note: Before deleting an inbound replica set, pause inbound replication from the partner. See *partner select inbound-pause* on page 2-108.

It is recommended that, if possible, you manage replicas and replica sets from the group where the original volume resides (the primary group).

Format

```
partner select partner_name inbound-replicaset delete set_name
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of a replica set.

Example

The following command deletes an inbound replica set (v1.1):

```
> partner select psgroup2 inbound-replicaset delete v1.1
```

partner select inbound-replicaset select

Enables you to select a partner and an inbound replica set stored in the group and perform the following tasks:

- Create and modify access control records for an inbound replica set (only for manual transfer replication with the Manual Transfer Utility CLI).
- Clone an inbound replica
- Delete an inbound replica
- Promote an inbound replica set to a volume, either temporarily (the resulting recovery volume keeps the ability to be demoted) or permanently (disables the ability to be demoted)
- Display the replicas in the inbound replica set
- Confirm the completion of the first data transfer after loading the data into the replica set on the secondary group (only for manual transfer replication with the Manual Transfer Utility CLI).
- Mark lost cached blocks in the inbound replica as valid

Note: You can obtain the name of a replica set with the following command:

```
partner select partner_name inbound-replicaset show
```

Format

```
partner select partner_name inbound-replicaset select set_name
subcommand [parameter]
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an inbound replica set.

Subcommands

access	Manages access control records for a replica placeholder used in a manual transfer replication operation.
clone	Clones a replica.
delete	Deletes a replica.
first-manual-xfer done	Confirms the completion of the first data transfer using manual transfer replication. For more information about manual replication, see the <i>Group Administration</i> manual.
lost-blocks mark-valid	Sets the replica online and marks the lost cached blocks as valid. This option may present a security risk, and the blocks may contain old data. Note that lost cached blocks can occur if a power failure lasts longer than 72 hours.
promote keep-demote [retain-iscsi-name]	Temporarily promotes an inbound replica set to a recovery volume, optionally retaining the iSCSI target name of the original volume. Keeps the ability to be demoted to an inbound replica set.
promote [parameters]	Permanently promotes an inbound replica set to a new volume, and loses the ability to be demoted to an inbound replica set.
show	Displays information about the replica set and replicas.

partner select inbound-replicaset select access

Manages access control records for the replica placeholder for a volume's manual transfer replication operation. (Used only with the CLI version of the Manual Transfer Utility.)

Note: See the *Group Administration* manual for detailed information about manual transfer replication.

Before you can load transfer files into a volume's replica placeholder on the secondary group, you must allow the system running the Manual Transfer Utility CLI to connect to the replica placeholder, which has an iSCSI target associated with it.

You can create, modify, and delete access control records only for the replica placeholder created for a volume that is configured to use manual transfer replication. After the manual transfer of the volume data is complete, you can delete the access control record.

By default, the inbound replica set has an access control record inherited from the original replicated volume. This access control record only allows communication between the partner groups.

Format

```
partner select partner_name inbound-replicaset select set_name access
subcommand
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an inbound replica set that represents a replica placeholder.

Subcommands

create	Creates an access control record.
select	Selects an access control record.
delete	Deletes an access control record.
show	Displays information about the replica set and replicas.

Example

The following command displays the access control record for replica placeholder for a volume configured to use manual transfer replication:

```
> partner select group1 inbound-replicaset select test1.1 access show
```

ID	Initiator	Ipaddress	AuthMethod	UserName	Apply-To
1		*.*.*.*	chap-local	group1	both

partner select inbound-replicaset select access create

Creates an access control record for the replica placeholder for a volume's manual transfer replication operation. (Used only with the CLI version of the Manual Transfer Utility.)

Before you can load transfer files into a volume's replica placeholder on the secondary group, you must allow the system running the Manual Transfer Utility CLI to connect to the replica placeholder, which has an iSCSI target associated with it.

Format

```
partner select partner_name inbound-replicaset select set_name access
create subcommand parameter
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an inbound replica set that represents a replica placeholder.

Parameters

username <i>chap_name</i>	Specifies the CHAP user name (up to 128 alphanumeric characters) to which access is limited.
ipaddress <i>ip_address</i>	IP address to which access is restricted. An asterisk (*) in any of the four parts of an IP address is interpreted as a wildcard character; that is, any value is accepted for that 8-bit field. For example, specify *.*.*.* for unrestricted host access (not recommended except for testing).

<code>initiator name</code>	Name of the iSCSI initiator to which access is restricted; for example: <code>iqn.2000-05.com.qlogic.qla-4000.sn00044</code>
<code>authmethod chap none</code>	Specifies whether the record uses CHAP authentication (<code>chap</code>) to restrict access to the volume. The default is <code>none</code> ; CHAP authentication is not used. You must also specify the <code>username chap_name</code> parameter for CHAP authentication.

Examples

The following command creates an access control record with access granted to a specific CHAP user and sets the authentication method to CHAP:

```
> partner select secondary inbound-replicaset select vol-1.1 access create
username dbuser authmethod chap
```

Created access entry with ID 2.

The following command creates an access control record with a specific IP address:

```
> partner select secondary inbound-replicaset select vol-1.1 access create
ipaddress 172.17.30.22
```

Created access entry with ID 3.

partner select inbound-replicaset select access delete

Deletes an access control record for the replica placeholder for a volume's manual transfer replication operation. (Used only with the CLI version of the Manual Transfer Utility.)

This command applies only to replica sets that were created for a manual transfer replication operation. After you have completed manual replication, use this command to delete the access control records that were created to allow the system to access the replica placeholder.

Format

```
partner select partner_name inbound-replicaset select set_name access
delete access_entry_id
```

Variables

<code>partner_name</code>	Group name of a partner.
<code>set_name</code>	Name of an inbound replica set that represents a replica placeholder.
<code>access_entry_id</code>	Access control record identification number (from the output of the <code>show</code> subcommand; see <i>partner select inbound-replicaset select access</i> on page 2-115).

Example

The following command deletes an access control record:

```
> partner select secondary inbound-replicaset select vol-1.1 access delete 4
Do you really want to delete? (y/n) [n] y
Access entry deletion succeeded.
```

partner select inbound-replicaset select access select

Displays or modifies an access control record for the replica placeholder for a volume's manual transfer replication operation. (Used only with the CLI version of the Manual Transfer Utility.)

This command applies only to replica sets that were created for a manual transfer replication operation.

Format

```
partner select partner_name inbound-replicaset select set_name access
select access_entry_id subcommand / parameter
```

Variables

<code>partner_name</code>	Group name of a partner.
<code>set_name</code>	Name of an inbound replica set that represents a replica placeholder.
<code>access_entry_id</code>	Access control record identification number (from the output of the <code>show</code> subcommand; see <i>partner select inbound-replicaset select access</i> on page 2-115).

Subcommand

show	Displays detailed information about the specified access control record number.
------	---

Parameters

authmethod chap none	Specifies whether the record uses CHAP authentication (chap) to restrict access to the volume. The default is none; CHAP authentication is not used. You must also specify the username chap_name parameter for CHAP authentication.
initiator name	Name of the iSCSI initiator to which access is restricted; for example: iqn.2000-05.com.qlogic.qla-4000.sn00044
ipaddress ip_address	IP address to which access is restricted. An asterisk (*) in any of the four parts of an IP address is interpreted as a wildcard character; that is, any value is accepted for that 8-bit field. For example, specify *.*.*.* for unrestricted host access (not recommended except for testing).
username chap_name	Specifies the CHAP user name (up to 128 alphanumeric characters) to which access is limited.

Examples

The following command displays detailed information about a particular access control record for an inbound replicaset:

```
primary> partner select secondary inbound-replicaset select vol-1.1 access
select 1 show
```

```
_____ Access Information _____
Initiator:                               Ippaddress: *.*.*.*
AuthMethod: chap-local                   UserName: secondary
Apply-To: both
```

The following commands modify the CHAP user name for an access control record, and show the detail information for the record before and after the change:

```
primary> partner select secondary inbound-replicaset select vol-1.1 access
select 2 show
```

```
_____ Access Information _____
Initiator:                               Ippaddress: *.*.*.*
AuthMethod: chap                         UserName: kabbott
Apply-To: snapshot
```

```
primary> partner select secondary inbound-replicaset select vol-1.1 access
select 2 username dbuser
```

```
primary> partner select secondary inbound-replicaset select vol-1.1 access
select 2 show
```

```
_____ Access Information _____
Initiator:                               Ippaddress: *.*.*.*
AuthMethod: chap                         UserName: dbuser
Apply-To: snapshot
```

partner select inbound-replicaset select clone

Selects an inbound replica set stored in the group and clones a replica from that set, creating a new volume.

Cloning a replica creates a new volume with a different iSCSI target name, but the same size and thin-provision settings (if applicable) as the original volume. The new volume will contain the volume contents that existed when the replica was created and will be available immediately through the IP address of the secondary group (not the primary group, where the original volume resides). You can use and modify the new volume as you would any other volume.

By default, the new volume will be set online, have read-write permission, and use the group-wide snapshot space and iSCSI settings, unless you override them. You can specify the storage pool in which the new volume will reside.

You can clone only complete replicas. Cloning a replica does not have any effect on the replica, which continues to exist after being cloned, or replication activity.

Cloning a replica consumes 100% of the original volume size from free secondary group pool space. If you want to create snapshots or replicas of the new volume, additional space is needed.

You can display the names of the replicas in a replica set as follows:

```
partner select partner_name inbound-replicaset select set_name show
```

Format

```
partner select partner_name inbound-replicaset select set_name clone
replica_name new_vol_name [parameter...]
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an inbound replica set.
<i>replica_name</i>	Name of a replica.
<i>new_vol_name</i>	Name of new volume.

Parameters

<i>description text</i>	Description for the new volume. If the <i>text</i> variable contains spaces, surround it with quotation marks.
<i>read-write read-only</i>	New volume permission (default is read-write).
<i>offline online</i>	New volume status (default is online).
<i>snap-reserve n%</i>	Amount of space, as a percentage of the new volume size, to reserve for snapshots. You must include the percent sign. The default is the group-wide setting, as described in <i>grpparams def-snap-reserve</i> on page 2-42.
<i>snap-warn n%</i>	Threshold at which an alarm is generated because the amount of free space reserved for snapshots of the new volume has fallen below this value, as a percentage of the total reserved snapshot space. You must include the percent sign. The default is the group-wide setting, as described in <i>grpparams def-snap-warn</i> on page 2-43.

<code>snap-depletion <i>action</i></code>	<p>Action to take when the new volume's snapshot reserve is exceeded, either <code>delete-oldest</code> (delete the oldest snapshots, the default) or <code>volume-offline</code> (set the volume and its snapshots offline).</p> <p>The default is the group-wide setting, as described in <i>grpparams def-snap-depletion</i> on page 2-42.</p>
<code>iscsi-alias <i>alias_name</i></code>	<p>iSCSI target alias, up to 64 alphanumeric characters, for the new volume. Some iSCSI initiators can see the alias.</p> <p>The default is the group-wide setting, as described in <i>grpparams def-iscsi-alias</i> on page 2-41.</p>
<code>unrestricted</code>	<p>Allows unrestricted host access to the new volume. Unrestricted access is not recommended. Instead, after cloning the replica, you should create one or more access control records to restrict host access to the new volume.</p> <p>See <i>volume select access create</i> on page 2-180.</p>
<code>bind <i>member_name</i></code>	<p>Binds the new volume to the specified member. Volume data will be restricted to this member.</p> <p>Binding a volume to a member will override any RAID preference and will disable performance load balancing for the volume.</p>
<code>pool <i>pool_name</i></code>	<p>Pool in which to place the new volume.</p>

Example

The following command clones an inbound replica and creates a volume named `v1-clone`:

```
> partner select psgroup11 inbound-replicaset select v1.1 clone
v1.1-2006-01-26-11:19:27.15 v1-clone
```

Cloning is in progress. Successfully created volume 'v1-clone'

partner select inbound-replicaset select delete

Selects an inbound replica set and deletes a replica stored in the group.

You can display the names of the replicas in a replica set as follows:

```
partner select partner_name inbound-replicaset select set_name show
```

Notes: You cannot delete the most recent replica, or the only replica in a set.

Before deleting an inbound replica, pause inbound replication from the partner to the group. See *partner select inbound-pause* on page 2-108.

You will not be asked for confirmation before deleting the replica.

It is recommended that, if possible, you manage replicas and replica sets from the group where the original volume resides (the primary group).

Format

```
partner select partner_name inbound-replicaset select set_name delete
replica_name
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an inbound replica set.
<i>replica_name</i>	Name of a replica.

Example

The following command deletes an inbound replica:

```
> partner select psarray11 inbound-replicaset select dbvol.1 delete
dbvol.1-2006-01-24-16:17:32.9
```

partner select inbound-replicaset select first-manual-xfer

Selects a partner and confirms that all the transfer files created for a volume using manual transfer replication have been loaded to the replica placeholder (only with the Manual Transfer Utility CLI).

Run this command only on the secondary group, specifying the primary group and the inbound replica set that represents the replica placeholder, after loading the transfer files to the replica.

The primary group periodically polls the secondary group to check the status of replication transfers. This command sends a confirmation status back to the primary group and changes the volume and replica status on both groups.

Format

```
partner select partner_name inbound-replicaset select set_name
first-manual-xfer done
```

Variables

<i>partner_name</i>	Group name of the primary group (where the replicated volume is located).
<i>set_name</i>	Name of an inbound replica set that represents the replica placeholder.

Example

The following example confirms the completion of a manual transfer replication for a volume that originated on group2:

```
> partner select group2 inbound-replicaset select emailvol
first-manual-xfer done
```

partner select inbound-replicaset select promote

Selects an inbound replica set from a partner and promotes it to a volume and snapshots.

The new volume will contain the data of the most recent replica. Additional replicas will be changed into corresponding snapshots.

There are two ways to promote an inbound replica set:

- Permanent promotion to a volume. Replication of the original volume ceases and the replica set is deleted from the group. This promotion is permanent; the volume cannot later be demoted to the original inbound replica set (although it can be demoted to a failback replica set).

By default when you promote permanently, the volume will have a new, unique iSCSI target name, and hosts must access the volume through the IP address of the current group. Optionally, you can specify that the new volume retain the iSCSI target name (and SCSI identification number) of the original volume. However, there must be only one volume associated with a particular target name and SCSI ID.

- Temporary promotion to a recovery volume. Replication of the original volume stops, although the replication relationship is retained so you can later fail back to the primary group. The recovery volume optionally uses the same iSCSI target name as

the original volume. After the recovery volume is no longer needed, you can demote the recovery volume to an inbound replica set, returning it to its original state.

If changes are made to the recovery volume and you want to fail back the changes to the primary group, you must demote the volume on the primary group to a failback replica set and replicate the changes. You can then demote the recovery volume and promote the failback replica set to return to the original replication configuration. See the *Group Administration* manual for detailed information about failback procedures.

Note: Promoting a replica set will fail if replication is in progress for the replica set that you are attempting to promote. You must pause inbound replication before promoting a replica set, then resume it after the promotion. See *partner select inbound-pause* on page 2-108.

Promoting a replica set does not consume additional pool space on the secondary group. The volume and its snapshot reserve will use *exactly* the amount of space that was allocated to the replica set in its storage pool, and the delegated space on the recovery group will be reduced by that same amount.

For example, if 200% of the volume size was allocated to the replica set for a 3 GB volume (for a total of 6 GB of allocated space), after promoting the replica set, 3 GB will be used for the new volume itself, another 3 GB (100% of the new volume size) will be reserved for the new volume's snapshots, and the delegated space will be reduced by 6 GB.

Format for Permanent Promotion

```
partner select partner_name inbound-replicaset select set_name promote
new_vol_name [parameter...]
```

Format for Temporary Promotion

```
partner select partner_name inbound-replicaset select set_name promote
keep-demote [retain-iscsi-name]
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an inbound replica set.
<i>new_vol_name</i>	Name of new volume.

Parameters

<code>description text</code>	Description for the new volume. If the <i>text</i> variable contains spaces, surround it with quotation marks.
<code>read-write read-only</code>	New volume permission (the default is read-write).
<code>offline online</code>	New volume status (the default is online).
<code>snap-warn n%</code>	Threshold at which an alarm is generated because the amount of free space reserved for snapshots of the new volume has fallen below this value, as a percentage of the total reserved snapshot space. You must include the percent sign. The default is the group-wide setting, as described in <i>grpparams def-snap-warn</i> on page 2-43.
<code>snap-depletion action</code>	Action to take when the new volume's snapshot reserve is exceeded, either <code>delete-oldest</code> (delete the oldest snapshots, the default) or <code>volume-offline</code> (set the volume and its snapshots offline). The default is the group-wide setting, as described in <i>grpparams def-snap-depletion</i> on page 2-42.
<code>iscsi-alias alias_name</code>	iSCSI target alias, up to 64 alphanumeric characters, for the new volume. The default is the group-wide setting, as described in <i>grpparams def-iscsi-alias</i> on page 2-41.
<code>unrestricted</code>	Allows unrestricted host access to the new volume. Unrestricted access is not recommended. Instead, after cloning the replica, you should create one or more access control records to restrict host access to the volume. See <i>volume select access create</i> on page 2-180.
<code>retain-iscsi-name</code>	Sets the new volume target iSCSI name identical to the iSCSI target name (and SCSI ID) of the original volume.

Examples

The following command permanently promotes an inbound replica set to a volume:

```
> partner select psg1 inbound-replicaset select v1.1 promote v1-new
```

Promoting is in progress. Successfully created volume 'v1-new'

The following command temporarily promotes an inbound replica set to a recovery volume:

```
> partner select group2 inbound-replicaset select vol3 promote keep-demote
```

Replica set promoted to recovery volume. You can demote the original volume and then configure replication to the primary group.

partner select inbound-replicaset select show

Selects a partner and displays information about an inbound replica set stored in the group.

Format

```
partner select partner_name inbound-replicaset select set_name show
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an inbound replica set.

Example

The following command displays information about an inbound replica set:

```
> partner select group2 inbound-replicaset select v1.1 show
```

```

_____ Inbound ReplicaSet Information _____
Name: v1.1                PrimaryIscsiName:
ReservedSpace: 50GB      iqn.2001-05.com.equallogic:2-8c0900-
FreeSpace: 3.69GB        8dd81000-1e400a8ba7e40644-v1
Replicas: 2              Status: online
StartingTime: None

```

```

_____ Inbound-Replicas _____
Name                TimeStamp      Size  Status
-----
v1.1-2006-05-26-12:59:27.55  Fri May 26  25GB  complete
                               12:59:27 2006
v1.1-2006-05-26-13:09:27.59  Fri May 26   5GB  complete
                               13:09:27 2006

```

partner select inbound-replicaset show

Selects a partner and displays the inbound replica sets stored in the group.

Format

```
partner select partner_name inbound-replicaset show
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Example

The following command displays the inbound replica sets from partner `psgroup2`:

```
> partner select psgroup2 inbound-replicaset show
```

Name	ReservedSpace	FreeSpace	Replicas	Status
-----	-----	-----	-----	-----
v1.1	50GB	2.62GB	5	online
v2.1	100.01GB	4.53GB	3	online

partner select inbound-resume

Resumes inbound replication data transfer from the selected partner to the group.

Format

```
partner select partner_name inbound-resume
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Example

The following command resumes replication from the partner to the group:

```
> partner select psgroup2 inbound-resume
```

partner select outbound-pause

Pauses (temporarily suspends) outbound replication data transfer from the group to the selected partner.

Format

```
partner select partner_name outbound-pause
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Example

The following command pauses all replication from the group to the partner:

```
> partner select AGroup outbound-pause
```

partner select outbound-repol

Enables you to select a partner and manage the group replica collections stored on the partner, including deleting an outbound replica collection and displaying the replicas in a collection.

Note: You cannot delete the most recent replica, or the only replica in a set.

Format

```
partner select partner_name outbound-repol subcommand
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Subcommands

<code>delete <i>repol</i></code>	Deletes the specified outbound replica collection. This deletes the replicas in the collection.
<code>select <i>repol</i> show</code>	Selects a group replica collection and displays the replicas in the collection

<code>show [custom]</code>	Displays the group replica collections stored on the partner. Specify <code>custom</code> to display custom replica collections.
----------------------------	--

Examples

The following command displays the replica collections stored on the partner:

```
> partner select psgroupa outbound-repcol show
```

Name	Collection	TimeStamp	Replicas	Schedule
vc1.1-2006-03-10-11:07:04.470	vc1	2006-03-10:11:07:04	2	svcl
vc1.1-2006-03-10-11:10:05.471	vc1	2006-03-10:11:10:05	2	svcl

The following command displays the replicas in an outbound replica collection:

```
> partner select psgroupa outbound-repcol select
vc1.1-2006-03-10-11:15:49.473 show
```

```

_____ Outbound-repcol Information _____
Name: vc1.1-2006-03-10-11:15:49.473  CreationTime: 2006-03-10:11:15:49
NoOfReplicas: 2                      Schedule: svcl
_____ Replicas _____
Name                               TimeStamp
-----
v1.1-2006-03-10-11:15:49.939       2006-03-10:11:15:49
v2.1-2006-03-10-11:15:49.940       2006-03-10:11:15:49

```

The following command deletes an outbound replica collection:

```
> partner select psgroupa outbound-repcol delete
vc1.1-2006-03-10-11:15:49.473
```

Outbound-replica collection deletion succeeded.

partner select outbound-repcolset

Manages the group replica collection sets stored on the partner, including deleting replica collection sets and displaying the replica collections in a replica collection set.

