

**EMC Solutions Enabler
Symmetrix CLI
Version 6.0**

COMMAND REFERENCE
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REV A01

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As part of its effort to continuously improve and enhance the performance and capabilities of the EMC product line, EMC periodically releases new versions of both the EMC Enginuity Operating Environment and EMC Solutions Enabler. Therefore, some functions described in this guide may not be supported by all versions of Enginuity or Solutions Enabler currently in use. For the most up-to-date information on product features, see your product release notes.

If an EMC Solutions Enabler feature does not function properly or does not function as described in this guide, please contact the EMC Customer Support Center for assistance. If you are an EMC Development Partner, refer to the EMC Powerlink website.

Audience This manual provides reference information for command-line users and script programmers. The manual provides the syntactical reference information for all of the SYMCLI commands in the Solutions Enabler software.

Organization The following defines the structure of this manual:

Chapter 1, *SYMCLI Command Reference*, provides an alphabetical listing of all the SYMCLI commands, and describes the syntax, arguments, and options for each command.

Appendix A, *SYMCLI Environment Variables*, provides SYMCLI environment variables that can be set to streamline and expedite your command line session.

Appendix B, *SYMCLI Options File*, explains the behavior parameters that can be set to critically change the default behavior of SYMCLI operations, SYMAPI calls, and their control actions.

Appendix C, *SYMCLI Events*, describes the events reported for the SYMCLI environment.

Appendix D, *SYMCLI Return Codes*, lists the set of return codes for the various conditions possible with each SYMCLI command.

This guide also contains a glossary of terms.

Related Documentation

Other Symmetrix publications of related interest are:

- ◆ *EMC Solutions Enabler Support Matrix*
- ◆ *EMC Solutions Enabler Installation Guide*
- ◆ *EMC Solutions Enabler Symmetrix Base Management CLI Product Guide*
- ◆ *EMC Solutions Enabler Symmetrix SRDF CLI Product Guide*
- ◆ *EMC Solutions Enabler Symmetrix TimeFinder CLI Product Guide*
- ◆ *EMC Solutions Enabler Symmetrix SRM CLI Product Guide*
- ◆ *EMC Host Connectivity Guides*

Conventions Used in this Manual

The following conventions are used in this manual:

In this manual, every use of the word SYMCLI means EMC Solutions Enabler.

Note: A note calls attention to any item of information that may be of special importance to the reader.



CAUTION

A caution contains information essential to avoid damage or degraded integrity to storage of your data. The caution might also apply to protection of your software or hardware.

Typographical Conventions

This manual uses the following type style conventions in this guide:

bold text	Boldface text provides extra emphasis and emphasizes warnings, and specifies window names and menu items in text.
<i>italic text</i>	<i>Italic text and characters emphasizes new terms, identifies variables in a software syntax (non-literal notation), identifies unique word usage, and applies emphasis in examples and in references to book titles and sections.</i>
fixed space courier font	A fixed space font identifies files and path names, and is used in command line entries, displayed text, or program listings.

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SYMCLI Command Reference

This chapter presents the syntactical form (manpage) with argument and option descriptions for each of the SYMCLI commands that span the Solutions Enabler series. The commands appear in alphabetical order:

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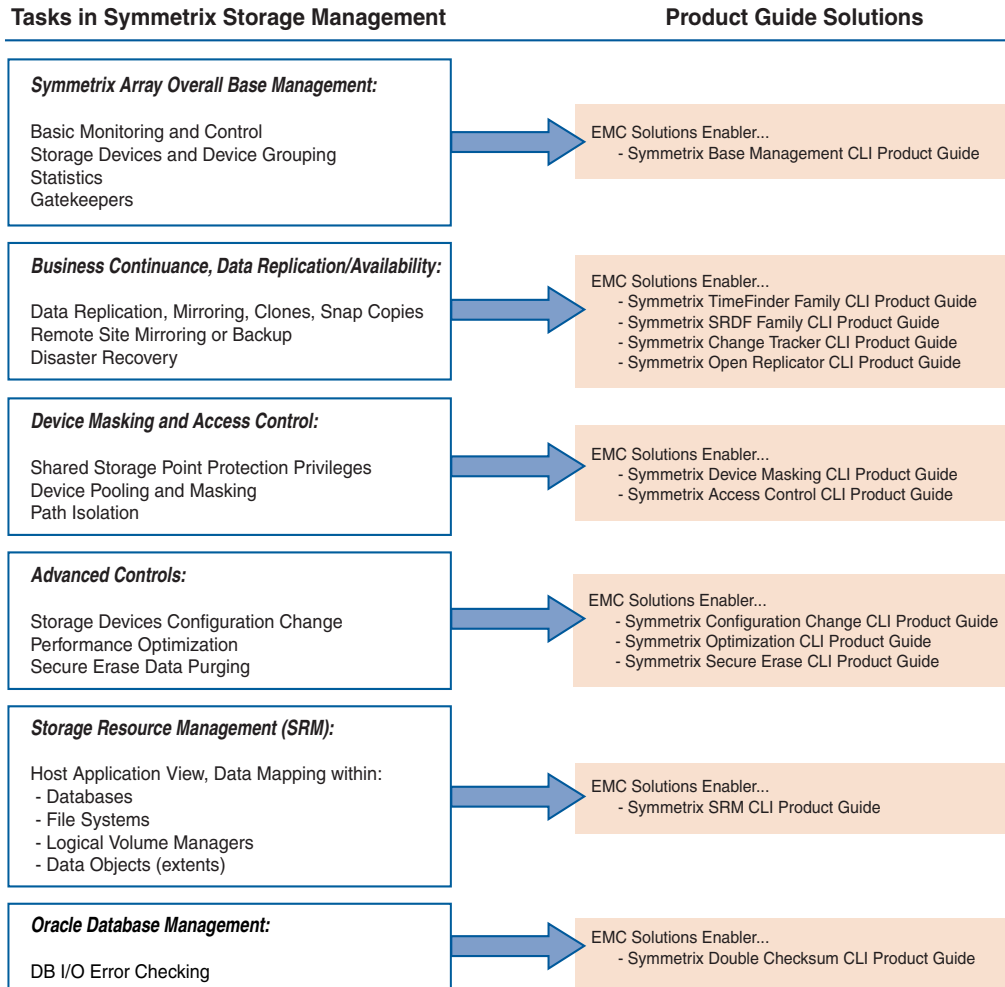
SYMCLI Conventions

Categories of information shown below (similar to UNIX man pages) are listed for each command, where applicable.

- ◆ **Command name** appears in **bold** typeface at the top of a page followed by a brief description of what the command does.
- ◆ **SYNTAX** lists the arguments and options for each command.
- ◆ **DESCRIPTION** provides a description of the command.
- ◆ **ARGUMENTS** explains the command arguments.
- ◆ **OPTIONS** explains the command options.
- ◆ **PARAMETERS** explains the command parameters.
- ◆ **RETURN CODES** specifies the primary success and failure codes for each command.
- ◆ **EXAMPLES** provides examples of the syntax and output, if any, of the command.

Related Documentation

The following chart indicates which Product Guides to refer to by SYMCLI task.



Commands by Product Guide

Table 1-1 contains the list of Solutions Enabler Product Guides and their related CLI commands.

Table 1-1 Commands by Product Guide

Solutions Enabler Product Guide	Command
<i>Symmetrix Base Management CLI Product Guide</i>	<code>symapierr</code>
	<code>symapisrv</code>
	<code>symaudit</code>
	<code>symbcv</code>
	<code>symcfg</code>
	<code>symcli</code>
	<code>symdev</code>
	<code>symdg</code>
	<code>symdisk</code>
	<code>symdrv</code>
	<code>symgate</code>
	<code>syming</code>
	<code>symlabel</code>
	<code>symld</code>
	<code>symlmf</code>
	<code>sympd</code>
	<code>symstat</code>
<i>Symmetrix Device Masking CLI Product Guide</i>	<code>symmask</code>
	<code>symmaskdb</code>
<i>Symmetrix Double Checksum CLI Product Guide</i>	<code>symchksum</code>
<i>Symmetrix Secure Erase CLI Product Guide</i>	<code>symerase</code>
<i>Symmetrix Change Tracker CLI Product Guide</i>	<code>symchg</code>
<i>Symmetrix Configuration Change CLI Product Guide</i>	<code>symconfigure</code>

Table 1-1 Commands by Product Guide (continued)

<i>Symmetrix SRM CLI Product Guide</i>	<code>symhost</code>
	<code>symhostfs</code>
	<code>symioctl</code>
	<code>symlv</code>
	<code>sympart</code>
	<code>symrdb</code>
	<code>symrslv</code>
	<code>symvg</code>
<i>Symmetrix Optimization CLI Product Guide</i>	<code>symoptmz</code>
	<code>symqos</code>
<i>Symmetrix TimeFinder Family CLI Product Guide</i>	<code>symclone</code>
	<code>symioctl</code>
	<code>symmir</code>
<i>Symmetrix SRDF CLI Product Guide</i>	<code>symcg</code>
	<code>symioctl</code>
	<code>symrdf</code>
	<code>symreplicate</code>
<i>Symmetrix Open Replicator CLI Product Guide</i>	<code>symrcopy</code>
<i>Symmetrix Access Control CLI Product Guide</i>	<code>symacl</code>

symacl

Sets up or updates Symmetrix® access control information.

SYNTAX

```

symacl -h

symacl <-file CommandFile | (redirect stdin)>
    [-v|-noecho]
    preview

symacl -sid SymmID [-v|-noecho] \
    <-file CommandFile | (redirect stdin)>
    prepare
    commit [-force] [-restore]

symacl -sid SymmID [-noprompt]
    release

symacl [-sid <SymmID|ALL>]
    show accpool PoolName [-acl]
    accgroup GroupName [-acl]

symacl [-sid <SymmID|ALL>]
    list -accpool
    list -accgroup
    list -acl
    list -v

symacl -sid SymmID
    backup -file CommandFile

symacl -unique

```

DESCRIPTION

This command allows the user to set up or update Symmetrix access control information. All information regarding access control of the Symmetrix devices is stored within the Symmetrix array.

A lock is taken out by the specified Symmetrix during an access control change session. Only one access control session can be active within a Symmetrix at any one time. When making changes to the access control database, the host making the change must have the ADMIN privilege and the caller must supply an ADMIN PIN. The verbose list option can be used to determine if a host has such an ADMIN privilege. The verbose list option can be used to check if a Symmetrix has been configured for access control.

To execute a change to the Symmetrix access control information, you need to enter the changes in a command file (*CommandFile*) and execute the following operations:

- ◆ preview
- ◆ prepare
- ◆ commit

The `preview` argument is used after you first create the command file. It verifies the syntax and correctness of the contents of the entries in the command file.

The `prepare` argument performs the preview checks and also verifies the appropriateness of the requested access control modifications against the current state of the Symmetrix array.

The `commit` argument performs both the preview and prepare checks and then commits the contents of the command file to the Symmetrix access control database.

Note: It is not mandatory to execute a preview or prepare action prior to a commit. These actions can be used in the debug of the command file entries or ensure that the commit action will not be rejected.

If you are the security administrator and you intend to release a lock on the command file session, you must either set environment variable `SYMCLI_ACCESS_PIN` to your access ID or enter your PIN every time `symacl` prompts you.

The command file format contains various command entries terminated with a semicolon (;). The commands are parsed case insensitive, but the data with the commands is parsed case sensitive. The following are various types of changes possible in the command file:

- ◆ Create new access groups
- ◆ Add and remove access IDs to access groups
- ◆ Move an access ID from one group to another
- ◆ Remove access IDs from access groups
- ◆ Create new device pools
- ◆ Add and remove devices to device pools
- ◆ Delete device pools and groups

- ◆ Add ACEs to grant access
- ◆ Remove ACEs to deny access

Redirect stdin

Optionally, for UNIX platforms, you can redirect a number of screen entries to `stdin` to save keystroke entries and not deal with the command file. For example, to prepare a chain of `symacl` commands on the screen to be redirected to `stdin`, use the following syntax:

```
symacl -sid SymmID prepare <<DELIM
create accgroup foo...;
add host accid...;
add user accid...;
add user accid...;
DELIM
```

The backup operation saves the contents of the access control database in the file specified by the file argument. The file must not previously exist. The backup file created is compatible for use with the `symacl` utility.

The restore operation replaces the contents of the access control database with the contents of the file specified by the file argument.

ARGUMENTS

`backup`

Backs up the access control database for the specified Symmetrix to the specified file.

`commit`

Activates the changes (defined in the command file) into the specified Symmetrix array.

`list`

Lists all ACEs, device (access) pools , or access groups.

`prepare`

Performs the preview checks and also verifies the appropriateness of the requested access control modifications against the current state of the Symmetrix array.

`preview`

Verifies the syntax and correctness of the contents of the command file.

	<code>release</code>	Releases any pending access control session lock and aborts the access control session.
	<code>show</code>	Shows detail information about the access group or pool.
KEYWORDS	The following are the keywords used with the <code>list</code> argument:	
	<code>accgroup</code>	Lists the access IDs of a specified access group.
	<code>accpool</code>	Shows the Symmetrix devices in a specified access controlled device pool.
OPTIONS	The following are the available options to the various actions:	
	<code>-accgroup</code>	Shows the access group information with a specified Symmetrix array.
	<code>-accpool</code>	Lists the device pool information.
	<code>-acl</code>	For <code>list</code> and <code>show</code> actions, displays access control entries in the output. Also can display all access control entries for a specified access group.
	<code>-file</code>	Specifies the command file to be processed for changes to the access control.
	<code>-force</code>	Forces a commit action even if there are non-fatal errors encountered in the prepare stage. Use this flag with discretion.
	<code>-h</code>	Provides brief, online help information.

`-noecho`

Blocks the printing of session status and progress messages during the access control change session's preview, prepare, and commit actions. Cannot be used with the `-v` option.

`-noprompt`

When used with the `release` action, suppresses the automatic prompt (reply) to the user for confirmation before executing the indicated operation.

`-restore`

Replaces the contents of the access control database with the contents of the specified file.

`-sid`

Specifies the Symmetrix ID whose access control information will be read or modified. When `ALL` can be specified, the action is directed to all Symmetrix arrays.

`-unique`

Returns an encrypted 24-digit access ID for the host machine or operating node.

`-v`

Echoes the contents of the command file to the output terminal. Cannot be used with the `-noecho` option.

PARAMETERS

CommandFile

The command file name. The command file contains a set of access control command entries.

GroupName

The access control group name of some common users or hosts.

PoolName

The pool name of a specific set of devices to be protected.

SymmID

The 12-character ID that specifies the Symmetrix array.

**COMMAND FILE
SYNTAX**

The following are the possible command syntaxes for the command file entries:

Creating a new pool

```
create accpool PoolName;
```

Adding devices to a pool

```
add dev StartDevName[:EndDevName] to accpool PoolName;
```

Removing devices from a pool

```
remove dev StartDevName[:EndDevName] from accpool  
PoolName;
```

Deleting a pool

```
delete accpool PoolName [remove_aces=true];
```

Creating a new access group

```
create accgroup GroupName
```

Adding an access ID to an access group

```
add user accid Id name IdName to accgroup AdminGrp;  
add host accid Id name IdName to accgroup GroupName;  
add restored accid Id name IdName  
to accgroup GroupName;  
add default accid name IdName to accgroup GroupName;
```

Removing an access ID from an access group

```
remove accid name IdName from accgroup GroupName;
```

Moving an access ID to a access group

```
move accid name IdName to accgroup GroupName;
```

Deleting an access group

```
delete accgroup GroupName [remove_aces=true];
```

Granting an access control entry

```
grant access=<AccessType,...> to accgroup GroupName  
for <accpool PoolName> | ALL | <NON-POOLED devs>;
```

Removing access control entries

```
remove access=<AccessType,...> from accgroup GroupName
    for <accpool PoolName> | ALL | <NON-POOLED devs>;
remove aces from accgroup GroupName;
remove aces from accpool PoolName;
```

COMMAND FILE LINE OPTIONS

The following are command line options specifically for commands used in the command file:

`remove_aces=true`

When deleting a pool or group, this command option removes any corresponding access control entries. If this action is not done, ACEs must be removed before the pool or group can be deleted.

ALL

When used with the grant command, it creates an ACE for all devices in the Symmetrix array regardless of whether they are already part of a device pool.

When used with the remove access command, it removes the ACE for all devices.

NON-POOLED

When used with the grant command, it creates an ACE for all devices in the Symmetrix array that are not currently part of a device pool.

When used with the remove access command, it removes the ACE.

COMMAND FILE PARAMETERS

The following are command parameters used in the command file only:

AccessType

The rights (type) of access desired for the pool or group. Possible values are:

```
ADMIN
ADMINRD
ALL
BASE
BASECTRL
BCV
```

BDF
CACHCTRL
CFGDEV
CFGSYM
CHECKSUM
CREATEDV
DIRCTRL
ECC
ERASE
OPTMZR
POWRPATH
QOS
RDF
SDDF
SDR
SNAP
VLOGIX

ALL, CFGSYM, CREATEDV, DIRCTRL, POWRPATH, and VLOGIX access types can be specified only for ALL the devices in a Symmetrix array or all NON-POOLED devices not associated with an access control device pool. These types can not be associated with access control device pools.

EndDevName

The last Symmetrix device name in a sequence (such as 02C).

GroupName

The name of the access group (8 characters maximum).

IdName

The name of the access ID (8 character maximum).

Id

The unique ID. If creating a host-based access ID, the ID is obtained by using the `-unique` option of `symacl`. If creating a new user-based access ID for the `AdminGrp`, the ID, which is assigned by the access control administrator, must be between four and twelve characters long.

PoolName

The name of the device pool (8 character. maximum).

StartDevName

The first Symmetrix device name in a sequence (such as 00C).

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

The following examples create pools and groups, add devices and IDs, and assign access control entries to those groups and pools. It also sets up default access for those hosts that are not yet or never will be registered.

Pool Examples

The following example creates an access pool named *poola*:

```
symacl -sid 12345 -file add_new_pool.cmd commit
```

where *add_new_pool.cmd* command file contains:

```
create accpool poola;
```

The following example adds devices to an access pool:

```
symacl -sid 12345 -file add_new_devices.cmd commit
```

where *add_new_devices.cmd* command file contains:

```
add dev 0A:0B to accpool poola;
```

The following example removes devices from an access pool:

```
symacl -sid 12345 -file remove_devices.cmd commit
```

where *remove_devices.cmd* command file contains:

```
remove dev 0A:0B from accpool poola;
```

The following example deletes an access pool and all the ACEs associated with the access pool:

```
symacl -sid 12345 -file delete_pool_aces.cmd commit
```

where *delete_pool_aces.cmd* command file contains:

```
delete accpool poola remove_aces;
```

The following example deletes an access pool:

```
symacl -sid 12345 -file delete_pool.cmd commit
```

where delete_pool.cmd command file contains:

```
delete accpool poola;
```

Group Examples

The following example creates an access group:

```
symacl -sid 12345 -file add_new_group.cmd commit
```

where add_new_group.cmd command file contains:

```
create accgroup groupa;
```

The following example adds a user access ID to an access group:

```
symacl -sid 12345 -file add_new_id_to_grp.cmd commit
```

where add_new_id_to_grp.cmd command file contains:

```
add user accid my_pin name admin1 to accgroup groupa;
```

The following example adds a host access ID to an access group:

```
symacl -sid 12345 -file add_new_id_to_grp.cmd commit
```

where add_new_id_to_grp.cmd command file contains:

```
add host accid 12345678-34567890-08974321 name  
nodea to accgroup groupa;
```

The following example adds the default access ID to an access group:

```
symacl -sid 12345 -file add_new_id_to_grp.cmd commit
```

where add_new_id_to_grp.cmd command file contains:

```
add default accid name unknown to accgroup groupa;
```

The following example removes an ID from an access group:

```
symacl commit -sid 12345 -file remove_id_from_grp.cmd
```

where remove_id_from_grp.cmd command file contains:

```
remove accid name nodea from accgroup groupa;
```


The following example moves an ID to an access group:

```
symacl commit -sid 12345 -file move_id_to_group.cmd
```

where `move_id_to_group.cmd` command file contains:

```
move accid name nodea to accgroup groupa;
```

The following example deletes an access group:

```
symacl -sid 12345 -file delete_group.cmd commit
```

where `delete_group.cmd` command file contains:

```
delete accgroup groupa;
```

The following example deletes an access group and corresponding ACEs, if any:

```
symacl -sid 12345 -file del_grp_and_aces.cmd commit
```

where `del_grp_and_aces.cmd` command file contains:

```
delete accgroup groupa remove_aces;
```

Add ACE Examples

The following example add an ACE, granting ADMIN privilege:

```
symacl -sid 12345 -file add_acl.cmd commit
```

where `add_acl.cmd` command file contains:

```
grant access=ADMIN to accgroup groupa for accpool  
poola;
```

The following example adds an ACE for all Symmetrix devices regardless of whether they are already in a pool. This ACE grants BASE access:

```
symacl -sid 12345 -file grant_all_devs_acl.cmd commit
```

where `grant_all_devs_acl.cmd` command file contains:

```
grant access=BASE to accgroup groupa for ALL devs;
```

The following example adds an ACE granting BASE access for all those Symmetrix devices, which do not belong to an access pool:

```
symacl -sid 12345 -file add_not_in_pool_devs_acl.cmd commit
```

where `add_not_in_pool_devs_acl.cmd` command file contains:

```
grant access=BASE to accgroup groupa for NON-POOLED  
devs;
```

Remove ACEs Example

The following example removes an ACE:

```
symacl -sid 12345 -file remove_acl.cmd commit
```

where `remove_acl.cmd` command file contains:

```
remove access=ADMIN from accgroup groupa for accpool  
poola;
```

The following example removes all ACEs for *groupa*:

```
symacl -sid 12345 -file remove_aces_for_group.cmd  
commit
```

where `remove_aces_for_group.cmd` command file contains:

```
remove aces from accgroup groupa;
```

The following example removes all ACEs for *poola*:

```
symacl -sid 12345 -file remove_aces_for_pool.cmd  
commit
```

where `remove_aces_for_poola.cmd` command file contains:

```
remove aces from accpool poola;
```

The following example removes an ACE setup for BASE access for all Symmetrix devices regardless of whether they are already in a pool:

```
symacl -sid 12345 -file rem_all_devs_acl.cmd commit
```

where `rem_all_devs_acl.cmd` command file contains:

```
remove access=BASE from accgroup groupa for ALL devs;
```

The following example removes an ACE setup for BASE access for Symmetrix devices not already in a pool:

```
symacl -sid 12345 -file rem_not_in_pool_devs_acl.cmd  
commit
```

where `rem_not_in_pool_devs_acl.cmd` command file contains:

```
remove access=BASE from accgroup groupa for  
NON-POOLED devs;
```

symapierr

Translates a CLI return code to a string.

SYNTAX `symapierr [-h] ErrorCode`

DESCRIPTION Returns a string with a detailed description of the return code generated by the CLI executable.

ARGUMENTS None.

OPTIONS -h

Provides brief, online help information.

PARAMETERS *ErrorCode*

A numerical representation of an error.

RETURN CODES Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLE To return a string for error number (10), enter:

```
symapierr 10
```

```
SYMAPI Error Symbol : SYMAPI_C_NO_DEVS_FND_UPGRADE  
SYMAPI Error Message: No Symmetrix devices found with  
microcode version 5x63 or up.
```

symapisrv

Starts or stops an executable image, called the SYMAPI server, which executes remote SYMAPI functions with the remotely-connected Symmetrix systems.

SYNTAX

```
symapisrv -h
```

```
symapisrv [-background]
           start [-service Servicename] | [-port Port]
               [-secllevel Seclevel]
```

```
symapisrv
           stop [-service Servicename] | [-port Port]
```

For additional arguments that are specific to Windows platforms, refer to the *Arguments* section.

DESCRIPTION

The `symapisrv` command is an executable image that must run to service the TCP/IP client/server connection on the remote host. The server provides a SYMAPI and SYMCLI client/server interface to remotely-attached Symmetrix arrays. The `symapisrv` command works with three files: `netcnfg`, `symapinlck`, and `symapislck` in the same directory.

The `netcnfg` file is an editable file located in directory:

<code>/var/symapi/config/</code>	on UNIX
<code>C:\Program Files\EMC\symapi\config\</code>	on Windows NT
<code>SYMAPI\$CONFIG:</code>	on OpenVMS

The `netcnfg` file contains the service names and connection information of the available network services. The file contents are maintained by the System Administrator who has knowledge of the available networks. For more information, refer to the *EMC Solutions Enabler SYMCLI Installation Guide*.