Format

```
partner select partner_name outbound-repcolset subcommand
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Subcommands

<code>delete repcolset</code>	Deletes the specified outbound replica collection set. This deletes the replicas in the collection.
<code>select repcolset show</code>	Selects a group replica collection set and displays the replica collections in the set.
<code>show</code>	Displays the group replica collection sets stored on the partner.

Examples

The following command displays the group replica collection sets stored on the partner:

```
> partner select psgroupa outbound-repcolset show
```

Collection	NoOfRepcols	Status
vc1	2	enabled

The following command displays the replica collections in an outbound replica collection set:

```
> partner select psgroupa outbound-repcolset select vc1 show
```

```

_____ Replication Information _____
PartnerName: psg34                      DesiredStatus: enabled
NoOfRepcols: 2

_____ Outbound-repcols _____
Name                               Collection TimeStamp      Replicas Schedule
-----
vc1.1-2006-03-10-11:24:49.476  vc1          2006-03-10:11:24:49    2  svc1
vc1.1-2006-03-10-11:27:49.477  vc1          2006-03-10:11:27:49    2  svc1

```

The following command deletes an outbound replica collection set:

```
> partner select psgroupa outbound-repcolset delete vc1
```

```
Outbound-replica collection set deletion succeeded.
```

partner select outbound-replicaset

Enables you to select a partner and perform the following tasks:

- Display the outbound replica sets and replicas
- Delete an outbound replica or replica set

Format

```
partner select partner_name outbound-replicaset subcommand
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Subcommands

delete	Deletes a replica set.
select	Selects a replica set for the purpose of deleting a replica or displaying the replicas in the replica set.
show	Displays all the group's outbound replica sets.

partner select outbound-replicaset delete

Selects a partner and deletes an outbound replica set.

You can obtain the name of an outbound replica set with the following command:

```
partner select partner_name outbound-replicaset show
```

Format

```
partner select partner_name outbound-replicaset delete set_name
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of a replica set.

Example

The following command deletes an outbound replica set:

```
> partner select psgroup1 outbound-replicaset delete vol3
```

partner select outbound-replicaset select

Enables you to select a partner and an outbound replica set and perform the following tasks:

- Display the outbound replicas in the replica set
- Delete a specific outbound replica

You can obtain a name of an outbound replica set with the following command:

```
partner select partner_name outbound-replicaset show
```

Format

```
partner select partner_name outbound-replicaset select set_name  
subcommand
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an outbound replica set.

Subcommands

delete	Deletes a replica.
show	Displays information about the replica set and its replicas.

partner select outbound-replicaset select delete

Selects a partner and an outbound replica set and deletes an outbound replica.

Notes: You cannot delete the most recent replica, or the only replica in a set.

You can delete an outbound replica only if it is complete (that is, the status is complete, not in-progress). Do not disable replication on the volume or the delete will fail.

To display the individual replicas within an outbound replica set, use:

```
partner select partner_name outbound-replicaset select set_name show
```

Format

```
partner select partner_name outbound-replicaset select set_name delete  
replica_name
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of an outbound replica set.
<i>replica_name</i>	Name of a replica.

Example

The following command deletes an outbound replica:

```
> partner select psall outbound-replicaset select vol3 delete  
vol3.1-2006-02-10-09:54:5
```

```
Do you really want to delete the outbound replica? (y/n) [n] y
```

partner select outbound-replicaset select show

Selects a partner and an outbound replica set and displays details about the replica set and its replicas.

Format

```
partner select partner_name outbound-replicaset select set_name show
```

Variables

<i>partner_name</i>	Group name of a partner.
<i>set_name</i>	Name of a replica set.

Example

The following command selects an outbound replica set, and displays details about that replica set:

```
> partner select psgroup1 outbound-replicaset select v1 show
```

```

_____ Outbound-Replicaset Information _____
Name: v1                               Remote-Rep-Reserve: 200%
Local-Rep-Reserve: 100%                 Borrow-Space: enabled
DesiredStatus: enabled                   Status: ready
RemoteISCSIName:                         Remaining Data: 0MB
  iqn.2001-05.com.equallogic:6-8a0700- Completed Data: 0MB
  54f0e0a02-3bdff02a6c641534-v1.1       StartingTime: None

```

```

_____ Outbound-Replicas _____
Name                               TimeStamp
-----
v1.1-2006-07-10-11:23:44.1666      Mon Jul 10 11:23:44 2006
v1.1-2006-07-10-12:23:43.1670      Mon Jul 10 12:23:43 2006
v1.1-2006-07-10-13:23:54.1676      Mon Jul 10 13:23:54 2006

```

partner select outbound-replicaset show

Selects a partner and displays the outbound replica sets.

Format

```
partner select partner_name outbound-replicaset show
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Example

The following command displays the replica sets outbound to a partner:

```
> partner select psgroup1 outbound-replicaset show
```

```

ReplicaSetName CurrReplicas  Status  Remaining  StartingTime
-----
vol2             10      ready   0MB        2006-01-26:14:00:01
vol5             6       ready   0MB        2006-01-26:17:12:44

```

partner select outbound-resume

Resumes outbound replication data transfer from the group to the selected partner.

Format

```
partner select partner_name outbound-resume
```

Variable

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Example

The following command resumes outbound replication to the partner:

```
> partner select psgroup2 outbound-resume
```

partner select show

Enables you to select a partner and display the partner configuration, inbound and outbound replicas and replica sets, and failback replica sets.

Format

```
partner select partner_name show [parameter]
```

Parameters

failback-replicaset	Displays the partner's failback replica sets stored in the group.
inbound-replicas	Displays the partner's replicas stored in the group.
inbound-replicaset	Displays the partner's replica sets stored in the group.
outbound-replicas	Displays the group's replicas stored on the partner.
outbound-replicaset	Displays the group's replica sets stored on the partner.

Example

The following command shows configuration details for partner `psgroup2`:

```
> partner select psgroup2 show
```

```

_____ Partner Information _____
Name: psgroup2                IPAddress: 182.19.2.206
Space-Received: 0MB           Space-Received-Used: 0MB
Outbound-Password: *****  OutboundDesiredStatus: enabled
Description:                  Space-Delegated: 200GB
Space-Delegated-Used: 150.03GB Inbound-Password: *****
InboundDesiredStatus: enabled Contact:
Email:                        Phone:
Mobile:                       Pool-Delegated: default
_____ Outbound-replicaset _____

ReplicaSetName  CurrReplicas  Status      Remaining  StartingTime
-----
staff1          23            ready       0MB        None
dbvol           38            ready       0MB        None
vol30           38            ready       0MB        None
_____ Outbound-repcolsets _____
Collection      NoOfRepcols      Status
-----

```

partner show

Displays details about the group's replication partners.

The following information appears:

- Name – Name of the partner.
- Received – Total partner space delegated to the group.
- RecvUsed – Used partner space delegated to the group. (Not shown if you specify the `-poolinfo` option.)
- Delegated – Total group space delegated to the partner.
- DelegUsed – Used group space delegated to the partner.

- `OutboundStatus` – Status of replication from the group to the partner (enabled or paused).
- `InboundStatus` – Status of replication from the partner to the group (enabled or paused).
- `Pool` – Pool from which delegated space is consumed. (Only shown if you specify the `-poolinfo` option.)

Format

```
partner show [-poolinfo]
```

Examples

The following command displays details about the group's replication partner:

```
> partner show
```

Name	Received	RecvUsed	Delegated	DelegUsed	OutboundStatus	InboundStatus
psa10	0MB	0MB	600GB	0MB	enabled	enabled
jagrp1	0MB	0MB	300GB	0MB	paused	enabled
jagrp2	0MB	0MB	0MB	0MB	enabled	enabled
groupd	1000GB	100.02GB	500.01GB	100.02GB	enabled	enabled

The following command displays details about the pool from which delegated space is consumed:

```
> partner show -poolinfo
```

Name	Received	Delegated	DelegUsed	OutboundStatus	InboundStatus	Pool
psa10	0MB	600GB	0MB	enabled	enabled	default
jagrp1	0MB	300GB	0MB	paused	enabled	default
jagrp2	0MB	0MB	0MB	enabled	enabled	default
groupd	1000GB	500.01GB	100.02GB	enabled	enabled	default

pool

Manages pools in the group. The storage in a group can be organized into one to four pools. A pool is comprised of the storage space from the members that are assigned to the pool.

A member can be assigned only to one pool at a time. Unless otherwise specified, a member is assigned to the default pool (by default, named `default`). If you delete a pool, the members in the pool are automatically moved to the default pool.

When you create a volume, you can assign it to a specific pool, if desired. Otherwise, the volume will be located in the default pool.

As needed, you can remove a member or volume from a pool and assign it to a different pool. However, these operations can be lengthy because the data movement will compete with user I/O for computational and network bandwidth.

You can also merge one pool into another pool.

Note: Only one member or volume at a time can be moved into or out of a pool, unless you are merging one pool into another.

Format

`pool subcommand`

Subcommands

<code>create</code>	Creates a pool.
<code>delete</code>	Deletes a pool.
<code>merge</code>	Moves the members and volumes assigned to one pool into another pool and deletes the empty pool.
<code>rename</code>	Renames a pool.
<code>select</code>	Displays or modifies a pool or displays details about a pool.
<code>show</code>	Displays all the pools in the group.

pool create

Creates a pool in the group. Optionally, you can specify a description for a pool.

Format

```
pool create pool_name [description]
```

Variables

<i>pool_name</i>	Pool name, up to 64 characters. Valid characters include letters, numbers, and hyphens. The first character must be a letter or number.
<i>description</i>	Description for the pool, up to 128 alphanumeric characters. If the description contains spaces, surround it with quotation marks.

Example

The following command creates a pool:

```
> pool create staffpool "Pool for staff data"
```

```
Pool creation succeeded.
```

pool delete

Deletes a pool from the group. The members in the pool are automatically moved to the default pool.

You cannot delete the default pool.

Format

```
pool delete pool_name
```

Variable

<i>pool_name</i>	Name of pool you want to delete.
------------------	----------------------------------

Example

The following command deletes a pool:

```
> pool delete testpool
```

```
Do you really want to delete the pool? (y/n) [n]y
Pool deletion succeeded.
```

pool merge

Merges one pool into another pool.

This operation moves the members and volumes assigned to one pool (the source pool) into a different pool (the destination pool). After the merge operation completes, the source pool is deleted.

Format

```
pool merge source_pool destination_pool
```

Variables

<i>source_pool</i>	Pool containing the objects (members and volumes) that you want to merge into another pool.
<i>destination_pool</i>	Pool where the members and volumes from the source pool will move to (must already exist).

Example

The following command merges the members and volumes assigned to the `staff` pool into the `default` pool:

```
pool merge staff default
```

```
If you merge one pool into another pool, the pool being merged is deleted
after its members are moved to the destination pool. Are you sure you want
to merge the pool? (y/n) [n] y
```

pool rename

Renames a pool. You can rename the default pool, if desired.

Format

```
pool rename pool_name new_pool_name
```

Variables

<i>pool_name</i>	Pool that you want to rename.
<i>new_pool_name</i>	New name for pool, up to 64 characters. Valid characters include letters, numbers, and hyphens. The first character must be a letter or number.

Example

The following command renames a pool:

```
> pool rename pool2 engpool
```

pool select

Selects a pool for the purpose of modifying the pool description or displaying pool details, including the members and volumes that are assigned to the pool.

Format

```
pool select pool_name description text
```

Variable

<i>pool_name</i>	Pool name.
<i>text</i>	Description of the pool, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.

Example

The following command displays details about a pool:

```
> pool select pool2 show
```

```

_____ Pool Information _____
Name: pool2                               Description:
Default: false                             TotalVolumes: 4
VolumesOnline: 4                           VolumesInUse: 0
TotalSnapshots: 1                          SnapshotsOnline: 0
SnapshotsInUse: 0                          TotalMembers: 1
MembersOnline: 1                            MembersInUse: 1
TotalCapacity: 2233.05GB                    VolumeReserve: 264.04GB
VolumeReportedSpace: 266.03GB               SnapReservedSpace: 264.04GB
SnapReservedSpaceInUse: 0MB                 ReplicationReservedSpace: 14.03GB
DelegatedSpace: 0MB                         DelegatedSpaceInUse: 0MB
FreeSpace: 1690.94GB                        FailbackSpace: 0MB
ThinProvFreeSpace: 16909.42GB

```

```

_____ Members _____

Name      Status  Model   Version  Disks  Capacity  FreeSpace  Connections
-----
member2   online  70-0011 V3.3.0   14     2233.05GB 1976.2GB   0

```

```

_____ Volumes _____

Name      Size      Snapshots  Status  Permission  Connections
-----
vollch    10GB      0           online  read-write  0
vol2      4GB       0           online  read-write  0
vol3      2GB       0           online  read-write  0
voll1     250GB     1           online  read-write  0

```

pool show

Displays information about all the pools in a group.

Format

```
pool show
```

Example

The following command displays all the pools in a group:

```
> pool show
```

Name	Default	Members	Volumes	Capacity	FreeSpace
default	true	1	2	2667.48GB	2467.42GB
pool02	false	2	1	500.23MB	150.23MB

save-config

Allows you to save the group configuration to a file and use the information to restore a group in the event of a complete group failure.

Note: The `save-config` command does not restore volume data.

To restore a group, you must have the same number of members as existed in the group prior to the failure; otherwise, you must edit the `save-config` file to customize the new group configuration.

The `save-config` command generates a restoration file, by default named `config.cli`, which contains the CLI commands needed to recreate the group and saves the file on an array. Use `ftp` or `scp` to copy the file from the array to a host for safe-keeping (as described in *diag* on page 3-5). However, on the `ftp open` command line, be sure to specify the group IP address.

The `save-config` command can be run in default or group-only mode. In default mode, the resulting file will automatically restore the following:

- Replication partner configuration
- Storage pools
- Member RAID level, pool, and network interface configuration
- Group customization, including lists of servers
- Volume configuration, including access control records
- Volume collection configuration
- Schedules for snapshots and replication
- Local CHAP account configuration
- Event settings
- Account configuration

If you specify the `save-config` command with the `-grouponly` parameter, member and pool configuration information will be saved as comments instead of commands, so you must manually restore these parts of the configuration. A member's RAID level and pool must be configured before you can use the storage.

The `save-config -grouponly` command will not restore the basic member network configuration or the group configuration, but it will save this information as comments in the restoration file. The following information must be manually supplied to each member by running the `setup` utility:

- Group name and IP address
- Passwords
- Member name, IP address, default gateway, and netmask.

Note: A `save-config` file may not be able to successfully restore a member that is running a firmware version that is different from the firmware that was running on the array that generated the restoration file.

Format

```
saveconfig [-verbose] [-grouponly] [file_name]
```

Parameter

<code>-verbose</code>	Specifies verbose mode; commands saved in the file are also displayed on-screen.
-----------------------	--

Variable

<i>file_name</i>	Name of file to which the group configuration will be saved, up to 256 characters. If a file name is not specified, the file default name is <code>config.cli</code> . The file is not time-stamped; it is overwritten each time you run the command. It is recommended that you use a unique file name so you can easily identify the restoration file for a group.
------------------	---

Examples

The following command saves the group configuration to a specified file name:

```
> save-config group23rest.cli
configuration saved to group23rest.cli
You can retrieve the file using ftp or scp.
```

The following command saves the group configuration to the default file name with member and pool information commented out:

```
> save-config -grouponly
configuration saved to config.cli
You can retrieve the file using ftp or scp.
```

To restore a group, follow these steps:

1. Run the `reset` command on each member. Contact your array support provider before running the `reset` command.
2. Run `setup` on each member and specify the member configuration (member name, IP address, netmask, and default gateway) and the group configuration (group name, IP address, and passwords).
3. If you used the group-only option, set up the pools, then for each member, select the pool and RAID level, and configure the network interfaces.
4. Use `ftp` or `scp` to copy the saved restoration file to an array, as described in *update* on page 3-17. However, on the `ftp open` command line, be sure to specify the group IP address.
5. Use `telnet` or `SSH` to connect to the group IP address and log in to the group. At the CLI prompt, use the following format to execute the commands in the restoration file:

```
exec -echo -ignore ../mgtdb/update/file_name
```

For example:

```
> exec -echo -ignore ../mgtdb/update/group23rest.cli
```

show

Displays a summary of the group configuration or detailed information about a specific group component.

Format

```
show [parameter]
```

Parameters

account [active]	Displays the group administration accounts and information about accounts that are currently logged in to the group. The output is the same as for the <code>account show</code> command.
alerts	Displays the priorities for the event notification methods. The output is the same as for the <code>alerts show</code> command.
chapuser	Displays local CHAP accounts, including the account name, password, and status.
collections	Displays the volume collections in the group. Output is the same as for the <code>collections show</code> command.
grpparams	Displays all the group parameters and their values. The output is the same as for the <code>grpparams show</code> command.
member	Displays the group members or details about a specific member. The output is the same as for the <code>member show</code> command.
partners	Displays information about configured replication partners. The output is the same as for the <code>partner show</code> command.
pool	Displays the pools in the group and the number of members in each pool. The output is the same as for the <code>pool show</code> command.
recentevents	Displays event messages in the group, starting with the most recent.
snapcol	Displays the snapshot collections in the group. Output is the same as for the <code>snapcol show</code> command.
usersessions	Displays a list of accounts that are currently logged in to the group. This output is the same as for the <code>show accounts active</code> and <code>account show active</code> commands.
volume	Displays the volumes or details about a specific volume in the group. The output is the same as for the <code>volume show</code> command.

Example

The following command displays a summary of the group configuration:

```

_____ Group Information _____
Name: group1                               Group-IpAddress: 111.22.106.140
DateAndTime: Tue May 1 08:58:04 2007      TimeZone: America/New_York
TotalVolumes: 12                           VolumesOnline: 10
VolumesInUse: 0                             TotalSnapshots: 21
SnapshotsOnline: 1                         SnapshotsInUse: 0
TotalMembers: 2                             MembersOnline: 2
MembersInUse: 2                             TotalCapacity: 8481.81GB
VolumeReserve: 418.05GB                    VolumeReportedSpace: 522.73GB
SnapReservedSpace: 433.8GB                 SnapReservedSpaceInUse: 30.56GB
ReplicationReservedSpace: 158.04GB         FailbackReservedSpace: 207.11GB
DelegatedSpace: 854GB                       DelegatedSpaceInUse: 290.01GB
FreeSpace: 6410.8GB                         TotalDisks: 30
OnlineDisks: 27                             SpareDisks: 3
OfflineDisks: 0                             FailedDisks: 0
Collections: 2                               Snapcols: 11
CustomSnapcols: 2                           ThinProvFreeSpace: 64108GB

```

```

_____ Members _____
Name      Status  Version  Disks  Capacity  FreeSpace  Connections
-----
member2   online  V3.3.0   14     2233.05GB 1976.2GB   0
member1   online  V3.3.0   16     6248.76GB 5882.16GB  0

```

```

_____ Volumes _____
Name      Size      SnapShots  Status      Permission  Connections  TP
-----
exchangevol  100GB    14         online      read-write  0             Y
vol1ch      10GB     0          online      read-write  0             Y
vol2        4GB      0          online      read-write  0             N
vol3        2GB      0          online      read-write  0             N
vol4        20GB     0          online      read-write  0             Y
test        25GB     0          offline     read-write  0             Y
vol1        250GB    1          online      read-write  0             N
volwithFB   10GB     2          online      read-write  0             N
volnoFB     100MB    3          online      read-write  0             N
test1       100GB    0          online      read-write  0             N
test.vole   100MB    0          online      read-write  0             N
da45        1.46GB   1          offline     read-write  0             N

```

 Volume Collections

Name	NoOfVolumes	NoOfSnapcols
coll1	2	11
coll2	4	0

 Pools

Name	Default	Members	Volumes	Capacity	FreeSpace
default	true	1	8	6248.76GB	4719.85GB
pool2	false	1	4	2233.05GB	1690.94GB

 Partners

Name	Received	RecvUsed	Delegated	DelegUsed	OutboundStatus	InboundStatus
group2	1500.01G	1124.21G	854GB	290.01GB	enabled	enabled
	B	B				

show account

Displays all the group administration accounts.

Specify the `active` parameter to display the accounts currently logged in to the group. For users logged in through the GUI, the `active` parameter also shows the remote IP address of the user and the local IP address (that is, the group or member IP address to which the user is connected).