The `symapinlck` and `symapislck` files are the required network service lock files on a server host to guarantee a single port listener for a network service. These files are internal files that do not require user intervention.

To execute a remote SYMCLI session, the `netcnfg` files on both the client and server host should map to the same network service entry for the TCP/IP connection between them (to execute remote SYMAPI functions).

An optional file (`nethost`) for trusted-user host access can also be present in the server configuration directory. When this file exists (maintained by the System Administrator), only the nodes and users listed in this file are allowed to connect to the server to execute remote SYMAPI functions. The following is the format of the trusted host file:

```
node          user-1 [, ..., user-n]
address       user-1 [, ..., user-n]
*             user-1 [, ..., user-n]
node          *
address       *
*             *
```

ARGUMENTS

`start`

Starts the SYMAPI server image (at the server).

`stop`

Stops the SYMAPI server image (at the client or server).

WINDOWS ARGUMENTS

The following are additional and special arguments for Windows NT, Windows 2000, and .NET servers only:

`install`

Installs or registers the SYMAPI server as a Windows service. The following is the command syntax:

```
symapisrv
  install
  [-service Servicename] |
  [-port Port]
```

`uninstall`

Uninstalls the SYMAPI server as a Windows service. The following is the command syntax:

```
symapisrv
  uninstall
  [-service Servicename] |
  [-port Port] |
```

query

Checks the status of the SYMAPI server running the Windows service. The following is the command syntax:

```
symapisrv
  query
  [-service Servicename] |
  [-node Node][-port Port] |
  [-address Address][-port Port]
```

OPTIONS

-address

Applies a server network address (*nnn.nnn.nnn.nnn*).

-background

Runs the SYMAPI server on UNIX as a background daemon.

-h

Provides brief, online help information.

-node

Applies a node name to the command.

-port

Applies a port number to the command.

-secllevel

Specifies the security level of the server. Can only be specified without **-service** option.

-service

Applies a network service name to the command.

PARAMETERS

Servicename

A specific network service name.

SecLevel

One of the keywords specified in the `netcnfg` file or the SYMAPI options file.

RETURN CODES Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES To start the local SYMAPI server on network service SYMAPI_SERVER, enter:

```
symapisrv -service SYMAPI_SERVER start
```

To stop the local server on network service SYMAPI_SERVER, enter:

```
symapisrv -service SYMAPI_SERVER stop
```

To stop the remote SYMAPI server listening on port 2707 on node symmserver, enter:

```
symapisrv -port 2707 stop
```

To start the SYMAPI server at the default port with security level to accept both secure and non-secure (legacy) sessions, enter:

```
symapisrv -seclevel ANY start
```

To start the SYMAPI server in the background at port 2709 with security level to accept ONLY secure sessions, enter:

```
symapisrv -seclevel SECURE start -back
```

The following example starts the SYMAPI server in the background at port 2709 with security level to accept ONLY secure sessions.

```
symapisrv -seclevel SECURE start -back
```

symaudit

Allows the user to extract records from a Symmetrix audit log file to determine what application on what host initiated actions that directed Symmetrix behavior.

Provides a monitor option for displaying the records as they are written to the log file.

Provides the ability to determine the date and time of the current log file data and its size.

SYNTAX

```
symaudit show -sid SymmID

symaudit list -sid SymmID [-v] [-text] [-h]
                    [-function_class ClassName]
                    [-action_code ActionName]
                    [-host HostName]
                    [-vendor_id VendorId]
                    [-application_id ApplId]
                    [-symdev_range StartDevname:EndDevname]
                    [-start_date date_time]
                    [-end_date date_time]
                    [-record_num RecordNumber]
                    [-n RecordCount]

symaudit monitor -sid SymmID [-v] [-text]
                  [-i Interval] [-c Count]
```

DESCRIPTION

The `symaudit` command is used to retrieve information from the Symmetrix audit log file. Data is written to the audit file during control operations initiated by host applications. The audit file correlates activity from all hosts into one file.

The `symaudit` command can filter the extracted data through the use of options that specify match criterion. The options include host name, application name, function class, and action code. A combination of filters can be used.

The `monitor` action causes the command to run in the foreground polling the Symmetrix for new audit log records every *Interval* seconds, either until the iteration *Count* is satisfied or the program is stopped.

Verbose mode (`-v`) provides a more detailed output.

ARGUMENTS

`list`

Lists the extracted audit log records.

`monitor`

Monitors the Symmetrix array for new audit log data in real time.

`show`

Shows the time period and quantity of data in the audit log file.

OPTIONS

`-action_code`

Filters the audit log records so that only the records containing the specified action code return.

`-application_id`

Filters the audit log records so that only the records generated by the specified application return.

`-c`

Specifies the number (count) of times to poll for data. If this option is not specified, the audit log is polled continuously.

`-end_date`

Indicates the date and time of the last audit log record to display. The format is `[mm/dd[/YY]] : [hh:mm[:ss]]`. If only the `hh:mm` is provided, the current day will be assumed. If only `mm/dd` is provided, the current year is assumed. A four-digit year can also be specified. If the `end_date` and the `-n` options are omitted, the output continues until the end of file.

`-function_class`

Filters the audit log records so that only the records belonging to the specified `function_class` return.

`-h`

Provides brief, online help information.

`-host`

Filters the audit log records so that only the records containing the specified host name return.

-i

Specifies the repeat interval in seconds. The default interval is 30 seconds. The minimum interval is 5 seconds.

-n

Specifies the number of records to display.

-sid

Symmetrix ID. Identifies which Symmetrix audit log file to process.

-start_date

Indicates the date and time of the first audit log record to display. Format is `[mm/dd[/yy]]:[hh:mm[:ss]]`. If only the `hh:mm` is provided, the current day will be assumed. If only `mm/dd` is provided, the current year is assumed. A four-digit year can also be specified.

-symdev_range

Filters the audit log records so that only the records containing the name of a `symdev` within the indicated range in the text field return.

-text

Indicates that the text associated with the audit log record should be displayed.

-v

Provides a more detailed, verbose listing.

-vendor_id

Filters the audit log records so that only the records containing the specified `vendor_id` return.

-record_num

Indicates at which record number in the audit log to start processing.

PARAMETERS*ActionName*

The name of a control action associated with an audit log entry.
Valid actions are:

Abort	AbortSnapshot	Activate
Acquire	Add	ArchiveLog
AuthCtrl	BeginBackup	BeginRestore
BeginSnapshot	Break	BlkSIO
Cancel	Checkpoint	ClearStats
CreatePair	Commit	Create
Delete	DeletePair	Disable
Enable	EndBackup	EndRestore
EndSnapshot	Erase	ExpandDB
Failback	Failover	Freeze
FSnapRes	FullEstablish	FullRestore
GenSwapList	Hold	IncEstablish
IncRestore	Initialize	Invalidate
ISnapRes	Lock	Merge
NotReady	Offline	Online
Other	Prepare	R1Update
RdfSet	Ready	Recreate
Refresh	Relabel	Release
Relocated	Remove	Rename
Replace	Reset	ReStart
RestoreSnapshot	Resume	RWDisable
RWEnable	Set	Split
Start	Stop	Suspend

Swap	Terminate	Thaw
UnBlkSIO	Unhold	Unlock
Validate	WrDisable	Unknown

ApplId

The name of an application whose activity generated audit log entries.

ClassName

The name of a functional class area. Valid class names are::

Access	Base	BaseCtrl
BcvEmul	BCV	Cache
CfgChg	CG	CGRdf
CKSum	Clone	DBMap
DDF	DEVMask	DirCtrl
Discover	Erase	EventGet
HeartBt	Mapping	Optmzr
QOS	RDF	ResvCtrl
Snap	Stats	Sync
WormCtrl	User	Other
Unknown		

EndDevname

The last Symmetrix device name name in a range that should be used to filter log file entries.

HostName

The name of the host system whose application generated the audit log entry.

RecordCount

A count of the number of audit log records that should be returned.

RecordNumber

A record sequence number that is within the audit log file's current range.

StartDevname

The first Symmetrix device name in a range that should be used to filter log file entries.

SymmID

The 12-digit ID of the Symmetrix array.

VendorId

The name of the vendor that produced the application whose activity generated audit log entries.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

```
>symaudit -sid 75 show
```

```

                A U D I T   L O G   D A T A

Symmetrix ID           : 000000005075

Starting date          : 12/24/2001 09:02:23
Ending date            : 01/16/2002 09:53:36

Starting record number :      1
Ending record number   :     109
Total record count     :     109
```

```
>symaudit -sid 75 list -v -start_time 1/10:9:50 \
                    -end_time 1/10:9:55
```

```

                A U D I T   L O G   D A T A

Symmetrix ID           : 000000005075

Starting date          : 01/10/2002 09:53:12
Ending date            : 01/10/2002 09:53:12

Record Number          :      89
Records in Seq         :      2
Offset in Seq          :      1
Time                   : 01/10/02 09:53:01
Vendor ID              : EMC Corp
Application ID         : SYMCLI
Application Version     : 5.0.0.3
```

```
API Library           : SDK-Command
API Version           : T5.0.0.3 (Edit Level: 237)
Host Name             : api110
OS Name               : SunOS
OS Revision           : 5.8Generic
Client Host           :
Process ID            : 00017339
Task ID               : 00000000
Function Class         : Optmzr
Action Code           : Lock
Text                  : STARTING an Optimizer \
'SymNewOptmzrLockAcquire' operation on
SYMID:000000005075.

Record Number         :          90
Records in Seq        :           2
Offset in Seq         :           2
Time                  : 01/10/02 09:53:12
Vendor ID             : EMC Corp
Application ID         : SYMCLI
Application Version    : 5.0.0.3
API Library           : SDK-Command
API Version           : T5.0.0.3 (Edit Level: 237)
Host Name             : api110
OS Name               : SunOS
OS Revision           : 5.8Generic
Client Host           :
Process ID            : 00017339
Task ID               : 00000000
Function Class         : Optmzr
Action Code           : Lock
Text                  : The Optimizer \
'SymNewOptmzrLockAcquire' control operation SUCCEEDED.
```

symbcv

Performs operations on one or more Symmetrix BCV (business continuance volume) devices.

SYNTAX

```
symbcv [-sid SymmID]
        [-h] [-offline] [-v]
        [-resv] [-i Interval] [-c Count]

list pd

list [dev]

symbcv -g DgName
        [-h] [-offline]

associate pd PdevName [LdevName]

associateall [pd|-host HostName]
        [-sid SymmID] [-SA <#|ALL>] [-P #]
        [-CAP #] [-N #] [-R1|-NOR1] [-R2|-NOR2]
        [-RANGE SymDevStart:SymDevEnd]

disassociate pd PdevName [-force]

move pd PdevName DestDgName [-force] [-rename]

symbcv -g DgName
        [-h] [-offline]
        [-sid SymmID]
        [[[-rdf] [-bcv]] | [-rrdf]]
        [-RDFG GrpNum] [-remote_RDFG Remote_Grp_num]

associate dev SymDevName [LdevName]

associateall [dev|-host HostName]
        [-RDFG GrpNum] [-remote_RDFG Remote_Grp_num]
        [-SA <#|ALL>] [-P #]
        [-CAP #] [-N #] [-R1|-NOR1] [-R2|-NOR2]
        [-RANGE SymDevStart:SymDevEnd]

disassociate dev SymDevName [-force]

move dev SymDevName DestDgName [-force] [-rename]

symbcv -g DgName
        [-h] [-offline] [[[-rdf] [-bcv]] | [-rrdf]]
        [-force]

disassociate ld LdevName [-force]
```

```

move ld LdevName DestDgName [-rename] [-force]

moveall DestDgName
  [-SA <#|ALL>] [-P #]
  [-CAP #] [-N #] [-R1|-NOR1] [-R2|-NOR2]
  [-RANGE SymDevStart:SymDevEnd] [-rename]

rmall
  [-SA <#|ALL>] [-P #]
  [-CAP #] [-N #] [-R1|-NOR1] [-R2|-NOR2]
  [-RANGE SymDevStart:SymDevEnd]

symbcv -cg CgName
  [-h] [-offline]

associate pd PdevName [LdevName]

associateall [pd|-host HostName]
  -sid SymmID [-SA <#|ALL>] [-P #]
  [-CAP #] [-N #] [-R1|-NOR1] [-R2|-NOR2]
  [-RANGE SymDevStart:SymDevEnd]

disassociate pd PdevName [-force]

move pd PdevName DestCgName [-force]

symbcv -cg CgName -sid SymmID
  [-h] [-offline] [[-rdf] [-bcv] | -rrdf]
  [-RDFG GrpNum] [-remote_rdfg Remote_GrpNum]

associate dev SymDevName [LdevName]

associateall [dev|-host HostName]
  [-SA <#|ALL>] [-P #]
  [-CAP #] [-N #] [-R1|-NOR1] [-R2|-NOR2]
  [-RANGE SymDevStart:SymDevEnd]

disassociate dev SymDevName [-force]

move dev SymDevName DestCgName [-force]

disassociate ld LdevName [-force]

move ld LdevName DestCgName [-force] [-rename]

symbcv -cg CgName -sid SymmID
  [-h] [-offline] [-force]
  [[-rdf] [-bcv] | -rrdf]
  [-RDFG GrpNum] [-remote_rdfg Remote_GrpNum]

```



```
moveall DestDgName
  [-SA <#|ALL>] [-P #]
  [-CAP #] [-N #] [-R1|-NOR1] [-R2|-NOR2]
  [-RANGE SymDevStart:SymDevEnd] [-rename]

rmall
  [-SA <#|ALL>] [-P #]
  [-CAP #] [-N #] [-R1|-NOR1] [-R2|-NOR2]
  [-RANGE SymDevStart:SymDevEnd]
```

DESCRIPTION

The `symbcv` command performs operations on a BCV device. The BCV device can be addressed by its physical (host) name or by its Symmetrix device name. Note that in certain versions of Enginuity, the BCV device must be local to this host before it can be associated with a group.

These operations include: associating a BCV device with a device group, associating all devices in a Symmetrix array with a device group, listing the BCV devices, disassociating a BCV device from a device group, associating a BCV device with a composite group, associating all devices in a Symmetrix array with a composite group, and disassociating a BCV device from a composite group.

ARGUMENTS

`associate pd`

Specifies a physical device (host) name to associate a Symmetrix BCV device with an existing group.

You can substitute `add` for the argument `associate`.

`associate dev`

Specifies a Symmetrix device name to associate a Symmetrix BCV device with an existing group.

You can substitute `add` for the argument `associate`.

`associateall pd`

Associates all BCV devices that are visible to the host and are not currently associated with any existing group.

You can substitute `addall` for the argument `associateall`.

`associateall dev`

Associates all BCV devices that are not associated with any existing group. The `dev` specifies all Symmetrix devices, regardless if they are visible to the host.

You can substitute `addall` for the argument `associateall`.

`disassociate dev`

Specifies a Symmetrix device name of the BCV device to disassociate from a group. The BCV device must have been previously associated with an existing group and the BCV device must be in a state that allows it to be disassociated.

You can substitute `remove` for the argument `disassociate`.

`disassociate ld`

Specifies a logical device name of the BCV device to disassociate from a group. The BCV device must have been previously associated with an existing group and the BCV must be in a state that allows it to be disassociated.

You can substitute `remove` for the argument `disassociate`.

`disassociate pd`

Specifies a physical (host) device name of the BCV device to disassociate from a group. The BCV device must have been previously associated with an existing group and the BCV must be in a state that allows it to be disassociated.

You can substitute `remove` for the argument `disassociate`.

`list dev`

Lists all BCV devices that are configured on the Symmetrix arrays attached to this host. This is the default.

`list pd`

Lists all BCV devices that are visible to this host.

move

Moves one BCV device from one existing group to another group. The source and destination groups can be of different types. The logical name of the BCV device is preserved unless the `-rename` option is specified.

moveall

Moves all BCV devices from one existing device group to another group. The source and destination groups can be of different types. The logical names of the BCV devices are preserved unless the `-rename` option is specified.

move ld

Move a logical device from one existing group to another group. The source and destination groups can be of different types.

rmall

Removes all BCV devices from the specified group.

OPTIONS**-bcv**

Indicates that the remotely attached BCV will be paired with the remote mirror of a locally attached BCV RDF device. This option is used in conjunction with the `-rdf` option.

-c

Indicates the number (`count`) of times to display. If this option is not specified and an interval (`-i`) is specified, statistics will be displayed continuously.

-CAP

Sets the minimum device capacity (in megabytes) for the selection criteria of a number of devices for a group.

-cg

Specifies the composite group name.

Note: `-cg` and `-g` cannot be used at the same time.

-force

Forces a BCV device to be disassociated from a group. No Symmetrix array access is attempted.

-g

Applies a device group name to the operation.

Note: -cg and -g cannot be used at the same time.

-h

Provides brief, online help information.

-i

Sets the repeat interval in seconds. The default interval is 10 seconds.

-N

Sets the number of BCV devices to associate, move, or remove to/from a specified group.

-NOR1

Indicates that the BCV RDF R1 devices should not be associated via the SRDF links.

-NOR2

Indicates that BCV RDF R2 devices should *not* be associated.

-offline

Makes the Symmetrix data connection offline from the host in-memory database for this action.

-P

Supplies the front-end (SCSI or Fibre) director port number to only select devices that are physically connected through this director port. All ports are selected by default.

-R1

Indicates that only BCV RDF R1 devices should be associated.

`-R2`

Indicates that only BCV RDF R2 devices should be associated.

`-RANGE`

Applies the action to a number of Symmetrix devices within a contiguous range to associate all, move all, or remove all devices to/from a group.

`-rdf`

Indicates that the BCV is being remotely associated with the group. In this case, the BCV is reachable by way of the locally attached Symmetrix array and an SRDF link to the remote Symmetrix array. The group must be an RDF type.

`-RDFG`

Indicates a Symmetrix RDF group number through which the remotely associated BCV is reached. This option can only be used in conjunction with the `-rdf` or `-rrdf` option.

`-remote_RDFG`

Indicates the Symmetrix RA (RDF) group number to reach the remotely associated RBCV device. This option can only be used in conjunction with the `-rrdf` option.

`-rename`

Renames the BCV device(s) to the default names as they are moved from their current group to the destination group. By default, they will retain their current logical names.

`-resv`

Lists the BCV devices that have SCSI reservations.

`-rrdf`

Indicates that the BCV is being remotely associated with a remote BCV in the group. This option can be used when the BCV device is reachable via the SRDF links two hops away. The group must be an RDF group.

-SA

Supplies the front-end (SCSI or Fibre) director number to only select devices that are physically connected through this director. Optionally, if ALL (the default) is selected, all devices satisfying various other criteria will be selected.

-sid

Specifies the Symmetrix ID to limit the scope of the operation to the specified Symmetrix array.

-v

Provides a more detailed, verbose listing.

PARAMETERS

DestCgName

The destination composite group into which the BCV device(s) are moved.

DestDgName

The destination device group name.

DgName

The device group name.

LdevName

The BCV logical device name, either named by the user or automatically assigned when a BCV device is associated with a group.

PdevName

The physical device (host) name for the device, such as `/dev/rdisk/c2t0d2s2`.

SymDevname

The Symmetrix device name, unique per Symmetrix array, such as 00C.

SymDevEnd

The Symmetrix device name, ending the contiguous range of selected devices, such as 00C.

SymDevStart

The Symmetrix device name, starting the range of selected devices, such as 002.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To associate a BCV device with device group `ProdDB`, enter:

```
symbcv -g ProdDB associate pd c2t0d2s2
```

To associate a BCV device with device group `ProdDB` and to name it `BCV001`, enter:

```
symbcv -g ProdDB associate dev 000C BCV001
```

To associate all BCV devices from 0009 to 001F on Symmetrix array 87 with device group `ProdDB` that are not already associated with any group, not R1 devices, and are visible to this host, enter:

```
symbcv -g ProdDB associateall pd -sid 87 \
-RANGE 0009:001F -NOR1
```

To list all BCV devices that are visible to this host and have SCSI reservations, enter:

```
symbcv list pd -resv
```

To list (6 times every 10 seconds) all BCV devices regardless of whether they are visible to this host, enter:

```
symbcv list dev -i 10 -c 6
```

To disassociate a BCV device `ProdBCV001` from a device group `ProdDB`, enter:

```
symbcv -g ProdDB disassociate ld ProdBCV001
```

To move BCV device 000E from device group `ProdDB` to `ProdDB6` and rename the device to the `ProdDB6` convention, enter:

```
symbcv move dev 000E -g ProdDB ProdDB6 \
-rename
```

To move all BCV devices (not to exceed 300) with Symmetrix device names ranging from 000C to 01FF that have at least 4 megabytes of storage from device group `ProdDB` to `ProdDB6`, enter:

```
symbcv -g ProdDB moveall -CAP 4 \  
-RANGE 000C:01FF -N 300 ProdDB6
```

To remove all BCV devices that are mapped to a front-end director SA-16B from a device group `ProdDB` (no matter what state they are in), enter:

```
symbcv -g ProdDB rmall -SA 16B -force
```

To associate a BCV device with composite group `MyCg`:

```
symbcv -cg MyCg associate pd /dev/rdisk/c3t0d2s2
```

To associate a BCV device with composite group `MyCg`:

```
symbcv -cg MyCg associate dev 000C -sid 87
```

To associate all BCV devices, that are not already associated with any group and visible to this host on the specified Symmetrix array with composite group `MyCg`:

```
symbcv -cg MyCg -sid 87 associateall
```


symcfg

Discovers or displays Symmetrix configuration information. Refreshes the host's Symmetrix database file or removes Symmetrix information from the database file. Rebuilds the set of devices known to the local host.

It can also be used to:

- ◆ View or release a *hanging* Symmetrix exclusive lock.
- ◆ Display online or offline RDF (RA) directors.
- ◆ Display online or offline front-end (SA or FA) director ports.
- ◆ Display available network services entered in the network service file.
- ◆ Display existing UNIX gatekeeper and database semaphores.
- ◆ Display application and host registration information.
- ◆ Display host port connection information.
- ◆ Display mainframe CU image information.

SYNTAX

```
symcfg -h

symcfg [-version | -kit | -db]

symcfg
  discover [-all | -symmetrix | -clariion]
  scan

symcfg
  sync [-sid SymmID]
      [-rdf | -bcv | -local | -dirsts | -snap | -cfgmgr]
  remove [-sid SymmID] [-noprompt]
  release [-sid SymmID] [-noprompt] [-lockn <#>] [-force]
  verify -sid SymmID

symcfg [-cid ClarID]
  -clarrion sync

symcfg [-sid SymmID] [-ssid] [-offline]
  list [-CA <#|ALL>] [-v]
  list [-DA <#|ALL>] [-v]
  list [-DIR <#|ALL>] [-v]
  list [-DIR <#|ALL>] [-address [-available] [-fibre]]
  list [-EA <#|ALL>] [-v]
```

```

list [-EA <#|ALL> [-P #]] [-address [-available]]
list [-EF <#|ALL>] [-v]
list [-EF <#|ALL> [-P #]] [-address [-available]]
list [-FA <#|ALL>] [-P #]
list [-FA <#|ALL> [-P #]] [-address [-available]]
list [-RA <#|ALL>] [-switched] [-v]
list [-SA <#|ALL>] [-P #]
list [-SA <#|ALL>] [-P #] [-address [-available] [-fibre]]

symcfg [-cid ClarID]
    -clarrion list

symcfg [-sid SymmID]
    list -memory
    list -rdfg <#|ALL> [-dynamic | -static]

symcfg [-sid SymmID] [-v] [-offline]
    list [-SA <#|ALL>] [-port]
    list [-FA <#|ALL>] [-port]
    list [-RA <#|ALL>] [-port]

symcfg [-sid SymmID] [-v]
    list [-LRU <#|ALL>] [-offline]
    list [-lock] [-lockn <#|RDF|GNS|ALL>]
    list [-connections [-sorthost] [-capacity]]
    list [-applications [-client] [-host HostName]]
    list [-cuimage]
    show <AppID> -applications [-client] [-host HostName]
    show -cuimage cuImageNumber [-ssid_num <SSIDnumber>]
symcfg [-v]
    list [-services] [offline]
    list [-semaphores]

symcfg -RA <#|ALL> [-sid SymmID] [-noprompt] [-v]
    online
    offline

symcfg -SA # -P # [-sid SymmID] [-noprompt] [-v]
    online
    offline

symcfg authorization list
    authorization <add | update> -host HostName -username UserName
        -password PassWord
    authorization delete -host HostName -username UserName

```

DESCRIPTION

The `symcfg` command is used to discover a Symmetrix configuration, refresh the Symmetrix configuration database file, and display configuration information about the Symmetrix arrays attached to the host and/or any of its directors.

The `symcfg` command can be used to view whether the specified Symmetrix array(s) have an exclusive Symmetrix lock. You can release the lock if it is hanging.

The `symcfg` command can be used to set one or all RDF RA or SA directors on a locally-attached Symmetrix array to either online or offline from the Symmetrix configuration database.

The `symcfg` command can be used to display the LRU cache management configuration of a Symmetrix array.

It can also be used to list the services entered in the network services file (`netcnfg`) or list all the UNIX gatekeeper, database, and lock file semaphores. It can display application and host registration, and port connection information.

In addition, some arrays require authorization information to provide to access the array. The `symcfg` authorization command can be used to supply this information for use in subsequent discovery operations. The `symcfg` authorization command allows you to list, add, update or delete this connectivity information. Update allows you to update the password of an existing entry.

If a configuration has devices mapped to either an EA (ESCON) or EF (FICON) front end directors, the CU image information can be viewed.

ARGUMENTS

`authorization`

Used to supply and manage connectivity information required by certain arrays for use in subsequent discovery operations. The `symcfg` authorization command allows you to list, add, update or delete this connectivity information.

`discover`

Scans all devices on the host looking for Symmetrix devices and builds or rebuilds the Symmetrix configuration database. If you reconfigure your Symmetrix array by adding or removing devices that the host sees, you will need to run `symcfg discover` prior to

running `symcfg sync` in order to obtain accurate information. This command interrogates all SCSI devices and can take a significant amount of time to complete.

The options `-symmetrix` and `-clariion` give flexibility to the user to discover ONLY Symmetrix arrays or ONLY CLARiiON arrays. The `-all` option will discover all known storage arrays.

Note: If you need to update the device configuration status information, the `sync` action is a more efficient way. Also, if you had previously run `discover` and had subsequently removed Symmetrix array(s), a later execution of `discover` will not remove information, relating to the removed Symmetrix array(s), from the database.

list

Lists brief or detailed information about your Symmetrix configuration.

Using the `-lock` option with `list`, you can view whether one or more Symmetrix arrays have a external lock held. By default, only lock 0 is checked. The `-lockn ALL` command checks for all Symmetrix external locks known to SYMAPI. The `-lockn RDF` command checks for locks specific to RDF. The `-lockn GNS` command will list the GNS specific locks.

In addition, the `list` action can be used to list network services available, and the state of gatekeeper and database semaphores. Specifying the `-rdfg` option displays a list of RDF groups for the specified Symmetrix array.

offline

Sets one or all RDF RA directors or a front-end (SA or FA) director port on a locally-attached Symmetrix array to offline status.

Note: Exercise care when applying this action.

online

Sets one or all RDF RA directors or a front-end (SA or FA) director port on a locally-attached Symmetrix array to online status.

Note: Exercise care when applying this action.

release

Releases any existing Symmetrix exclusive lock from the indicated Symmetrix array(s).



CAUTION

Use this action ONLY if you are SURE that no operations using these locks are in progress.

SYMAPI uses several Symmetrix external locks. Use `-lockn` to specify the lock. If `-lockn` is not specified, the lock number defaults to 0.

remove

Removes all information about the indicated Symmetrix array from the Symmetrix configuration database. If there is more than one Symmetrix array attached, then information and definitions about all arrays are removed.

scan

Activates the necessary processing on the host system to recreate a list of accessible devices. It should be initiated when the set of devices that a host can access has changed. It should be followed by a `discover`, if the device changes are associated with Symmetrix devices.

show

Shows the detailed application registration data or CU image definitions.

sync

Refreshes the Symmetrix configuration database file with data from the Symmetrix arrays. The Symmetrix configuration must have been previously discovered, using the `discover` action. If you reconfigure your Symmetrix array by adding or removing devices which the host sees, you will need to run `discover` prior to `symcfg sync` to obtain accurate information.

verify

Verifies whether the Symmetrix configuration and the Symmetrix database file are in sync.

The `verify` action returns the following unique return code if the Symmetrix configuration and the Symmetrix configuration database file are out of sync:

Code#	Code Symbol and Description
24	CLI_C_NOT_IN_SYNC The Symmetrix configuration and the Symmetrix configuration database file are not in sync. You should run either a discover or a full sync.

OPTIONS

-address

Lists the Vbus, TID, and LUN addresses associated with devices mapped to the front-end directors.

-all

Discover all known types of storage arrays.

-applications

Lists the application registrations sorted by Symmetrix ID. Only those applications that have been run will be listed.

-authorization

Allows you to list, add, update or delete host connectivity information. Update allows you to update the password of an existing host/username entry.

-available

Requests the next available Vbus, TID, or LUN address be appended to the output list. Used with the `-address` option.

-bcv

Refreshes (synchronizes) the configuration database file with BCV information.

-capacity

Shows the total Symmetrix storage space connected to each registered host.

-cid

Supplies the CLARiiON ID to to display only information limited to the specified CLARiiON array.

-clariion

Discovers CLARiiON arrays only.

-client

Lists the specific user (client) applications that have been registered. Used with the `list` and `show` actions.

-connections

Applies the `list` action to display the host-to-Symmetrix connectivity, sorted by Symmetrix ID. Only those hosts that have at least one registered application will be listed.

-CA

Confines the action to a channel director number. To select all channel director numbers, specify `ALL`.

-cfgmgr

Refreshes the SYMAPI configuration database file with disk space and Symmetrix configuration metrics gathered from the Symmetrix configuration server.

-CUimage

Lists or shows mainframe CU image information.

-DA

Confines the action to a disk director number. To select all disk director numbers, specify `ALL`.

-db

Displays Symmetrix configuration database information.

-DIR

Confines the action to a director number. To select all director numbers, specify `ALL`.

-dirsts

Refreshes the configuration database file with director status.

-dynamic

Lists Dynamic RDF groups.

-EA

Confines the action to a ESCON director number. To select all ESCON director numbers, specify `ALL`.

-EF

Confines the action to a FICON (Fibre-ESCON) director number. To select all FICON director numbers, specify `ALL`.

-FA

Identifies the front-end (fibre) director number. Use `ALL` to return data for all available fibre front-end directors.

-fibre

Confines the front-end information output to fibre directors only. Used with the `-address` option.

-force

Forces the release of a Symmetrix external lock (EMC® use only). Currently, releasing lock 15 (Symmetrix configuration lock) requires the use of this option.



CAUTION

Use this action ONLY if you are SURE that no operations using these locks are in progress.

-h

Provides brief, online help information.

-host

Lists only application information for the specified host or specifies a host name during authorization actions.

`-kit`

Lists the SYMAPI kit details.

`-local`

Refreshes (synchronizes) the configuration database file with local Symmetrix information.

`-lock`

Displays whether the Symmetrix array(s) currently has one or more Symmetrix external locks. The `-lockn ALL` command checks for all Symmetrix external locks known to SYMAPI. The `-lockn RDF` command checks for locks specific to RDF.

If `-lockn` is not specified, the lock number defaults to 0.

If all or some of the targeted Symmetrix arrays have a Symmetrix exclusive lock, the list action with the `-lock` option returns the following unique return codes:

Code#	Code Symbol
16	CLI_C_SYM_NOT_ALL_LOCKED
17	CLI_C_SYM_NONE_LOCKED

Refer to Appendix D, *SYMCLI Return Codes* for more information.

`-lockn`

Specifies the Symmetrix external lock (SEL) number. You can choose to set a specific lock number to return, and if this option is not specified, the lock number defaults to 0. Optionally, you can return only RDF locks by specifying `RDF`, RDFA locks by specifying `RDFA`, or SELs used by GNS by specifying `GNS`, or `ALL` locks.

`-LRU`

Lists the cache-slot allocation and allocation percentage of a specified Least-Recently-Used (LRU) cache management group number, when used with the `list` action. You can list all the LRUs if you specify `ALL`.

-memory

Displays information about the memory boards.

-noprompt

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

-P

Identifies a specific (SCSI or fibre) port of a front-end director.

-password

The password associated with the user supplied by the
-username option.

-port

Lists the various front-end director port statuses (online/offline) and the associated director numbers when used with the `list -SA` option. Used with `list -FA`, `list -RA`, in addition to port statuses, the connection status of ports is also displayed.

-RA

Confines the action to an RDF director number. To select all RDF director numbers, specify `ALL`.

-rdf

Refreshes (synchronizes) the configuration database file with RDF information from the Symmetrix array(s) and the attached remote Symmetrix array(s).

-rdfg

Lists RDF groups of the Symmetrix array.

-SA

Confines the action to a front-end (SCSI or fibre) director number. To select all front-end director numbers, specify `ALL`.

-semaphores

Displays gatekeeper, database, and lock file semaphores.

`-services`

Displays configured network services.

`-sid`

Supplies the Symmetrix ID to display only information limited to the specified Symmetrix array.

`-snap`

Refreshes (synchronizes) the configuration database file with up-to-date TimeFinder/Snap information.

`-sorthost`

Sorts a `-connections` list request by host, rather than by Symmetrix ID.

`-ssid`

Displays MVS subsystem information.

`-static`

Lists static RDF groups.

`-switched`

Displays the local and remote Symmetrix arrays, their RDF directors, and RA groups that are connected in the open RDF switch fabric.

`-symmetrix`

Discover Symmetrix arrays only.

`-username`

The name of the user to authorize.

`-v`

Provides a more detailed, verbose listing.

`-version`

Displays SYMCLI/SYMAPI version information.

PARAMETERS*AppID*

The application ID.

HostName

The host name.

PassWord

The password associated with the *UserName* supplied during authorization actions.

SSIDNumber

The subsystem number.

SymmID

The 12-digit ID of the Symmetrix array.

UserName

The username supplied during authorization actions.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To discover all Symmetrix arrays connected to this host and to build or rebuild the Symmetrix configuration database file from information gathered, enter:

```
symcfg discover
```

To display information about the attached Symmetrix arrays, enter:

```
symcfg list
```

To display detailed information about the attached Symmetrix arrays and their directors, enter:

```
symcfg list -v -dir all
```

To display detailed information about the attached Symmetrix arrays and director 1B, enter:

```
symcfg list -v -dir 1B
```

To display information about all front-end directors for the specified Symmetrix array, enter:

```
symcfg list -SA ALL -sid 710
```

To list information about all registered hosts connected to the specified Symmetrix array, enter:

```
symcfg list -connections -sid 010000658710
```

To list information about all registered applications on every locally attached Symmetrix array, enter:

```
symcfg list -applications
```

To list all configured network services in the network services file, enter:

```
symcfg list -services
```

To list all gatekeeper and database semaphores, enter:

```
symcfg list -semaphores
```

To verify whether the Symmetrix 0098 configuration and the Symmetrix configuration database are in sync, enter:

```
symcfg verify -sid 0098
```

To display the content of CU image 0x00:

```
symcfg -cumage show 0
```

symcg

Performs operations on a Symmetrix composite group (CG).

SYNTAX

```
symcg -h

symcg
    create CgName [-type REGULAR | RDF1 | RDF2]
                    [-apidb |-ppath |-rdf_consistency]
    delete CgName [-force] [-symforce]
    rename OldCgName NewCgName

    export CgName [-f FileName] [-rdf]
    import CgName [-f FileName]
                    [-apidb |-ppath |-rdf_consistency]

    list [-apidb |-ppath |-rdf_consistency]
          [-offline] [-v]
    list [-inactive]
    show CgName [-inactive] [-offline | -lock]

    activate CgName [-noprompt]
    activateall [-noprompt]
    release CgName [-force] [-noprompt]
              [-sid SymmID] [-lock #]

symcg -cg CgName
    add [pd] PdevName [LdevName]
    remove [pd] PdevName [-force] [-symforce]
    show ld LdevName
    rename ld OldLdevName NewLdevName
    remove ld LdevName [-force] [-symforce]

symcg -cg CgName -sid SymmID
    add dev SymDevName [LdevName] [-vdev]
    remove dev SymDevName [-force] [-symforce]

symcg -cg CgName [-sid SymmID] [-RDFG GrpNum]
          [-RANGE <SymDevStart:SymDevEnd>] [-vdev]

    addall [[pd]|dev] [-R1|-R2] [-vdev]
    rmall [-force] [-symforce]

symcg -cg CgName [-noprompt] [-v] [-force]
    enable
    disable
```

```

symcg -cg CgName [-sid SymmID] [-noprompt] [-v]
                [-bcv | -vdev] [-force]

write_disable [LdevName [LdevName...]]
rw_enable [LdevName [LdevName...]]
ready [LdevName [LdevName...]]
not_ready [LdevName [LdevName...]]
relabel [LdevName [LdevName...]]

symcg -cg CgName [-sid SymmID]
                [-v] [-noprompt] [-force]
                [-bcv|-rbcv|-brbcv|-rrbcv|-vdev]

hold [LdevName [LdevName...]]
unhold [LdevName [LdevName...]]

```

DESCRIPTION The `symcg` command can be used to create a new composite group and delete existing composite groups. In addition, it can be used for exporting, importing, listing, and showing information about a composite group, adding devices to a composite group, removing devices from a composite group, and enabling and disabling RDF consistency on a composite group.

The `symcg` command can write disable, read/write enable, ready, not-ready, hold, and unhold a composite group.

ARGUMENTS

`activate`

Activates a specified composite group (imports to GNS).

`activateall`

Activates all the inactive composite groups.

`add pd`

Adds a Symmetrix device, given its physical (host) device name, to an existing composite group.

`add dev`

Adds a Symmetrix device, given its Symmetrix device name, to an existing composite group.

addall

Adds all Symmetrix devices that are visible to this host and are not already members of a composite group, and that belong to a specified Symmetrix array to the specified existing composite group.

addall dev

Adds all Symmetrix devices that are visible to the host, devices that are not visible to the host, and devices that are not already members of a composite group.

create

Creates an empty composite group. If type REGULAR is specified the composite group will not be stored in PowerPath®. If no type is specified then the group will become a REGULAR group by default. If the host supports RDF consistency groups, and the options file setting RDF_CG_TO_PPATH is enabled on the host, or the `-ppath` option is specified in the command line, then RDF consistency groups will be stored in PowerPath. A PowerPath consistency group type will be NA until STD devices are added to the group.

delete

Deletes an existing composite group. If the composite group has members, the command will fail, unless the `-force` flag is used. If the force flag is specified, the devices that are members of the group are removed, and the group is deleted. If RDF consistency is enabled and cannot be disabled, the command will fail unless the `-symforce` flag is used.

disable

Disables RDF consistency for all STD device(s) in the composite group.

enable

Enables RDF consistency for all STD device(s) in the composite group.

export

Exports the contents of a composite group to a text file, which can later be used to import the composite group.

hold

Holds all devices in the composite group. By default, all devices in the STD device list are acted upon.

import

Imports the the composite group described by a text file which was created by the export action. If `-apidb` is specified the non-REGULAR group will not be stored in PowerPath.

list

Lists all the composite groups that have been created for this host. If `-inactive` is specified, all the inactive composite groups will be listed.

not_ready

Places all devices in the composite group in the `not_ready` state. By default, all devices in the STD device list are acted upon.

ready

Makes ready all devices in the composite group. By default, all devices in the STD device list are acted upon.

relabel

Applies the defined Windows device label to the device. Refer to *symlabel* on page 1-173 for information about how to define a device label.

release

Releases the Device External Lock (DEL) associated with the devices in a composite group.

remove ld

Removes a Symmetrix device from an existing composite group by specifying its logical device name.

`remove pd`

Removes a Symmetrix device, using its physical (host) device name, from an existing composite group. If RDF consistency is enabled, the command will fail unless the `-force` flag is used. If RDF consistency can not be disabled, the command will fail unless the `-symforce` flag is used.

`remove dev`

Removes a Symmetrix device, using its Symmetrix device name, from an existing composite group. If RDF consistency is enabled, the command will fail unless the `-force` flag is used. If RDF consistency can not be disabled, the command will fail unless the `-symforce` flag is used.

`rename ld`

Renames a logical device.

`rmall`

Removes all Symmetrix devices from an existing composite group. If RDF consistency is enabled, the command will fail unless the `-force` flag is used. If RDF consistency can not be disabled, the command will fail unless the `-symforce` flag is used.

`rw_enable`

Enables read/write on all devices in the composite group. By default, all devices in the STD device list are acted upon.

`show`

Shows detailed information about a specified composite group.

`show ld`

Shows status information for a logical device in the composite group.

`unhold`

Releases the hold on all devices in the composite group. By default, all devices in the STD device list are acted upon.

`write_disable`

Write-disables all devices in the composite group. By default, all devices in the STD device list are acted upon.

OPTIONS

`-all`

Activates all inactive composite groups.

`-apidb`

Lists the composite groups that are in the host's SYMAPI configuration database. On a `create` or `import`, overrides the `options` file setting and stores the RDF consistency groups in the host's configuration database file only.

`-bcv`

Chooses all devices in the BCV device list of a composite group.

`-brcv`

Chooses all devices in the BRBCV device list of a composite group.

`-cg`

Targets an operation on a composite group.

`-f`

Specifies the text file to be used with `export` or `import`.

`-force`

Forces a deletion of a composite group, with or without members. Also used with `enable` and `disable` actions to perform the action when devices are in unexpected RDF modes and states. When used with the `remove` action, if the device is enabled, it will be disabled and removed. Applies to the following actions as well: `write_disable`, `rw_enable`, `ready`, `not_ready`, `hold`, and `unhold`.

`-h`

Provides brief, online help information.

-inactive

Lists or shows inactive composite groups.

-noprompt

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

-offline

Obtain information from the Symmetrix host configuration database.

-ppath

Lists the composite groups that are in PowerPath. On a `create` or `import`, overrides the `options` file setting and store the RDF consistency group in PowerPath, if PowerPath RDF consistency groups are supported on this host.

-R1

Adds or removes RDF1 (R1) devices only.

-R2

Adds or removes RDF2 (R2) devices only.

-RANGE

Specifies the ranges of Symmetrix devices to add and remove.

-rbcv

Chooses all devices in the RBCV device list of a composite group.

-rdf

Exports the remote Symmetrix ID(s) and remote Symmetrix device names. This allows the composite group to be imported on a host connected to the remote Symmetrix arrays.

-rdf_consistency

Creates or imports the composite group, allowing it to be enabled for RDF consistency once devices have been added to the composite group.

`-RDFG`

Adds or removes devices that belong to this RDF (RA) group.

`-rrbcv`

Chooses all devices in the RRBCV device list of a composite group.

`-sid`

Specifies the unique Symmetrix ID.

`-symforce`

When used with `remove` or `delete`, if the device is enabled and it can not be disabled, the operation will continue.

`-type`

Identifies a composite group type. Values are: `REGULAR`, `RDF1`, `RDF2`.

`-v`

Provides a more detailed, verbose listing.

`-vdev`

Chooses all devices in the VDEV device list of a composite group.

PARAMETERS

CgName

Composite group name. The name must be unique to this host.

FileName

Text file to be used with export or import.

LdevName

Device logical name, either named by the user or automatically assigned, when a device is added to a composite group.

PdevName

Host name for the device, such as `/dev/rhdiskpower61`.

SymDevName

Symmetrix device name, unique per Symmetrix array, such as `01C`.

OUTPUT FILE FORMAT

The output file created by `export` and read by `import` is of the following format:

```
<CG TYPE>
  S <SYMMETRIX ID> <SYMMETRIX DEVICE NAME>
  B <SYMMETRIX ID> <SYMMETRIX DEVICE NAME>
  R <SYMMETRIX ID> <SYMMETRIX RA GROUP NUM>      /
                        <SYMMETRIX DEVICE NAME>
  Z <SYMMETRIX ID> <SYMMETRIX RA GROUP NUM>      /
                        <SYMMETRIX DEVICE NAME>
  Y <SYMMETRIX ID> <SYMMETRIX RA GROUP NUM>      /
                        <REMOTE SYMMETRIX RA GROUP NUM> /
                        <SYMMETRIX DEVICE NAME>
  V <SYMMETRIX ID> <SYMMETRIX DEVICE NAME>
  . . .
```

Valid values for <CG TYPE> are:

```
CGTYPE_NA
CGTYPE_REGULAR
CGTYPE_RDF1
CGTYPE_RDF2
```

The following labels are defined as:

```
S identified a STD device
B identifies a local BCV device
R identifies a RBCV device
Z identifies a BRBCV device
Y identifies a RRBCV device
Z identifies a VDEV
```

<SYMMETRIX ID> is the 12 digit identifier of the Symmetrix upon which the local STD devices reside.

<SYMMETRIX RA GROUP NUM> is the RDFG (RA) number which can be used in combination with the local Symmetrix ID to get to the remote Symmetrix array.

<REMOTE SYMMETRIX RA GROUP NUM> is the RDFG (RA) number that can be used in combination with the local RA group number and the local Symmetrix ID to get to the Symmetrix array that is 2 hops away.

<SYMMETRIX DEVICE NAME> is the Symmetrix device number.

The file will have as many device description lines as the composite group has members. Blank lines will have a pound sign (#) in the first column and will be ignored.

RETURN CODES Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES The following example creates a REGULAR Symmetrix composite group, `mycg1`:

```
symcg create mycg1
```

The following example lists all Symmetrix composite groups in detailed format:

```
symcg -v list
```

The following example shows information about composite group `oracg`:

```
symcg show oracg
```

The following example exports composite group `oracg` to a text file, `oracg.txt`:

```
symcg export oracg -f oracg.txt
```

The following example deletes Symmetrix composite group `oracg`, regardless whether the group has devices in it:

```
symcg -force delete oracg
```

The following example imports composite group `oracg` from a text file, `oracg.txt`:

```
symcg import oracg -f oracg.txt
```

The following example adds a device to Symmetrix composite group `oracg`:

```
symcg -cg oracg add pd /dev/rhdiskpower61
```

The following example removes a device from a Symmetrix composite group `oracg`:

```
symcg -cg oracg -sid 55 remove dev 00C
```

symchg

Marks areas of Symmetrix disk storage so that objects occupying those areas can be monitored for changes by the Change Tracker.

SYNTAX

```
symchg -h
```

```
symchg [-v] [-sid SymmID]
```

```
create    dev SymDevname
delete    dev SymDevname
mark      dev SymDevname
remove    dev SymDevname
```

```
symchg <-g DgName | -cg CgName> [-bcv] [-v]
```

```
create    ld LdevName
delete    ld LdevName
mark      ld LdevName
remove    ld LdevName
```

```
symchg <-file DevFile> -sid SymmID [-v]
```

```
create
delete
mark
remove
```

```
symchg [-v] [-sid SymmID]
```

```
list      [-session [dev]]
```

```
symchg [-v] [-session] [[-reset | -multi] [-i Interval] [-c Count]]
```

```
view      dev SymDevname [-sid SymmID]
view      <-g DgName | -cg CgName> [-bcv] [-log LogFile]
view      <-g DgName | -cg CgName> ld LdevName
view      -file DevFile [-log LogFile]
```

```
symchg [-ra NumRAs] [-rate KB/s] [-resync [mmmm|hh:mm]]
        [-start mmddyyyy hh:mm] [-stop mmddyyyy hh:mm]
        [-backend] [-range start:end] [-v]
```

```
report    -log LogFile <-g DgName | -cg CgName> [-bcv]
report    -file DevFile -log LogFile [-sid SymmID]
```


DESCRIPTION

The `symchg` command (also known as Change Tracker) time stamps and marks an area of Symmetrix disk storage occupied by a disk storage object using a DeltaMark (SDDF) bitmap. This allows a marked area to be examined at a later time to view changes to the stored object. You can mark storage objects such as Symmetrix devices, lists of Symmetrix devices in a device file, and the standard or BCV devices of a Symmetrix device group or a composite group.

When viewing the changes for an object, the output can either be sent to `stdout` or saved to a user-defined log file. The information saved to the log file is stored in a comma-separated format. This enables the data to be imported into a spreadsheet for analysis. The results in the logfile can be summarized by specifying the `report` argument to `symchg`.

The information saved to the log file can be the number of tracks (delta) changed between sample intervals, by specifying the `-reset` option, or the cumulative tracks changed over time (sum), or both, by specifying `-multi`. The sum method is default.

The `symchg` command can calculate certain RDF capacity planning values based on the amount of change to the monitored objects. The RDF values that can be calculated are re-synchronization time, the number of Remote Adapters (RAs), and the RA transfer rates.