Format

```
show account [active]
```

Examples

The following command displays information about group administration accounts:

```
> show account
```

```

_____ Local Accounts _____
Name           Permission Privilege   Status   LastLogin
-----
grpadmin       read-write  group-admin enable   2006-10-24:10:33:26
kristen        read-write  group-admin enable   None
monitor        read-only   group-admin enable   None
pool2          read-write  pool-admin  enable   None

```

```

_____ Radius Accounts _____
Name           Permission Privilege   Status   LastLogin
-----
tstgroup       read-write  pool-admin  enable   2006-08-22:20:46:05
staffdb        read-only   pool-admin  enable   2006-08-17:08:34:25

```

The following command shows the accounts that are currently logged in to the group:

```
> show account active
```

```

Name      Type      StartTime                Remote IP      Local IP
-----
grpadmin  telnet    2006-03-22:14:36:05
monitor   gui-ssl   2006-03-23:17:16:25    182.12.22.12  182.1.15.2

```

show alerts

Displays the event priorities (info, warning, error, or fatal) for e-mail and syslog notification, if enabled.

Format

```
show alerts
```

Example

The following command shows the priorities for e-mail and syslog notification:

```
> show alerts
```

Notification Method	Priority
-----	-----
Email	warning,error,fatal
SysLog	info,warning,error,fatal

show chapuser

Displays the local CHAP accounts configured in the group for iSCSI initiator authentication.

Format

```
show chapuser
```

Example

The following command shows the local CHAP accounts:

```
> show chapuser
```

Name	Password	Status
-----	-----	-----
dbase	nty57nbel4gmg	enable
guest	jrmainline	enable
testchap	testing	enable

show collections

Displays information about the volume collections in the group.

Format

```
show collections
```

Example

The following command displays the volume collections in the group:

```
> show collections
```

Name	NoOfVolumes	NoOfSnapcols
vc1	3	2
vc5	2	4

show grpparams

Displays the group parameters and their current values.

Format

```
show grpparams
```

Example

The following command displays the current values for the group parameters:

```
> show grpparams
```

```

_____ Group Information _____
Name: group1                               Group-IpAddress: 111.19.106.140
Def-Snap-Reserve: 100%                     Def-Snap-Warn: 10%
Def-Snap-Depletion: delete-oldest         Def-Thin-Growth-Warn: 60%
Def-Thin-Growth-Max: 100%                 DateAndTime: Wed May 2 14:50:28 2007
TimeZone: America/New_York               Description:
Def-Iscsi-Prefix:                         Def-Iscsi-Alias: yes
  iqn.2001-05.com.equallogic              Info-Messages: enabled
Webaccess: enabled                       Webaccess-noencrypt: enabled
Cliaccess-SSH: enabled                   Cliaccess-Telnet: enabled
Email-Notify: enabled                   Syslog-Notify: enabled
iSNS-Server-List:                       Email-List: kabbott@company.com
NtpServers:                              Sntp-Server-List: 123.77.32.4
Syslog-Server-List: 111.23.4.56          Target-Auth-UserName:
Target-Auth-Password:                   prJXHpjz2XbPBB2B
  Rxr2RJPxhHPXjXBX                       Email-From: kabbott@company.com
Location: default                       Conn-Balancing: enabled
Discovery-Use-Chap: disabled             Email-Contact:
Perf-balancing: enabled                  Disallow-Downgrades: yes

```

```

_____ Radius Information _____
radius-auth-list:                               login-radius-auth: disabled
radius-auth-retries: 1                          radius-auth-timeout: 2secs
login-radius-acct: disabled                      radius-acct-retries: 1
radius-acct-timeout: 2secs                       iscsi-radius-auth: disabled
iscsi-local-auth: enabled                        radius-acct-list:
login-radius-attr: enabled                       radius-auth-secrets:
radius-acct-secrets:

```

```

_____ Snmp Information _____
read-only-comms: public                          read-write-comms:
trap-community: SNMP-trap                       snmp-managers:

```

show member

Displays the members in the group or details about a specific member, including any in-progress member operation, such as removing a member from a pool.

Format

```
show member [member_name] | -poolinfo
```

Variable

<i>member_name</i>	Name of the member.
--------------------	---------------------

Examples

The following command displays a summary of the group members:

```
> show member
```

```

Name           Status  Version  Disks  Capacity  FreeSpace  Connections
-----
member2        online  V3.3.0   14     2233.05GB  1976.2GB   0
member1        online  V3.3.0   16     6248.76GB  5882.16GB  0

```

The following command displays a summary of the group members and pool information:

```
> show member -poolinfo
```

Name	Status	Version	Disks	Capacity	FreeSpace	Connections	Pool
member2	online	V3.3.0	14	2233.05GB	1976.2GB	0	pool2
member1	online	V3.3.0	16	6248.76GB	5882.16GB	0	default

The following command displays details about a member:

```
> show member mem1
```

```

_____ Member Information _____
Name: member2                               Status: online
TotalSpace: 2233.05GB                       UsedSpace: 256.85GB
SnapSpace: 0MB                               Description:
Def-Gateway: 111.22.0.1                     Serial-Number: B020742
Disks: 14                                    Spares: 2
Controllers: 2                               CacheMode: write-back
Connections: 0                               RaidStatus: ok
RaidPercentage: 0%                          LostBlocks: false
HealthStatus: normal                        LocateMember: disable
Controller-Safe: disabled                   Low-Battery-Safe: enabled
Version: V3.3.0                             Delay-Data-Move: disable
Pool: pool2                                 Raid-policy: raid50

```

```

_____ Health Status Details _____

```

```
Critical conditions::
None
```

```
Warning conditions::
None
```

```

_____ Operations InProgress _____

```

```
ID StartTime          Progress Operation Details
```

```
-----
```

show partners

Displays information about the group's replication partners.

The following information appears in the `show partners` command output:

- `Received` – Total partner space delegated to the group.
- `RecvUsed` – Used partner space delegated to the group.
- `Delegated` – Total group space delegated to the partner.
- `DelegUsed` – Used group space delegated to the partner.
- `OutboundStatus` – Status of replication from the group to the partner (enabled or paused).
- `InboundStatus` – Status of replication from the partner to the group (enabled or paused).

Format

```
show partners [-poolinfo]
```

Example

The following command displays a summary of the group partners:

```
> show partners
```

Name	Received	RecvUsed	Delegated	DelegUsed	OutboundStatus	InboundStatus
group2	1500.01GB	1124.21GB	854GB	290.01GB	enabled	enabled

show pool

Displays information about the pools in the group.

Format

```
show pool
```


Example

The following command displays the pools in the group:

```
> show pool
```

Name	Default	Members	Volumes	Capacity	FreeSpace
default	true	1	9	6248.76GB	4695.82GB
pool2	false	1	3	2233.05GB	1714.98GB

show recentevents

Displays event messages in the group, starting with the most recent.

When an event occurs (such as the creation of a volume or the removal of a power supply), a message is generated. These messages enable you to track normal operations and detect problems before they disrupt operations. Event messages can also help you diagnose problems.

The `show recentevents` command displays output equal to a screen or page at a time, unless paging has been turned off with the `cli-settings paging off` command. If paging has been turned off, the command displays all events.

Each event is assigned a priority. Table 2-5 lists event priorities in order from highest (most severe) to lowest (least severe).

Table 2-5: Event Priorities

Priority	Description
FATAL	Catastrophic failure that requires immediate administrator intervention.
ERROR	Serious failure that should be investigated and may require administrator intervention.
WARNING	Potential problems in the group. An event with this priority may become an event with ERROR priority if administrator intervention does not occur.
INFO	Normal operational and transitional events that are of interest to administrators but do not require intervention.

Each event message shows the following information:

- Group member that reported the event
- Date and time of the event, in the format *mm/dd/yy hh:mm:ss*
- Event priority level
- Message text

Format

```
show recentevents
```

Example

The following command shows examples of events:

```
> show recentevents
```

```
170:61:member2:SP:31-Jan-2007
20:08:29.320062:verify.c:338:INFO:14.2.14:0:
Parity verification completed on RAID LUN 0 after 16385 seconds.
.
.
.
312:189:member1:MgmtExec: 1-May-2007
00:00:00.230190:SnapColSchedule.cc:950:WARNING:8.3.11:
Replica collection schedule 'coll1-sched' failed to create a replica
collection.
.
.
.
58:52:member1:SP: 4-Apr-2007
13:32:56.470053:emm.c:1371:WARNING:28.3.51:
Warning health conditions currently exist. Investigate these conditions
before they affect array operation.
Control modules are initializing. Control module failover cannot occur
until the initialization completes.
There are 1 outstanding health conditions. Investigate these conditions
before they affect array operation.
.
.
.
4:2:member2:SP:30-Apr-2007 13:11:09.170003:emm.c:920:ERROR:28.4.50:
Control module in slot 1 is not functioning or not installed.
```

show snapcol

Displays information about the snapshot collections in the group.

Format

```
show snapcol
```

Example

The following command displays the snapshot collections currently on the group:

```
> show snapcol
```

Name	Snapshots	Collection	Schedule
snapcoll11-2007-03-13-15:00:48.1	2/2	coll1	

show usersessions

Displays information about the administration accounts that are currently logged in to the group. For users logged in through the GUI, the following are shown:

- Type. The user's method of connection (console or GUI-SSL).
- Start time. The time the user logged in.
- Remote IP address. The IP address of the user's system.
- Local IP address. The group or member IP address to which the user is connected).

Format

```
show usersessions
```

Example

The following displays the accounts that are currently logged in to the group:

```
> show usersessions
```

Name	Type	StartTime	Remote IP	Local IP
grpadmin	telnet	2006-06-14:09:36:51		
grpadmin	gui-ssl	2006-06-14:11:09:29	123.4.56.789	234.56.7.8

show volume

Displays the group volumes or information about a specific volume, including replication partners (if replication is enabled), access control records, and in-progress operations for the volume (for example, replication, bind, or pool move operations).

You can also display pool information for all the volumes.

Format

```
show volume [vol_name] | [-poolinfo]
```

Variable

<i>vol_name</i>	Name of the volume.
-----------------	---------------------

Examples

The following command displays all the volumes in the group and their status, including whether the volume has thin provisioning enabled (in the column labeled TP):

```
> show volume
```

Name	Size	SnapShots	Status	Permission	Connections	TP
exchangevol	100GB	14	online	read-write	1	Y
vol1ch	10GB	0	online	read-write	1	Y
vol2	4GB	0	online	read-write	1	N
vol3	2GB	0	online	read-write	1	N
vol4	20GB	0	online	read-write	1	Y
test	25GB	0	offline	read-write	0	Y
vol1	250GB	1	online	read-write	1	N
volwithFB	10GB	2	online	read-write	0	N
volnoFB	100MB	3	online	read-write	1	N
test1	100GB	0	online	read-write	1	N
test.volume	100MB	0	online	read-write	1	N
data45	1.46GB	1	offline	read-write	0	N

The following command shows detailed information about a specific volume:

```
> show volume vol2
```

Volume Information	
Name: vol2	Size: 4GB
VolReserve: 4.01GB	VolReserveInUse: 1005MB
ReplReserveInUse: 0MB	iSCSI Alias: vol2

```

iSCSI Name:                               ActualMembers: 1
  iqn.2001-05.com.equallogic:0-8a0906-   Snap-Warn: 10%
  dcefc1902-1759e8e89714614f-vol2      Snap-Depletion: delete-oldest
Description:                               Snap-Reserve: 100%
Snap-Reserve-Avail: 100% (4.01GB)        Permission: read-write
DesiredStatus: online                    Status: online
Connections: 1                           Snapshots: 0
Bind:                                     Type: replicated
ReplicationReserveSpace: 4.01GB          Replicas: 1
ReplicationPartner: group2              Pool: pool2
Transmitted-Data: 999MB                 Received-Data: 999MB
Pref-Raid-Policy: none                  Pref-Raid-Policy-Status: none
Thin-Provision: disabled                Thin-Min-Reserve: 0% (0MB)
Thin-Growth-Warn: 0% (0MB)             Thin-Growth-Max: 0% (0MB)
ReplicationTxData: 1005MB
    
```

Access Records

ID	Initiator	Ippaddress	AuthMethod	UserName	Apply-To
1		172.17.30.22	none		both

Replication Partners

Partner Name	CurrReplicas	Status	Remaining	StartingTime
group2	1	ready	0MB	None

Operations InProgress

ID	StartTime	Progress	Operation	Details

The following command shows pool information for all the volumes:

```
> show volume -poolinfo
```

Name	Size	SnapShots	Status	Connections	Pool	TP
exchangevol	100GB	14	online	1	default	Y
vol1ch	10GB	0	online	1	default	Y
vol2	4GB	0	online	1	pool2	N
vol3	2GB	0	online	1	pool2	N
vol4	20GB	0	online	1	default	Y
test	25GB	0	offline	0	default	Y
vol1	250GB	1	online	1	pool2	N
volwithFB	10GB	2	online	0	default	N
volnoFB	100MB	3	online	1	default	N
test1	100GB	0	online	1	default	N
test.volume	100MB	0	online	1	default	N
data45	1.46GB	1	offline	0	default	N

snapcol

Create and manage the snapshot collections in a group.

A snapshot collection consists of snapshots, created simultaneously, of multiple volumes. A snapshot collection is created each time you create snapshots of the volumes in a volume collection. A custom snapshot collection is created when you create a snapshot of two or more individual volumes at the same time.

To restore data, you can restore or clone an individual snapshot in a collection.

Format

```
snapcol subcommand
```

Subcommands

create	Creates a snapshot collection.
delete	Deletes a snapshot collection. This will delete the individual snapshots in the collection.
rename	Renames a snapshot collection.
select	Enables you to: <ul style="list-style-type: none"> • Modify a snapshot collection description. • Display information about the selected snapshot collection.
show	Displays all snapshot collections or all custom snapshot collections.

snapcol create

Creates a collection of simultaneous snapshots of the volumes in a volume collection, or volumes you specify individually.

Format

```
snapcol create {coll_name|vol_name} [snap_coll_name] [description text]
```

Variables

<i>coll_name</i>	Name of a volume collection.
------------------	------------------------------

<i>snap_coll_name</i>	Optional name for the snapshot collection, up to 128 alphanumeric characters. Both autogenerated names and assigned names are appended with a timestamp, which is not part of the 64-character name length limit.
<i>vol_name</i>	One or more volume names, separated by commas and no spaces.
<i>text</i>	Text for snapshot collection description, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.

Examples

The following command creates a snapshot collection (`sc23monday`) from a volume collection (`coll123`) that contains two volumes:

```
> snapcol create coll123 sc23monday description "Database Snaps"
```

Snapshot creation succeeded.

The actual snapshot collection name will have a timestamp appended, so it will appear in output as `sc23monday-2006-06-15-13:28:54.49`, for example. If the name plus the timestamp is longer than 30 characters, the name will wrap in the output of the `snapcol show` command.

The timestamp portion of the name is always 23 characters long, and consists of the leading hyphen, year, month, day, and hour (separated by hyphens), then the minute and second (separated by colons), a period, and an incremental number.

This leaves seven (7) available characters for the user-assigned portion of the name, before the name will wrap onto the following line of output.

The following command creates a snapshot collection from the specified volumes. The snapshot collection name is generated automatically:

```
> snapcol create vol1,vol2,vol3
```

Snapshot collection creation succeeded.

For the previous example, the snapshot collection name is “`snapcol`” followed by a hyphen and the timestamp; for example: `snapcol-2007-05-01-09:36:42.149`.

snapcol delete

Deletes a snapshot collection. The snapshots that comprise the collection will be deleted.

Format

```
snapcol delete snap_coll_name
```

Variable

<i>snap_coll_name</i>	Name of a snapshot collection.
-----------------------	--------------------------------

Example

The following command deletes a snapshot collection:

```
> snapcol delete scwednesday-2006-06-14-14:27:46.27
```

```
Do you really want to delete the snapshot collection? (y/n) [n]y
Snapshot collection deletion succeeded.
```

snapcol rename

Renames a snapshot collection. The new name is not automatically appended with a timestamp.

Format

```
snapcol rename snap_coll_name new_snap_coll_name
```

Variables

<i>snap_coll_name</i>	Name of a snapshot collection.
<i>new_snap_coll_name</i>	New snapshot collection name, up to 64 alphanumeric characters. Note: Names are not case-sensitive. For example, snap-01 and SNAP-01 are considered the same.

Example

The following command renames a snapshot collection:

```
> snapcol rename snapcol-2006-06-14-14:27:46.27 June14
```

snapcol select

Enables you to select a snapshot collection and modify the description or display details about the snapshot collection.

Format

```
snapcol select snap_coll_name [description text]|show
```

Variables

<i>snap_coll_name</i>	Name of a snapshot collection.
<i>text</i>	Text for snapshot collection description, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.

Example

The following command displays information about a custom snapshot collection:

```
> snapcol select staff2-2006-03-09-14:52:16.52 show
```

```

_____ Snapcol Information _____
Name: staff2-2006-03-09-14:52:16.52      Description: Data and Staff
Creation Time: 2006-03-09:14:52:16      NoofSnapsAtCreation: 1
CurrentNofSnaps: 1                      Schedule:
Collection:

_____ SnapShots _____
Name                Permission Status      Connections
-----
datavol-2006-03-09-14:52:16.2 read-write offline      0

```

snapcol show

Displays all snapshot collections or all custom snapshot collections in the group.

Format

```
snapcol show [custom]
```

Examples

The following command displays the snapshot collections in the group:

```
> snapcol show
```

Name	Snapshots	Collection	Schedule
snapcol-2006-06-12-17:45:21.11	1/1		
mailcol-2006-06-14-12:02:10.19	2/2	mailcol	
mailcol-2006-06-14-12:04:22.20	2/2	mailcol	
mailcol-2006-06-14-12:09:00.21	2/2	mailcol	
staff-2006-06-14-14:02:17.24	2/2	staffcol	
June14	2/2		
mailcol-2006-06-15-02:30:00.41	2/2	mailcol	Daily
mvcollection-2006-06-15-10:31:08.42	3/3		
mailcol-2006-06-15-10:53:31.43	2/2	mailcol	
mailcolSN-2006-06-15-10:54:05.44	2/2	mailcol	
mailcol-2006-06-15-12:30:00.48	2/2	mailcol	DailyRep
testsnap-2006-06-15-13:28:54.49	2/2	kacoll	

Note: If the name of a snapshot collection exceeds 30 characters, it wraps onto the next line of output, as is the case with the last entry shown in the preceding example. The complete snapshot name is testsnap-2006-06-15-13:28:54.49.

The following command displays the custom snapshot collections in the group:

```
> snapcol show custom
```

Name	Snapshots	Collection	Schedule
snapcol-2006-06-12-17:45:21.11	1/1		
June14	2/2		

volume

Manages the volumes in a group.

Format

volume *subcommand*

Subcommands

create	Creates a volume.
delete	Deletes a volume.
rename	Renames a volume.
select	<p>Enables you to:</p> <ul style="list-style-type: none"> • Display or modify the volume configuration • Increase or decrease the size of a volume. • Move the volume to a different pool • Enable or disable thin provisioning on a volume • Change the RAID preference for the volume • Cancel an in-progress operation for the volume • Create volume snapshots • Replicate the volume to a different group • Manage replication for a volume • Demote a volume to a failback replica set or demote a recovery volume to an inbound replica set • Make an inbound replica set promotion permanent • Manage snapshot and replication schedules for the volume • Set or modify limits on thin-provisioned volumes • Clone the volume or a snapshot • Restore the volume from a snapshot • Manage the volume's access control records to restrict host access • Set the volume offline or online • Restrict volume data to a particular member • Display volume iSCSI connections • Handle lost blocks on the volume
show	Displays all group volumes or detailed information about a specific volume.

volume create

Creates a volume in the group.

When creating a volume, you must specify the volume name and size. A volume will be created in the default pool, unless you specify a different pool. By default, a volume has read-write permission and is set online. A volume will use the group-wide snapshot, thin-provisioning, and iSCSI settings unless you override the settings when you create the volume or modify the volume.

Note: The actual amount of reserved space for the volume is rounded up to the nearest multiple of 15MB.

When you create a volume, an iSCSI target name is automatically generated. This is the name that iSCSI initiators use to access the volume through TCP/IP port 3260 (the standard iSCSI port). The iSCSI target name will consist of the iSCSI target prefix (`iqn.2001-05.com.equallogic`, by default), followed by a generated string, followed by the volume name.

An example of an iSCSI target name is shown here:

```
iqn.2001-05.com.equallogic:6-4b0200-062460afe-13000011cd5c1-dbvol
```

You can also enable thin provisioning on a volume either at the time you create it or later. Thin provisioning can provide you with a more efficient method of allocating storage space to users. However, it should only be used in environments with administrators who can closely monitor disk space usage.

When you create a volume that does not have thin provisioning enabled, the full volume size is reserved for the volume (consumed from free pool space). Therefore, the volume's reported size (that is, the size seen by iSCSI initiators) will be the same as the volume reserve.

When you enable thin provisioning on a volume, you specify the minimum volume reserve, in addition to a volume size. In this case, only the volume reserve is consumed from free pool space. Therefore, the volume's reported size will be larger than or equal to the volume reserve.