ARGUMENTS

`create`

Creates a Change Tracker session that monitors changes to logical objects. Simultaneously, you can mark and examine more than one object per session. This command supports Symmetrix devices, using their Symmetrix device name, logical device name, device group, or just BCV devices of a device group.

`delete`

Unmarks the disk storage and deletes the DeltaMark session.

`list`

Lists all disk storage objects that have been marked. It can list all Symmetrix devices that have an established DeltaMark session.

`mark`

Marks the area of disk storage to be monitored. First, a session must be created for the device containing the object to be marked.

remove

Removes the marked object from the `symchg` database without terminating the DeltaMark session.

report

Generates a report on the amount of change for the specified object in a specified log file. Reports are generated for device groups only.

view

Processes the bitmap that corresponds to the disk storage object and displays the amount and rate of change. Also shows whether a DeltaMark session exists for a specified disk device. The possible storage objects are specified selecting a Symmetrix device name, logical device name, device group, or just BCV devices of a device group.

OPTIONS**-backend**

Displays the DA and Back-end disk address of the device whose changes are being measured.

-bcv

Confines the action to just the BCV devices of the device group.

-c

Applies a count for the number of times to repeat execution of the `view` action. If `-c` is not specified and the `-i` option is specified, the change information for the object continues to be re-displayed indefinitely at every `-i` interval.

-cg

Specifies the composite group name.

-g

Applies the action to a Symmetrix device group name.

-h

Provides brief, online help information.

`-i`

Applies a repeat interval (seconds) between the executions of the `view -c` action. The default interval value between counts is 60 seconds. The minimum value between counts is 30 seconds. If the `-c` option is not specified and `-i` is specified, the change information for the object continues to be re-displayed indefinitely at every `-i` interval.

`-log`

Specifies a log file (owned by the user) that is read (`report` action) from or written (`view` action) to.

`-multi`

Reports changed tracks per both the Sum and the Delta method. This option requires the `-i` or `-c` options.

`-ra`

Applies a number to specify the quantity of RA directors in your Symmetrix configuration for the `report` action.

`-range`

Specifies the start and end Symmetrix device names. Applies to `report` action.

`-rate`

Applies the RA director's transfer rate (in KB/sec) to the `report` action.

`-reset`

Causes the specified storage device or object to be marked unchanged. This option requires the `-i` or `-c` options.

`-resync`

Applies a specific time window (in minutes, or hours and minutes) to synchronize the RDF pair to the `report` action.

`-session`

Causes the `list` argument to list all physical devices with created DeltaMark sessions. Causes the `view` argument to show if a DeltaMark session exists for the devices that the object spans.

Note that the `-i` and `-c` options are not allowed when viewing a `-session` option.

`-sid`

Applies a Symmetrix ID to the action, limiting the scope of the operation to a specific Symmetrix array.

`-start`

Applies a start date/time to begin processing data in the log file. The default operation is to start at the beginning of the log file.

`-stop`

Applies a stop date/time to stop processing data in the log file. The default operation is to stop at the end of the log file.

`-v`

Provides a more detailed, verbose listing.

PARAMETERS

CgName

Composite group name given by user.

DevFile

Device list file containing the list of devices to be acted upon. The file should have one *SymDevName* per line.

DgName

A device group name.

LogFile

A log file name.

LdevName

A logical device name either named by the user or automatically assigned when a logical device is added to a device group.

SymDevname

A Symmetrix device name.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES To create a DeltaMark session for just Symmetrix device 17C, enter:

```
symchg create dev 017C
```

To create a DeltaMark session for each Symmetrix device in a device group, enter:

```
symchg create -g ProdDB
```

To examine the amount and rate of change for logical device Ldev1 in device group ProdDB, enter:

```
symchg view -g ProdDB ld Ldev1
```

To save changed information in log file /tmp/logfile for device group ProdDB, performing ten samples and resetting the changed information after each sample, enter:

```
symchg view -g ProdDB -reset -log /tmp/logfile -c 10
```

To list all the disk storage objects that are currently marked, enter:

```
symchg list
```

To list all the disk storage objects for each DeltaMark session that are currently marked, enter:

```
symchg list -session
```

To generate a summary report on each of the Symmetrix devices of device group ProdDB for /tmp/logfile, enter:

```
symchg report -g ProdDB -log /tmp/logfile -v
```

To generate a summary report (/tmp/logfile) on device group ProdDB, with an RA transfer of 1000 KB/sec and perform a resync of the changed tracks every 10 minutes, enter:

```
symchg report -g ProdDB -log /tmp/logfile -rate 1000 \  
-resync 10
```

To delete the marks and terminate the DeltaMark session for Symmetrix device 14D, enter:

```
symchg delete dev 14D
```

To unmark all the Symmetrix devices associated with device group ProdDB without deleting the DeltaMark session for these devices:

```
symchg remove -g ProdDB
```

symchksum

Controls Symmetrix EMC Double Checksum operations on the RDBMS database devices, RDBMS tablespace devices, or Symmetrix devices.

SYNTAX

```
symchksum -h

symchksum -sid SymmID

    list [-v]

    show dev SymDevName [-blocks|-kb|-mb]

    disable dev SymDevName -force

symchksum [-type RdbType][-db DbName]
          [-tbs TbsName][-control] [-redo]

    enable [-reject_io][-fractured_reject_io]
          [-phone_home] [-discard] [-v]
          [-check_dba][-check_all_blocks][-straddle]
          [-suppress_feature Keyword, [Keyword]]

    disable [-v]

    validate [-v]

    verify [-v]
```

DESCRIPTION

This command enables checksum checking, and other checks, on a set of Symmetrix devices. At this time, only Oracle RDBMS products are supported with this command. An Oracle instance must be configured to compute checksums¹.

The I/O of enabled extents on a specified device are checked by performing a checksum algorithm. When checksum errors are detected, an error is logged to the Symmetrix. You can specify to reject the I/O or have the Symmetrix phone home on checksum errors.

Note: The software forces the logging bit on (for Oracle8.1 and higher).

1. The Oracle `init.ora` parameter `db_block_checksum` is used. Consult the Oracle database documentation for further details.

The `symchksum` command also performs the following two operations automatically:

- ◆ Verify the magic number in Oracle data blocks (MagicNumber)

Note: Not available for redo logs.

- ◆ Check for non-zero data block address (NonZeroDbA)

To suppress one or both of these operations, use the `-suppress_feature` option and supply the name of the feature, for example:

```
symchksum -supress_feature MagicNumber, NonZeroDbA
```

In addition, the following three operations can be manually enabled:

1. Check all blocks in the I/O: This option causes MagicNumber and NonZeroDbA checks to be performed on all blocks in the write. Normally, these checks are performed on the first block of the write only.

To select the check all blocks feature, use `-check_all_blocks`.

2. Check for I/O straddling of Oracle extents: If a single I/O spans beyond the bounds of defined EMC DoubleChecksum extents, the I/O is said to straddle. To check for straddle I/O, select this feature. Do not use this feature if autoextend is used on the rdbms datafiles.

To select the straddle feature, use `-straddle`.

3. Compare data block address and target block of I/O (`-check_dba`).

When `-check_dba` is enabled, extended data is stored on each extent. This limits the ability of `symchksum` to collapse adjacent extents.

If an I/O is not a multiple of the object blocksize, you can choose to reject the I/O. This is called a fractured I/O, and is selected with the `-fractured_reject_io` option. When using this option, the `-reject_io` option must also be used.

The `-reject_io` has an optional clause, `-discard`. When extents are enabled with `-discard`, EMC Double Checksum writes blocks to disk until an error is detected. If an I/O is larger than 32 KBs, the `-discard` option divides a large I/O into smaller units of 32 KBs each. When a checksum failure is detected, all blocks in that unit, and

subsequent units, are discarded. If `-discard` is not specified, failed bytes will likely be transferred to disk per SCSI convention.

Important: Check with your EMC Representative for up-to-date availability information for `-discard`, `MagicNumber`, and `NonZeroDb` on your Enginuity™ release level.

Database objects can be specified using restrictors. The options `-tbs`, `-redo`, and `-control` are all restrictors. If these restrictors are not used, the entire database is implied. If the `-tbs` restrictor is used, it must be used by itself. The `-redo` and `-control` restrictors can be used together.

These restrictors can also be used with the `disable` argument.

When the database control files, redo logs, or tablespace name is specified, the device information that defines those objects is obtained with the SYMAPI database mapping functions. The extents of those devices are used when defining the set of extents to be checked for checksum errors.

When a Symmetrix device is specified with the `disable` action, the `-force` flag is required. Disabling extents in this way can cause a mapped tablespace or database to be only partially protected, so use with caution. All the extents being monitored for checksum errors on the specified Symmetrix device will be disabled.

Note: Exercise care when disabling checksum on a specified device. This capability is provided only for unusual cases. For example, if a tablespace is dropped before disabling checksum, normal methods can't be used to disable checksum because the tablespace no longer exists. In such a case, disabling by device must be used.

After using `disable` by device, it is very likely that other objects have been unintentionally disabled. Check to make sure the objects that should be enabled are still completely enabled.

There is a maximum of 200 extents per device that can be monitored at one time for Enginuity 5x70 revision 50 and higher. The maximum is 31 extents for earlier Enginuity versions.

When listing the physical devices that have checksum checking enabled, the information reported is from the first extent encountered. If you want to see all the extent details for a particular device, use the `show` command.

Environment Variables

You need to define the UNIX environment variables for the Oracle database for the database mapping commands to succeed (refer to Table 1-2).

Table 1-2 UNIX Environment Variables

For Database	Set Variables
Oracle	ORACLE_HOME ORACLE_SID PATH

See your System Administrator for more specific information about setting these variables for your system platform and database.

Table 1-3 lists the various environment variables that you should set to eliminate the repetition of argument entries or options in your command line sequences. The database user login information must be supplied using the SYMCLI_RDB_CONNECT variable.

Table 1-3 symchksum DB Environment Variables

Variable Name	Description	Default
SYMCLI_RDB_CONNECT	Specifies a user name, password, and remote service name for a user's relational database account (<i>user/password@service</i>).	None. Must be specified by user.
SYMCLI_RDB_NAME	Specifies the default relational database name (<i>DbName</i>). Possible values: Oracle	NULL
SYMCLI_RDB_TYPE	Specifies a specific type (<i>DbType</i>) of database. Possible values: Oracle	NULL

Note: SYMCLI_RDB_CONNECT must be set with your user name and password for you to access the specified database with this command.

For any individual command, you can override the variable value of SYMCLI_RDB_TYPE to explicitly specify the option in the command argument.

If *symchksum* is being run in client/server mode and the required RDBMS environment variables are properly set in the client machine, they will also be applied to the server.

An Oracle database user must have one of the following to run this utility:

- ◆ "Select any table" privilege (Oracle8i and earlier)
- ◆ "SELECT_CATALOG_ROLE" (Oracle9i and newer)
- ◆ DBA role
- ◆ SYSDBA system role

ARGUMENTS

`enable`

Enables checksum checking on the extents of the specified devices.

`disable`

Disables checksum checking on the extents of the specified devices.

`list`

Lists all devices that currently have checksum checking enabled.

`show`

Shows the extents of a specified device that are having checksum checking performed.

`validate`

Validates that a specified database or tablespace is able to have checksum checking enabled. This is a way to determine if an installation is a candidate for EMC Double Checksum. Validate does not make any changes.

`verify`

Verifies whether the specified database or tablespace has checksum checking enabled on all their devices.

The verify action returns the following unique return codes if the verify criteria was not met:

Code#	Code Symbol and Description
14	CLI_C_NOT_ALL_VALID Returned if only some of the specified RDBMS extents are checksum enabled.
15	CLI_C_NONE_VALID Returned if none of the specified RDBMS extents are checksum enabled.

OPTIONS

`-check_all_blocks`

Checks all blocks in the I/O. Otherwise, only the first block is checked.

`-check_dba`

Compares the data block address and target block of I/O.

`-control`

Affects control files only.

`-db`

Applies a specific relational database name.

`-discard`

Discards bytes in the current buffer and subsequent buffers, when a checksum failure is detected.

`-force`

Applies force with the disable action on all of the extents of the Symmetrix device.

`-fractured_reject_io`

Rejects I/O if not a multiple of Oracle blocksize.

`-h`

Provides brief, online help information.

`-phone_home`

Phones home when a checksum error is detected.

`-reject_io`

Rejects I/O when a checksum error is detected.

`-redo`

Specifies relational database redo logs.

`-sid`

Specifies a Symmetrix ID.

`-straddle`

Checks for writes that straddle defined database extents.

`-supress_feature`

Turns off a default operation.

`-tbs`

Specifies a relational database tablespace name.

`-type`

Specifies a relational database type.

`-v`

Provides a more detailed, verbose listing.

KEYWORDS

MagicNumber

A default operation that verifies the 3-bit magic number.

NonZeroDb

A default operation that checks for non-zero data block addresses.

PARAMETERS

DbName

The specific relational database name.

RdbType

The relational database type (currently, only Oracle).

SymDevName

The specific Symmetrix device name.

SymmID

The 12-digit ID of the Symmetrix array.

TbsName

The specific tablespace name.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To list the devices on Symmetrix 3890 that have extents being checked for checksum errors, enter:

```
symchksum -sid 3890 list
```

To show all the extents of Symmetrix device 0A1 that are being checked for checksum errors, enter:

```
symchksum show dev 0A1
```

To enable Oracle checksum checking on the extents of all the devices that define the current database instance and then to phone home on error, enter:

```
symchksum -type Oracle -phone_home enable
```

To enable Oracle checksum checking on the extents of all the devices that define the tablespace, and to log any errors, enter:

```
symchksum -type Oracle -tbs SYSTEM enable
```

To enable Oracle checksum type checking on the extents of all the devices that house the Oracle control files, and to log any errors, enter:

```
symchksum -type Oracle -control enable
```

To verify that Oracle tablespace USER01 has checksum checking on all the devices that have defined it, enter:

```
symchksum -type Oracle -tbs USER01 verify
```

To disable Oracle checksum checking on the current database instance, enter:

```
symchksum -type Oracle disable
```

To disable (with force) checksum checking for all checksum extents on Symmetrix device 0A1, enter:

```
symchksum -sid 3890 disable dev 0A1 -force
```

To check and determine if the Oracle tablespace is a candidate for Double Checksum, enter:

```
symchksum validate -tbs ACCOUNTING_1
```

To enable Oracle checksum and suppress the default straddle operation, enter:

```
symchksum -type Oracle enable -suppress_feature Straddle
```

To enable Oracle checksum and add the optional operations of check DBA and check all blocks, enter:

```
symchksum -type Oracle enable -check_dba -check_all_blocks
```

symcli

Provides a brief description of all the commands included in the Symmetrix Command Line Interface (SYMCLI).

SYNTAX

```
symcli [-env] [-def] [-h] [-v]
```

DESCRIPTION

The `symcli` command provides a brief explanation of the commands included in the Symmetrix Command Line Interface. Manual pages are available for each individual command listed using the `symcli` command.

ARGUMENTS

None.

OPTIONS

`-def`

Displays the SYMCLI environmental variable values that are currently set.

`-env`

Displays the list of environmental variables that can be used with SYMCLI commands.

`-h`

Provides brief, online help information.

`-v`

Provides a brief description of all the SYMCLI commands.

PARAMETERS

None.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To obtain a list of the SYMCLI commands, enter:

```
symcli -v
```

To obtain a list of the environment variables that can be set, enter:

```
symcli -env
```

symclone

Performs TimeFinder® Clone control operations on a device group, composite group, devices within the device group, or devices in a device file.

SYNTAX

symclone -h

```
symclone -g DgName [-v] [-noprompt]\
                  [-force] [-i Interval] [-c Count]\
                  [-preserveTGTLocks -lockid LockNum]\
                  [[-rdf [-bcv]] | -rrbcv]

create            [-opt|-exact] [[[-copy|-precop] -differential] [-skip]
                  <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
                  <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
                  <<[LdevName [[SYM|BCV] ld LdevName]]>...>

activate          [-vxfs <MountPoint...>]\
                  [-ppath <SRCDEVS|PowerPathPdevName...>
                  [-rdb -dbtype DbType [-db DbName]]\
                  [-consistent]\
                  [-preaction Script] [-postaction Script]\
                  [-not_ready] [-skip]
                  <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
                  <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
                  <<[LdevName [[SYM|BCV] ld LdevName]]>...>

terminate         [-symforce] [-skip]
                  <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
                  <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
                  <<[LdevName [[SYM|BCV] ld LdevName]]>...>

recreate          [-skip] [-precop]
                  <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
                  <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
                  <<[LdevName [[SYM|BCV] ld LdevName]]>...>

establish         [-vxfs <MountPoint...>]\
                  [-ppath <SRCDEVS|PowerPathPdevName...>
                  [-rdb -dbtype DbType [-db DbName]]\
                  [-consistent]\
                  [-preaction Script] [-postaction Script]\
                  [-not_ready] [-skip]\
                  [-full [-opt|-exact] [-copy [-differential]]]
                  <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
```



```

<<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
<<[LdevName [[SYM|BCV] ld LdevName]]>...>

restore    [-preaction Script] [-postaction Script]\
           [-full]
           <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
           <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
           <<[LdevName [[SYM|BCV] ld LdevName]]>...>

symclone -g DgName [-offline] [-i Interval] [-c Count]

query      [LdevName [LdevName...]] [-multi]

verify     [-created|-copied|-copyinprog|-copyonaccess|-precopy]\
           [-cycled]
           <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
           <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
           <<[LdevName [[SYM|BCV] ld LdevName]]>...>

symclone -g DgName [-h]\
  set mode  [copy|precopy|nocopy]
           <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
           <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
           <<[LdevName [[SYM|BCV] ld LdevName]]>...>

symclone -sid SymmID <-file DeviceFileName|'redirect stdin'>
           [-force] [-noprompt] [-i Interval] [-c Count]\
           [-preserveTGTLocks -lockid LockNum] [-v] [-h]

create     [[-copy] [-precopy] -differential] [-skip]

activate   [-vxfs <MountPoint...>] |
           [-ppath <SRCDEVS | PowerPathPdevName...> |
           [-rdb -dbtype DbType [-db DbName] ] |
           [-consistent]\
           [-preaction Script] [-postaction Script]\
           [-not_ready] [-skip]

terminate  [-symforce] [-skip]

recreate   [-skip] [-precopy]

establish  [-vxfs <MountPoint...>] |
           [-ppath <SRCDEVS | PowerPathPdevName...> |
           [-rdb -dbtype DbType [-db DbName] ] |
           [-consistent]\
           [-preaction Script] [-postaction Script]\
           [-not_ready] [-skip]
           [-full [-opt|-exact] [-copy [-differential]]]

```

```

restore  [-preaction Script] [-postaction Script]\
         [-full]

symclone -sid SymmID <-file DeviceFileName | 'redirect stdin'>
         [-h] [-force] [-i Interval] [-c Count]

query    [-multi]

verify   [-created | -copied | -copyinprog | -copyonaccess |
         -precopy [-cycled]]

set mode  [precopy|copy|nocopy]

symclone [-sid SymmID] [-h] [-i Interval] [-c Count]\
         [-offline] [-v]

list

symclone -cg CgName [-h] [-v] [-noprompt]
         [-force] [-i Interval] [-c Count] [-sid SymmID]\
         [[-rdf [-bcv]] | -rrbcv]

create    [-opt|-exact] [[-copy] [-precopy] -differential]\
         [-skip]
         <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
         <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
         <<[LdevName [[SYM|BCV] ld LdevName]]>...>

activate  [-vxfs <MountPoint...>] |
         [-ppath <SRCDEVS | PowerPathPdevName...> |
         [-rdb -dbtype DbType [-db DbName] ] |
         [-consistent]\
         [-preaction Script] [-postaction Script]\
         [-not_ready] [-skip]
         <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
         <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
         <<[LdevName [[SYM|BCV] ld LdevName]]>...>

terminate [-symforce] [-skip]
         <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
         <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
         <<[LdevName [[SYM|BCV] ld LdevName]]>...>

recreate  [-skip] [-precopy]
         <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
         <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
         <<[LdevName [[SYM|BCV] ld LdevName]]>...>

```

```

establish  [-vxfs <MountPoint...>] |
           [-ppath <SRCDEVS | PowerPathPdevName...>] |
           [-rdb -dbtype DbType [-db DbName]] |
           [-consistent]\
           [-preaction Script] [-postaction Script]\
           [-not_ready] [-skip]\
           [-full [-opt|-exact] [-copy [-differential]]]
           <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
           <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
           <<[LdevName [[SYM|BCV] ld LdevName]]>...>

restore    [-preaction Script] [-postaction Script]\
           [-full]
           <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
           <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
           <<[LdevName [[SYM|BCV] ld LdevName]]>...>

symclone -cg CgName [-h] [-offline]\
           [-i Interval] [-c Count] [-sid SymmID]

query      [LdevName [LdevName...]]\
           [-multi] [-bcv] [-rdf] [-rrbcv]

verify     [-created | -copied | -copyinprog | -copyonaccess |
           -precopy [-cycled] | -recreated]
           <<[LdevName [[SYM|BCV] pd PdevName]]>...> |
           <<[LdevName [[SYM|BCV] dev SymDevName]]>...> |
           <<[LdevName [[SYM|BCV] ld LdevName]]>...>

```

DESCRIPTION The `symclone` command performs TimeFinder Clone operations on a device or composite group, on a device within a device or composite group, or on pairs listed in a device file. These operations include creating and activating a source device with a target device in a copy session, terminating the session, and querying the state of the device pair.

All Clone operations can be performed on a group or individual device basis. Before a target device can be cloned from a source device, the target must have previously been associated with the device group. The target and source devices must be of the same size and emulation type.

ARGUMENTS `activate`

Activates an internal copy session with the devices in the device or composite group with one or more target devices that are associated with the group.

While the operation is in progress, the state of the device pair is either `CopyInProgress` or `CopyOnAccess`. When the operation completes, the state changes to `Copied`.

`create`

Creates an internal copy session with the devices in the device or composite group with one or more target devices that are associated with the group. While the operation is in progress, the state of the device pair is `CreateInProgress`. When the operation completes, the state changes to `Created`.

`establish`

Creates and activates an internal copy session with the devices that are in the group with one or more target devices that are associated with the group. Without the `-full` option, causes a `recreate` followed by an `activate` operation.

`list`

Lists all copy sessions that have been created on the Symmetrix array.

`query`

Returns information about the state of mirroring of one or all device pairs in a group.

`recreate`

Requests that just the changed tracks since the last `activate` action be copied over to the target device. The session must have been created with the `-differential` option. A subsequent `activate` action must be issued to establish a new point-in-time copy.

`restore`

Causes a copy from the target device to a source device to take place. With `-full`, a full copy of the data currently on the target device will take place. The device must be in a `Copied` state for a `restore` to take place.

`set mode`

Allows the session to be changed to `Precopy`, `Copy`, or `NoCopy` while in the `Created` state. Once a session is in the `Precopy` state, it is not allowed to go into one of the other states.

terminate

Terminates (stops) the existing internal copy session between the specified source and target devices in a group.

verify

Verifies whether one device pair is or all device pairs in a group are in the Copied state.

The verify action returns the following unique return codes if the verify criteria was not met:

Code #	Code Symbol
53	CLI_C_NOT_ALL_COPYINPROG
54	CLI_C_NONE_COPYINPROG
55	CLI_C_NOT_ALL_COPIED
56	CLI_C_NONE_COPIED
57	CLI_C_NOT_ALL_COPYONACCESS
58	CLI_C_NONE_COPYONACCESS
60	CLI_C_NOT_ALL_CREATED
61	CLI_C_NONE_CREATED
68	CLI_C_NOT_ALL_RECREATED
69	CLI_C_NONE_RECREATED
73	CLI_C_NOT_ALL_PRECOPY
74	CLI_C_NONE_PRECOPY
75	CLI_C_NOT_ALL_PRECOPY_CYCLED
76	CLI_C_NONE_PRECOPY_CYCLED

Refer to RETURN CODES for more information.

OPTIONS**-bcv**

When used with `-rdf`, causes `symclone` to execute the operation on the remote BCV device(s), RBCVs.

-c

Specifies the number (count) of times to display or to acquire an exclusive lock on the Symmetrix devices (when used with control actions). If this option is not specified but an interval (`-i`) is specified, the program will loop continuously to display or start the mirroring operation.

-cg

Applies a composite group name to the command.

-consistent

Causes the source and target pairs to be consistently activated.