As the volume reserve is used (for example, data is written to the volume), the volume reserve for a thin-provisioned volume will grow automatically. When in-use space reaches a user-defined warning limit, an alarm and event message is generated. When in-use space reaches the user-defined maximum, the volume is set offline.

See the *Group Administration* guide for more information on thin-provisioned volumes.

Note: Snapshot reserve, local replication reserve, and replica reserve are based on a percentage of the volume reserve.

Format

```
volume create vol_name size [parameter]
```

Variables

<i>vol_name</i>	<p>Volume name, up to 64 alphanumeric characters.</p> <p>Access to a volume is always through the iSCSI target name, not through the volume name.</p> <p>Volume names must be unique in the group. For example, if you have multiple storage pools, no two volumes in different pools can have the same name.</p>
<i>size</i> [GB]	<p>Volume size (reported size as seen by initiators). Volume size is assumed to be megabytes unless you specify otherwise. You can specify size with any of the following suffixes: m, mb, MB, g, gb, or GB.</p> <p>Because of rounding algorithms, the group's actual capacity may be less than the capacity shown in the CLI or GUI. If you attempt to create a volume that uses more than the group's remaining capacity as displayed, the volume creation will fail, and you will receive an error message that states the actual available space.</p>

Parameters

<code>bind</code> <i>member_name</i>	<p>Binds the new volume to the specified member. Volume data will be restricted to this member.</p> <p>Binding a volume to a member will override any RAID preference and automatically performance load balancing for the volume.</p>
<code>description</code> <i>text</i>	<p>Description for the volume, up to 128 alphanumeric characters. If the text contains spaces, surround it with quotation marks.</p>
<code>iscsi-alias</code> <i>alias_name</i>	<p>iSCSI target alias, up to 64 alphanumeric characters, for the volume. Some iSCSI initiators can see the alias.</p> <p>The default is the group-wide setting, as described in <i>grpparams def-iscsi-alias</i> on page 2-41.</p>
<code>online offline</code>	<p>Volume status. The default is online.</p>

<code>pool pool_name</code>	Pool in which the volume data will reside. The default is the default pool.
<code>read-write read-only</code>	Volume permission. The default is read-write.
<code>snap-depletion action</code>	Action to take when the snapshot reserve is exceeded, either <code>delete-oldest</code> (delete the oldest snapshots, the default) or <code>volume-offline</code> (set the volume and its snapshots offline). The default is the group-wide setting, as described in <i>grpparams def-snap-depletion</i> on page 2-42.
<code>snap-reserve n%</code>	Amount of space, as a percentage of the volume size, to reserve for snapshots. You must include the percent sign. The default is the group-wide setting, as described in <i>grpparams def-snap-reserve</i> on page 2-42.
<code>snap-warn n%</code>	Threshold at which an alarm is generated because the amount of free space reserved for snapshots has fallen below this value, as a percentage of the total reserved snapshot space. You must include the percent sign. The default is the group-wide setting, as described in <i>grpparams def-snap-warn</i> on page 2-43.
<code>thin-provision</code>	Enables thin provisioning on the volume.
<code>thin-min-reserve n%</code>	Minimum volume reserve (default is 10% of the total volume size) for a thin-provisioned volume. This is the amount of immediately writable, guaranteed space reserved for the volume.
<code>thin-growth-warn n%</code>	When the amount of in-use space reaches this value, as a percentage of the volume size, a warning alarm and event message is generated. Applies only to thin-provisioned volumes. The default is the group-wide limit, as described in <i>grpparams def-thin-growth-warn</i> on page 2-45.
<code>thin-growth-max n%</code>	When in-use space reaches this limit, as a percentage of the volume size, the volume will be set offline. Applies only to thin-provisioned volumes. The default is the group-wide limit, as described in <i>grpparams def-thin-growth-max</i> on page 2-44.
<code>unrestricted</code>	Allows unrestricted host access to the volume and its snapshots, which is not recommended. Instead, create access control records to limit host access. See <i>volume select access</i> on page 2-179 for more information.

Examples

The following command creates a 100 GB volume named `dbvol` in pool `perf1`:

```
> volume create dbvol 100GB pool perf1
```

```
Volume creation succeeded.  
iSCSI target name is iqn.2001-05.com.equallogic:6-4b0200-062460afe-  
13000011cd5c1-dbvol
```

The following command attempts to create a volume of 3.05 GB (with no snapshot reserve), which is larger than the free space in the default pool, and returns a message stating the actual amount of free pool space:

```
> volume create total 3.05GB snap-reserve 0%
```

```
% Error - Available space is less than requested  
Available Group space= 3120MB  
Requested Volume size= 3123MB Requested Reserved Space= 0MB
```

As the example shows, the actual free pool space available for volumes is 3120 MB or 3.046875 GB, which is less than the 3.05 GB specified in the command line.

The following command attempts to create a volume of 1200GB with a 200% snapshot reserve, in a pool with sufficient space for the volume, but not the requested snapshot reserve amount:

```
agroup> volume create hugevol 1200gb snap-reserve 200%
```

```
% Error - Available space is less than requested  
Available Group space = 1690785MB  
Requested Volume size = 1228800MB Requested Reserved Space = 2457600MB
```

The following command creates a thin-provisioned volume of 200 GB, with a minimum reserve of 20%, a threshold warning set at 75%, and a maximum growth limit set to 85%:

```
agroup> volume create vol-thin1 200GB thin-provision thin-min-reserve 20%  
thin-growth-warn 75% thin-growth-max 85%
```

```
Volume creation succeeded.  
iSCSI target name is iqn.2001-05.com.equallogic:0-8a0906-5041d1a02-  
61cffd39bde46374-vol-thin1
```


volume delete

Deletes a volume, which returns free space to the group.

Note: All snapshots associated with the volume are also deleted.

Format

```
volume delete vol_name
```

Variable

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

Example

The following command deletes a volume (and all its snapshots):

```
> volume delete tempvol
```

```
Do you really want to delete the volume? (y/n) [n]y
Volume deletion succeeded.
```

volume rename

Renames a volume.

The iSCSI target name does not change if you rename the volume, so no host modifications are needed. However, if the iSCSI target alias for the volume is set to the volume name, the alias will change to match the new volume name.

Format

```
volume rename vol_name new_vol_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>new_vol_name</i>	New volume name, up to 64 alphanumeric characters.

Example

The following command renames a volume:

```
> volume rename staffvol vol2
```

volume select

Enables you to select a volume and perform these tasks:

- Display or modify the volume configuration
- Move the volume to a different pool
- Change the RAID preference for the volume
- Cancel an in-progress operation for the volume
- Create volume snapshots
- Replicate the volume to a different group
- Demote a volume to a failback replica set or demote a recovery volume to an inbound replica set
- Make an inbound replica set promotion permanent
- Manage replication for a volume
- Manage snapshot and replication schedules for the volume
- Clone the volume or a snapshot
- Increase or decrease the size of a volume.
- Enable or disable thin provisioning on a volume.
- Modify the attributes of a thin-provisioned volume
- Restore the volume from a snapshot
- Manage the volume's access control records to restrict host access
- Set the volume offline or online
- Restrict volume data to a particular member
- Display volume iSCSI connections
- Handle lost blocks on the volume

Format

```
volume select vol_name subcommand | parameter ...
```

Variable

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

Subcommands

<code>access</code>	Manages access control records for the volume.
<code>clone</code>	Clones the volume, creating a new volume.
<code>delete-failback</code> <i>new_volume_name</i>	Makes an inbound replica set promotion permanent. (Used only with a recovery volume, which is created by promoting an inbound replica set.) The resulting volume will no longer be flagged as a recovery volume and cannot be demoted to the original inbound replica set.
<code>replication</code>	Manages volume replication and promotion.
<code>schedule</code>	Manages snapshot and replication schedules for the volume.
<code>show</code>	Displays details about the volume or iSCSI connections to the volume.
<code>shrink [no-snap]</code> <code>[no-adjust-snap-resv]</code> <i>size</i> [GB]	Decreases the volume to the specified size. The size is assumed to be in megabytes unless you specify otherwise. You can specify size with any of the following suffixes: m, mb, MB, g, gb, or GB. See <i>volume select shrink</i> on page 2-211 for more information.
<code>size [no-snap]</code> <i>size</i> [GB]	Increases the (reported) volume size. The size is assumed to be in megabytes unless you specify otherwise. You can specify size with any of the following suffixes: m, mb, MB, g, gb, or GB. The new size will not be recognized by hosts currently connected to the volume unless they support file system expansion. Before increasing the volume size, understand how it affects the operating system, file system, or application using the volume, and set the volume offline first if necessary for your environment. Note: Some operating systems cannot support volumes larger than 2TB. A warning message is displayed when you attempt to grow a volume beyond 2TB. Make sure your operating system will recognize the new, larger size. See <i>volume select size</i> on page 2-213 for more information.

snapshot	Manages volume snapshots or restores the volume from a snapshot.
----------	--

Parameters

bind <i>member_name</i>	<p>Binds the volume to the specified member. Volume data will be restricted to this member.</p> <p>Binding a volume to a member will override any RAID preference for the volume.</p>
cancel-operation <i>op_id</i>	<p>Cancels an in-progress operation for the volume. For example, you can cancel an in-progress replication, bind, or pool move operation.</p> <p>Use the <code>volume select show</code> command to obtain the operation's ID number.</p>
description <i>text</i>	Description for the volume, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.
iscsi-alias <i>alias_name</i>	iSCSI target alias for the volume, up to 64 alphanumeric characters. Some iSCSI initiators can see the alias.
lost-blocks <i>action</i>	<p>Action to take when lost cached blocks occur on the volume, either:</p> <ul style="list-style-type: none"> • <code>return-error</code> – Sets the volume online but retains the lost cached block state. If an application attempts to read a lost block, an error will occur. If the block is rewritten, no error will occur, the block will no longer be considered lost, and the volume status will be <code>online-lost-cached-blocks</code>. • <code>mark-valid</code> – Sets the volume online and marks the lost cached blocks as valid. This action may present a security risk, and the blocks may contain old data. <p>Note that lost cached blocks can occur if a power failure lasts longer than 72 hours.</p>
offline online	Sets a volume offline or online.
pool <i>pool_name</i>	<p>Pool in which the volume data will be located.</p> <p>Moving a volume across pools can be a lengthy operation because all the volume data must be moved from the members in the current pool to the members in the new pool. The data movement will compete with user I/O for computational and network bandwidth.</p>

<pre>pref-raid-policy raid-policy</pre>	<p>RAID policy preference for the volume data. If you specify <code>raid5</code>, <code>raid50</code>, or <code>raid10</code>, the group will attempt to place the volume data on a pool member with that RAID policy.</p> <p>The default RAID policy is <code>none</code>, which allows the group to determine the optimal RAID policy for the volume data.</p> <p>Volume clones do not inherit the RAID preference policy of the parent volume; they are set to <code>none</code>, by default.</p>
<pre>read-only read-write</pre>	<p>Sets the volume permission to read-only or read-write (the default). (To make an online volume read-only, you must first set it offline.)</p>
<pre>snap-depletion action</pre>	<p>Action to take when the reserved snapshot space has been exceeded, either <code>delete-oldest</code> (the default; delete the oldest snapshots until enough space is recovered) or <code>volume-offline</code> (set the volume and its snapshots offline).</p>
<pre>snap-reserve n%</pre>	<p>Space reserved for snapshots as a percentage of volume size. You must include the percent sign (for example, <code>150%</code>).</p>
<pre>snap-warn n%</pre>	<p>Threshold at which an alarm is generated because the amount of free space reserved for snapshots has fallen below the specified value, as a percentage of the total reserved snapshot space. You must include the percent sign (for example, <code>20%</code>).</p>
<pre>thin-provision disable enable [tp-options]</pre>	<p>Disables or enables thin provisioning on an existing volume.</p> <p>When you disable thin provisioning on a volume, the volume reserve increases to the volume's reported size.</p> <p>For example, consider a thin-provisioned volume with a reported size of 500GB and a volume reserve that currently equals 300GB. If you disable thin provisioning, the amount of volume reserve will increase to 500GB.</p> <p>When enabling thin provisioning, the <code>thin-min-reserve</code>, <code>thin-growth-warn</code>, and <code>thin-growth-max</code> parameters are optional. If not specified, the volume will use the group-wide defaults.</p> <p>See the <i>Group Administration</i> guide for information about space reserve considerations when enabling and disabling thin provisioning on an existing volume.</p>
<pre>thin-min-reserve n%</pre>	<p>Minimum volume reserve (default is 10% of the total volume size) for a thin-provisioned volume. This is the amount of guaranteed space (volume reserve) for the volume.</p>

thin-growth-warn n%	<p>When the amount of in-use space reaches this value, as a percentage of the volume size, a warning alarm and event message is generated. Applies only to thin-provisioned volumes.</p> <p>Additional warnings are generated as the amount of in-use space grows beyond this value, as follows:</p> <ul style="list-style-type: none"> • For volumes less than 200GB, a warning is generated with every additional 5% increase in the in-use space. • For volumes larger than 200GB, a warning is generated with every additional 10GB of in-use space. <p>The default is the group-wide limit, as described in <i>grpparams def-thin-growth-warn</i> on page 2-45.</p>
thin-growth-max n%	<p>When in-use space reaches this limit, as a percentage of the volume size, the volume will be set offline. Applies only to thin-provisioned volumes.</p> <p>The default is the group-wide limit, as described in <i>grpparams def-thin-growth-max</i> on page 2-44.</p>
unbind	Removes any member binding for the volume.

Examples

The following commands set a volume offline and change its permission to read-only:

```
> volume select dbvol offline
> volume select dbvol read-only
```

The following commands identify and then cancel an operation (identification number 1) to move the volume vol-A to a different pool:

```
> volume select vol-A show
.
.
.
_____ Operations InProgress _____

ID StartTime                Operation Details
-----
1  2006-07-18:15:42:38  Moving from pool default to pool pool2
> volume select vol-A cancel-operation 1
```

volume select access

Manages access control records for the selected volume and its snapshots.

It is recommended that you use access control records (up to 16) to restrict host (iSCSI initiator) access to a volume and its snapshots (iSCSI targets). This will prevent multiple hosts from simultaneously accessing the same volume or snapshot and possibly corrupting data.

A volume and its snapshots share a list of access control records; however, you can specify that a record apply only to the volume, only to the volume's snapshots, or to both. If a volume or snapshot does not have at least one access control record, no host can access it. If you do not want any host access, delete all the access control records for the volume and its snapshots.

Each access control record can restrict host access according to IP address, iSCSI initiator name, CHAP (Challenge Handshake Authentication Protocol) account name, or any combination of these methods. A host must match *all* the requirements specified in *one* record in order to access the volume or snapshot.

For testing purposes only, you can set up an access control record that allows unrestricted host access to the volume and snapshots. See the `ipaddress` parameter on page 2-183 for more information.

Format

```
volume select vol_name access subcommand
```

Variable

<code>vol_name</code>	Name of a volume.
-----------------------	-------------------

Subcommands

<code>create</code>	Creates an access control record.
<code>delete</code>	Deletes an access control record.
<code>select</code>	Selects an access control record for the purpose of displaying or modifying the record.
<code>show</code>	Displays an access control record.

volume select access create

Creates an access control record for a volume, its snapshots, or both.

A host must match all the requirements specified in one access control record to gain access. In each record, you can specify one or more of the following:

- CHAP user name. To use CHAP for initiator authentication, you must set up local CHAP accounts or specify an external RADIUS server. See *chapuser* on page 2-13 and *grpparams cliaccess-ssh* on page 2-39 for more information.
- IP address.
- iSCSI initiator name.

Notes: If using IP addresses or iSCSI initiator names to restrict access to a volume, be sure to create an access control record for each IP address or iSCSI initiator name presented by an authorized host.

If you are using CHAP, you can enable or disable (default) functionality that prevents unauthorized hosts from discovering targets (volumes) that are only authenticated with CHAP. See *grpparams discovery-use-chap* on page 2-46 for more information.

When you create an access control record, the record is automatically assigned an identification number. Use this number to manage the record with the CLI.

Format

```
volume select vol_name access create parameter ...
```

Variable

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

Parameters

<i>apply-to type</i>	Specifies whether the record restricts access to the volume, its snapshots, or both the volume and its snapshots (default). The <i>type</i> variable can be <i>volume</i> , <i>snapshot</i> , or <i>both</i> .
----------------------	--

<code>authmethod chap none</code>	<p>Specifies whether the record uses CHAP authentication (<code>chap</code>) to restrict access to the volume. The default is <code>none</code>; CHAP authentication is not used.</p> <p>You must also specify the <code>username chap_name</code> parameter for CHAP authentication.</p>
<code>initiator name</code>	<p>Name of the iSCSI initiator to which access is restricted. For example:</p> <pre>iqn.2000-05.com.qlogic.qla-4000.sn00044</pre>
<code>ipaddress ip_address</code>	<p>IP address to which access is restricted. An asterisk (*) in any of the four parts of an IP address is interpreted as a wildcard character; that is, any value is accepted for that 8-bit field.</p> <p>For example, specify <code>*.*.*.*</code> for unrestricted host access (not recommended except for testing).</p>
<code>username chap_name</code>	<p>CHAP account name to which access is restricted. The name must match one of the local CHAP accounts or an account on an external RADIUS server.</p> <p>You must also specify the <code>authmethod chap</code> parameter for CHAP authentication.</p>

Example

The following command creates an access control record that restricts volume access to a host with IP address 123.13.3.44:

```
> volume select dbvol access create ipaddress 123.13.3.44
```

Created access entry with ID 2.

volume select access delete

Deletes an access control record for the selected volume.

Format

```
volume select vol_name access delete n
```

Variables

<code>vol_name</code>	Name of a volume.
-----------------------	-------------------

<i>n</i>	<p>Identification number for an access control record, automatically generated when you create a record.</p> <p>Use the <code>volume select access show</code> command to display the identification numbers for a volume's access control records.</p>
----------	---

Example

The following command deletes an access control record for volume `dbvol`:

```
> volume select dbvol access delete 2
```

```
Access entry deletion succeeded.
```

volume select access select

Displays or modifies the selected access control record for a volume.

When you modify an access control record, the modification overwrites all existing requirements in the record. See the command examples.

Format

```
volume select vol_name access select n show|parameter ...
```

Variables

<i>vol_name</i>	Name of a volume.
<i>n</i>	<p>Identification number for an access control record, automatically generated when you create a record.</p> <p>Use the <code>volume select access show</code> command to display the identification numbers for a volume's access control records.</p>

Parameters

<code>apply-to type</code>	Specifies whether the record restricts access to the volume, its snapshots, or both the volume and its snapshots. The type variable can be <code>volume</code> , <code>snapshot</code> , or <code>both</code> .
----------------------------	---

authmethod <i>chap</i> none	<p>Specifies whether the record uses CHAP authentication (<i>chap</i>) to restrict access to the volume.</p> <p>You must also specify the username <i>chap_name</i> parameter to use CHAP authentication.</p>
initiator <i>init_name</i>	<p>Name of the iSCSI initiator to which access is restricted. For example:</p> <p><code>iqn.2000-05.com.qlogic.qla-4000.sn00044</code></p>
ipaddress <i>ip_address</i>	<p>IP address to which access is restricted. An asterisk (*) in any of the four parts of an IP address is interpreted as a wildcard character; that is, any value is accepted for that 8-bit field.</p> <p>For example, specify <code>*.*.*.*</code> for unrestricted host access (not recommended except for testing).</p>
username <i>chap_name</i>	<p>CHAP account name to which access is restricted. The name must match one of the local CHAP accounts or an account on an external RADIUS server.</p> <p>You must also specify the authmethod <i>chap</i> parameter to use CHAP authentication.</p> <p>See <i>chapuser</i> on page 2-13 and <i>grpparams cliaccess-ssh</i> on page 2-39 for information about configuring CHAP authentication in the group.</p>

Examples

The following command displays information about an access control record for volume `dbvol`:

```
> volume select dbvol access select 1 show
```

```

_____ Access Information _____
Initiator:                               Ippaddress: 182.19.1.123
AuthMethod: chap                         UserName: tbase
Apply-To: both
```

The following command modifies the access control record in the previous example so that it includes only IP address `182.20.30.44`:

```
> volume select dbvol access select 1 ipaddress 182.20.30.44
```

volume select access show

Displays the access control records for the selected volume.

Format

```
volume select vol_name access show
```

Variable

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

Example

The following command shows the two access control records for the volume mailvol:

```
> volume select mailvol access show
```

ID	Initiator	IpAddress	AuthMethod	UserName	Apply-To
----	-----	-----	-----	-----	-----
1		182.23.33.23	CHAP	jchen	volume
2		114.33.23.13	none		both

volume select clone

Clones the selected volume, creating a new volume.

The new volume will have a different name, but the same size and contents as the original volume at the time of the cloning. By default, the new volume will be online and have read-write permission and use the group-wide snapshot and iSCSI settings, unless you override them.

Cloning a volume consumes 100% of the original volume size from free pool space. Cloned volumes inherit the original volume's thin-provision status. If the original volume has thin provisioning enabled, so will the clone, with all the same attributes as the original. However, a volume clone does not inherit the RAID preference policy of the parent volume; it is set to none, by default.

The new volume does not inherit the original volume's snapshot reserve settings; the new volume is created with the group-wide default value for snapshot reserve. The new volume also does not inherit the original volume's replication space settings or

configuration. If you want to create replicas of the new volume, you must configure replication on the new volume.

The new volume is available immediately and you can use and modify it as you would any other volume.

The cloned volume will reside in the same pool as the original volume. To change the pool, modify the new volume.

Note: Cloning a volume does not have any effect on the original volume, which continues to exist after being cloned.

Format

```
volume select vol_name clone clone_name parameter ...
```

Variables

<i>vol_name</i>	Name of a volume.
<i>clone_name</i>	Name for the new volume.

Parameters

<code>bind</code> <i>member_name</i>	Binds the new volume to the specified member. Volume data will be restricted to this member. Binding a volume to a member will override any RAID preference for the volume.
<code>description</code> <i>text</i>	Description for the new volume. If the <i>text</i> variable contains spaces, surround it with quotation marks.
<code>iscsi-alias</code> <i>alias_name</i>	iSCSI target alias, up to 64 alphanumeric characters, for the new volume. Some iSCSI initiators can see the alias. The default is the group-wide setting, as described in <i>grpparams def-iscsi-alias</i> on page 2-41.
<code>offline online</code>	New volume status. The default is online.
<code>read-write read-only</code>	New volume permission. The default is read-write.

<code>snap-depletion action</code>	<p>Action to take when the new volume's snapshot reserve is exceeded, either <code>delete-oldest</code> (delete the oldest snapshots, the default) or <code>volume-offline</code> (set the volume and its snapshots offline).</p> <p>The default is the group-wide setting, as described in <i>grpparams def-snap-depletion</i> on page 2-42.</p>
<code>snap-reserve n%</code>	<p>Amount of space, as a percentage of the new volume size, to reserve for snapshots of the new volume. You must include the percent sign.</p> <p>The default is the group-wide setting, as described in <i>grpparams def-snap-reserve</i> on page 2-42.</p>
<code>snap-warn n%</code>	<p>Threshold at which an alarm is generated because the amount of free space reserved for snapshots of the new volume has fallen below this value, as a percentage of the total reserved snapshot space. You must include the percent sign.</p> <p>The default is the group-wide setting, as described in <i>grpparams def-snap-warn</i> on page 2-43.</p>
<code>unrestricted</code>	<p>Allows unrestricted host access to the new volume.</p> <p>Unrestricted access is not recommended. Instead, after cloning the volume, create one or more access control records for the new volume to restrict host access. See <i>volume select access create</i> on page 2-180.</p>

Example

The following command clones volume `dbvol`, creating the new volume `vol3`:

```
> volume select dbvol clone vol3
```

```
Volume creation succeeded.
iSCSI target name is iqn.2001-05.com.equallogic:6-8b0900-2ae20000-
99e00000067405b5-vol3
Cloning is in progress.
```

volume select delete-failback

Selects a recovery volume (a volume created by promoting an inbound replica set), and makes the promotion permanent. The resulting volume will no longer be flagged as a recovery volume and cannot be demoted to the original inbound replica set.

You must give the volume a new name.

If you want to replicate the volume, you must configure replication on the volume. The first replication will require a complete transfer of the volume data.

Format

```
volume select recovery_volume delete-failback new_name
```

Variables

<i>recovery_volume</i>	Name of a recovery volume.
<i>new_name</i>	New volume name.

Example

The following command makes a promotion permanent for a recovery volume:

```
groupB> volume select dbvol2.1 delete-failback dbvol-new
```

Deleting failback for a recovery volume will break the replication relationship between the partners. Are you sure you want to delete failback? (y/n) [n] **y**

volume select replication

Enables you to select a volume, enable replication on the volume, create replicas, and manage the volume replication.

Format

```
volume select vol_name replication [subcommand]
```

Variable

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

Subcommands

cancel	Cancels an in-progress replication to a partner.
create-replica	Creates a replica of the volume on a partner.

demote	Demote a volume to a failback replica set or demote a recovery volume to an inbound replica set.
disable	Disables replication to a partner.
enable	Enables volume replication to a partner.
pause	Temporarily suspends volume replication to a partner.
resume	Resumes volume replication to a partner.
select	Displays or modifies the volume replication configuration, including modifying the local replication reserve and the replica reserve.
show	Displays a summary of partners to which the volume is being replicated and the status of any in-progress replication.

volume select replication cancel

Cancels an in-progress replication to a partner.

Format

```
volume select vol_name replication cancel partner_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>partner_name</i>	Group name of a partner.

Example

The following command cancels replication of volume `staffvol` to `psgroup2`:

```
> volume select staffvol replication cancel psgroup2
```

volume select replication create-replica

Creates a replica that represents the contents of the volume at the current time.

Note: Before you can create a replica, you must establish a partnership with the group that will store the replicas, as described in *partner create* on page 2-95, and then

enable replication on the volume, as described in *volume select replication enable* on page 2-191.

If you plan to use manual transfer replication, do not create the first replica until you are ready to start the transfer process.

A replica set is the set of replicas for a volume. The replica set name is based on the volume name. The names of individual replicas are based on the volume name and a timestamp.

The process of creating a replica is initiated from the primary group, which is the group where the volume resides. The replica will exist as part of a replica set, residing on the secondary group. To access the data in a replica, you must clone the replica or promote the replica set on the secondary group.

Format

```
volume select vol_name replication create-replica partner_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>partner_name</i>	Group name of the partner that will store the replica.

Example

The following command creates a replica of volume `vol4` on partner `psgroup2`:

```
> volume select vol4 replication create-replica psgroup2
Replica creation is in progress.
```

volume select replication demote

This command performs two operations:

- Demotes a recovery volume to an inbound replica set, returning it to its original state.
- Demotes a replicated volume to a failback replica set.

For failback purposes, after demoting a volume to a failback replica set, you can replicate any recovery volume changes, demote the recovery volume to an inbound replica set, and then promote the failback replica set to the original volume, returning to the original replication configuration.

You must set a volume offline before you demote it.

Format

```
volume select vol_name replication demote|demote partner_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>partner_name</i>	Group name of a partner. Required only if you are demoting a volume to a failback replica set.

Examples

The following commands set the recovery volume `vol5.1` offline and demote it to an inbound replica set:

```
> volume select vol5.1 offline
```

```
> volume select vol5.1 replication demote
```

```
1553:125:member1:MgmtExec: 1-May-2007
10:34:10.180126:snapshotRestore.cc:789:INFO:8.2.9:Volume successfully
restored from snapshot 'voll.1-2007-04-05-09:36:14.13'. A new snapshot
'voll.1-2007-05-01-10:34:10.109' was created from volume prior to being
restored.
```

```
1558:130:member1:MgmtExec: 1-May-2007
10:34:10.410131:volumeSecondaryDemote.cc:1590:INFO:7.2.38:Recovery volume
'voll.1' has been successfully demoted to a replica set.
```

The following commands set a volume offline and demote it to a failback replica set:

```
> volume select data45 offline
```

```
> volume select data45 replication demote group2
```

```
Demoting a volume to a failback replica set enables you to replicate the
recovery volume to the primary group. Do you want to demote the volume?
(y/n) [n] y
```

volume select replication disable

Disables replication of the selected volume to a replication partner.

Note: Disabling a volume for replication does not delete any existing replica sets being stored on the partner. Access the replica sets by logging in to the partner and using `partner select inbound-replicaset` commands.

If you disable replication to a partner and then later re-enable replication to the partner, the initial replica will be a complete transfer of the volume data. If you want to stop replication temporarily, pause the replication instead of disabling it.

Format

```
volume select vol_name replication disable partner_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>partner_name</i>	Group name of a partner.

Example

The following command disables replication of volume `staffvol` to `psgroup2`:

```
> volume select staffvol replication disable psgroup2
```

volume select replication enable

Enables replication of the selected volume to a replication partner. Before you can replicate a volume individually or as part of a volume collection, you must enable the volume for replication.

Note: You must have already established a partnership with the group that will store the replicas, as described in *partner create* on page 2-95.

Enabling replication on a volume does not create any actual replicas. See *volume select replication create-replica* on page 2-188 or *volume select schedule create* on page 2-202 for information about creating replicas.

To enable replication for a volume, specify:

- The amount of pool space to reserve for tracking volume changes during replication (local replication reserve) and for storing the failback snapshot. You can also enable the temporary use of free pool space if the local replication reserve is not big enough to hold all the volume changes during replication.

- The partner that will store the replica set.
- The portion of delegated space on the partner to reserve for storing the replica set (remote reserve).
- Whether to use manual replication for the first data transfer for the volume.
- Whether to keep the failback snapshot (most recent complete replica) in the local replication reserve. If you choose to keep the failback snapshot, you will need more local replication reserve space than if not. If the failback snapshot exists, you may be able to synchronize the groups upon failback by replicating only volume changes.

See the *Group Administration* guide for more information about failback.

Format

```
volume select vol_name replication enable partner_name [parameter...]
```

Variables

<i>vol_name</i>	Name of volume to be replicated.
<i>partner_name</i>	Group name of a partner.

Parameters

<code>remote-rep-reserve n%</code>	<p>Portion of delegated space on the partner that will be reserved for the volume's replica set (replica reserve). The default is 200% of the volume size; the minimum is 105%. You must specify the percent sign.</p> <p>If there is insufficient replica reserve to complete a replication, you will receive a console message stating that the replication has been paused and the amount by which the replica reserve must be increased to complete the replication.</p>
------------------------------------	--

local-rep-reserve n%	<p>Amount of pool space used to track volume changes during replication (local replication reserve) and store the failback snapshot, if enabled. The default is 100% of the volume size; the minimum is 5%. Reserving less than 100% is not recommended. You must specify the percent sign.</p> <p>If you choose to keep the failback snapshot, you will need more local replication reserve than if you do not. The recommended amount of local replication reserve is the amount you would need normally, plus another 100%. For example, if the local replication reserve is 90% and you choose to keep the failback snapshot, the local replication reserve should be set to 190%.</p> <p>If there is insufficient local replication reserve to track the changes (and the <code>borrow-space</code> parameter is not set to enabled), you will receive a console message stating that the replication has been cancelled.</p>
borrow-space enable disable	<p>Controls whether to temporarily use free pool space if the local replication reserve is not big enough to track the volume changes during replication. The default is <code>enable</code>.</p> <p>Be sure to enable this parameter if you reserve less than 100% of the volume size for the local replication reserve, or less than 200% if keeping the failback snapshot. If there is insufficient pool space to track the changes, you will receive a console message stating that the replication has been cancelled.</p>
keep-failback	<p>Keep a failback snapshot in the local replication reserve.</p> <p>The failback snapshot may enable you to fail back to the primary group by synchronizing only the volume changes.</p>
first-manual-xfer	<p>Specifies that the first data transfer for the volume (the entire volume contents) will be done manually; that is, by transporting physical media containing the volume data to the location of the secondary group and loading it into the replica set.</p> <p>For more information about manual replication, see the <i>Group Administration</i> manual.</p>

Examples

The following command enables replication of volume `newvol` to group `group2`, using the default local replication reserve and replica reserve values:

```
> volume select newvol replication enable group2
```

Replication is enabled.

Replicas will not be created until initiated using the " replication create-replica " command or by the replication schedule.

```

_____ Replication Information _____
PartnerName: group2                Remote-Rep-Reserve: 200%
Local-Rep-Reserve: 100%            Borrow-Space: enabled
DesiredStatus: enabled             Status: ready
RemoteISCSIName:                   Remaining Data: 0MB
  iqn.2001-05.com.equallogic:0-8a0906- Completed Data: 0MB
  8d4cc1902-0d246640e7f46375-newvol.1 StartingTime: None
Keep-Failback: disabled           FailbackBaselevel: None

```

```
_____ History _____
```

```

StartTime          EndTime          Data          Transfer
-----

```

The following command enables replication of volume `vol-thin1` to group `group2`, using the default local replication reserve and replica reserve values, and specifying manual replication for the first data transfer:

```
> volume select vol-thin1 replication enable group2 first-manual-xfer
```

Replication is enabled.

Replicas will not be created until initiated using the " replication create-replica " command or by the replication schedule.

Please ensure that groupname and outbound-password is used to establish connection to the replica snap on the secondary.

```

_____ Replication Information _____
PartnerName: group2                Remote-Rep-Reserve: 200%
Local-Rep-Reserve: 100%            Borrow-Space: enabled
DesiredStatus: enabled             Status: ready
RemoteISCSIName:                   Remaining Data: 0MB
  iqn.2001-05.com.equallogic:0-8a0906- Completed Data: 0MB
  7eccc1902-24046640e7c46375-vol-thin1 StartingTime: None
  .1                                Keep-Failback: disabled
FailbackBaselevel: None

```

History

StartTime	EndTime	Data	Transfer
-----------	---------	------	----------

The following command enables replication of volume `dbvol` to group `group2`, using the default local replication reserve and replica reserve values and keeping the failback snapshot:

```
> volume select vol2 replication enable group2 keep-failback
```

Replication is enabled.
 Replicas will not be created until initiated using the " replication create-replica " command or by the replication schedule.

Replication Information

PartnerName: group2	Remote-Rep-Reserve: 200%
Local-Rep-Reserve: 100%	Borrow-Space: enabled
DesiredStatus: enabled	Status: ready
RemoteISCSIName:	Remaining Data: 0MB
iqn.2001-05.com.equallogic:0-8a0906-	Completed Data: 0MB
e87cc1902-83795358e264614f-vol2.1	StartingTime: None
Keep-Failback: enabled	FailbackBaselevel: None

History

StartTime	EndTime	Data	Transfer
2007-04-05:09:53:06	2007-04-05:10:08:12	0MB	success

volume select replication pause

Pauses replication of the selected volume to a replication partner.

To resume replication, see *volume select replication resume* on page 2-196.

Format

```
volume select vol_name replication pause partner_name
```

Variables

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

<i>partner_name</i>	Group name of a partner.
---------------------	--------------------------

Example

The following command pauses replication of volume `dbvol` to `psgroup2`:

```
> volume select dbvol replication pause psgroup2
```

volume select replication resume

Resumes replication of the selected volume to a replication partner.

Format

```
volume select vol_name replication resume partner_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>partner_name</i>	Group name of a partner.

Example

The following command resumes replication of volume `dbvol` to `psgroup2`:

```
> volume select dbvol replication resume psgroup2
```

volume select replication select

Displays or modifies the selected volume replication configuration.

You can modify the local replication reserve or the replica reserve for a volume replication or enable the temporary use of free pool space if the local replication reserve is insufficient.

You can also choose to keep a failback snapshot in local replication reserve space. Note the failback replica will not be established until you create a replica.

Note: When a volume replication data transfer is in progress, you can reduce the local replication reserve only if the new local replication reserve size is more than what is currently being used to track volume changes.

When a volume replication data transfer is in progress, you can reduce the replica reserve only if the new replica reserve size is more than what is currently being used to store the replica set. Alternately, you can delete replicas (oldest first) to free up replica reserve space and then reduce the size of the replica reserve.

Format

```
volume select vol_name replication select partner_name show | [parameter...]
```

Variables

<code>vol_name</code>	Name of replicated volume.
<code>partner_name</code>	Group name of partner.

Parameters

<code>borrow-space enable disable</code>	Controls whether to temporarily use free pool space if the local replication reserve is not big enough to hold all the volume changes during replication. The default is <code>enable</code> . Be sure to enable this parameter if you reserve less than 100% of the volume size for the local replication reserve. If there is insufficient pool space to track the changes, you will receive a console message stating that the replication has been cancelled.
<code>keep-failback enable disable</code>	Enables or disables keeping a failback snapshot for the volume. After enabling, create a replica immediately to establish the failback baseline.
<code>local-rep-reserve n%</code>	Amount of pool space in the group that will be used to track volume changes during replication and store the failback snapshot (5% to 200% of the volume size). You must specify the percent sign. If there is insufficient space to track the changes (and the <code>borrow-space</code> parameter is not set to <code>enabled</code>), you will receive a console message stating that the replication has been cancelled.

<pre>remote-rep-reserve n%</pre>	<p>Portion of delegated space on the partner that will be allocated to the volume's replica set (105% to 200% of the volume size). You must specify the percent sign.</p> <p>If there is insufficient replica reserve to complete a replication, you will receive a console message stating that the replication has been paused and the amount by which the replica reserve must be increased to complete the replication.</p>
----------------------------------	---

Examples

The following command displays the replication configuration for volume `vol14` on partner `psgroup2`:

```
> volume select vol14 replication select psgroup2 show
```

```

_____ Replication Information _____
PartnerName: psgroup2                Remote-Rep-Reserve: 200%
Local-Rep-Reserve: 100%              Borrow-Space: enabled
DesiredStatus: enabled               Status: ready
RemoteISCSIName:                     Remaining Data: 0MB
  ign.2001-05.com.equallogic:6-8b0900- Completed Data: 0MB
  9434b0c01-462ff039c7241af9-11.1    StartingTime: None
Failback: disabled

```

```

_____ History _____
StartTime          EndTime          Data          Transfer
-----

```

Possible values for requested replication status (`DesiredStatus` field) on the primary group are shown in Table 2-6.

Table 2-6: Requested Replication Status on Primary Group

Status	Description
disabled	Replication of the volume has been manually disabled.
enabled	Volume is enabled for replication.
paused	Replication of the volume has been manually paused.

Possible values for current replication status on the primary group (`Status` field) are shown in Table 2-7.

Table 2-7: Current Replication Status on Primary Group

Status	Description
auth-failure	Authentication between the partners failed. Note: Check the passwords configured on the partners.
cancelling	Administrator cancelled the replication operation.
completed	A replication operation completed. For manual replication, indicates the administrator on the secondary group completed and confirmed the upload of volume data from the primary group.
disabled	Volume replication has been manually disabled.
failed	Volume replication has failed. Note: Check the event log to determine why the replication operation failed.
in-progress	Volume is currently being replicated to the partner.
manual-in-progress	Manual replication of a volume has begun. Administrator intervention might be required to complete the transfer.
partner-down	Volume replication is disabled because the partner cannot be reached. Note: Check the network connection between partners.
partner-paused-inbound	Partner administrator paused inbound replication.
partner-paused-outbound	Partner administrator paused outbound replication.
paused	Administrator paused replication to the partner.
paused-max-snap-reached	Volume replication paused because the partner has reached the maximum number of replicas or snapshots for a group. To continue the replication, you must delete replicas (or snapshots) on the partner. If a schedule is being used to create replicas, you may want to lower value of the maximum number of replicas to keep setting.

Table 2-7: Current Replication Status on Primary Group (Continued)

Status	Description
paused-remote-reserve-low	Volume replication was paused because the replica reserve must be increased. An event message will display the amount to which the replica reserve must be increased in order for the replication to complete. Note: See <i>volume select replication enable</i> on page 2-191 for information about increasing the replica reserve.
paused-remote-resize-failed	Volume size was increased, but the corresponding replica reserve resize operation on the partner failed. Because replica reserve is based on volume size, when you increase the volume size, the replica reserve requirement automatically increases. To increase the replica reserve for a volume, delegated space must be available on the partner. Note: If there is not enough partner space delegated to the group, request that the partner administrator increase the delegated space.
paused-partner-allows-downgrades	Volume replication was paused because the partner group must be prevented from reverting to a firmware version prior to V3.2. See <i>grpparams disallow-downgrades</i> on page 2-46 for more information.
paused-partner-needs-upgrade	Volume replication was paused because the partner is running firmware that does not support the latest features.
ready	Volume is not currently being replicated.
waiting	Volume replication data transfer has not yet started because the maximum number of in-use replication iSCSI sessions has been reached.

Possible values for current replication status on the secondary group are shown in Table 2-8.

Table 2-8: Current Replication Status on Secondary Group

Status	Description
auth-failure	Authentication between the partners failed. Note: Check the passwords configured on the partners.
far-end-down	The primary group cannot be reached. Check the network connectivity between the partners.

Table 2-8: Current Replication Status on Secondary Group (Continued)

Status	Description
incomplete	Replication is incomplete. For volumes configured to use manual transfer replication, this might mean that more transfer files need to be loaded into the replica placeholder.
ready	Volume is not currently being replicated.
stopped	Replication between the partners was stopped.

volume select replication show

Displays the replication partners for the selected volume and the status of any in-progress replication.

Format

```
volume select vol_name replication show
```

Example

The following command displays the partner to which `vol2` is replicated:

```
> volume select vol2 replication show
```

```
Partner Name      CurrReplicas Status      Remaining   StartingTime
-----
psgroup2         5           inprogress 870MB       2006-02-06:15:00:00
```

volume select schedule

Manages schedules for creating snapshots or replicas of the selected volume.