-copied

Verifies that the device pair(s) are in the Copied state.

-copy

Causes the device copy to take place in the background. Normally, the copying of tracks is not completed unless the source device is written to or the target device is read or written to. When the `symclone create -copy` operation is executed, the state of the device pair is CopyInProgress. The state changes to Copied when all the tracks are moved to the target device.

-copyinprog

Verifies that the copy session(s) are in the CopyInProgress state.

-copyonaccess

Verifies that the copy session(s) are in the CopyOnAccess state.

-created

Verifies that the copy session(s) are in the Created state.

-cycled

Verifies that the Copy session(s) have completed one precopy cycle. Requires the `-precopy` option.

-db

Specifies the name of the relational database. This is not required for Oracle.

-dbtype

Specifies the relational database type.

-differential

When used with `create`, creates SDDF sessions for maintaining changed track information. This option implies copy if the `-copy` option is not specified.

-exact

Applies to group operations that causes the clone (standard source and BCV target devices) pairing algorithm to select the pairs according to the exact order in which the source and target devices were added to the specified group. This option overrides all other pairing algorithms.

-file

Applies a device file to the command. The device file contains device pairs (*SymDevnames*) listing a pair per each line (the standard first, a space, and the BCV last within each line entry). Device files can include comment lines that begin with the pound sign (#).

-force

Attempts to force the operation even though one or more paired devices in the device group may not be in the normal, expected state(s) or the specified operation.

-full

Causes a data copy of all tracks to the target device. This option is only valid with a `Restore` or `Establish` command.

-g

Applies a device group name to the command.

-h

Provides brief, online help information.

-i

Specifies the repeat interval, in seconds, to display or to acquire an exclusive lock on the Symmetrix devices. The default interval is 10 seconds. The minimum interval is 5 seconds. When used with the `verify` action, the number of seconds specified indicates the interval of time (in seconds) to repeat the verify command(s) before the verify action finds and reports the pairs fully synchronized.

-lockid

Specifies the lock holder ID for preserving the target locks on the control operation. Lock number ID must be provided as a hexadecimal number.

`-multi`

Applies to a `query` operation in a multi-copy session environment to show all targets that are paired with source devices. It lists the devices in chronological order.

`-noprompt`

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

`-not_ready`

Performs the Clone activation operation but leaves the target devices as Not Ready to their hosts.

`-offline`

Specifies that the Symmetrix data connection is offline from the host in-memory database.

`-opt`

Applies to the `symclone create` command to optimize the device pair selection (standard source and BCV target devices) to achieve the highest copy speed between them.

`-postaction`

Causes the script argument to be executed after an `activate` command.

`-ppath`

Lists one or more PowerPath devices for which I/O is to be suspended just before the `activate` is performed and resumed, as soon as `activate` completes.

As an alternative to the list, the key word `SRCDEVS` can be supplied, which will use the pathnames from the standard devices being controlled.

`-preaction`

Causes the script argument to be executed before an `activate` command.

-precopy

Used with `create` and `recreate`. Causes the device copy to take place in the background before the `activate` starts. Normally, the copying of tracks is not started until the `activate` occurs. The `precopy` process continuously runs in the background until the `activate` is called.

-preserveTGTLocks

Causes the action not to take out device locks on the target devices. The target devices must already be locked by the same lock holder ID. Requires the `-lockid` option.

-rdb

Freezes the log files and specified database just before the `activate` is performed, and thaws as soon as the `activate` completes.

-rrbcv

Causes the action to be executed on the multi-hop Symmetrix array.

-rdf

Causes the action to be executed on the remote Symmetrix array.

-sid

Applies the command to a specified Symmetrix ID. Used with the `-file` flag to specify the Symmetrix array on which the command should be performed, or with `-cg` to restrict the operation to a single Symmetrix array.

-skip

Skips the source locks flag. Will not lock the source devices if all of the specified source devices are either locked or are all unlocked. Applicable only when the source device is a standard device (not a BCV).

-symforce

Requests that the Symmetrix array force the operation to occur that overrides instances where they are normally rejected.

**CAUTION**

Use care when applying this option as data can be lost or corrupted.

With a *terminate*, it causes the Symmetrix array to terminate a synchronized copy pair.

-v

Provides a more detailed, verbose listing.

-vxfs

Lists one or more VERITAS VxFS file system mount points. The file system(s), mounted on this host, will be frozen just before the activate is performed and thawed as soon as the activate completes.

PARAMETERS

CgName

The composite group name.

DbName

The relational database name.

DbType

The relational database type. Possible values:

Oracle
 SQLServer
 MVSDB2
 IBMUDB
 Informix
 Sybase

DgName

The device group name.

DevFilename

The device filename. The device file contains device pairs (*SymDevnames*) listing a pair per each line (the standard first, a space, followed by the BCV name on each line).

LdevName

The logical device name of either the standard (such as DEV002) or the BCV device (such as BCV005).

LockNum

The lock ID number as a hexadecimal value.

MountPoint

File system mount point.

PdevName

The physical device (host) name for the target device (such as `/dev/rdisk/c2t0d2s2`).

PowerPathPdevName

A PowerPath device name (one or more physical device names can be entered).

Script

The full pathname of a script file to be executed.

SymDevname

The Symmetrix device name, unique per Symmetrix array, for the target device (such as `01C`).

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To create device group `ProdDB` as a regular device group, enter:

```
symdg create ProdDB
```

To define device group `ProdDB` as the default device group, enter:

```
setenv SYMCLI_DG ProdDB
```

To add standard device `/dev/rdisk/clt1d1s2` to device group `ProdDB` and names it `act1`, enter:

```
symld add pd clt1d1s2 act1
```

To associate BCV device `/dev/rdisk/c2t0d2s2` to device group `ProdDB` and names it `mybcv1`, enter:

```
symbcv associate pd c2t0d2s2 mybcv1
```

To create a copy of the source device `act1` in group `ProdDB` with a specified target device (associated with the group), enter:

```
symclone create act1 sym ld mybcv1 -copy
symclone activate act1 sym ld mybcv1
```

To wait until the BCV pair is fully copied, polling every 30 seconds, enter:

```
symclone -i 30 verify act1
```

To terminate the device act1 in group ProdDB, enter:

```
symclone terminate act1 sym ld mybcv1
```

To query information about all paired devices in device group ProdDB, enter:

```
symclone query
```

symconfigure

Allows you to manage major configuration changes affecting devices of a specified Symmetrix array as well as manage dynamic (hot) spares.

SYNTAX

```
symconfigure -h

symconfigure list -sid SymmID [-v | -freespace
                               [-units cylinders | MB]]

symconfigure -sid SymmID [-noprompt] [-noecho|-v]
                        [-i Interval] [-c Count]
                        [-f[ile] Cmd_Filename | (redirect stdin)]
    preview
    prepare
    commit

symconfigure verify -sid SymmID

symconfigure query -sid SymmID [-i Interval] [-c Count]
                        [-v]

symconfigure abort -sid SymmID

symconfigure -version [-v] [-sid SymmID]
```

DESCRIPTION

Allows you to modify Symmetrix devices, ports, RDF characteristics, host assignments, create or delete Symmetrix devices, and manage SAVEDEV pools. A lock on the Symmetrix configuration is engaged by the configuration server during the configuration change session. A session is processed in a series of progressive stages (preview, prepare, commit), which can be monitored using polling options.

Not all stages are always executed. Use discretion when controlling which stages are to be completed to allow checking and debugging of the command files before the changes are implemented. The stages are: preview, prepare, and commit.

The `preview` argument verifies the syntax and correctness of each individual change defined, and then terminates the session without change execution.

The `prepare` argument will perform the preview checks and also verify the appropriateness of the resulting configuration definition against the current state of the Symmetrix array; the argument then terminates the session without change execution. The `prepare` argument has no function for SAVEDEV pool sessions.

The `commit` argument completes all stages and executes the changes in the specified Symmetrix array.

The `query` argument allows the monitoring of progress of a configuration request.

The `abort` argument allows for the termination of a change session left dangling due to the host connection to the configuration server becoming broken.

The `verify` argument verifies that the configuration currently running in the specified Symmetrix array complies with the requirements for the host-based configuration changes.

The `list` argument with its single option (`-freespace`) shows the free physical disk space within the Symmetrix array.

For the configuration change session, a set of changes can be defined within a command file. The command file format contains various command entries terminated with a semicolon (;). Multiple changes can be made in one session, but all changes must fall into the same class. An exception to this is that increasing and decreasing mirror protection can be done in the same session.

Mapping and unmapping devices include options for modifying the device masking associated with those devices. Refer to `symmask` and `symmaskdb` for additional information.

Starting with Enginuity Version 5669, changes for multiple operation classes can be executed within the same session, except for dynamic RDF changes and SAVEDEV pool changes.

SAVEDEV pool sessions are executed directly within the Symmetrix and do not communicate with the configuration server. The `query` and `abort` arguments are not available for pool sessions.

Redirect stdin

Optionally, for UNIX platforms, you can redirect a number of screen entries (*here documents*) to `stdin` and not deal with the command file. For example, to prepare a chain of `symconfigure` commands on the screen to be redirected to `stdin`, use the following syntax:

```
symconfigure -sid SymmID prepare <<DELIM
add dev foo...;
add dev foo...;
add dev foo...;
DELIM
```

Classes Table 1-4 describes the classes of configuration control operations that are available when applying the `symconfigure` command:

Table 1-4 Configuration Control Classes

Class	Description
Configuring RDF	- Adds/removes RDF attributes. - Swaps RDF source/target attributes for an RA group. - Enables/disables RDFA on an RA group. - Sets RA group attributes.
Converting a device's configuration	Converts a device's configuration by adding or removing BCV or DRV attributes.
Creating devices	Creates new Symmetrix devices.
Decreasing mirroring	Removes mirror(s) from an existing device, resulting in the creation of a new device; for example, convert 4-Way-Mir to two 2-Way-Mir.
Increasing mirroring	Adds mirror(s) to an existing device, for example, convert 2-Way-Mir to 3-Way-Mir or convert RDF1 to RDF1+Mir.
Managing spare disks	- Adds a new spare disk. - Removes an existing spare disk.
Mapping devices to ports	- Maps/unmaps a Symmetrix device to a front-end port. - Maps/unmaps a range of Symmetrix devices that form a mainframe CU image to a front end port. - Copies device mappings from one EA/EF port to another. - Adds/removes PAV aliases from mainframe devices.
Handling Meta devices	Forms/dissolves meta devices. Adds/removes meta members.
Setting device attributes	Marks devices as available for use as: - Dynamic RDF devices - RAD - WORM - VCM database devices - RDB checksum devices Enables the SCSI3 persistent reservation option for clustered devices.
Managing SAVEDEV pools	- Adds/deletes pools. - Adds/removes pool members. - Enables/disables pool members.

Table 1-4 Configuration Control Classes (continued)

Class	Description
Setting device emulation	Sets the device emulation type. Currently device emulation can only be changed among FBA emulation types.
Setting front-end port attributes	• Sets/resets SCSI or fibre port flags. • Sets fibre FA loop ID. • Sets hostnames of port connections. • Sets Gig-E front-end port IP addresses and netmasks. Note: The overall processing time for the changes can vary from 5 minutes to over an hour, depending on the class of changes. RDF changes will also be applied to the remote Symmetrix array. Even more time is needed if the devices are to be synchronized.
Setting the Symmetrix metrics	Sets the metrics of Symmetrix configuration. Current available metrics include: • concurrent_rdf • dynamic_RDF • dynamic_concurrent_rdf • FBA_multi_access_cache • max_hypers_per_disk • max_pav_aliases • pav_mode • rdfa_cache_percent • rdfa_host_throttel_time • RAID_5_support • RAID_S_members • RAID_S_support • VCMDB_restricted_access

ARGUMENTS`abort`

Attempts to gain control of an existing session to abort it and frees the configuration session lock.

The `abort` command allows a `-sid` option for referencing a remote Symmetrix array. This permits a configuration session with RDF changes to be aborted.

`commit`

Fully processes the set of changes, activating the results in the specified Symmetrix array.

list

When used with the `-freespace` option, shows the free physical disk space within the Symmetrix array as it can be used to create new Symmetrix devices for different emulation modes. Free disk space on *unformatted* disks is shown as available for all emulation modes. If a physical disk has been partially used to create a device, that device is considered *formatted* and the rest of the available space can only be used for devices of the same emulation mode.

When used with the `-v` option, displays configuration information that is not stored in the SYMAPI database and that needs to be retrieved directly from the configuration server.

prepare

Performs the preview checks and also verifies the appropriateness of the resulting configuration definition against the current state of the Symmetrix array; `prepare` then terminates the session without change execution. The `prepare` action has no function for SAVEDEV pool sessions.

preview

Analyzes the changes for validity, and then terminates without any change execution.

query

Returns information about the status of a configuration change session.

verify

Verifies that the configuration currently running in the specified Symmetrix array complies with the requirements for the host-based configuration changes.

OPTIONS

-c

Specifies the number (count) of times to query a session status. If this option is not specified and an interval (`-i`) is specified, the program will loop, querying for status until the change session completes. When used with the `preview/prepare/commit` actions, the process will attempt `-c` number of times waiting for the database or configuration locks to clear.

-file

Specifies the command file to be processed by the configure action.

-h

Provides brief, online help information.

-i

Specifies the repeat interval in seconds to display status information for the configuration session. The default interval is 10 seconds. The minimum interval is 5 seconds.

-noecho

When using the `preview`, `prepare` and `commit` actions, this blocks the displaying of session status and progress messages, during the configuration change session. (Does not inhibit the log file activity.)

-noprompt

Removes the no prompt option for the `preview`, `prepare`, and `commit` action. The default is to prompt for confirmation before executing the indicated control operation.

-sid

Applies the command to a specified Symmetrix ID (*SymmID*).

-v

Displays the command line entries from the command file as they are processed. Cannot be used with the `-noecho` option.

-version

Lists the SYMCLI, SYMAPI, and configuration server version information. Connects to the configuration server managing the Symmetrix configuration for version information. The `-sid` option is required if the host is connected to more than one Symmetrix array.

PARAMETERS

Cmd_Filename

The command file name. The command file contains a set of change-command entries of the same class.

SymmID

The 12-character ID to specify the Symmetrix array.

**COMMAND FILE
SYNTAX**

The following are the syntaxes of the possible command file entries:

Adding a new device

```
create dev count=n, size=Cylinders,
      emulation=EmulationType,
      config=DeviceConfig,
      [, remote_config=DeviceConfig, ra_group=n,
        [remote_mvs_ssid=nnn] ]
      [, mvs_ssid=nnn]
      [, attribute=ckd_meta | savedev
        [in pool PoolName] [member_state=ENABLE | DISABLE]
      [, disk_group_num=nnn, remote_disk_group_num=nnn];
```

Adding a new spare disk

```
create spare count=n, format = [512 | 520];
```

Adding a meta member

```
add dev SymDevName[:SymDevName] to meta SymDevName
      [, protect_data=[TRUE | FALSE],
      bcv_meta_head=SymDevName];
```

Adding a SAVEDEV to a pool

```
add dev SymDevName[:SymDevName] to pool PoolName
      type=SAVEDEV [, member_state=<ENABLE | DISABLE> ];
```

**Assigning a PAV alias address to a device mapped to EA/EF
ports**

```
add pav alias to dev SymDevName[:SymDevName]
      starting alias=cuu_address;
```

Converting a device's configuration

```
convert dev SymDevName[:SymDevName] to DeviceConfig
      [ ra_group=n, remote_dev=SymDevName,
        invalidate=R1|R2, start_copy=YES|NO ]
      [mvs_ssid=nnn] [raidset = [TRUE | FALSE]];
```

Converting a meta device's configuration

```
convert meta SymDevName config=MetaOption>
      [, stripe_size=MetaStripeSize>[cyl]],
      [, protect_data=[TRUE|FALSE],
      [bcv_meta_head=SymDevName];
```

Converting an RDF device from static RDF to dynamic RDF

```
convert rdf dev SymDevName[:SymDevName] to dynamic;
```

Creating a SAVEDEV pool

```
create pool PoolName, type=SAVEDEV;
```

Deleting a SAVEDEV pool

```
delete pool PoolName, type=SAVEDEV;
```

Deleting a symdev

```
delete dev SymDevName[:SymDevName]
[,raidset=[TRUE | FALSE]];
```

Deleting a spare disk

```
delete spare disk=[director_num, da_interface,
                  scsi_id];
```

Disabling a SAVEDEV from session use

```
disable dev SymDevName[:SymDevName] in pool
PoolName, type=SAVEDEV;
```

Dissolving a meta device

```
dissolve meta dev SymDevName;
```

Enabling a SAVEDEV for session use

```
enable dev SymDevName[:SymDevName]
in pool PoolName, type=SAVEDEV;
```

Forming a meta device

```
form meta from dev SymDevName,
config=MetaOption
[, stripe_size=MetaStripeSize][cyl]]
[,count=member_count];
```

Mapping a device

```
map dev SymDevName to dir DirectorNum:PortNum
[target=ScsiTarget,] lun=ScsiLun
[, vbus=FibreVbus]
[,device_number=ckd_device_number]
[,awwn=awwn | wwn=wwn | iscsi=iscsi];
```

Mapping a range of devices to an EA/EF port

```
map dev SymDevName[:SymDevName] to dir
DirectorNum:PortNum, starting
base_address=cuu_address [mvs_ssid=nnn];
```

Mapping a range of devices to an EA/EF port using the same addressing from a different port

```
map dev SymDevName[:SymDevName] to dir
DirectorNum:PortNum, copying dir
DirectorNum:PortNum;
```

Removing a meta member

```
remove dev SymDevName[:SymDevName] from meta
SymDevName;
```

Removing PAV alias addresses from devices mapped to EA/EF ports

```
remove pav alias from dev SymDevName[:SymDevName],
starting alias=cuu_address;
```

Removing a SAVEDEV from a named pool, placing it in the default_pool

```
remove dev SymDevName: [SymDevName] from pool PoolName,
type=SAVEDEV;
```

Setting the device emulation

```
set device SymDevName[:SymDevName]
emulation=EmulationType;
```

Setting the device attribute

```
set dev SymDevName[:SymDevName]
attribute=[NO] device_attr;
```

Setting Symmetrix configuration metrics

```
set symmetrix MetricName=MetricValue
[, MetricName=MetricValue]
```

Setting port characteristics

```
set port DirectorNum:PortNum
[FlagName=enable|disable
[, FlagName=enable|disable]]
gige primary_ip_address=IPAddress
primary_netmask=IPAddress
default_gateway=IPAddress
[fa_loop_id=integer] [hostname=HostName];
```

Setting an RA (RDF) group parameter

```
set [ra | rdf] group GroupNum
[session_priority = SessionPriority] |
[minimum_cycle_time = CycleTime];
```

Swapping RDF groups

```
swap ra group nnn,
refresh=R1|R2, start_copy=YES|NO;
```

Unmapping devices

```
unmap dev SymDevName[:SymDevName] from dir
<ALL:ALL | ALL:PortNum |
DirectorNum:ALL | DirectorNum:PortNum>
[devmask_access=remove | retain];
```

Unmapping a range of devices from EA or EF ports

```
unmap dev SymDevName[:SymDevName] from dir
< ALL:ALL | ALL:PortNum | DirectorNum:ALL |
DirectorNum:PortNum [new_ssid=nnn];
```

**COMMAND FILE
ARGUMENTS****alias**

Specifies an alternative front-end mapping address, used by a mainframe host to access a device.

base_address

Specifies the base address to be assigned to the first device in the mapping request. It will be incremented by one for each device in the range of devices being mapped.

bcv_meta_head

Specifies the name of a `bcv_meta` that matches the original meta device in capacity, stripe count, and stripe size. This must be used when adding new members to an existing, striped meta device, or when reconfiguring a meta device, if the data on the meta device is to be protected.

config

Selects the device configuration (*DeviceConfig*) to apply to the command.

default_gateway

Specifies the gateway or router address for a front-end Gig-E port.

device_number

When mapping a CKD device to an OS/390 host, a device number should be provided in place of a target, device logical unit number (LUN), or VBUS field.

devmask_access

Indicates whether a device masking database should be updated, when unmapping devices.

emulation

Selects what host device management system to emulate (see parameter *Emulation Type*).

fa_loop_id

Specifies the FA director loop ID (arbitrated loop physical address). Possible integer values are from 0 to 125.

`format`

Specifies the recording format to be used on a spare disk. Values are 512 or 520. Select a format based on what type of disk it should be able to replace.

- For Symmetrix DMX models:
 - for CKD and FBA use 512
 - for AS/400 and Tandem use 520
- For Symmetrix 5 models:
 - for CKD and FBA use 512
 - for AS/400 and Tandem use 520
- For Symmetrix 4 models:
 - With selective LLF enabled:
 - for CKD and FBA use 512
 - for AS/400 and Tandem use 520
 - If no AS/400 or Tandem devices:
 - for CKD and FBA use 512
 - for CKD use 512
 - for FBA, AS/400, and Tandem use 520

`gige`

Indicates that one or more network address values are going to be specified for a front-end Gig-E director.

`invalidate`

Specifies which RDF device (R1 source or R2 target) to invalidate. At some point, this device will need a full refresh (by synchronizing all tracks from the remote mirror).

`mvs_ssid`

When creating a device in a Symmetrix array that also contains CKD devices, an MVS subsystem ID (`mvs_ssid`) value can be provided so the new FBA devices are not seen as part of an existing subsystem ID group.

`pool`

A SAVEDEV pool, used to define the set of SAVEDEVs that are available for a Snap session.

`primary_ip_address`

The IP address for a front-end Gig-E port.

`primary_netmask`

Specifies the IP netmask for a front-end Gig-E port.

`protect_data`

Specifies whether the data on the existing meta device needs to be protected when adding members to an existing, striped meta. Valid settings are `TRUE` and `FALSE`. If this option is not specified, a setting of `TRUE` is the default.

`ra_group`

Specifies an integer (positive) for the RA group.

`raidset`

Indicates that all members of the group should be processed, when requesting a change to a member of a RAID-S group, this option . It is not necessary to list the other members. This option is available for converting RAID-S groups to unprotected devices, or deleting all members of the group.

`refresh`

Specifies which RDF device (R1 source or R2 target) to refresh. Possible values are R1 or R2.

`remote_config`

Specifies the device configuration of the corresponding remote device, when creating an RDF device. Must be an RDF configuration such as RDF2.

`remote_dev`

Defines the remote Symmetrix device name when converting a device and specifies a corresponding remote device of an RA group.

`remote_mvs_ssld`

When creating an RDF device in a remote Symmetrix array that also contains CKD devices, an MVS subsystem ID (`remote_mvs_ssld`) value can be provided so the new FBA devices are not seen as part of an existing subsystem ID group.

Only one `mvs_ssld` and `remote_mvs_ssld` can be used in a session. They will be applied to all devices created within that session.

When using the convert device command to reduce mirroring, the removed mirror becomes a new stand-alone Symmetrix device. An attempt will be made to use the same MVS SSID for the new device. If the MVS SSID group is full, you must supply a new MVS SSID.

When mapping a set of devices to an EA or EF port, the current `mvs_ssid` assigned to the devices may need to be changed. If the devices are becoming part of an existing CU image, they will be assigned the `mvs_ssid` of the device already mapped. If a new CU image is being formed and mapped, a new `mvs_ssid` can be assigned during the map request. It is not valid to have some devices with a particular SSID mapped and some unmapped.

start_copy

Indicates whether an RDF pair should be synchronized after the configuration change is committed.

COMMAND FILE PARAMETERS

awwn

User-given name, or ASCII World Wide Name (WWN), given in two parts separated by a slash (/).

ckd_meta

When creating a device with emulation type CKD-3380 or CKD-3390, indicates that the device should be a striped meta device.

ckd_device_number

A hexadecimal value from 0x00 to 0xFF.

count

A positive integer.

cuu_address

A base or alias address for a device being mapped to an EA or EF port. These mainframe ports expect devices to be mapped in groups to form CU images. The first digit in the address is the CU image number, which can range from 0 to 0xF. The remaining two digits can range from 00 to 0xFF.

CycleTime

The minimum time to wait before attempting an RDFA cycle switch. Values range from 5 to 59 seconds.

Cylinders

Number of cylinders of the specified devices; a positive integer. A cylinder for FBA emulation is 960 512-byte blocks. To convert a device size in blocks to cylinders:

$$\text{cylinders} = \text{blocks} / 960$$

To convert a size in megabytes to cylinders:

$$\text{cylinders} = \text{megabytes} * 1048576 / (512 * 960)$$

Devices that are intended to be used as BCV, RDF, or meta members will need to precisely match the corresponding devices in size. Use the `symdev/sympd show` command or the `symdev/sympd list -cyl` command to see relevant device sizes.