Schedules can create snapshots or replicas on an hourly, daily, or weekly basis. For example, you can set up a schedule that creates a snapshot or replica once a day, once a week, or every 2 hours during work hours.

Do not configure a replication schedule to start before you have completed the first transfer, if using manual replication. The scheduled replication will be skipped if the first transfer is not complete.

Note: Using a schedule can result in the creation of many snapshots or replicas. To control the number of snapshots or replicas, use the `max-keep` command parameter when creating a schedule. In addition, the size of the snapshot reserve limits the number of snapshots you can create for a volume, and the size of the replica reserve limits the number of replicas you can create for a volume.

Format

```
volume select vol_name schedule subcommand
```

Variable

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

Subcommands

<code>create</code>	Creates a schedule.
<code>delete</code>	Deletes a schedule.
<code>rename</code>	Renames a schedule.
<code>select</code>	Modifies or displays details about a schedule.
<code>show</code>	Displays all schedules.

volume select schedule create

Creates a snapshot or replication schedule for the selected volume.

Do not configure a replication schedule to start before you have completed the first transfer, if using manual replication. The scheduled replication will be skipped if the first transfer is not complete.

For each schedule, you must specify:

- Schedule name
- Schedule type
- Time to start creating the snapshots or replicas
- Partner name (only for replication schedules)

Optionally, you can specify other parameters, depending on the schedule type.

Format

```
volume select vol_name schedule create sched_name parameter ...
```

Variables

<i>vol_name</i>	Name of a volume.
<i>sched_name</i>	Schedule name.

Parameters

<code>type</code> <i>type</i>	Type of schedule, either <code>once</code> , <code>hourly</code> , or <code>daily</code> . You <i>must</i> specify a schedule type.
<code>start-time</code> <i>hh:mm[AM PM]</i>	Time when the schedule will start creating snapshots or replicas. Use 24-hour time or specify AM or PM. You <i>must</i> specify a start time.
<code>end-time</code> <i>hh:mm[AM PM]</i>	Time when the schedule will stop creating a sequence of snapshots or replicas. Use 24-hour time or specify AM or PM. Applicable only to schedules of type <code>daily</code> .
<code>read-write read-only</code>	Permission for snapshots created from the schedule. The default is <code>read-write</code> .
<code>max-keep</code> <i>n</i>	Maximum number of snapshots or replicas (created from the schedule) to retain. The default is 10. If you reach the maximum limit, the oldest snapshot or replica created from the schedule will be deleted before another snapshot or replica is created.
<code>frequency</code> <i>nmins nhour[s]</i>	Interval between the creation of snapshots or replicas, in minutes or hours (for example: <code>5mins</code> , <code>1hour</code> , <code>2hours</code>). Applicable only to schedules of type <code>hourly</code> and <code>daily</code> .
<code>start-date</code> <i>mm/dd/yy</i>	Month, day, and year that the schedule will start. The default is the day that the schedule was created (or the following day, if the starting time has already passed).
<code>end-date</code> <i>mm/dd/yy</i>	Month, day, and year that the schedule will stop. The default is no ending date.
<code>repeat-interval</code> <i>ndays</i>	Number of days between the creation of snapshots or replicas. Applicable only to schedules of type <code>daily</code> .

<code>partner partner_name</code>	Name of the partner that will store replicas created through the schedule. You <i>must</i> specify a partner for replication schedules.
<code>enable disable</code>	Enables (default) or disables the schedule.

Examples

The following command creates a replication schedule that creates a replica of volume `db1` on partner `psgroup2` every day at 11:30 PM:

```
> volume select db1 schedule create dailydb type daily start-time 11:30PM
repeat-interval 1days partner psgroup2
```

Schedule creation succeeded.

The following command creates a snapshot schedule that creates snapshots of volume `mail5` every day, every 2 hours, from 7:00AM to 8:00PM:

```
> volume select mail5 schedule create msnap type daily start-time 07:00AM
end-time 20:00 frequency 2hours repeat-interval 1days
```

volume select schedule delete

Deletes a snapshot or replication schedule for the selected volume.

Deleting a schedule does not affect snapshots or replicas created by the schedule.

Format

```
volume select vol_name schedule delete sched_name
```

Variables

<code><i>vol_name</i></code>	Name of a volume.
<code><i>sched_name</i></code>	Name of a schedule.

Example

The following command deletes the backup2 schedule:

```
> volume select staffvol2 schedule delete backup2
```

```
Do you really want to delete? (y/n) [n]y
```

```
Schedule deletion succeeded.
```

volume select schedule rename

Renames a snapshot or replication schedule for the selected volume.

Format

```
volume select vol_name schedule rename sched_name new_sched_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>sched_name</i>	Name of a schedule.
<i>new_sched_name</i>	New schedule name, up to 64 alphanumeric characters.

Example

The following command renames a schedule:

```
> volume select staffvol2 schedule rename backup2 backupcopy
```

volume select schedule select

Modifies a snapshot or replication schedule or displays details about a schedule.

Note: You cannot modify the partner for a replication schedule. Instead, delete the schedule and then create a new schedule with the desired partner.

Format

```
volume select vol_name schedule select sched_name show|parameter ...
```

Variables

<code>vol_name</code>	Name of a volume.
<code>sched_name</code>	Name of a schedule.

Parameters

<code>enable disable</code>	Enables or disables the schedule.
<code>end-date mm/dd/yy</code>	Month, day, and year that the schedule will stop.
<code>end-time hh:mm[AM PM]</code>	Time when the schedule will stop creating a sequence of snapshots or replicas. Use 24-hour time or specify AM or PM. Applicable only to schedules of type <code>daily</code> .
<code>frequency nmins nhour[s]</code>	Interval between the creation of snapshots or replicas, in minutes or hours (for example: <code>5mins</code> , <code>1hour</code> , <code>2hours</code>). Applicable only to schedules of type <code>hourly</code> and <code>daily</code> .
<code>max-keep n</code>	Maximum number of snapshots or replicas (created from the schedule) to retain. If you reach the maximum limit, the oldest snapshot or replica created from the schedule will be deleted before another snapshot or replica is created.
<code>read-only read-write</code>	Permission for snapshots created from the schedule.
<code>repeat-interval ndays</code>	Number of days between the creation of snapshots or replicas. Applicable only to schedules of type <code>daily</code> .
<code>start-date mm/dd/yy</code>	Month, day, and year that the schedule will start.
<code>start-time hh:mm[AM PM]</code>	Time when the schedule will start creating snapshots or replicas. Use 24-hour time or specify AM or PM.
<code>type type</code>	Type of schedule, either <code>once</code> , <code>hourly</code> , or <code>daily</code> .

Examples

The following command changes the time that snapshots of volume `staffvol2` are created with the schedule `bckup`:

```
> volume select staffvol2 schedule select bckup start-time 10:15PM
```

The following command displays details about the replication schedule `hourly2`:

```
> volume select staff2 schedule select hourly2 show
```

```

_____ Schedule Information _____
Name: hourly2                               Type: hourly
Start-Date: 05/03/04                       End-Date: None
Start-Time: 07:00AM                        End-Time: 08:00PM
Frequency: 1hour                           Repeat-Interval:
NextCreation: Fri May 5 14:00:00          Partner: psgroup4
      2006

```

volume select schedule show

Displays the snapshot and replication schedules for the selected volume or displays details about a specific schedule.

Format

```
volume select vol_name schedule show [sched_name]
```

Variables

<i>vol_name</i>	Name of a volume.
<i>sched_name</i>	Name of a schedule.

Example

The following command displays the snapshot and replication schedules for the volume `dbvol`:

```
> volume select dbvol schedule show
```

```

Name      Interval DateRange      TimeRange  Frequency  NextCreate
-----
hour4     hourly   04/28/04-None 12:00AM   5mins      Fri May 5
                                           14:10:00 2006

```

```

_____ Replication Schedules _____

```

```

Name      Interval DateRange      TimeRange  NextCreate  Partner
-----
repdaily  daily   05/03/04-None 10:00PM   Fri May 5   betal
                                           22:00:00 2006

```

volume select show

Displays detailed information about the selected volume, including access control records, replication activity, and in-progress operations (for example, replication, bind, or pool move operations). You can specify (display) only one parameter at a time.

Format

```
volume select vol_name show|parameter
```

Variable

<code>vol_name</code>	Name of a volume.
-----------------------	-------------------

Parameters

<code>access</code>	Access control records.
<code>connections</code>	Active iSCSI connections.
<code>members</code>	Members that contain volume data.
<code>replicas</code>	Volume replicas.
<code>replication</code>	Replication partners storing volume replicas.
<code>schedules</code>	Snapshot and replication schedules.
<code>snapshots</code>	Snapshots.

Examples

The following command displays detailed information about a volume:

```
> volume select newvol show
```

```

_____ Volume Information _____
Name: newvol                               Size: 100GB
VolReserve: 100GB                          VolReserveInUse: 0MB
ReplReserveInUse: 0MB                      iSCSI Alias: newvol
iSCSI Name:                                ActualMembers: 1
  iqn.2001-05.com.equallogic:0-8a0906-     Snap-Warn: 10%
  9711d1a02-47affd39be246375-newvol      Snap-Depletion: delete-oldest
Description:                               Snap-Reserve: 100%
Snap-Reserve-Avail: 100% (100GB)          Permission: read-write
DesiredStatus: online                     Status: online
Connections: 0                             Snapshots: 0

```

```

Bind:                                     Type: replicated
ReplicationReserveSpace: 100GB           Replicas: 0
ReplicationPartner: group2               Pool: default
Transmitted-Data: 0MB                    Received-Data: 0MB
Pref-Raid-Policy: none                   Pref-Raid-Policy-Status: none
Thin-Provision: disabled                  Thin-Min-Reserve: 0% (0MB)
Thin-Growth-Warn: 0% (0MB)              Thin-Growth-Max: 0% (0MB)
ReplicationTxData: 0MB
    
```

Access Records

```

ID Initiator      Iaddress      AuthMethod  UserName      Apply-To
-----
1                172.17.30.22 none         both          both
    
```

Replication Partners

```

Partner Name      CurrReplicas  Status      Remaining      StartingTime
-----
group2            0             ready       0MB            None
    
```

Operations InProgress

```

ID StartTime      Progress      Operation Details
-----
    
```

The `Status` field in the Volume Information section displays the current volume status, as described in Table 2-9. The requested status (`DesiredStatus` field) is set by an administrator and described in Table 2-10.

Table 2-9: Current Volume Status

Status	Description
online	Volume was set online by an administrator, and no failures have occurred. Authorized hosts can access the volume.
offline	Volume was set offline by an administrator, but no failures have occurred. Hosts cannot access the volume.
offline-snap-reserve-met	Volume was automatically set offline because the reserved snapshot space was exceeded and the snapshot recovery policy dictates that the volume be set offline. Note: To correct this condition, increase the amount of reserved snapshot space. See <i>volume select</i> on page 2-174.

Table 2-9: Current Volume Status (Continued)

Status	Description
offline-thin-max-grow-met	Volume was automatically set offline because the in-use volume reserve reached the maximum in-use value. Note: To correct this condition, increase the value of the maximum in-use space level for the volume; see <i>volume select</i> on page 2-174. You can also add more space to the pool (by adding a member).
offline-nospace-auto-grow	Volume was automatically set offline because there is not enough free space in the pool for the thin-provisioned volume to grow. Note: To correct this condition, add more space to the pool (by adding a member).
offline-member-down	Volume was automatically set offline because a member that contains volume data is down or cannot be reached by the other members over the network. Note: To correct this condition, fix the problem that caused the member to go down or become unreachable.
offline-lost-blocks	Volume was automatically set offline because blocks were lost. Note: To correct this condition, choose how to handle the lost blocks. See <i>volume select</i> on page 2-174 for more information.

Table 2-10: Requested Volume Status

Status	Description
online	Administrator set the volume online. Authorized hosts can access the volume.
offline	Administrator set the volume offline. Hosts cannot access the volume.
online-lost-blocks	Administrator chose to set the volume online despite lost blocks. Authorized hosts can access the volume. If an application attempts to read a lost block, an error will occur. If the block is re-written, no error will occur, and the block will no longer be marked lost.

The following command displays the access control records for a volume:

```
> volume select dbvol12 show access
```

ID	Initiator	Ipaddress	AuthMethod	UserName	Apply-To
1		182.19.1.200	none		volume
2		182.19.2.120	chap	dos3	both

The following command displays volume replicas being stored on partner beta1:

```
> volume select staff30 show replicas
```

beta1	
Name	TimeStamp
staff30.1-2006-07-10-21:50:30.1763	Mon Jul 10 21:50:30 2006
staff30.1-2006-07-10-22:50:05.1786	Mon Jul 10 22:50:05 2006
staff30.1-2006-07-10-23:49:59.1808	Mon Jul 10 23:49:59 2006

The following command displays information about the active iSCSI connections to a volume:

```
> volume select dbvol12 show connections
```

Initiator	UpTime	RxData	TxData
182.19.1.200	28min 58sec	0.00KB	12.00KB

The following command displays the amount of volume data on the members:

```
> volume select dbvol12 show members
```

Member Name	Contribution
mem24	95.03GB
mem23	105.00GB

volume select shrink

Decreases the size of a volume.

Note: Shrinking a thin-provisioned volume is not supported in the current release.

Before shrinking a volume, be sure that whatever is using the volume (file system, application) is able to recognize and handle the new size of the volume. The new volume

size will not be recognized by hosts currently connected to the volume unless they support file system shrinking.

You must set the volume offline before shrinking it. Therefore, it is recommended that you first cleanly stop all activity on the volume (unmount file systems, stop or quiesce applications).

If a volume is configured for replication, decreasing the volume size will also decrease the local replication reserve and the replica reserve, as these are calculated as a percentage of the volume reserve. Changes take effect the next time the volume is replicated.

If you have snapshot space reserved for a volume, decreasing the volume size will, by default, decrease the amount of snapshot reserve, as this is also calculated as a percentage of volume reserve. However, if the amount of in-use space for snapshots would exceed the new reserve percentage, the percentage is automatically *increased* enough to preserve the existing snapshots.

For example, consider a 100GB volume with a 100% snapshot reserve and 80GB (80%) of snapshots. If you shrink the volume to 50GB, a 100% snapshot reserve now represents only 50GB of space. The percentage will be increased to 160% to avoid deleting any snapshots.

If the amount of in-use snapshot reserve was 40GB (40% of the original volume size), shrinking the volume to 50GB means the snapshots now use 80% of the new snapshot reserve. The percentage will not be increased, because no snapshots are at risk of deletion.

To leave the percentage (but not the amount) of snapshot space unchanged, use the `no-adjust-snap-resv` option. If the original snapshot reserve percentage was 100% before shrinking the volume, this option keeps it at 100% of the new volume size. Therefore, some existing snapshots may be deleted.

By default, a snapshot of the volume is created before the volume size is decreased. Use the `no-snap` option to skip the creation of a snapshot.

Format

```
volume select vol_name shrink new_size [parameters]
```

Variables

<code><i>vol_name</i></code>	Name of a volume to shrink.
------------------------------	-----------------------------

<code>new_size[GB]</code>	New smaller size for the volume. The size is assumed to be in megabytes unless you specify otherwise. You can specify size with any of the following suffixes: m, mb, MB, g, gb, or GB.
---------------------------	---

Parameters

<code>no-snap</code>	Does not create a snapshot of the volume before reducing its size.
<code>no-adjust-snap-resv</code>	Maintains the same percentage of snapshot reserve for the volume, based on the new volume size. May result in the loss of existing snapshots.

Example

The following commands set volume `bigvol` offline and shrink it from 100GB to 50GB, creating a snapshot:

```
> volume select bigvol offline
> volume select bigvol shrink 50g
```

Be sure the file system and/or application using the volume supports volumes getting smaller. Shrinking a volume could result in losing data. Using the `no-adjust-snap-resv` option can result in losing old snapshots. Do you really want to continue? (y/n) [n]**y**

Creating snapshot.

volume select size

Increases the size of a volume.

The new size will not be recognized by hosts currently connected to the volume unless they support file system expansion. Before increasing the volume size, understand how it affects the operating system, file system, or application using the volume, and set the volume offline first if necessary for your environment.

Note: Some operating systems cannot support volumes larger than 2TB. A warning message is displayed when you attempt to grow a volume beyond 2TB. Make sure your operating system will recognize the new, larger volume size.

If you have snapshot space reserved for a volume, increasing the volume size will also increase the snapshot reserve. If a volume is configured for replication, increasing the

volume size will also increase the local replication reserve and the replica reserve. Changes to replica space take effect the next time the volume is replicated.

If you attempt to increase the volume to a size greater than the remaining pool capacity as displayed in the GUI or CLI, you will receive an error message that states the actual available space.

Unless you specify the `no-snap` option, a snapshot will be created for the volume before the volume size is increased.

Format

```
volume select vol_name size [no-snap] new_size
```

Variables

<i>vol_name</i>	Name of a volume to increase.
<i>new_size[GB]</i>	New, larger size for the volume. The size is assumed to be in megabytes unless you specify otherwise. You can specify size with any of the following suffixes: m, mb, MB, g, gb, or GB.

Example

The following command increases the size of a volume to 200GB:

```
> volume select voldb size 200gb
```

volume select snapshot

Manages snapshots of the selected volume.

Format

```
volume select vol_name snapshot subcommand
```

Variable

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

Subcommands

<code>create-now</code>	Creates a snapshot at the current time.
<code>delete</code>	Deletes a snapshot.
<code>rename</code>	Renames a snapshot.
<code>select</code>	For the selected volume: <ul style="list-style-type: none"> • Modifies or displays a snapshot configuration • Restores a volume from a snapshot • Clones a snapshot • Handles lost blocks on a snapshot
<code>show</code>	Displays all the volume's snapshots or a details for a specific snapshot.

volume select snapshot create-now

Creates a snapshot of the selected volume at the current time.

The snapshot name and the snapshot iSCSI target name are generated automatically. The snapshot name, which is used to manage the snapshot in the group, is derived from the volume name plus a timestamp plus an identification number. The iSCSI target name, which is used by hosts to access the snapshot, consists of the iSCSI target prefix (`iqn.2001-05.com.equallogic`, by default), followed by a generated string, followed by the snapshot name.

Format

```
volume select vol_name snapshot create-now [parameter ...]
```

Variable

<code><i>vol_name</i></code>	Name of a volume.
------------------------------	-------------------

Parameters

<code>offline online</code>	Snapshot status. The default is offline.
<code>read-write read-only</code>	Snapshot permission. The default is read-write.
<code>description <i>text</i></code>	Snapshot description, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.

Example

The following command creates a snapshot at the current time with read-only permission:

```
> volume select dbvol snapshot create-now read-only
```

```
Snapshot creation succeeded.
snapshot name is dbvol-2006-01-25-11:28:01.5
```

volume select snapshot delete

Deletes a snapshot of the selected volume.

To display snapshot names, see *volume select snapshot show* on page 2-224.

Format

```
volume select vol_name snapshot delete snap_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>snap_name</i>	Name of a snapshot.

Example

The following command deletes a snapshot:

```
> volume select vol2 snapshot delete vol2-2002-12-30-11:43:46.5
```

```
Do you really want to delete? (y/n) [n]y
Snapshot deletion succeeded.
```

volume select snapshot rename

Renames a snapshot of the selected volume.

To display snapshot names, see *volume select snapshot show* on page 2-224.

Renaming a snapshot does not change the iSCSI target name for the snapshot. However, if the iSCSI target alias is set to be the same as the snapshot name, the alias will change to match the new snapshot name.

Format

```
volume select vol_name snapshot rename snap_name new_snap_name
```

Variables

<i>vol_name</i>	Name of a volume.
<i>snap_name</i>	Name of a snapshot.
<i>new_snap_name</i>	New snapshot name, up to 64 alphanumeric characters.

Example

The following command renames a snapshot:

```
> volume select dbv snapshot rename dbv-2006-03-30-11:46:48.5 dbv33
```

volume select snapshot select

Enables you to select a snapshot and perform the following tasks:

- Display the snapshot configuration
- Modify the snapshot configuration
- Restore the volume from the snapshot
- Clone the snapshot
- Handle lost blocks on the snapshot

To display snapshot names, see *volume select snapshot show* on page 2-224.

Format

```
volume select vol_name snapshot select snap_name subcommand|parameter ...
```

Variables

<i>vol_name</i>	Name of a volume.
<i>snap_name</i>	Name of a snapshot.

Subcommands

<code>clone</code>	Clones a snapshot to create a new volume.
<code>restore</code>	Restores the volume from a snapshot.
<code>show [connections]</code>	Displays detailed information about a snapshot or about iSCSI connections to a snapshot.