The following AS/400 device models must be created using the specific meta size as noted:

AS/400 Model#	Meta Size	Enginuity Version
AS/400_M590	17484	5x67
AS/400_M590R	17484	5x67
AS/400_M6713_30	17540	5x67
AS/400_M6713_50	17540	5x67
AS/400_M6717_50	17540	5x67
AS/400_M2105_A01	17484	5x68
AS/400_M2105_A81	17484	5x68

The following AS/400 device models exceed the device size capacity in block size for Symmetrix and must be created as separate devices to form a meta device:

AS/400 Model#	Total Blocks	Suggested Meta Size ^a	Enginuity Version
AS/400_M6718_50	35720	8930	5x68
AS/400_M2105_A02	35720	8930	5x68

AS/400 Model#	Total Blocks	Suggested Meta Size ^a	Enginuity Version
AS/400_M2105_A82	35720	8930	5x68
AS/400_M9337_5AA	35720	8930	5x67
AS/400_M9337_5AC	35720	8930	5x67

a. Meta size is suggested based on four Symmetrix hypervolumes to form the meta device.

da_interface

The DA SCSI path (c, d, e, or f).

device_attr

A device attribute that restricts how a device can be accessed. These include:

- RAD
- RDB_Cksum
- Worm (can be enabled only)
- VCMDB (for device masking)
- dyn_rdf (this option provides the most flexibility in performing dynamic RDF operations)
- dyn_rdf1_only
- dyn_rdf2_only
- SCSI3_persist_reserv

The `dyn_rdf2_only` and `dyn_rdf1_only` options limit a device to either an R1 or R2 device. Therefore, using them prevents the ability to perform RDF swaps.

DeviceConfig

A valid Symmetrix/SYMAPI device and configuration.

When this parameter is being used to apply or remove the BCV, DRV, or RDF attribute, the change will be denied if the device configuration result would change the device's mirroring. Also, cannot be used to convert RDF1 devices to RDF2 devices, which must be done using the `swap ra group` command.

The mirroring protection of a device can be increased, but this must be done in a separate session from BCV/DRV/RDF changes.

The mirroring protection of a device can also be decreased, and this, too, must be done in a separate session from BCV/DRV/RDF changes. As a result of removing mirrors from a device, a new device is created from the discarded mirrors, resulting in a new Symmetrix device. If the original or new device is unprotected, it cannot be mapped to a host. Possible device configuration values are:

Unprotected
 2-Way-Mir
 3-Way-Mir
 4-Way-Mir
 RAID-S
 RDF1
 RDF2
 RDF1+R-S or RDF1-R-S ^a
 RDF2+R-S or RDF2-R-S ^a
 RDF1+Mir or RDF1-Mir
 RDF2+Mir or RDF2-Mir
 BCV
 2-Way-BCV-Mir
 DRV
 RDF1-BCV ^a
 RDF2-BCV ^a
 RDF1-BCV+Mir or RDF1-BCV-Mir ^a
 RDF2-BCV+Mir or RDF2-BCV-Mir ^a
 VDEV
 RAID 5
 BCV+R-5 or BCV-R-5
 RDF1+R-5 or RDF1-R-5
 RDF2+R-5 or RDF2-R-5
 RDF1-BCV+R-5 or RDF1-BCV-R-5
 RDF2-BCV+R-5 or RDF2-BCV-R-5

a. Not allowed for create (add) device.

DirectorNum

The director identity number, such as 16A.

EmulationType

SYMAPI emulation type. Possible values are:

- FBA
- CELERRA_FBA
- VME_512_FBA

- CKD-3380
- CKD-3390

Note: When changing a device’s emulation, changes can only be among FBA emulation types.

The following AS/400 device types:

Engenuity level 5x67+	AS/400_M590
	AS/400_M590R
	AS/400_M6713_30
	AS/400_M6713_50
	AS/400_M6717_50
	AS/400_M9337_5AA
	AS/400_M9337_5AC
Engenuity level 5x68+	AS/400_M6718_50
	AS/400_M2105_A01
	AS/400_M2105_A02
	AS/400_M2105_A81
	AS/400_M2105_A82
Engenuity level 5670+	AS/400_2105_A03
	AS/400_2105_A83
	AS/400_2105_A04
	AS/400_2105_A84

FibreVbus

The virtual bus (vbus) address for mapping to an FA port if the volume set addressing is a hex value (for HP-UX).

FlagName

A SCSI or fibre port flag.

SCSI port flags can be set on both SA and FA ports, unless otherwise noted. FA port flags can only be set on FA ports.

Engenuity levels 5x68 or greater		Engenuity levels 5x67 and earlier	
SCSI port flags: - Negotiate_Reset (SA ports only) - Soft_Reset - Environ_Set - HP3000_Mode - Common_Serial_Number - Disable_Q_Reset_on_UA - Sunapee - Siemens - Sequent - Avoid_Reset_Broadcast - Server_On_AS400 - SCSI_3	Fibre port flags: - Volume_Set_Addressing - Non_Participating^a - Init_Point_to_Point^a - Unique_WWN^a - VCM_State - OpenVMS	SCSI port flags: - Tagged_Commands^b - Linked_Commands^b - Sync_Transfer^b - Wide_Transfer^b - Negotiate_Reset - Soft_Reset - Environ_Set - Cyl_Count_In_Name^b - PBAY_Monitor - HP3000_Mode - Command_Reordering - Common_Serial_Number - Set_Qerr - Disable_Q_Reset_on_UA - Disable_Ultra^b - Sunapee - Siemens - Disable_False_Disconnect^b - Disable_Mini_Q^b - Avoid_Force_Negotiate - Auto_Busy - Sequent - Avoid_Reset_Broadcast - Server_On_AS400 - SCSI_3 - Disable_Interleaved_Cmds	Fibre port flags: - Disk_Array - Volume_Set_Addressing - Hard_Addressing - Non_Participating - Global_3rdParty_Logout - Init_Point_to_Point - Unique_WWN - Generic_VSA^b - VCM_State - Class_2_Service^b - OpenVMS

a. Not available for Gig-E ports.

b. Not available for host-based configuration changes.

HostName

12-character host name.

invalidate_opt

The RDF device to invalidate. Accepted values are R1, R2, or NONE.

IPAddress

An valid IPv4 or IPv6 network address. For IPv4, the dotted format of `nnn.nnn.nnn.nnn` is expected. For IPv6, the colon-separated format of `m:m:m:m:m:m:m:m`, where `m` is four hexadecimal digits.

iscsi

The iSCSI name.

member_count

The total number of devices to add to the meta device, including the head. Use when the configuration server must select device members from the pool of unmapped devices.

Only devices matching the specified head in size, emulation, protection, and attributes will be selected. This option should be omitted if selecting members using the `add dev` command.

MetaOption

The meta type configuration. Possible values are CONCATENATED or STRIPED.

MetaStripeSize

Size of a striped meta device. Stripe size can be specified in 512-byte blocks, or cylinders. If specifying cylinders, the keyword `cyl` must follow the size field. Recommended stripe size is 1920 (2 cylinders).

Note: If no stripe size is specified when creating a striped meta, a default of two cylinders will be assigned.

Possible sizes in 512 byte blocks are:

1920 (2 cyl)

3840 (4 cyl)

7680 (8 cyl)

15360 (16 cyl)

30720 (32 cyl)

61440 (64 cyl)

Note: 1 cylinder = 960 512-byte blocks.

MetricName

The Symmetrix metric to be set. Possible values are:

`concurrent_rdf` — Enables access to the concurrent RDF feature - multiple R2 devices for a single R1. Possible values are `ENABLE` or `DISABLE`.

`dynamic_rdf` — Enables the creation of a pool of devices that are RDF-capable, (can be dynamically assigned as RDF1 or RDF2 devices). Possible values are `ENABLE` or `DISABLE`.

`dynamic_concurrent_rdf` — Enables access to the concurrent RDF feature (multiple R2 devices for a single R1) for dynamic RDF devices. Possible values are `ENABLE` or `DISABLE`.

`fba_multi_access_cache` — Determines whether a read request can share cache slots in some conditions. Possible values are `ENABLE` or `DISABLE`.

`max_pav_aliases` — If PAV is enabled, specifies the maximum number of aliases that can be assigned to a devices. Possible values for a Symm 6 are 1-7 using 5670, 1-15 using 5671, and for a Symm 7 are 1-255.

`max_hypers_per_disk` — Specifies the maximum number of hypers that can be created on a physical disk. Possible values are 1 to 32.

`PAV_mode` — Enables the use of PAV (Parallel Access Volumes). Possible values are:

`STANDARD` — Standard PAV volumes with static aliasing.

`DYNAMIC_STANDARD` — Standard PAV volumes with dynamic aliasing.

`rdfa_cache_percent` — The percentage of write pending cache that can be used by RDFA. This is a value from 0 to 100 percent.

`rdfa_host_throttle_time` — The number of seconds to throttle host writes to RDFA devices when cache is full, before dropping RDFA sessions. Throttling will delay a write from the host until a cache slot becomes free. Values are from 0 to 65535.

`raid_5_support` — Enables the ability to create RAID 5 devices in the Symmetrix array. Possible values are `ENABLE` or `DISABLE`.

`raid_s_members` — If RAID-S support is enabled, this identifies the number of members in the Parity RAID set. Possible values are 3 or 7, or set to `SYMAPI_C_NA`. This also controls the RAID 5 member count.

`raid_s_support` — Enables the ability to create RAID-S devices in the Symmetrix array. Possible values are `ENABLE` or `DISABLE`.

`VCMDB_restricted_access` — Restricts host access to the VCM database as indicated by the user. Possible values are `ENABLE` or `DISABLE`.

MetricValue

A numeric or string value for the selected *MetricName*.

PoolName

From 1 to 12 alphanumeric character pool name. Hyphens (-), and underscore (_) characters are also permitted.

PortNum

An integer (non-negative) specifying the port.

ra_group

An integer (non-negative) specifying the group.

refresh_opt

The RDF device to refresh. Legal values are R1 or R2.

remote_dev

A hexadecimal value specifying the Symmetrix device name.

remove

Removes any device masking access entries for this device and path. Use with the `devmask_access` argument in an `unmap` command.

retain

Retains any device masking access entries for this device and path. Use with the `devmask_access` argument in an `unmap` command.

savedev

When creating a device, indicates that the device should be a save device. The device becomes part of a pool of devices for use with EMC Snap for virtual device snap operations.

scsiLun

The SCSI logical array number (hex value).

scsi_id

The disk's SCSI ID, a hex value.

scsi_target

The SCSI target ID (hex value).

SessionPriority

The priority used to determine which RDFA sessions to drop if cache becomes full. Values range from 1 to 64, with 1 the highest priority (last to be dropped).

SymDevName

The Symmetrix device name (such as 001C).

wwn

World Wide Name.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To add four new Symmetrix devices to Symmetrix array 000000012345 as two-way mirrored devices with a size of 1100 cylinders, using FBA emulation, and to create the hypervisors to support the new devices in disk group 3, enter:

```
symconfigure -sid 12345 commit -file  
add_new_symdevs.cmd
```

where `add_new_symdevs.cmd` contains:

```
create dev count=4, size=1100,  
emulation=FBA, config=2-Way-Mir  
disk_group=3;
```

To create a BCV CKD metadvice with a total of 1200 cylinders from four Symmetrix devices of 300 cylinders each on Symmetrix array 000000012345 by converting the meta to a BCV, enter:

```
symconfigure -sid 12345 commit -file  
add_new_ckdmeta.cmd
```

where `add_new_ckdmeta.cmd` contains:

```
create dev count=4, size=1200,  
emulation=ckd-3390, config=2-Way-Mir,  
attribute=ckd_meta;
```

To create a striped meta device in Symmetrix 12345, using device 0030 as the meta head, and 0031 - 0033 as members, enter:

```
symconfigure -sid 12345 commit -file add_meta.cmd
```

where `add_meta.cmd` contains:

```
form meta from dev 0030 config=striped,  
stripe_size=2 cyl;  
add dev 0031:0033 to meta 0030;
```

To verify the mapping command file is correct that will map the meta head to director 16A, port 0, SCSI target/LUN 0,7, and echo the contents at the terminal, enter:

```
symconfigure -sid 12345 preview -file meta_map.cmd -v
```

where `meta_map.cmd` contains:

```
map dev 0030 to dir 16A:0 target=0, lun=7;
```

To map a device to a fibre port that uses volume set addressing, enter:

```
symconfigure commit -sid 12345 -file map_vsa.cmd
```

where `map_vsa.cmd` contains:

```
map dev 0122 to dir 03A:0, vbus=0A, target=0F, lun=3;
```

To map a device to a fibre port that uses peripheral device addressing and updates the VCM database with a record for device 0123 and the HBA indicated by the AWWN alias value, enter:

```
symconfigure commit -sid 12345 -file map_pda.cmd
```

where `map_pda.cmd` contains:

```
map dev 0123 to dir 03B:0, lun=3F, awwn=api60/ch1;
```

To map 40 devices to a mainframe port and assign a set of aliases, enter the following command. The SSID of the devices will be changed during the mapping, and the devices will form a new CU image, 0x7.

```
symconfigure commit -sid 12345 -file cu_7.cmd
```

where `cu_7.cmd` contains:

```
map dev 040:068 to dir 03B:0,  
    starting base_address=700,  
    mvs_ssid=701;  
add pav alias to dev 040:068,  
    starting alias=780
```

To map a set of devices in CU image 0x07 to a second director port, copying the addresses and the aliases, enter:

```
symconfigure commit -ssid 12345 -file copy_map.cmd
```

where `copy_map.cmd` contains:

```
map dev 040:068 to dir 15B:0 copying dir 03B:0;
```

To remove the alias addresses from the devices in CU image 0x07, enter:

```
symconfigure commit -sid 12345 -file alias_rem.cmd
```

where `alias_rem.cmd` contains:

```
remove pav alias from dev 040:068,  
    starting alias=780;
```

To unmap devices 0020 - 0024 from all front-end directors, enter:

```
symconfigure -sid 12345 commit -file unmap_dev.cmd
```

where unmap_dev.cmd contains:

```
unmap dev 0020:0024 from dir ALL:ALL;
```

To unmap half the devices in CU image 0x07 and assign them a new SSID, enter:

```
symconfigure commit -sid 12345 -file unmap_range.cmd
```

where unmap_range.cmd contains:

```
unmap dev 040:54 from dir ALL:ALL, new_ssid=620;
```

To enable the use of VCM for masking device visibility to host systems for director 03A, port 0, enter:

```
symconfigure commit -sid 3160 commit -file  
setup_fa_port.cmd
```

where setup_fa_port.cmd contains:

```
set port 03A:0 VCM_State=enable;
```

To swap RA group 1 on Symmetrix 12345 from an R1 source to an R2 target group, enter:

```
symconfigure -sid 12345 commit -file swap_ra_group.cmd
```

where swap_ra_group.cmd contains:

```
swap ra group 1, refresh=r2, start_copy=no;
```

To set the RDFA session priorities for two different RA groups, enter:

```
symconfigure commit -sid 12345 -file setup_rdfa.cmd
```

where setup_rdfa.cmd contains:

```
set ra group 24, session_priority=1;  
set ra group 42, session_priority=8;
```

To increase the number of hypers that can be configured on a physical disk in the Symmetrix array and allow the use of RAID 5 devices with 7+1 membership, enter:

```
symconfigure commit -sid 3160 -file  
set_sym_metrics.cmd
```

where `set_sym_metrics.cmd` contains:

```
set symmetrix max_hypers_per_disk=64,  
raid_5_support=ENABLE;  
raid_s_members=7;
```

To change the emulation type of three devices (001A, 001B, 001C) from FBA to Celerra FBA, enter:

```
symconfigure commit -sid 3160 -file device_set.cmd
```

where:

```
set device 001A:001C emulation=CELERRA_FBA;
```

If a device is no longer needed as a Volume Logix database device, the following command will remove that attribute:

```
symconfigure commit -sid 3160 -file device_reset.cmd
```

where `device_reset.cmd` contains:

```
set device 001A, attribute=NO VCMdb;
```

To reserve an unused disk as a dynamic spare, enter:

```
symconfigure commit -sid 3160 -file add_spare.cmd
```

where `add_spare.cmd` contains:

```
create spare, count=1, format=512;
```

To remove a disk from being reserved as a dynamic spare, enter:

```
symconfigure commit -sid 3160 -file rem_spare.cmd
```

where `rem_spare.cmd` contains:

```
delete spare_disk=[ 02A, D, 1];
```

To create a new pool and move some SAVE devices from an existing pool into it, enter:

Session 1:

```
disable dev 01D:01F to pool HR, type=savedev;
```

Session 2:

```
create pool HR, type=savedev;  
add dev 01D:01F to pool HR, type=savedev,  
    member_state=ENABLE;
```

symdev

Performs operations on a device given the device's Symmetrix device name.

SYNTAX

`symdev -h`

```
symdev [-sid SymmID] [-offline] [-v] [-resv] [-wwn]
      list [-SA <#|ALL>] [-P #] [-CAP #] [-N #] [-cyl]
           [-scsi] [-fibre] [-held] [-RADIANT]
           [-noport] [-multiport] [-firstport]
           [-RANGE SymDevStart:SymDevEnd]
           [-R1] [-R2] [-bcv] [-nobcv] [-drv] [-vcm]
           [-meta] [-hotspare] [-dynamic] [-worm]
           [-vdev] [-savedev] [-raids] [-raid5]
           [-rdfa] [-disk_group nn]
      list [pd]
```

```
symdev [-sid SymmID] [-offline]
      list [-DA <#|ALL>] [-interface <#|ALL>] \
           [-disk <#|ALL>] [-hyper <#|ALL>] \
           [-firstport]
```

```
symdev [-sid SymmID] [-offline]
      list -space [-cyl] -DA <#|ALL>
```

```
symdev [-sid SymmID] [-v]
      list -lock [-RANGE <SymDevStart:SymDevEnd>]
```

```
symdev [-sid SymmID] [-offline] -inventory list
```

```
symdev [-cid ClarID] [-offline]
      [-CAP #] [-N #] [-RANGE SymDevStart:SymDevEnd]
      -clariion list
```

```
symdev [-sid SymmID] [-offline] [-v]
      show SymDevName
```

```
symdev [-sid SymmID] [-force] [-lock #]
      [-RANGE <SymDevStart:SymDevEnd>] [-noprompt]
      release
```

```
symdev -sid SymmID [-noprompt]
      rw_enable      SymDevName [-SA <#|ALL>] [-P #]]
      write_disable SymDevName [-SA <#|ALL>] [-P #]]
      ready          SymDevName
      not_ready      SymDevName
      relabel        SymDevName
      hold           SymDevName
      unhold         SymDevName
```



```

symdev -sid SymmID -file <filename> [-noprompt]

        rw_enable      [-SA <#|ALL> [-P #]]
        write_disable  [-SA <#|ALL> [-P #]]
        ready
        not_ready
        relabel
        hold
        unhold

```

DESCRIPTION The `symdev` command displays information about all or selected Symmetrix devices regardless of whether they are visible to the local host. You can release a Device External Lock (DEL) on one or more specified Symmetrix devices.

ARGUMENTS

`hold`

Sets the *hold* bit on a device. The hold bit is automatically placed on a target device during an TimeFinder/Snap operation.

`list`

Lists all or selected Symmetrix devices that are configured in one or more Symmetrix arrays connected to this host.

`list pd`

Lists all host visible Symmetrix devices that are configured in one or more Symmetrix arrays connected to this host.

`not_ready`

Sets the device(s) to be Not Ready. The device must be in a User Ready status for this operation to succeed.

`ready`

Sets the device(s) to be Ready. The device must be in a User Not Ready status for this operation to succeed.

`relabel`

Applies the defined label to the device. The device must be in a User Not Ready status for this operation to be accepted. Refer to the `symlabel` command to find out how to define a device label.

release

Releases a Device External Lock associated with one or more devices within a Symmetrix array.



CAUTION

Use the release lock action only if you believe that a Symmetrix lock is currently hung and there are NO other operations in progress to the specified Symmetrix array (local or remote). In addition make sure that your application is authorized to use the lock number you are specifying.

rw_enable

Sets the device(s) to be Read and Write Enabled to the local hosts, on the specified front director port(s). If no ports are specified, then the device(s) will be Read and Write Enabled on all ports for which the device is visible.

show

Shows detailed information about a Symmetrix device, given the Symmetrix device name, such as 000C.

unhold

Resets the *hold* bit on a device. The hold bit is automatically removed from a target of a Snap device when the TimeFinder/Snap pair is stopped. However, the unhold argument can be used if there was a problem removing the hold bit.

write_disable

Sets the device(s) to be Write Disabled to the local hosts, on the specified front director port(s). If no ports are specified, then the device(s) will be Write Disabled on all ports on which the devices is (are) visible.

OPTIONS

-bcv

Lists just the BCV devices.

-CAP

Sets the device capacity to a specific value (in megabytes) for the selection criteria to be listed.

-cid

Restricts the selection to the specified CLARiiON array.

-clariion

Lists CLARiiON devices.

-cyl

Lists the device capacity in cylinders in the output. The default is megabytes (MB).

-DA

Lists the Symmetrix devices that are mapped to a certain DA director number. The interface, disk, and hyper IDs can also be used to confine the list further, but defaults to ALL unless specified.

-disk

Lists the Symmetrix devices that are mapped to a certain disk SCSI ID. The DA, interface, and hyper IDs can also be used to confine the list further, but defaults to ALL unless specified.

-disk_group

Lists the Symmetrix devices whose hypers are contained on disks within the specified disk group.

-drv

Lists just the DRV devices.

-dynamic

Lists dynamic RDF devices capable of being formed into RDF pairs.

-file

Filename containing the list of devices to be acted upon. The file should have one *SymDevName* per line.

-fibre

Lists devices mapped to front-end fibre directors.

-firstport

Confines the display to just the first port of information for devices that are mapped to more than one port.

-force

Causes a device lock to be released independent of other options currently controlling whether to use device locks.

-h

Provides brief, online help information.

-held

Lists Symmetrix devices in the device group that have device holds for an TimeFinder/Snap session.

-hotspare

Lists the Symmetrix devices that currently have a dynamic hot spare invoked against them.

-hyper

Lists the Symmetrix devices that are mapped to a certain hyper ID. The DA, interface, and disk IDs can also be used to confine the list further, but defaults to ALL unless specified.

-interface

Lists just the Symmetrix devices that are mapped to a certain DA director interface path. The DA, disk, and hyper IDs can also be used to confine the list further, but defaults to ALL unless specified.

-inventory

Returns a table listing the number of configured Symmetrix devices for each supported emulation type.

-lock

Lists devices that have a device external lock.

`-meta`

Lists meta-head devices.

`-multiport`

Lists the Symmetrix devices that are mapped to multiple front-end adapter ports.

`-N`

Sets the number of devices to list.

`-nobcv`

Lists just the standard devices (BCV devices excluded).

`-noport`

Lists the Symmetrix devices that are not mapped to any front-end adapter ports.

`-noprompt`

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

`-offline`

Displays the Symmetrix devices from the Symmetrix configuration database without refreshing the data from the Symmetrix array.

`-P`

Lists devices mapped to a specific SCSI or front-end fibre director port. By default, all ports are selected.

`-R1`

Lists RDF1 (R1) devices.

`-R2`

Lists RDF2 (R2) devices.

`-raid5`

Lists RAID 5 devices only.

`-raids`

Lists RAID-S devices by RAID group number. The `-raid` option is synonymous with `-raids`.

`-RANGE`

Applies a range of Symmetrix devices for a number of devices to list.

`-rdfa`

Lists devices that are RDFA-backed.

`-resv`

Lists all Symmetrix devices that have SCSI reservations.

`-SA`

Lists devices mapped to a specific SCSI or fibre front-end director number.

`-savedev`

Lists devices that are Symmetrix SAVE devices.

`-scsi`

Lists devices mapped to SCSI front-end directors (SAs).

`-sid`

Restricts the selection criterion to the specified Symmetrix array uniquely identified by the specified Symmetrix ID.

`-space`

Shows the available or unconfigured storage space for the specified listing of disks.

`-v`

Provides a more detailed, verbose listing.

`-vcm`

Lists all of the device masking (or VCM) devices in the Symmetrix array.

`-vdev`

Lists devices that are Symmetrix virtual devices.

`-worm`

Lists all WORM-enabled devices.

`-wwn`

Lists the full WWN of all devices.

PARAMETERS

ClarID

The ID of the CLARiiON® array.

SymDevname

The Symmetrix device name, unique per Symmetrix array, such as 001C.

SymDevStart

The first Symmetrix device name in a sequence, such as 001C.

SymDevEnd

The last Symmetrix device name in a sequence, such as 00B6.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To list all Symmetrix devices that are configured in Symmetrix arrays connected to this host, enter:

```
symdev list
```

To show detailed information about Symmetrix device 000C in a Symmetrix array with the specified unique ID, enter:

```
symdev -sid 870 show 000C
```

To list the first 20 BCV devices starting at Symmetrix device 001F, that are configured in each Symmetrix array, enter:

```
symdev list -BCV -RANGE 001F: -N 20
```

To list (verbose) a range of Symmetrix devices (0000 to 000A) that have a device external lock of 9, enter:

```
symdev list -sid 870 -lock 9 -RANGE 0000:000A -v
```

To release all Symmetrix devices in Symmetrix 870 that have a device external lock of 9, enter:

```
symdev release -sid 870 -lock 9
```


symdg

Performs operations on a Symmetrix device group.

SYNTAX

```
symdg -h

symdg
  create DgName [-type REGULAR | RDF1 | RDF2]
  delete DgName [-force]

  export DgName [-f FileName][-sid SymmID]\
                [-rdf [-RDFG GrpNum]][-delete]

  import DgName [-f FileName]

  dg2file DgName [-f FileName] \
                [-ftype STD|R1BCV|STD_BCV| \
                STD_R1BCV|STD_VDEV|BCV_VDEV]

  file2dg DgName [-f FileName] [-type REGULAR|RDF1|RDF2]

  dg2cg DgName CgName [-bcv | -nobcv | -rbcv | -rrbcv |
                        -brbcv | -vdev] [-force] [-rename]
                        [-apidb | -ppath | -rdf_consistency]

  list [-sid SymmID] [-offline] [-v]

  list [-inactive]

  activate DgName [-noprompt]

  activateall [-noprompt]

  show DgName [-offline | -lock | -inactive]

  rename DgName NewDgName

  release DgName [-force] [-lock #] [-noprompt]
```

DESCRIPTION

The `symdg` command performs operations specific to device groups: creating new device groups, importing ASCII group files, exporting groups to files, translating groups to/from Symmetrix Manager files, deleting groups, renaming groups, and listing and showing information about a device group.

ARGUMENTS**activate**

Activates a specified device group (Imports to GNS). If GNS is enabled on the host, this command allows device groups to be imported from the host database into the GNS repository. If GNS is not enabled on the host, this command has little or no use (for example, if GNS was previously enabled, and the GNS groups were copied to the host's configuration database, then the command would import those GNS device groups to the host's device group list).

activateall

Activates all the inactive device groups. If GNS is enabled on the host, this command allows device groups to be imported from the host database into the GNS repository. If GNS is not enabled on the host, this command has little or no use (for example, if GNS was previously enabled, and the GNS groups were copied to the host's configuration database, then the command would import those GNS device groups to the host's device group list).

create

Creates an empty device group of type REGULAR, RDF1, or RDF2. Only RDF devices can belong to an RDF device group. Only non-RDF devices can belong to the REGULAR group. All devices added to a group must belong to the same Symmetrix array. If you do not specify a type, the device group will be created using type REGULAR.

delete

Deletes an existing device group. If the device group has member or gatekeeper devices that are associated with it, the command will fail unless the `-force` option is used.

If the `-force` option is specified, the devices that are members of the group are removed from the group and become ungrouped devices.

dg2cg

Adds selected members of a device group to a target composite group.

dg2file

Creates a device group from a file in the same format used by the EMC Symmetrix Manager (SM-CLI). This action should not be used to make a backup copy of a device group; use export for that purpose.

export

Creates a text file that details the members of an existing device group. The device group can later be recreated from this file using the import command.

file2dg

Creates a device group from a Symmetrix Manager device file.

import

Imports and establishes a device group from a text file, previously created by the export action, that contains a list of device members.

list

Lists all the device groups that have been created for this host. If `-inactive` is specified, all the device groups from the inactive group list will be listed.

release

Releases a device external lock associated with all devices within a device group.

rename

Renames an existing device group. Use a device group name that is unique to this host.

show

Shows information about a device group. Information includes: group type, Symmetrix ID, creation time, number of devices that are members, a list of associated gatekeeper devices, and a list of associated Business Continuity Volume (BCV) devices.

OPTIONS

-all

Activates all inactive groups by adding their definition to the active group list.

-apidb

Create the composite group in the SYMAPI configuration database only.

-bcv

Adds only BCV devices to the target composite group.

-brbcv

Adds only the BRBCV devices to the target composite group.

-delete

Deletes the device group after the group is exported to a file, when used with the `export` argument. The default is to export the device group to the file without deleting the device group.

-f

Specifies a file name to the action.

-force

Forces a deletion of a device group, with or without members, or forces a partial device group conversion (`dg2cg`) of the devices to a consistency group (even though some devices cannot be converted).

-ftype

Specifies the device type to create a Symmetrix Manager file containing a list of the specified type of devices. Only one device type can be specified. If no type is specified, a list of standard devices will be used to create the file. Possible values are:

STD

Creates a file containing a list of all standard devices in the group.

R1BCV

Creates a file containing a list of all R1 BCV devices in a group.

STD_BCV

Creates a file containing a list of all standard/BCV pairs that are in the group. This includes both established and split pairs (from the point of view of the standard device).

STD_R1BCV

Creates a file containing a list of all standard/R1 BCV pairs that are in the group. This is a subset of the list provided by the STD_BCV option, but does not include devices that have never been paired.

STD_VDEV

Creates a file containing a list of all standard/virtual device pairs that are in the group.

BCV_VDEV

Creates a file containing a list of all BCV/virtual device pairs that are in the group.

-h

Provides brief, online help information.

-inactive

Lists or shows inactive device groups. When GNS is enabled on the host, the inactive groups are those that were previously defined in the host's configuration database file. When GNS is disabled on the host, this may show group definitions present the last time GNS was enabled on the host if they were captured in the host database file.

-lock

Displays existing device external locks on devices within the group. Use with the show action.

-nobcv

Adds only STD devices to the target composite group.

`-noprompt`

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

`-offline`

Makes the Symmetrix data connection offline from the host in-memory database for this action. When used with `list`, the verbose (`-v`) option must be used.

`-ppath`

Creates the RDF CG in PowerPath.

`-rbcv`

Adds only RBCV devices to the target composite group.

`-rdf`

Allows the group to be imported on the remote Symmetrix array from the file which is created. When exporting an RDF group, this will use the remote Symmetrix ID and device names, and toggle the RDF group type from R1 to R2 or vice versa.

`-rdf_consistency`

Creates a CG and allows it to be enabled for RDF consistency after adding devices to the CG.

`-RDFG`

Indicates the Symmetrix RA (RDF) group number to reach the remotely-associated BCV device.

`-rename`

Assigns new logical device names to all added devices.

`-rrbcv`

Adds only the RRBCV devices to the target composite group.

`-sid`

Lists the device group information for a specified Symmetrix ID.

-type

Identifies the type of device group, either REGULAR, RDF1, or RDF2. The default type is REGULAR.

-v

Provides a more detailed, verbose listing.

-vdev

Lists or adds on devices that are Symmetrix virtual devices.

PARAMETERS

CgName

The target composite group.

DgName

The device group name assigned by the user. The name must be unique to this host.

FileName

The data file used to export or import a device list, or used in the translation of a Symmetrix Manager device list.

NewDgName

The renamed device group name.

SymmID

The 12-digit ID of the Symmetrix array.

FILES

The `export` command creates a group file (ASCII text) and the `import` command reads the file to import a device group. The file will contain as many device description lines as devices and gatekeepers that are being defined in the group list. Any lines that are blank or have a pound sign (#) in the first column are ignored.

Group files contain device parameters in the following format:

```
<GroupType> <SymmID>
<DeviceType> <DeviceParameters>
<DeviceType> <SymDevname> <LdevName>
[<G PdevName>]
<DeviceType> <SymDevname> <LdevName>
[R <SymDevname> <LdevName> <RDFGroup>]
<DeviceType> <SymDevname> <LdevName>
...
...
```

The following describes the various parameters within the file format:

GroupType

Specifies an integer value that defines the type of group for this group list. Possible values are defined as follows:

0 = SYMAPI_C_DGTYPE_REGULAR

1 = SYMAPI_C_DGTYPE_RDF1

2 = SYMAPI_C_DGTYPE_RDF2

SymmID

The 12-digit ID of the Symmetrix array associated with the group.

DeviceType

Defines the kind of device for this group member as follows:

S = Standard

B = BCV

V = VDEV

R = Remote BCV

Z = Hop 2 remote BRBCV

G = Gatekeeper

DeviceParameters

Each device also has device parameters:

S <SymDevname> <LdevName>

B <SymDevname> <LdevName>

V <SymDevname> <LdevName>

R <SymDevname> <LdevName> <RAGroupNum>

Z <SymDevname> <LdevName> <RAGroupNum>

G <PdevName>

SymDevname

A Symmetrix device name, such as 000C.

LdevName

A logical device name, such as DEV002.

PdevName

The gatekeeper's physical device name (such as `/dev/rdisk/c2t0d2s2`). Appears for a gatekeeper (G) type only.

RDFGroup

The RDF group number of the standard device with which the BCV is paired.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To create a Symmetrix device group, `mydg_r1`, of type RDF R1, enter:

```
symdg -type RDF1 create mydg_r1
```

To list all Symmetrix device groups in a detailed format, enter:

```
symdg -v list
```

To rename Symmetrix device group `mydg_r1` to `oradg_rdf1`, enter:

```
symdg rename mydg_r1 oradg_rdf1
```

To show information about device group `oradg_rdf1`, enter:

```
symdg show oradg_rdf1
```

To export device group `oradg_rdf1` to file `oradg_rdf1.txt` and subsequently delete the device group from the database, enter:

```
symdg export oradg_rdf1 -f oradg_rdf1.txt -delete
```

To import or re-create device group `oradg_rdf1` from the file `oradg_rdf1.txt`, enter:

```
symdg import oradg_rdf1 -f oradg_rdf1.txt
```

To translate device group `oradg_rdf1` to file `devices1.txt` (which is in a Symmetrix Manager format), enter:

```
symdg dg2file oradg_rdf1 -f devices1.txt
```

To delete Symmetrix device group `oradg_rdf1`, regardless of whether the group has members, an associated gatekeeper, or BCV devices, enter:

```
symdg -force delete oradg_rdf1
```

To translate device group `oradg_rdf1` to file `devices1.txt`, enter:

```
symdg file2dg oradg_rdf1 -f devices1.txt
```

To translate and add the BCV devices of device group `oradg_rdf1` to a composite group named `oracg`, enter:

```
symdg dg2cg oradg_rdf1 oracg -bcv
```

symdisk

Reports on the configuration and status of disks and their hypers within Symmetrix arrays.

SYNTAX

```
symdisk    [-h]

symdisk    [-sid SymmID] [-v [-hypers]] [-hotspares]\
           [-cyl] [-by_diskgroup] [-disk_group nn]

           list [-da <#|ALL>] [-interface <#|ALL>]\
               [-tid <#|ALL>]

symdisk    [-sid SymmID] [-cyl]
           show DiskAddress
```

DESCRIPTION

The `symdisk` command allows access to the configuration information of the physical disks (spindles) that make up a Symmetrix array. It can be used to list all of the disks in a Symmetrix array, or only those that match certain criteria.

The selection criteria allows the user to return only data about the disks on a certain disk director (DA), disk interface (INT), or disk SCSI target ID (TID). Additionally, the `-hotspares` flag may be used to select only those disks that are configured as dynamic hot spares.

Using the `-v` option will provide more robust information. The `-hypers` flag can be used with `-v` to additionally display information about each of the logical hypers on a given disk including which Symmetrix devices they make up.

The `-by_diskgroup` option will organize the disks by disk group number. The `-disk_group` option will print only disks within that disk group.

ARGUMENTS

`list`

Lists all disks. With flags, the list can be restricted. The `-v` and `-hypers` options allow for more information to be printed about each disk.

`show`

Displays detailed information about the disk(s) that match the given DA, INT, and TID.

OPTIONS

-by_diskgroup

Lists the disks organized by disk group number.

-cyl

Displays the disk capacities in the cylinders in MB.

-da

Indicates disk director number. A value of ALL returns all disk directors.

-disk_group

Lists the disks that are members of the specified disk group number.

-h

Provides brief, online help information.

-hotspares

Indicates that only hotspare disks should be displayed.

-hypers

Shows hyper information, when used with **-v**.

-interface

Indicates disk interface number. A value of ALL returns all interfaces.

-sid

Indicates a unique Symmetrix ID.

-tid

Indicates a target ID. A value of ALL returns all targets.

-v

Provides a more detailed, verbose listing.

PARAMETERS*DiskAddress*

Disk adapter, interface, and TID <XXX:YZ> where XXX is the disk director, Y is interface, and Z is the TID. The format <XXX,Y,Z> is also accepted.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

The following example lists all disks in Symmetrix 012345678901:

```
symdisk list -sid 012345678901
```

The following example verbosely displays information about the specified disk (01A:C3) and its hypers:

```
symdisk list -sid 012345678901 -da 01A -interface C  
-tid 3 -v -hypers
```

The following example displays detailed information about the disk whose DA is 16B, interface (INT) is D, and TID is 5.

```
symdisk show 16B:D5
```

The following example provides the same information as the previous example, but shows an alternate input format for disk DA, INT, and TID.

```
symdisk show 16B,D,5
```

symdrv

Displays information for selected DRV devices.

SYNTAX

```
symdrv -h
```

```
symdrv [-sid SymmID] [-offline] [-v]
```

```
list [-CAP #] [-i Interval] [-c Count]
```

DESCRIPTION

The `symdrv` command lists all the DRV (dynamic reallocation volume) devices that are configured on Symmetrix arrays attached to this host.

ARGUMENTS

`list`

Lists all the DRV devices (*SymDevnames*) that are configured on Symmetrix arrays attached to this host.

OPTIONS

`-c`

Specifies the number (count) of times to display DRV devices. If this option is not specified and an interval (`-i`) is specified, the list of statistics will be displayed continuously.

`-CAP`

Sets the device capacity to a specific value (in megabytes) for the selection criteria to be listed.

`-h`

Provides brief, online help information.

`-i`

Specifies the repeat interval in seconds. The default interval is 10 seconds. The minimum interval is 5 seconds.

`-offline`

Displays Symmetrix devices from the Symmetrix configuration database without refreshing the data from the Symmetrix array.

`-sid`

Restricts the selection criterion to the specified Symmetrix array uniquely identified by the specified Symmetrix ID.

`-v`

Provides a more detailed, verbose listing.

PARAMETERS

Count

Number of iterations to execute before exiting.

Interval

Interval between polls, in seconds.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To list all DRV devices that are configured on Symmetrix arrays attached to this host, enter:

```
symdrv list
```

symerase

Allows the user to erase Symmetrix devices, by completely overwriting the device with a specified or a random bit pattern.

SYNTAX

```
symerase [-sid SymmID] [-h] [-noprompt] [-noecho]
          [-pattern RANDOM | ZEROS | ONES | UserPattern]
          [ dev SymDevName[:SymdevName] |
            pd PdevName |
            -g DgName ld [LdevName | ALL] |
            filesystem DriveLetter ]
          verify |
          commit [-confirm]
```

DESCRIPTION

The `symerase` command can be used to remove all data from a specified device or Microsoft filesystem. The data on the device will be overwritten with various forms of data, (random pattern, its complement, and a user-supplied pattern). If no pattern is specified on the command line, a random character will be written throughout the device as the last step in the process.

The devices to be erased must be visible to the host from which the command is being issued.

The user can specify which devices are to be erased using a Symmetrix device number (`dev`), a physical device name (`pd`), or a logical device name (`ld`) with a group name.

For Windows systems, a filesystem drive letter can also be used. The drive letter must be for a disk that was partitioned using the `diskpar` utility and it must be a *basic* disk, not a *dynamic* disk.

Multiple devices can be erased at the same time. Each device will be divided into a set of extents, and one extent from each device will be added to a group to be submitted in a batch to the Symmetrix array for processing. Status information will be displayed indicating the progress through the individual devices, and through the set of devices.

Note: This command requires Enginuity level 5670 or later.

ARGUMENTS

`commit`

Performs the preview function and then initiates the erase processing.

`verify`

Verifies the devices are in a state that indicates they are not in use by an application and that extent definitions meet the Engenuity code requirements.

OPTIONS

`-confirm`

Confirms the commit has completed by reading back the random pattern written to the device.

`dev`

Indicates a Symmetrix device name.

`filesystem`

For Windows OS only, indicates a file system is to be erased.

`-g`

Indicates a device group name.

`-h`

Provides brief, online help information.

`ld`

Indicates a logical device name.

`-noecho`

Runs the command with no output to the screen.

`-noprompt`

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

`-pattern`

Specifies a hexadecimal character (range 0x00 to 0xFF) pattern to be written to the device.

`pd`

Indicates a physical device name.

	<code>-sid</code>	Specifies the Symmetrix ID; required if using the <code>dev</code> argument.
PARAMETERS	<i>DgName</i>	A device group name.
	<i>DriveLetter</i>	For Windows only, a file system drive letter.
	<i>LdevName</i>	A logical device name, such as <code>DEV001</code> .
	ONES	A pattern of all ones should be written to the device.
	<i>PdevName</i>	The host name for the device, such as, <code>/dev/rdisk/c2t0d10s2</code> .
	RANDOM	A random pattern of 8 bits should be written to the device. This is the default if the <code>-pattern</code> option is not used.
	<i>SymdevName</i>	A Symmetrix device name, such as, <code>001C</code> .
	<i>SymmID</i>	The 12-digit ID of the Symmetrix array.
	<i>UserPattern</i>	A hexadecimal character to be used to overwrite the device, such as, <code>0x4A</code> .
	ZEROS	A pattern of all zeros should be written to the device.
RETURN CODES	Refer to Appendix D, <i>SYMCLI Return Codes</i> , for a complete list of return codes.	

EXAMPLES The following examples show various `symerase` command lines.

To erase the data on devices 001A through 001C on Symmetrix 120800005605, using a hexadecimal pattern, enter:

```
symerase -sid 120800005605 dev 001A:001C -pattern 0x2A -v commit
```

To verify that the physical device `/dev/rdisk/c2t0d1s2` can be erased, using a random pattern, without user confirmation, enter:

```
symerase pd /dev/rdisk/c2t0d1s2 -pattern RANDOM -noprompt verify
```

To erase the data on all members of device group `erase_grp`, using a pattern of ones, enter:

```
symerase -g erase_grp ld ALL -pattern ONES commit
```

To erase the data on filesystem `N:`, using a hexadecimal pattern, without user confirmation, enter:

```
symerase filesystem N: -pattern 0x10 -noprompt -v commit
```

symevent

Enables the monitoring and tracking of events on Symmetrix arrays.

Refer to Appendix C, *SYMCLI Events*, for a list of events reported by the SYMCLI environment.

SYNTAX

```
symevent [-h]
symevent [-sid SymmID] [-v] [-warn | -error | -fatal]
    monitor [-i Interval] [-c Count]
    list [-start <date:time>] [-end <date:time>] [-dir]
```

DESCRIPTION

The `symevent` command allows an administrator to monitor events within a Symmetrix array that may affect its operation. In most cases, a reported event represents a condition that has already been repaired. This tool allows an administrator to track those events in order to understand the events that have occurred, or are occurring, on your Symmetrix array.

The `monitor` action sets the command to run in the foreground where it polls the Symmetrix array for new events every *Interval*, defined in seconds, until the iteration *Count* is satisfied or the program is stopped.

The `list` action reports on the history of events, which is stored on the Symmetrix array. Specifying a start/end time allows you to retrieve events that occurred between the specified time bounds.

In addition, you can restrict the query to a specific Symmetrix array and restrict the events reported to a minimum severity level (warnings, errors, or fatal events).

ARGUMENTS

`list`

Lists events that have occurred on the Symmetrix array.

`monitor`

Monitors the Symmetrix array in real time for new events.

OPTIONS

`-c`

Specifies the number (count) of times to poll for events. If this option is not specified, `symevent` will continuously poll for events.

`-dir`

Display events sorted by reporting director.

`-end`

Specifies a date and time before which to report on events. Used with `list` action.

`-error`

Displays only events with a severity of Error or greater.

`-fatal`

Displays only events with a severity of Fatal.

`-h`

Provides brief, online help information.

`-i`

Defines the time interval, in seconds, between polls. The default interval is 10 seconds. The minimum interval is 5 seconds.

`-sid`

Specifies a unique Symmetrix ID.

`-start`

Specifies a date and time after which to report on events. Used with the `list` action.

`-v`

Provides a more detailed, verbose listing.

`-warn`

Displays only events with a severity of Warning or greater.

PARAMETERS

Count

Number of iterations to execute before exiting.

date:time

Date and time specification of the form

[mm/dd/yyyy] : [hh:mm[:ss]]. The current date and time will be substituted for omitted fields.

Interval

Interval between polls, in seconds.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To report on all events, on all locally-connected Symmetrix arrays, every 10 seconds, forever, enter:

```
symevent monitor
```

To poll for and display events of severity `warning` or greater on Symmetrix 012345678901 every 10 minutes for a 24-hour period, enter:

```
symevent monitor -sid 012345678901 -i 600 -c 144 -warn
```

To retrieve a verbose list of the events that have occurred on the given Symmetrix array between 9 a.m. and 5 p.m. today, enter:

```
symevent list -sid 012345678901 -v -start 9:00 -end 17:00
```

symgate

Performs support operations on a gatekeeper device.

SYNTAX

```
symgate -h
```

```
symgate [-offline]
```

```
    associate pd -g PdevName DgName
    disassociate pd -g PdevName DgName
    define      pd PdevName
    undefine    pd PdevName
```

```
symgate [-offline][-sid SymmID]
```

```
    associate dev SymDevname -g DgName
    disassociate dev SymDevname -g DgName
    define      dev SymDevname
    undefine    dev SymDevname
```

```
symgate list [-offline][-sid SymmID][-v]
```

DESCRIPTION

The `symgate` command performs operations on a gatekeeper device that can associate a gatekeeper with a device group, define a host device as a gatekeeper device (adding it to the gatekeeper device list), list the gatekeeper devices, disassociate a gatekeeper device from a device group, and remove a host device from the gatekeeper device list.

Note: The gatekeeper device MUST be visible to the local host.

ARGUMENTS

`associate`

Associates a Symmetrix host device with an existing device group.

You can substitute `add` for the argument `associate`.

`define`

Defines a host device as a gatekeeper device.

disassociate

Disassociates a gatekeeper device from a device group. The group must exist, and the gatekeeper device must have been previously associated with the group.

You can substitute `remove` for the argument `disassociate`.

list

Lists the host physical device names that are currently in the gatekeeper device list.

undefine

Removes a host device from the gatekeeper device list.

OPTIONS

-g

Applies the command to device group name.

-h

Provides brief, online help information.

-offline

Makes the Symmetrix data connection offline from the host in-memory database for this action.

-sid

Supplies the Symmetrix ID to list only gatekeeper devices belonging to the specified Symmetrix array.

-v

Provides a more detailed, verbose listing.

PARAMETERS

PdevName

The physical device (host) name for the device, such as `/dev/rdisk/c2t0d2s2`.

SymDevname

The Symmetrix device (numbered) name, such as 000C.

RETURN CODES Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLE To define a Symmetrix host device to be a gatekeeper device, enter:

```
symgate define pd /dev/rdsk/c2t0d2s2
```

To associate a gatekeeper device with Symmetrix array 56, in device group `prod`, enter:

```
symgate -g prod associate dev 000C -sid 56
```

To list all defined gatekeeper devices, enter:

```
symgate list
```

To disassociate a gatekeeper device from device group `ProdDB`, enter:

```
symgate -g ProdDB disassociate pd /dev/rdsk/c2t0d2s2
```

To undefine a gatekeeper device, enter:

```
symgate undefine dev 000C
```

symhost

Displays host configuration information and performance statistics.

SYNTAX

```
symhost show -config [-h]
```

```
symhost stats [-h] [-i Interval] [-c Count]  
              [-type CPU | MEMORY | DISK | ALL]
```

DESCRIPTION

The `symhost` command displays host configuration information and performance statistics. The performance statistics are displayed for CPU, memory, and host storage devices. Not all statistics are available for all hosts.