Parameters

<code>description text</code>	Description for the snapshot. If the <code>text</code> variable contains spaces, surround it with quotation marks.
<code>iscsi-alias alias_name</code>	iSCSI target alias for the snapshot, up to 64 alphanumeric characters. Some iSCSI initiators can see this alias.
<code>lost-blocks action</code>	Action to take when lost blocks occur on the snapshot, either: <ul style="list-style-type: none"> <code>return-error</code> – Set the snapshot online but retain the lost cached block state. If an application attempts to read a lost block, an error will occur. If the block is rewritten, no error will occur and the block will no longer be considered lost. The snapshot will be in the <code>online-lost-cached-blocks</code> state. <code>mark-valid</code> – Mark the lost blocks valid and set the snapshot online. This action may present a security risk, and the blocks may contain old data. <p>Note that lost cached blocks can occur if a power failure lasts longer than 72 hours.</p>
<code>offline online</code>	Snapshot status.
<code>read-only read-write</code>	Snapshot permission.

Example

The following command sets a snapshot of volume `db` online:

```
> volume select db snapshot select db-2006-01-30-10:59:46.1 online
```

volume select snapshot select clone

Clones the selected volume snapshot.

Cloning a snapshot creates a new volume with the same contents as the original volume at the time the snapshot was created. Hosts can connect to the new volume, and you can manage the volume as usual. For example, you can change the volume size, create access control records, or set up a snapshot schedule.

By default, the new volume will be set online, have read-write permission, and use the group-wide snapshot space and iSCSI settings, unless you override them.

Because the new clone is considered a volume, it is displayed in the output of the `volume show` command.

The snapshot will still exist after cloning. The cloned snapshot will be in the same pool as the volume.

Format

```
volume select vol_name snapshot select snap_name clone new_vol_name
[parameters]
```

Variables

<i>vol_name</i>	Name of a volume.
<i>snap_name</i>	Name of a snapshot.
<i>new_vol_name</i>	Name for new volume.

Parameters

<code>bind</code> <i>member_name</i>	Binds the new volume to the specified member. Volume data will be restricted to this member. Binding a volume to a member will override any RAID preference for the volume.
<code>description</code> <i>text</i>	Snapshot description, up to 128 alphanumeric characters. If the <i>text</i> variable contains spaces, surround it with quotation marks.
<code>iscsi-alias</code> <i>alias_name</i>	iSCSI target alias for the snapshot, up to 64 alphanumeric characters. Some iSCSI initiators can see the alias. The default is the group-wide setting, as described in <i>grpparams def-iscsi-alias</i> on page 2-41.
<code>offline online</code>	New volume status. The default is online.
<code>read-only read-write</code>	New volume permission. The default is read-write.

snap-depletion <i>action</i>	<p>Action to take when the new volume's snapshot reserve is exceeded, either <code>delete-oldest</code> (delete the oldest snapshots, the default) or <code>volume-offline</code> (set the volume and its snapshots offline).</p> <p>The default is the group-wide setting, as described in <i>grpparams def-snap-depletion</i> on page 2-42.</p>
snap-reserve <i>n%</i>	<p>Amount of space, as a percentage of the new volume size, reserved for snapshots of the new volume. You must include the percent sign.</p> <p>The default is the group-wide setting, as described in <i>grpparams def-snap-reserve</i> on page 2-42.</p>
snap-warn <i>n%</i>	<p>Threshold at which an alarm is generated because the amount of free space reserved for snapshots of the new volume has fallen below this value, as a percentage of the total reserved snapshot space. You must include the percent sign.</p> <p>The default is the group-wide setting, as described in <i>grpparams def-snap-warn</i> on page 2-43.</p>
unrestricted	<p>Allows unrestricted host access to the new volume. Unrestricted access is not recommended. Instead, after cloning the snapshot, you should create one or more access control records for the volume to restrict host access. See <i>volume select access create</i> on page 2-180.</p>

Example

The following command clones a snapshot and names the new volume `stf2`:

```
> volume select stf snapshot select stf-10-2006-01-11-15:44:35.11 clone stf2
```

volume select snapshot select restore

Restores the volume from the selected snapshot.

The restored volume will contain the data that existed in the volume at the time the snapshot was created and will have the original volume name and iSCSI target name.

Note: Before restoring a volume from a snapshot, be sure to disconnect any iSCSI initiators from the volume. Follow the instructions for your operating system and

initiator. Otherwise, the restored volume may be corrupted when initiators reconnect to it.

The snapshot will still exist after the restore operation.

The restored volume will be in the same pool as the original volume.

In addition, before the restore operation begins, a snapshot of the current volume is automatically created. This snapshot is named according to the normal rules for naming snapshots; in other words, the volume name plus a timestamp plus an identification number. If the restore operation fails, or if you want to return to the current volume, you can restore the snapshot of the current volume.

Format

```
volume select vol_name snapshot select snap_name restore
```

Variables

<i>vol_name</i>	Name of a volume.
<i>snap_name</i>	Name of a snapshot.

Example

The following command restores a volume from a snapshot:

```
> volume select db snapshot select db-2006-07-10-10:34:16.8 restore
```

volume select snapshot select show

Displays details about the selected snapshot or connections to the snapshot.

Format

```
volume select vol_name snapshot select snap_name show [connections]
```

Variables

<i>vol_name</i>	Name of a volume.
<i>snap_name</i>	Name of a snapshot.

Example

The following command displays detailed information about a snapshot:

```
> volume select newvol2 snapshot select inst-snap show
```

```

_____ Snapshot Information _____
Name: inst-snap                               Permission: read-only
DesiredStatus: online                         Status: online
OriginalVolumeSize: 5GB                      CreationTime: 2006-06-14:17:16:39
Schedule:                                     Replicate:
iSCSI Alias:                                 iSCSI Name:
  NewVol2-2006-06-14-17:16:39.45             iqn.2001-05.com.equallogic:6-8a0900-
Description:                                 cb76d4a01-40405000001af44907-newvol2
Connections: 0                               -2006-06-14-17:16:39.45
SnapsetName:

```

The `Status` field displays the current snapshot status, as described in Table 2-11. The requested status (`DesiredStatus` field) is set by an administrator and described in Table 2-12.

Table 2-11: Current Snapshot Status

Status	Description
online	Administrator set the snapshot online. Authorized hosts can access the snapshot, and no failures have occurred.
offline	Administrator set the snapshot offline. Hosts cannot access the snapshot, but no failures have occurred.
offline-lost-blocks	Snapshot was automatically set offline because lost blocks have occurred. Hosts cannot access the snapshot. Note: To correct this condition, choose how to handle the lost blocks. See <i>volume select snapshot select</i> on page 2-217 for more information.
offline-inconsistent	Snapshot was automatically set offline due to data inconsistencies. Contact your array support provider for information on how to proceed.
offline-member-down	Snapshot was automatically set offline because a member that contains snapshot data is down or cannot be accessed by the other members over the network. Hosts cannot access the snapshot. Note: To correct this condition, fix the problem that caused the member to go down or become unreachable on the network.

Table 2-11: Current Snapshot Status (Continued)

Status	Description
offline-nospace-auto-grow	Thin-provisioned volume and its snapshots were automatically set offline because there is not enough free space in the pool for the volume reserve to grow. Note: To correct this condition, add more space to the pool (such as by adding another member to the pool).
offline-snap-reserve-met	Snapshot was automatically set offline because the reserved snapshot space has been exceeded and the snapshot recovery policy dictates that the snapshots be set offline. Hosts cannot access the snapshot. Note: To correct this condition, increase the amount of reserved snapshot space. See <i>volume select</i> on page 2-174.
offline-thin-max-grow-met	Volume and its snapshots were set offline because the in-use volume reserve reached the maximum in-use value. Note: To correct this condition, increase the value of the maximum in-use space level for the volume (see <i>volume select</i> on page 2-174), or increase the volume size.

Table 2-12: Requested Snapshot Status

Status	Description
online	Administrator set the snapshot online. Authorized hosts can access the snapshot.
offline	Administrator set the snapshot offline. Hosts cannot access the snapshot.
online-lost-blocks	Administrator set the snapshot online, despite lost blocks. Authorized hosts can access the snapshot. If an application attempts to read a lost block, an error will occur. If the block is rewritten, no error will occur, and the block will no longer be marked lost.

volume select snapshot show

Displays the snapshots for the selected volume or detailed information about a specific snapshot.

Format

```
volume select vol_name snapshot show [snap_name]
```

Variables

<i>vol_name</i>	Name of a volume.
<i>snap_name</i>	Name of a snapshot.

Example

The following command displays all the snapshots for a volume:

```
> volume select dbvoll1 snapshot show
```

Name	Permission	Status	Schedule	Connections
-----	-----	-----	-----	-----
dbvoll1-2006-07-10-02:42:42.6	read-write	online	snapdb	0
dbvoll1-2006-07-10-02:42:42.7	read-write	online	snapdb	0
dbvoll1-2006-07-09-02:42:42.8	read-write	online	snapdb	0
dbvoll1-2006-07-08-02:42:42.9	read-write	online	snapdb	0

volume show

Displays the group volumes or detailed information about a specific volume, including access control records and in-progress operations (for example, replication, bind, or pool move operations).

Format

```
volume show [vol_name]
```

Variable

<i>vol_name</i>	Name of a volume.
-----------------	-------------------

Example

The following command displays the all the volumes in the group and their status, including whether the volume has thin provisioning enabled (in the column labeled TP):

```
> volume show
```

Name	Size	SnapShots	Status	Permission	Connections	TP
vol1	300MB	2	online	read-write	0	N
vol2	500MB	0	online	read-write	0	N
vol3	400MB	2	offline	read-write	0	N
vol4	10GB	3	online	read-write	0	N
fbvol1	200MB	2	online	read-write	0	N
vol5	65GB	0	online	read-write	0	Y
vol6	200GB	9	online	read-write	0	N
vol8	50MB	3	online	read-write	0	N
v1	200GB	1	online	read-write	0	Y
vol7	100MB	3	online	read-write	0	N
joe	100MB	5	online	read-write	0	N
newvol	50MB	1	online	read-write	0	N
dbvol	3GB	0	online	read-write	0	N
mailvol	4GB	0	online	read-write	0	N
minivol	100MB	0	online	read-write	0	N
klavol	120MB	0	online	read-write	0	N
vol9	125GB	0	online	read-write	0	Y

3 Array Management Commands

The array management CLI commands are described in alphabetical order in Table 3-1. These commands act on an individual PS Series array and are often used to perform maintenance.

Information about each command includes the following:

- Command name
- Brief description
- Command format
- Examples

See *Running Array Management Commands* on page 3-2 for information about running the commands.

Table 3-1: Array Management Commands

Command	Description
<code>clearlostdata</code>	Clears lost data on an array, as described in <i>clearlostdata</i> on page 3-3.
<code>diag</code>	Gathers diagnostic information from an array, as described in <i>diag</i> on page 3-5.
<code>ping</code>	Verifies connectivity between an array and other hosts on the network, as described in <i>ping</i> on page 3-9.
<code>reset</code>	Resets an array to the factory defaults (original condition), as described in <i>reset</i> on page 3-11.
<code>restart</code>	Shuts down and restarts an array, as described in <i>restart</i> on page 3-13.
<code>shutdown</code>	Performs a clean shutdown of an array, as described in <i>shutdown</i> on page 3-15.
<code>update</code>	Updates the firmware on an array, as described in <i>update</i> on page 3-17.

Running Array Management Commands

There are two ways to access an array and run array management commands:

- If a network connection is available, you can use telnet or SSH to connect to an array through an IP address assigned to a network interface on the array (for example, `eth0`). *Do not connect to the group IP address.*
- Use the null modem cable (or cables) shipped with the array to connect Serial Port 0 on the active control module to a console or a computer running a terminal emulator. (The active control module's ACT LED is green.) The following serial connection characteristics are required for CLI access:
 - 9600 baud
 - One STOP bit
 - No parity
 - 8 data bits
 - No hardware flow control

clearlostdata

Clears lost data blocks on an array.

Caution: Before using the `clearlostdata` command, contact your array support provider.

Use the `clearlostdata` command when blocks have been lost but the array does not know which blocks have been lost. In this case, the array will not be able to boot or will no longer be accessible from the network.

To access the CLI to run the `clearlostdata` command, see *Running Array Management Commands* on page 3-2.

Once connected to the array (either through a serial connection or a network connection to an IP address assigned to a network interface), press the <Enter> key and log in to a group administration account that has read-write permission (for example, the `grpadmin` account). The console will describe the problem and recommend that you use the `clearlostdata` command to try to correct the lost block problem. At the CLI prompt, enter the `clearlostdata` command.

The `clearlostdata` command may or may not be able to correct the entire lost blocks problem. In some cases, the problem may be corrected enough to boot the array. If volumes remain offline, you may not be able to recover the data on them. In these cases, you must delete the volumes, recreate them, and recover the data from a backup or replica.

If the array is a member of a group and the `clearlostdata` command is not effective, the array will not boot and you may need to delete the member from the group. If you delete the member, the array will be reset and returned to its factory defaults. Only delete an offline member in extreme circumstances because resetting the array will destroy any data on the array. See *member delete* on page 2-74 for more information.

Format

```
clearlostdata
```

Example

The following example shows how to log in to the `grpadmin` account from a console terminal and run the `clearlostdata` command on the array.

```
PS Series Storage Arrays

login: grpadmin
Password:

                Welcome to Group Manager
                Copyright 2001 - 2007 EqualLogic, Inc.

Data loss has occurred. The array will not initialize until the error
condition has been cleared.

> clearlostdata
cleaning luns
raid firing scan complete
.
.
.
>
```

diag

Gathers diagnostic information from an array and packages it into an e-mail message intended for your array support provider.

Run the `diag` command only if instructed by your array support provider.

The `diag` output does not contain any data from user volumes in any form.

There are three ways data collected from the `diag` command can be retrieved from the array:

- **By e-mail.** If e-mail event notification is enabled, and if at least one Ethernet interface on the array is up and operational, the `diag` command output is automatically mailed to the e-mail addresses configured for notification, or to those you specify with the `-e` option. The output is sent in one to eight separate e-mail messages, which are encoded for efficient transmission, and are not human-readable. See *grpparams email-notify* on page 2-49 for information about configuring e-mail event notification.

If there is a problem between the SMTP server and the destination e-mail client, the messages may not be delivered.

- **Using FTP or SCP.** If e-mail notification is not enabled, or if the messages do not get delivered, you can log into the array with FTP or SCP and retrieve the files manually. However, this method relies on having at least one Ethernet interface up and operational.
- **Capturing the output using the console interface.** This is the method of last resort, if e-mail and FTP or SCP do not work. To use this method, you must configure your terminal emulator, telnet, or ssh client to capture all the text that is sent to the screen, and answer “y” to the final prompt.

To access the CLI to run the `diag` command, see *Running Array Management Commands* on page 3-2.

Once connected to the array (either through a serial connection or a network connection to an IP address assigned to a network interface), press the <Enter> key and log in to a group administration account that has read-write permission (for example, the `grpadmin` account). At the CLI prompt, enter the `diag` command.

Format

```
diag ["options"]
```

Options

Options can be used in any combination, separated by spaces. All options used must be enclosed in one set of quotes.

-b	Operates in non-interactive batch mode. With this option, you cannot dump the output to the console.
-e <i>name@address</i>	Sends e-mail to up to three e-mail addresses, instead of those specified by the <code>grpparam email-list</code> setting. Addresses must be separated by commas only (no spaces).
-n	Sends no e-mail with the output. You must retrieve the output with FTP or SCP or use the option to dump output to the console.
-u	Uses existing output files. Skips the data-collection step and attempts to resend files from the previous <code>diag</code> command.

Examples

The following example shows how to use telnet to connect to an IP address assigned to a network interface on an array and run the `diag` command. This example assumes you have previously configured e-mail notification to send the output to `user@email.com`.

```
$ telnet 123.14.1.132
Connected to 123.14.1.132.
```

```
PS Series Storage Arrays
```

```
login: grpadmin
```

```
Password:
```

```

                Welcome to Group Manager
    Copyright 2001 - 2007 EqualLogic, Inc.
```

```
> diag
```

```
The diag command will gather configuration data from this array for support and troubleshooting purposes. No user information will be included in this data.
```

E-mail notification is not available, so you must retrieve the results from the array using FTP, or by using the "text capture" feature of your terminal emulator or Telnet program.

You will be given information to help you do this at the end of this procedure.

Do you wish to proceed (y/n) [y]: **y**

Starting data collection.

Section 1 of 14: ...

Section 2 of 14:

Section 3 of 14: ...

Section 4 of 14:

Section 5 of 14: ...

Section 6 of 14:

Section 7 of 14: .

Section 8 of 14:

Section 9 of 14:

Section 10 of 14: ...

Section 11 of 14:

Section 12 of 14: .

Section 13 of 14: .

Section 14 of 14:

Finished in 54 seconds

You have the option of retrieving the diagnostic data using FTP.

To do this, use the FTP 'mget' command to retrieve all files matching the specification "Seg_*.dgo". You must use the "grpadmin" account and password and connect to one of the following IP addresses:

182.17.192.231

alias 182.17.192.230

You also have the option to capture the output by using the "text capture" feature of your Telnet or terminal emulator program.

Do you wish to do this (y/n) [n]: **n**

The following example shows how to use the FTP utility to copy the diag output file from the array to a host. Invoke FTP on the host and enter the FTP open command, specifying an IP address assigned to one of the array's network interfaces.

When prompted, enter the `grpadmin` account and password. Be sure to specify the `diag` output file with the `mget` command.

```
$ ftp
ftp> open 123.14.1.132
Connected to 123.14.1.132.
220 123.14.1.132 FTP server ready.
User: grpadmin
331 Password required for grpadmin.
Password:
230 User grpadmin logged in.
Using binary mode to transfer files.
ftp> mget Seg_*.dgo
mget Seg_1.dgo? y
227 Entering Passive Mode (123,14,1,132,255,102)
150 Opening BINARY mode data connection for 'Seg_1.dgo' (614247 bytes).
226 Transfer complete.
614247 bytes received in 1.33 secs (4.5e+02 Kbytes/sec)
mget Seg_2.dgo? y
227 Entering Passive Mode (123,14,1,132,255,101)
150 Opening BINARY mode data connection for 'Seg_2.dgo' (880243 bytes).
226 Transfer complete.
880243 bytes received in 1.17 secs (7.3e+02 Kbytes/sec)
mget Seg_3.dgo? y
227 Entering Passive Mode (123,14,1,132,255,100)
150 Opening BINARY mode data connection for 'Seg_3.dgo' (317761 bytes).
226 Transfer complete.
317761 bytes received in 1.02 secs (3e+02 Kbytes/sec)
ftp> bye
221-
    Data traffic for this session was 1812251 bytes in 3 files.
    Total traffic for this session was 1813753 bytes in 6 transfers.
221 Thank you for using the FTP service on 123.14.1.132.
```

ping

Verifies connectivity from an array to other hosts on the network.

For example, you can use the `ping` command to test connectivity from an array to the host bus adapters (HBAs) or NICs on a server. The command is also useful for verifying connectivity to the group's SMTP server, NTP server, or default gateway.

If multiple network interfaces are configured on an array, you can specify the network interface from which you want to test connectivity. If you do not specify a network interface on the array, any configured interface will be used.

To access the CLI to run the `ping` command, see *Running Array Management Commands* on page 3-2.

Once connected to the array (either through a serial connection or a network connection to an IP address assigned to a network interface), press the <Enter> key and log in to a group administration account that has read-write permission (for example, the `grpadmin` account). At the CLI prompt, enter the `ping` command.

You must use `Ctrl/C` to stop the `ping` command output.

Format

```
ping ip-address | "-I array-ip-address ip-address"
```

Variables

<i>ip-address</i>	IP address of the HBA or NIC on the server to which you want to test connectivity.
<i>array-ip-address</i>	IP address of the array network interface from which you want to test connectivity.

Examples

The following `ping` commands test connectivity from an array to a server and from a specific network interface on an array to a server:

```
psgl> ping 182.17.1.110

PING 182.17.1.110 (192.17.1.110): 56 data bytes
64 bytes from 182.17.1.110: icmp_seq=0 ttl=59 time=0.000 ms
64 bytes from 182.17.1.110: icmp_seq=5 ttl=59 time=0.000 ms
^C
----192.17.1.110 PING Statistics----
6 packets transmitted, 6 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 0.000/0.000/0.000/0.000 ms

psgl> ping "-I 182.17.4.88 182.16.20.140"

PING 182.16.20.140 (192.16.20.140): 56 data bytes
64 bytes from 182.16.20.140: icmp_seq=0 ttl=127 time=0.000 ms
64 bytes from 182.16.20.140: icmp_seq=3 ttl=127 time=0.000 ms
^C
----192.16.20.140 PING Statistics----
4 packets transmitted, 4 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 0.000/0.000/0.000/0.000 ms
```


reset

Resets an array to the factory defaults (original condition). The `reset` command requires you to confirm that you want to perform the operation.

Before resetting an array, call your array support provider.

Caution: The `reset` command *irretrievably* eliminates all group, member, and volume configuration information and any volume data on the array. The array will not be able to connect to a group until you add it to the group.

If an array is a member of a multi-member group, it is highly recommended that you remove the member from the group, which automatically runs the `reset` command. This will move any volume data residing on the array to the remaining group members if possible. See *member delete* on page 2-74 for more information.

If the array is the only remaining member of a group, run the `reset` command. (You cannot remove the last member of a group.)

To access the CLI to run the `reset` command, see *Running Array Management Commands* on page 3-2.

Once connected to the array (either through a serial connection or a network connection to an IP address assigned to a network interface), press the <Enter> key and log in to a group administration account that has read-write permission (for example, the `grpadmin` account). At the CLI prompt, enter the `reset` command. After confirming that you want to reset the array, network connections are closed.

Format

```
reset
```

Example

In the following example, telnet is used to connect to the array. When you run the `reset` command and confirm the request, the network connection closes:

```
$ telnet 123.14.1.132
Trying 123.14.1.132...
Connected to 123.14.1.132.

PS Series Storage Arrays

login: grpadmin
Password:

                Welcome to Group Manager
                Copyright 2001 - 2007 EqualLogic, Inc.

psg22> reset
Warning: This command resets an array to the factory
defaults (original condition). The result is the
elimination of all group and volume configuration
information and any volume data residing on the array.

Before resetting an array that is a member of a group,
it is recommended that you delete the member from the
group.

Reset this array to factory defaults? [n/DeleteAllMyDataNow]>
DeleteAllMyDataNow
Connection closed by foreign host.
$
```

restart

Shuts down and restarts an array.

When you restart an array, there is no loss of member, volume, or group configuration information and no loss of volume data. When the restart completes, the member rejoins the group automatically. Volumes with data located on the member will be unavailable until the restart completes.

Note: Restarting an array should *only* be done as part of updating array firmware. Do not repeatedly restart an array.

To access the CLI to run the `restart` command, see *Running Array Management Commands* on page 3-2.

Once connected to the array (either through a serial connection or a network connection to an IP address assigned to a network interface), press the <Enter> key and log in to a group administration account that has read-write permission (for example, the `grpadmin` account). At the CLI prompt, enter the `restart` command.

After confirming that you want to restart the array, any network connections are closed, and the array is shut down. Then, the array automatically restarts.

Note: If you physically connect a serial cable to the secondary control module and run the `restart` command, only the secondary control module will be restarted. To restart both control modules, connect the cable to the active control module (ACT LED will be green) and run the `restart` command.

Format

```
restart
```

Example

In the following example, telnet is used to connect to the array. When you run the `restart` command and confirms the request, the network connection closes:

```
$ telnet 123.14.1.132
Trying 123.14.1.132...
Connected to 123.14.1.132.

PS Series Storage Arrays

login: grpadmin
Password:

                Welcome to Group Manager
                Copyright 2001 - 2007 EqualLogic, Inc

psg22> restart
Do you really want to restart the system? (yes/no) [no] yes
Connection closed by foreign host.
$
```

shutdown

Cleanly shuts down an array.

If you shut down an array that is a group member, there is no loss of member, volume, or group configuration information and no loss of volume data residing on the member. Any volumes with data on the array will be set offline until the array is completely restarted. Once the array is restarted, it rejoins the group automatically.

Note: The `shutdown` command *does not* power off the array. To power off the array, you must turn off both power supplies after the array shuts down.

Do not repeatedly shut down and restart an array.

To access the CLI to run the `shutdown` command, see *Running Array Management Commands* on page 3-2.

Once connected to the array (either through a serial connection to the active control module or a network connection to an IP address assigned to a network interface), press the <Enter> key and log in to a group administration account that has read-write permission (for example, the `grpadmin` account). At the CLI prompt, enter the `shutdown` command. After confirming that you want to shut down the array, network connections are closed, and the array is shut down.

If you are using a serial connection, the following message will appear on the console when it is safe to turn off power to both power supplies:

```
Press any key to reboot.
```

However, if you are using a network connection to run the `shutdown` command, the session will be disconnected before the array is shut down. Therefore, confirm that the ACT LED on each control module is off (not lit) before turning off power to both power supplies.

To fully restart the array, turn on power to both power supplies. When the array restart completes, volumes will be set online.

Note: If you physically connect a serial cable to the secondary control module and run the `shutdown` command, only the secondary control module will be shut down. To shut down both control modules, connect the serial cable to the active control module (ACT LED will be green) and run the `shutdown` command.

If you have a serial connection to an array that is shut down, but still has power, pressing any key will restart *only* the active control module. To ensure that both control modules restart, turn off and then turn back on power to the array. *Be sure to turn off and turn on both power supplies.*

Format

shutdown

Example

In the following example, telnet is used to connect to the array. When you run the shutdown command and confirms the request, the network connection closes:

```
$ telnet 123.14.1.132
Trying 123.14.1.132...
Connected to 123.14.1.132.
PS Series Storage Arrays
login: grpadmin
Password:
           Welcome to Group Manager
           Copyright 2001 - 2007 EqualLogic, Inc
psg22> shutdown
Do you really want to shutdown the system? (yes/n) [n] y
Connection closed by foreign host.
$
```

update

Updates array firmware.

A PS Series array includes single or dual control modules, each with a compact flash card running the PS Series firmware. You should always run the latest array firmware to take advantage of new product features, enhancements, and fixes.

Note: It is recommended that you read the PS Series *Release Notes* before beginning the update.

When updating array firmware, keep in mind the following important issues:

- **Update path.** Usually, you can update an array directly to the latest firmware version. However, in some cases, you may need to update to an interim version before updating to the latest version. See the PS Series *Release Notes* for information about supported firmware update paths.
- **Disallowed downgrades.** If you have run the `grpparams disallow-downgrade` command in the group (see `grpparams disallow-downgrades` on page 2-46), you cannot return any group member to a PS Series firmware version prior to V3.2. Run this command to use the new features in the V3.2 release.
- **Mixed firmware in a group.** It is recommended that all PS Series group members run the same version of the array firmware. The *Release Notes* describe which firmware versions can co-exist in a group; however, only features and bug fixes common to all versions will be available. If you are adding a new array to an existing group, consider updating the group to the latest firmware, before adding the new member to the group.
- **Multi-member group updates.** In a multi-member group, perform the update procedure on one member at a time. If you must update to an interim version, update all the members to the interim version, then update all the members to the final version. Between updating group members, wait for the SAN to stabilize before continuing with the update. For example, use the Group Manager GUI or CLI to ensure that all members and volumes are online. Also, be sure that iSCSI initiators reconnect to volumes, if applicable.
- **Minimizing host disruption during updates.** If an array is currently running a PS Series firmware version prior to 2.2.3, you must use the `restart` command to restart the array before copying the update kit to the array. In addition, regardless of the current running firmware, you must restart the array after the update procedure completes. When scheduling a firmware update, be sure to allot sufficient time to update and restart the entire group of arrays.

During an array restart, volumes with data on the array will be momentarily unavailable until the restart completes. While the volumes are unavailable, some iSCSI initiators may return errors to the operating system or applications.

The PS Series *Release Notes* provides examples of operating system and iSCSI initiator configurations that may be able to handle an array restart without disruption. In some cases, you may need to make modifications to the operating system. You should also ensure that the applications themselves can tolerate the restart. Other configurations may be able to tolerate an array restart without disruption. In all cases, you should first test them in a non-production environment.

If you do not have one of the identified configurations or if you are unsure of your application's ability to tolerate the restart, you should consider planning for downtime when updating firmware. This can involve shutting down the hosts accessing the group before beginning the update procedure. After the update completes, you can restart the hosts. Planning for application downtime may be the best way to protect against unexpected disturbances.

- **Backing up data.** Regular backups should be a vital part of maintaining a storage environment. In addition, because upgrading infrastructure is a critical service procedure, it should be carefully planned and implemented at off-peak hours, if possible, and after a backup has occurred.

The following steps take you through the PS Series firmware update procedure:

1. **Gather network information and locate a host.** The update procedure requires the following items for each array you are updating:
 - The IP address assigned to a network interface on the array (for example, the IP address assigned to `eth0`). Do not use the group IP address.
 - Host that has the `ftp` or `scp` utility available and network access to each array being updated. You can use the `ping` command to test network connectivity from an array's IP address to a host.
2. **Obtain the firmware update kit and documentation.** Follow these steps to obtain the update kit and documentation:
 - a. On the host that has the FTP or SCP utility available, use a web browser to access `support.dell.com/EqualLogic`.

- b. In the Downloads area, select the archived update kit that is right for your operating system. The kit is approximately 15 MB in size.
3. **Consider host implications. Shut down if necessary.** See the PS Series *Release Notes* for information about specific configurations that should not be affected by the momentary disruption in volume availability resulting from an array restart. If your configuration does not meet the requirements in the *Release Notes*, you may want to consider shutting down the hosts accessing the group volumes. After the update, you can restart the hosts.
4. **Cleanly restart the array, if currently running firmware prior to V2.2.3.** If the array is currently running a PS Series firmware version prior to 2.2.3, you must use the `restart` command to restart the array before copying the update kit to the array. To connect to the array, do one of the following:
 - Use telnet or SSH to connect to an array through an IP address assigned to a network interface on the array (for example, `eth0`). Do *not* connect to the group IP address.
 - Use the null modem cable (or cables) shipped with the array to connect Serial Port 0 on the active control module (LED labeled ACT is green) to a console or a computer running a terminal emulator. How you make a serial connection depends on the control module model. See *Running Array Management Commands* on page 3-2 for more information.

Once connected, press the <Enter> key and log in to an administration account that has read-write permission (for example, the `grpadmin` account). At the CLI prompt, enter the `restart` command. When the array shuts down, the network connection closes.

```
login: grpadmin
Password:

                Welcome to Group Manager

                Copyright 2001 - 2007 EqualLogic, Inc.

> restart
```

5. **Copy the kit to the array.** Use FTP or SCP to copy the update kit from the host in Step 2 to the array being updated. Specify the array IP address obtained in Step 1 as

input to the `open` command. When prompted for an account and password, specify the `grpadmin` account and password. *If using `ftp`, be sure the transfer occurs in binary mode.*

Note that the update kit name must not be changed at any step in the copy process. If the name is changed, the update will fail. Because some versions of `ftp` convert file names to uppercase, specify the update kit name twice with the `put` command, as shown in the example below. Alternatively, you can use `scp`, which does not change file names and does not require you to log in to the array.

The following example uses `ftp` to copy a firmware update kit named `kit_12345678.tgz` from a host to an array with the IP address `182.168.1.53`.

```
$ ftp
ftp> open 182.168.1.53
Connected to 182.168.1.53.
220 182.168.1.53 FTP server ready.
Name: grpadmin
331 Password required for grpadmin.
Password:
230 User grpadmin logged in.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> binary
200 Type set to I
ftp> put kit_12345678.tgz kit_12345678.tgz
local: kit_1234567.tgz remote: kit_1234567.tgz
229 Entering Extended Passive Mode (|||65534|)
150 Opening BINARY mode data connection for 'kit_12345678.tgz'.
100%|*****| 13191 KB 81.26 KB/s 00:00 ETA
226 Transfer complete.
13508472 bytes sent in 02:42 (81.06 KB/s)
ftp> close
Data traffic for this session was 13508472 bytes in 1 file.
Total traffic for this session was 13509009 bytes in 1
transfer. 221 Thank you for using the FTP service on
192.168.1.53.
ftp> bye
```

The following example shows how to use `scp` to copy a firmware update kit named `kit_12345678.tgz` from a host to an array with the IP address 182.168.1.53:

```
$ scp kit_12345678.tgz grpadmin@182.168.1.53:
grpadmin@182.168.1.53's password:*****
kit_12345678.tgz 100% 12MB 198.0KB/s 01:00
```

6. **Update the array firmware.** Use a serial connection or use telnet or SSH to connect to an IP address assigned to a network interface on the array (for example, `eth0`). Do not connect to the group IP address.

Once connected to an array, press the <Enter> key and log in to an administration account that has read-write permission (for example, the `grpadmin` account). At the CLI prompt, enter the `update` command. On a dual control module array, both control modules will be updated.

7. **Cleanly restart the array.** When the update completes, at the CLI prompt, enter the `restart` command. You must restart the array to apply the new firmware. It is recommended that you restart the array as soon as possible.
8. **Verify the firmware.** In the GUI, you can view control module information by expanding the members list in the leftmost panel, selecting a member name, and then clicking the `Controllers` tab. You can also use the following CLI command, specifying the member name:

```
member select member_name show controllers
```

On a dual control module array, the firmware on both control modules must be the same. If not, or if only one control module appears but two are installed, contact your array support provider.

9. **Repeat the procedure on each group member.** If you are updating firmware on a multi-member group, repeat Steps 4 to 8 on the remaining members. Between updating members, wait for the SAN to stabilize before continuing with the update.
10. **Restart hosts.** If you chose to shut down the hosts accessing the group volumes, you can restart them.

Format

`update`

Example

The following example uses a serial connection to an array to which the firmware update kit has been copied, updates the firmware, and then restarts the array.

```
PS Series Storage Arrays

login: grpadmin
Password:
        Welcome to Group Manager
        Copyright 2001 - 2007 EqualLogic, Inc.
> update
This command will update the firmware on the array's flash card memory
using the kit that is already loaded onto the array.

If you choose to proceed, you will be shown the current firmware version
and the version to which you will update. You will then be given the
choice to proceed again.

The firmware update will not take effect until the array is restarted.
Do you want to proceed (y/n) [y]: y
Active and secondary control modules detected.
.
.
.
Update completed successfully.
The update will take effect after the next member restart. If you want to
restart now, invoke the "restart" command.
> restart
```

4 Global Commands

The global commands control the behavior of the Group Manager command line interface (CLI). Descriptions of these commands are listed in alphabetical order in Table 4-1.

Information provided for each command includes the following:

- Brief description
- Command format
- Subcommands, variables, and parameters (if any)
- Examples

Table 4-1: Global Commands

Command	Description
<code>alias</code>	Performs text substitution. See <i>alias</i> on page 4-2.
<code>clear</code>	Clears the screen. See <i>clear</i> on page 4-2.
<code>cli-settings</code>	Displays and sets CLI settings. See <i>cli-settings</i> on page 4-2.
<code>exec</code>	Executes a file. See <i>exec</i> on page 4-4.
<code>exit</code>	When in subcommand mode, brings the user up a level. See <i>exit</i> on page 4-4.
<code>help</code>	Displays help on the CLI. See <i>help</i> on page 4-4.
<code>history</code>	Shows the command history. See <i>history</i> on page 4-6.
<code>logout</code>	Logs out the administrator. See <i>logout</i> on page 4-6.
<code>stty</code>	Displays and sets the terminal settings. See <i>stty</i> on page 4-7.
<code>tree</code>	Displays the CLI commands and command syntax in a hierarchical structure. See <i>tree</i> on page 4-7.
<code>whoami</code>	Displays the account name of the currently logged-in user. See <i>whoami</i> on page 4-9.

alias

Performs text substitution.

Format

```
alias alias_name original_text
```

Variables

<i>alias_name</i>	Text to use as the alias.
<i>original_text</i>	Text that <i>alias_name</i> replaces. If the <i>original_text</i> variable contains spaces, surround it with quotation marks.

Example

The following command establishes `ms1` as an alias for the command text `member`
`select member1`:

```
> alias ms1 "member select member1"
```

clear

Clears the screen.

Format

```
clear
```

cli-settings

Specifies certain CLI settings.

Format

```
cli-settings show|parameter
```

Parameters

confirmation on off	<p>Turns on (default) or off the confirmation for all commands.</p> <p>Note: Turning off confirmation can be dangerous. Some critical commands prompt for a response before starting the operation, such as: delete, logout, passwd, restart, and shutdown.</p> <p>Changes to this settings take effect immediately for the user who changed it and for users who subsequently log in as <code>grpadmin</code>. Any other current <code>grpadmin</code> CLI sessions are not affected by the change.</p>
displayinMB on off	Turns on or off (default) displaying group, volume, and member sizes in megabytes. This enables you to get more accurate space information.
events on off	Turns on (default) or off displaying events on the console.
formatoutput on off	Turns on (default) or off formatting for the output for show commands.
paging on off	Turns on (default) or off paging when the output is more than one screen size.

Examples

```
> cli-settings show
```

```

_____ Cli Settings _____
Confirmation: on                Paging: on
DisplayinMB: off              FormatOutput: on
Events: on
```

The following commands show the effect of turning `displayinMB` off and on.

```
> cli-settings displayinMB off
```

```
> volume show
```

```

Name          Size  SnapShots Status  Permission  Connections
-----
test-access  1GB   0         online  read-write   1
dbvol        10GB  0         online  read-write   0
```

```
> cli-settings displayinMB on
```

```
> volume show
```

Name	Size	SnapShots	Status	Permission	Connections
-----	-----	-----	-----	-----	-----
test-access	1024MB	0	online	read-write	1
dbvol	10240MB	0	online	read-write	0

exec

Executes a CLI script file (file containing other CLI commands). A script can change terminal settings, perform basic group administration tasks, and capture system information.

Format

`exec parameter filename`

Parameter

<code>-echo</code>	Echoes contents of the file during execution.
<code>-ignore</code>	When errors occur, ignores them and continues execution.

Variable

<code>filename</code>	Name of file to execute.
-----------------------	--------------------------

exit

Brings the user up one or all command levels from subcommand mode.

Format

`exit [all]`

help

Displays information about CLI commands. You can obtain help on any of the group administration, array management, or global commands. You can also get information about the available editing keystrokes.

Format

```
help command [commands|edit]
```

Variable

<i>command</i>	Name of command on which you want help.
----------------	---

Subcommands

<i>commands</i>	Displays the global CLI commands with help text.
<i>edit</i>	Displays information about the available editing keystrokes.

Example

The following command displays help on the account CLI command.

```
> help account
```

```
account      - Manages administration accounts.
create       - Creates a new account.
delete       - Deletes an account.
select       - Selects an account.
show         - Displays all administration accounts or
              information about a specific account.
```

The following command displays help on the global CLI commands.

```
> help commands
```

```
alias        - Performs text substitution.
clear        - Clears the screen.
cli-settings - Specifies certain CLI settings.
exec         - Executes a CLI script file.
exit         - Brings the user up a command level from
              subcommand mode.
help         - Displays information about CLI commands.
history      - Displays the command history.
logout       - Logs out a group administrator.
stty         - Displays terminal settings.
tree         - Displays the full CLI command syntax in a tree
              structure.
```

The following command example displays the available editing keystrokes.

```
> help edit
```

```
Available editing keystrokes
```

```
Delete current character.....Ctrl-d  
Delete text up to cursor.....Ctrl-u  
Delete from cursor to end of line.....Ctrl-k  
Move to beginning of line.....Ctrl-a  
Move to end of line.....Ctrl-e  
Get prior command from history.....Ctrl-p  
Get next command from history.....Ctrl-n  
Move cursor left.....Ctrl-b  
Move cursor right.....Ctrl-f  
Move back one word.....Esc-b  
Move forward one word.....Esc-f  
Convert rest of word to uppercase.....Esc-c  
Convert rest of word to lowercase.....Esc-l  
Delete remainder of word.....Esc-d  
Delete word up to cursor.....Ctrl-w  
Transpose current and previous character....Ctrl-t  
Enter command and return to root prompt.....Ctrl-z  
Refresh input line.....Ctrl-l
```

history

Displays the CLI command history.

Format

```
history
```

logout

Logs out an administration account user from the group.

Format

```
logout
```

stty

Displays the terminal settings.

Format

```
stty parameter ...
```

Parameters

<code>rows <i>n</i></code>	Sets the screen height. The <i>n</i> variable indicates the number of rows and must be an integer from 10 to 256 inclusive.
<code>columns <i>n</i></code>	Sets the screen width. The <i>n</i> variable indicates the number of columns and must be an integer from 20 to 255 inclusive.
<code>hardwrap on off</code>	Turns on (default) or off wrapping the output at the screen width.
<code>status</code>	Shows terminal status.

Example

The following `stty` command displays the current terminal settings:

```
> stty status
```

```
Terminal Type: telnet  
Screen width : 80  
Screen height: 25  
Hard wrap    : Off
```

tree

Displays the CLI command syntax in a tree structure, optionally showing the complete command syntax.

Format

```
tree [-syntax] [command]
```

Variable

<i>command</i>	Name of command on which you want syntax.
----------------	---

Examples

The following example shows part of the output from a `tree -syntax` command:

```
> tree -syntax
```

```
|+---account
| |
| | +---create [description <String>] [contact <String>]
| |   [email <String>] [phone <String>] [mobile <String>] <name>
| |   [<read-write | read-only>] [<enable | disable>]
| |
| | +---delete <name>
| |
| | +---select <name>
| | |
| | | +---contact <contact>
| | |
| | | +---description <description>
| |
| .
| .
| .
```

The following example shows only the basic syntax of the `chapuser` command:

```
> tree chapuser
```

```
chapuser
|
|+---create
|
|+---delete
|
|+---rename
|
|+---select
| |
| | +---disable
| |
| | +---enable
```

```
| |
| +---passwd
| |
| +---show
|
+---show
```

whoami

Displays the account name of the logged in user.

Format

```
whoami
```

Example

The following example displays the currently logged-in user account:

```
group1> whoami
kabbott
```


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