Currently, the supported platforms are: SunOS, HP-UX, AIX, Tru64 UNIX, Windows, and Linux.

ARGUMENTS

`show`

Shows detailed configuration information.

`stats`

Displays performance statistics.

OPTIONS

`-c`

Number (count) of times to display statistics. If this option is not specified and an interval (`-i`) is specified, statistics will be displayed continuously.

`-config`

Show detailed configuration information.

`-h`

Provides brief, online help information.

`-i`

Repeat interval in seconds. The default interval is 10 seconds. The minimum interval is 5 seconds.

-type

Type of performance information to display. The default is to display ALL statistics. Individual CPU, memory, and disk statistics can be selected.

- ◆ CPU – Report user, system, wait I/O, idle CPU time, interrupts, system calls and context switches statistics for each processor and overall.
- ◆ MEMORY – Report system-wide page in, page out, swap in and swap out statistics.
- ◆ DISK – Report read, write, busy and idle time statistics for each host disk.

PARAMETERS

None.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To display configuration information for the local host, enter:

```
symhost show -config
```

To display statistics about all processors, memory and disk every 60 seconds, enter:

```
symhost stats -i 60
```

To display statistics about all host processors every 30 seconds for one hour, enter:

```
symhost stats -i 30 -c 120 -type CPU
```

The following is an example of the output:

13:32:33	CPU	%User	%Sys	%WIO	%Idle	Int/s	Calls/s	CtxSw/s
13:32:33	0	0.0	0.0	100.0	0.0	401.7	1.6	9.3
13:32:33	2	0.0	0.1	0.0	99.8	101.4	9.2	84.7
13:33:03	0	0.0	0.0	100.0	0.0	401.0	8.0	35.9
13:33:03	2	0.0	0.2	0.0	99.7	101.7	17.1	70.3

Where the first column provides the time of day, and the other columns (from left to right) are as follows:

- ◆ CPU – CPU number/ID
- ◆ %User – $100 * (\text{CPU busy time in user mode} / \text{elapsed time})$
- ◆ %Sys – $100 * (\text{CPU busy time in system mode} / \text{elapsed time})$
- ◆ %WIO – $100 * (\text{CPU idle time for wait I/O} / \text{elapsed time})$
- ◆ %Idle – $100 * (\text{CPU idle time} / \text{elapsed time})$
- ◆ Int/s – Interrupts per second
- ◆ Calls/s – System calls per second
- ◆ CtxSw/s – Process context switches per second

To display statistics about host memory every 30 seconds for one hour, enter:

```
symhost stats -i 30 -c 120 -type MEMORY
```

The following is an example of the output:

13:22:18	Pi/s	Ppi/s	Po/s	Ppo/s	Si/s	Psi/s	So/s	Psos
13:22:18	716.6	1340.0	3.4	5.3	0.0	0.0	0.0	0.0
13:22:48	716.6	1340.0	3.4	5.3	0.0	0.0	0.0	0.0

Where the first column provides the time of day, and the other columns (from left to right) are as follows:

- ◆ CPU – CPU number/ID
- ◆ Pi/s – Page in requests per second
- ◆ Ppi/s – Number of pages paged in per second
- ◆ Po/s – Page out requests per second
- ◆ Ppo/s – Number of pages paged out per second
- ◆ Si/s – Swap in requests per second
- ◆ Psi/s – Number of pages swapped in per second
- ◆ So/s – Swap out requests per second
- ◆ psos – Number of pages swapped out per second

To display statistics about all host disks every 30 seconds for one hour, enter:

```
symhost stats -i 30 -c 120 -type DISK
```

The following is an example of the output:

14:09:01	DISK	RW/s	R/s	W/s	KbRW/s	KbR/s	KbW/s	%Busy	%Wait
14:09:01	c0t6d0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14:09:01	c0t0d0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Where the first column provides the time of day, and the other columns (from left to right) are as follows:

- ◆ DISK – Disk name
- ◆ RW/s – Read and write requests per second
- ◆ R/s – Read requests per second
- ◆ W/s – Write requests per second
- ◆ KbRW/s – KB read and written per second
- ◆ KbR/s – KB read per second
- ◆ KbW/s – KB written per second
- ◆ %Busy – $100 * (\text{disk active time} / \text{elapsed time})$
- ◆ %Wait – $100 * (\text{nonempty wait queue time} / \text{elapsed time})$

symhostfs

Displays mapping information about file systems, directories, and regular files that are defined on the host system.

SYNTAX

```
symhostfs -h

symhostfs [-meta|-data] [-kb|-mb|-blocks]

list [ObjName] [-file|-dir] [-R] [-v]

show  ObjName [-collapse|-expand|
              -no_extents|-phys_collapse]
```

DESCRIPTION

The `symhostfs` command displays mapping information specific to the file systems that are defined on your host system. The default is to list the mounted file systems. The list of files or subdirectories of a given parent directory can be obtained by specifying the `-dir` or `-file` option.

The command lists information about the following objects:

- ◆ Currently mounted or known file systems
- ◆ Files
- ◆ Directories and subdirectories

The attributes are shown for each object type. You can obtain logical-to-physical information about where the file extents are mapped for file systems that are mounted on Symmetrix devices.

ARGUMENTS

`list`

Lists various file systems, directories, or regular files on the host system.

`show`

Shows detailed mapping information about a file system, directory, or file on the host system.

OPTIONS

`-blocks`

Displays size information in 512-byte blocks.

-collapse

Collapses (if possible) the list of extents within the object (default).

-data

Displays only the data extents of a file, as opposed to the default (both metadata and data extents display).

-dir

Applies the `list` command to display directory information.

-expand

Expands (if possible) the list of extents within the object.

-file

Applies the `list` command to display file system information (default).

-h

Provides brief, online help information.

-kb

Displays size information in kilobytes.

-mb

Displays size information in megabytes (default).

-meta

Displays only the metadata extents of a file, as opposed to the default (both metadata and data extents display).

-no_extents

Shows information about the object without the extent information.

-phys_collapse

Provides a physical collapse of the extents of a file or file system.

-R

Displays directory or file information in a recursive manner.

-v

Provides a more detailed, verbose listing.

PARAMETERS

ObjName

Defines a directory or filename.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To list all the mounted file systems on your host, enter:

```
symhostfs list
```

To recursively list all the subdirectories of directory `"/usr"` on your host, enter:

```
symhostfs list "/usr" -dir -R
```

To display detailed information about directory `"/usr/guest"`, enter:

```
symhostfs show "/usr/guest/"
```

To show detailed information about file system `"/mountp1"`, and to collapse the extent information with the size reported in megabytes, enter:

```
symhostfs -collapse -mb show "/mountp1"
```

syminq

Issues a SCSI INQUIRY command, and optionally a SCSI READ CAPACITY, on one or all devices. In addition, it can be used to obtain a list of the local host's HBAs.

SYNTAX

```
syminq [-h]

syminq [-sym] [-bcv] [-powerpath] [PdevName]
      [-symmids] [-la | -nocapacity] [-pdevfile]
      [-v [-nocapacity]]
      [-copa] [-wnn [-colons]]

syminq [-clariion] [-powerpath] [PdevName]
      [-cids] [-la | -nocapacity]
      [-v [-nocapacity]] [-wnn [-colons]]

syminq [-hds] [PdevName]
      [-hids] [-la | -nocapacity]
      [-v [-nocapacity]]

syminq [-storworks] [PdevName]
      [-swids] [-la | -nocapacity]
      [-v [-nocapacity]]

syminq hba [-fibre | -scsi | -iscsi | -snia]
```

DESCRIPTION

The `syminq` command can be used to issue SCSI INQUIRY, and optionally SCSI READ CAPACITY, on one or all devices. By default, the scope of the command is for all disk devices. You can limit the scope to Symmetrix, CLARiiON, StorageWorks, or HDS devices.

In addition, it can be used to list the fibre and SCSI HBAs in the local host. This scope of this request can be limited to just fibre or just SCSI by specifying either the `-fibre` or `-scsi` options.

ARGUMENTS

None.

OPTIONS

`-bcv`

Displays Symmetrix BCV devices only.

`-cids`

Displays CLARiiON IDs.

`-clariion`

Displays CLARiiON devices only.

-colons

Indicates to use a colon separator between bytes of WWN data.

-copa

Lists physical device names only in a format to input into EMC's COPA tool (for EMC use only).

-fibre

Limits the HBA list request to fibre HBAs only.

-h

Provides brief, online help information.

-hds

Displays HDS devices only.

-hids

Displays HDS IDs.

-iscsi

Modifies the HBA list request to include iSCSI HBAs only.

-la

Lists physical device names only in a left-aligned format.

-nocapacity

Skips issuing a SCSI READ CAPACITY to the device(s).

-pdevfile

Lists physical device names in a format for use as pdevfile entries. The display output can be redirected to a pdev file name.

-powerpath

Displays EMC PowerPath-connected devices only.

-scsi

Limits the HBA list request to SCSI HBAs only.

`-snia`

Indicates to use only the SNIA API to gather HBA data. This implies `-fibre`.

`-storworks`

Displays StorageWorks devices only.

`-swids`

Displays StorageWorks IDs.

`-sym`

Displays Symmetrix devices only. The default is to display all devices.

`-v`

Provides a more detailed, verbose listing.

`-wwn`

Display device WWN.

PARAMETERS

hba

Host bus adapter. This parameter allows you to obtain a list of all of the local host's HBAs. This request can be limited to just SCSI or fibre HBAs as well.

PdevName

The host name for the device, such as `/dev/rdisk/c2t0d2s3`.

EXAMPLES

To issue just a SCSI INQUIRY to all Symmetrix devices that are visible to this host, enter:

```
syminq -sym -nocap
```

To issue a SCSI INQUIRY and READ CAPACITY to a device, enter:

```
syminq /dev/rdisk/c2t0d2s3
```

To issue a SCSI INQUIRY and READ CAPACITY command to a device and display more detailed, verbose information, enter:

```
syminq -v /dev/rdisk/c2t0d2s3
```

To request that the SCSI HBAs in the local host be listed, enter:

```
syminq hba -scsi
```

symioctl

Sends I/O control commands to a specified database server application.

SYNTAX

```
symioctl -h

symioctl -type DbType [-noprompt]

    begin backup [<Object> <Object> ...] [-checkpoint]
    end backup  [<Object> <Object> ...]
    freeze      [<Object> <Object> ...] [-checkpoint]
    thaw        [<Object> <Object> ...]
    checkpoint  [<Object> <Object> ...]
    archive log

    begin snapshot Object SAVEFILE SaveFile
                        [-checkpoint] [-overwrite]

    restore snapshot Object SAVEFILE SaveFile
                        [-norecovery] [-standby]

    end snapshot Object

    abort snapshot Object
```

DESCRIPTION

The `symioctl` command performs control operations on a specified database application. This utility is intended to be used in conjunction with a TimeFinder or SRDF split operation. The `freeze` action will suspend database updates from getting written to disk. Once the freeze action completes, a TimeFinder or SRDF operation can begin. After the split operation completes, a `symioctl thaw` action must be sent to resume full I/O access to the database.

For SQL Server 2000, the `snapshot` commands support the BACKUP and RESTORE database WITH SNAPSHOT operations using the Virtual Device Interface (VDI). The database can be restored in recovery, norecovery, or standby mode.

Note: The user account of the `symioctl` command must have System Administrator privileges. Application software must be installed and the environmental variables set.

In some instances, an object or object list is not required. Table 1-1 shows the details.

Table 1-1 Specifying Objects with `symioctl`

Argument	RDBMS	Objects	List Object
<code>freeze</code> <code>thaw</code>	Oracle SQL Server Informix IBM DB2/UDB Sybase	database server database name database server database name database name	No Yes No Yes No
<code>checkpoint</code>	Oracle SQL Server Informix	database server database name database server	No Yes No
<code>begin hot backup</code> <code>end hot backup</code>	Oracle	tablespace	Yes
<code>archive log</code>	Oracle	database server	No
<code>Begin/End/Abort/Restore snapshot</code>	SQL Server	database name	No

The `symioctl freeze/thaw` command supports the IBM UDB RDBMS using the IBM UDB/DB2 Suspend and Resume I/O features. This makes it possible for a secondary server to use the split image as a simple database clone for offline backup, as a standard database, or as a backup image to restore over the primary image.

For Oracle, hot backup control of a list of table objects must be performed before and after a `freeze/thaw` command. The steps required to split a group of BCV devices follows:

1. Issue the `symioctl begin backup` command.
2. Issue the `symioctl freeze` command.
3. Split standard and BCV pairs. This may involve several steps depending on your environment.
4. Issue the `symioctl thaw` command.
5. Issue the `symioctl end backup` command.

Environment Variables

You need to define the UNIX environment variables for Oracle and Informix databases in order for any database mapping commands to succeed (see Table 1-5).

Table 1-5 System DB Environment Variables

For Database	Set Variables
Oracle	ORACLE_HOME ORACLE_SID PATH
Informix	INFORMIXDIR ONCONFIG INFORMIXSERVER PATH

See your System Administrator for more specific information about setting these variables for your system platform and database.

Table 1-2 lists the various environment variables that you should set to simplify certain repetition of argument entries or options in your command-line sequences. These are particularly useful when you are about to apply multiple database calls.

Table 1-2 symioctl DB Environment Variables

Variable Name	Description	Default
SYMCLI_RDB_CONNECT	Specifies a username, password, and remote service name for a user's relational database account (<i>user/password@service</i>).	None. Must be specified by user.
SYMCLI_RDB_TYPE	Specifies a specific type (<i>DbType</i>) of database. Possible values: Informix Oracle SQLServer IBMUDB Sybase	NULL

SYMCLI_RDB_CONNECT must be set with your username and password for you to access the specified database with this command.

For any individual command, you can override the variable value of `SYMCLI_RDB_TYPE` to explicitly specify the option in the command argument.

Arguments specified on the command line containing special shell characters (i.e. \$, ', \, etc.) must be escaped with a backslash (\).

If `symioctl` is being run in client/server mode, any required RDBMS environmental variables that are set in the client's environment will be sent to the server for use.

ARGUMENTS

`abort snapshot`

For SQL Server 2000 and higher. The `BACKUP DATABASE SQL` command for the specified database will terminate and database writes will resume.

`archive log`

Archives the current log; for Oracle only.

`begin backup`

Places the specified tablespace objects into hot backup mode; for Oracle only.

`begin snapshot`

For SQL Server 2000 and higher. A `BACKUP DATABASE TO VIRTUAL_DEVICE WITH SNAPSHOT SQL` command is sent to SQL Server, which begins the snapshot backup and suspend writes for the specified database. After the BCV mirrors are split, the `end snapshot` command should be issued to save the snapshot metadata to a file.

`checkpoint`

Issues a checkpoint to the RDBMS.

`end backup`

Terminates the hot backup mode of the specified tablespace objects; for Oracle only.

end snapshot

For SQL Server 2000 and higher. The “BACKUP DATABASE” SQL command for the specified database will complete, database writes will resume, and the snapshot metadata will be saved to the save file (which is needed for a subsequent snapshot restore).

freeze

Suspends I/O at the application layer while a split operation occurs. All applications provide a halt mechanism, although behavior may differ.

restore snapshot

For SQL Server 2000 and higher. A `RESTORE DATABASE FROM VIRTUAL_DEVICE WITH SNAPSHOT` SQL command for the specified database is sent to SQL Server. The previously saved snapshot metadata is used by SQL Server to logically restore the database. The `-norecovery` and `-standby` options allow the RESTORE to operate in NORECOVERY or STANDBY mode. The undo file for the `-standby` option is automatically generated and stored with the save file under file name `undo_(databasename).ldf`.

thaw

Resumes full I/O to the specified database.

OPTIONS

`-checkpoint`

Requests a checkpoint prior to the specified action.

`-h`

Provides brief, online help information.

`-noprompt`

Specifies the no prompt option. The default is to prompt the user for confirmation before executing the indicated control operation.

`-norecovery`

Specifies a no recovery mode for the restore snapshot action on SQL Server.

`-overwrite`

Allows a backup process to overwrite an existing save file. By default, existing save files are protected.

`-standby`

Specifies a standby mode for the restore snapshot action on SQL Server.

`-type`

Applies the command to a database type of the database.

PARAMETERS

DbType

The database type. Possible values are:

Informix
Oracle
SQLServer
IBMUDB
Sybase

Object

Database name or tablespace name. If no objects are specified, the action defaults to all objects of the specified type database.

SaveFile

SQL Server snapshot only. Name of the save file used by begin snapshot and restore snapshot. For client/server mode, the meta-data file is saved by the server. An absolute path (e.g., `C:\TEMP\PUBS.SAV`) should be specified to ensure that the file can be located for protection or subsequent restores.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

This example backs up and then restores the SQL Server “pubs” database on a group of BCV devices. The snapshot metadata is saved in `C:\TEMP\PUBS.SAV`. The database login parameters are set via the environment as `user=sa`, `passwd=pass`, and `service=sqlserv`.

```
setenv SYMCLI_RDB_CONNECT "sa/pass@sqlserv"
setenv SYMCLI_RDB_TYPE SQLServer
symioctl begin snapshot pubs SAVEFILE C:\TEMP\PUBS.SAV
Split standard and BCV pairs.
```

```
symioctl end snapshot pubs
```

Protect the PUBS.SAV file.

Restore the PUBS.SAV save file.

Shut down SQL Server.

Restore the standard devices from BCVs.

Restart SQL Server.

```
symioctl restore snapshot pubs SAVEFILE
C:\TEMP\PUBS.SAV
```

To specify a NORECOVERY action for the saved file, enter:

```
symioctl restore snapshot -norecovery pubs SAVEFILE
C:\TEMP\PUBS.SAV
```

The database access environment variable (SYMCLI_RDB_CONNECT) must be set before any commands as follows:

```
setenv SYMCLI_RDB_CONNECT "scott/tiger@acme"
```

To freeze all I/O to an SQL Server database named pubs, enter:

```
symioctl freeze -type SQLServer pubs
```

To freeze all I/O to an IBM DB2/UDB database named pubs, enter:

```
symioctl freeze -type IBMUDB pubs
```

To thaw all I/O to an Oracle database, enter:

```
symioctl thaw -type Oracle
```

To place all tables in an Oracle database into hot backup mode, enter:

```
symioctl begin backup -type Oracle
```

To freeze all I/O to an Informix database without prompting for confirmation, enter:

```
symioctl freeze -type Informix -noprompt
```

To perform a checkpoint for an Informix database, enter:

```
symioctl checkpoint -type Informix
```

To archive the current log in an Oracle database, enter:

```
symioctl archive log -type Oracle
```

symlabel

Performs device label (signature) support operations on device(s) in a device group.

This command only pertains to applications running on a Windows NT 4.0 platform.

SYNTAX

```
symlabel -h

symlabel -g DgName [-noprompt]

    define LdevName [label Label] -type <WNT|AS40>
    undefine LdevName

symlabel -g DgName -type <WNT|AS40> [-offline]

    list [-bcv | -vdev]
    show LdevName
```

DESCRIPTION

The `symlabel` command performs device label (signature) operations on the device(s) of a device group. A device label (or signature) is initially assigned to each Symmetrix device by the host operating system. These labels must be relabeled during TimeFinder operations using a `symld relabel` command. For SYMCLI usage, you can define or undefine labels of devices in a device group in the SYMAPI configuration database. Subsequently, you can list or show defined or actual labels for these devices.

ARGUMENTS

`define`

Defines the device labels in the Symmetrix configuration database for the specified device in a device group.

`list`

For Windows only, lists the defined or actual labels of the devices of a device group. If the `offline` option is used, it lists only the defined labels in the Symmetrix configuration database.

`show`

Shows the device label and information about a specified device in the device group.

	<pre>undefine</pre> Removes the device labels that were previously defined in the Symmetrix configuration database.
MODIFIERS	<pre>label</pre> Applies an 8-digit hexadecimal label for Windows.
OPTIONS	<pre>-bcv</pre> Confines the action to specified local BCV device(s) that are associated with the device group. <pre>-g</pre> Applies a device group name to the command. Required for all <code>symld</code> operations. <pre>-h</pre> Provides brief, online help information. <pre>-noprompt</pre> Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation. <pre>-offline</pre> Switches the Symmetrix data connection offline from the host in-memory database for this action, which makes information confined to the SYMAPI configuration database on the host. Only defined labels for SYMCLI usage will be displayed. (If this option is not used, the disk drive labels are retrieved from the Symmetrix devices and then displayed.) <pre>-type</pre> Specifies the device label type for the following supported device type platforms: WNT — Windows AS40 — AS/400 <pre>-vdev</pre> Performs the action on virtual devices that are locally-associated with a device group.

PARAMETERS*DgName*

The device group name.

Label

An 8-digit hexadecimal label for Windows.

LdevName

The logical device name, either supplied by the user or automatically assigned when a device is added to a device group.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To define device label `abcd21` to one of the BCV devices (`BCV001`) in device group `ProdDB`, enter:

```
symlabel -g ProdDB define BCV001 label abcd21 -bcv \
-type WNT
```

To undefine the device label for BCV device `BCV001` in device group `ProdDB`, enter:

```
symlabel -g ProdDB undefine BCV001 -bcv
```

To list just the defined disk labels of all BCV devices in device group `ProdDB`, enter:

```
symlabel -g ProdDB list -bcv -offline
```

To list both the defined and the actual device labels of all BCV devices in device group `ProdDB`, enter:

```
symlabel -g ProdDB list -bcv
```

Using a Windows host, the following operational example relabels two established BCV pairs, `DEV001/BCV001` and `DEV002/BCV002` in group `ProdDB`:

```
symlabel -g ProdDB define -bcv -type WNT BCV001 \
label abcd01
symlabel -g ProdDB define -bcv -type WNT BCV002 \
label abcd02
symmir -g ProdDB split -not_ready -v ! Split not ready
symld -g ProdDB relabel -bcv -v ! Relabel the BCVs
symlabel -g ProdDB list -bcv ! Make sure label looks OK
symld -g ProdDB ready -bcv -v ! Make the BCVs now Ready
```

symld

Performs operations on one or more standard devices (STD) or virtual devices (VDEV) in a device group (dg).

SYNTAX

```
symld -h

symld -g DgName [-offline]

    add  pd PdevName [LdevName]

    add dev SymDevName [LdevName] [-sid SymmID]

    addall [-sid SymmID] [-SA <#|ALL>] [-P #] [-vdev | -RDFG #]
           [-CAP #] [-N #] [-RANGE SymDevStart:SymDevEnd]
           [pd|dev|-host HostName]

    break [LdevName] [-noprompt] [-vdev]

    list [-v] [-resv] [-cyl] [-held]

    show LdevName

    remove LdevName [-force]

    rmall [-force] [-SA <#|ALL>] [-P #] [-vdev]\
          [-CAP #] [-N #] [-RANGE SymDevStart:SymDevEnd]

    move   [-force] [-rename] LdevName DestDgName
    moveall [-force] [-rename] DestDgName \
           [-SA <#|ALL>] [-P #]\
           [-CAP #] [-N #] [-RANGE SymDevStart:SymDevEnd] [-vdev]

    rename LdevName NewLdevName

symld -g DgName [-noprompt] [-SA <#|ALL>] [-P #] [-bcv | -vdev]
    rw_enable      [LdevName [LdevName...]]
    write_disable  [LdevName [LdevName...]]

symld -g DgName [-noprompt] [-bcv | -vdev]
    ready          [LdevName [LdevName...]]
    not_ready      [LdevName [LdevName...]]
    relabel        [LdevName [LdevName...]]

symld -g DgName [-noprompt] [-bcv | -rbcv | -brbcv | -rrbcv | -vdev]
    hold          [LdevName [LdevName...]]
    unhold        [LdevName [LdevName...]]
```


DESCRIPTION

The `symld` command performs operations specific to a device in a device group: adds a device to a device group, adds all available devices to a device group, lists all devices in a device group, removes/moves a device or all devices from a device group, renames a device in a device group, and shows detailed information about a device in a device group.

The `symld` command is also used to write enable or write disable one or all devices, or front-end directors, in a device group. The `symld` command can also be used to break device reservations for one or more devices in a device group.

ARGUMENTS

`add dev`

Adds to an existing device group an ungrouped device, specifying its Symmetrix device name.

`add pd`

Adds to an existing device group an ungrouped device, specifying its physical (host) device name.

`addall dev`

Adds to an existing device group all ungrouped Symmetrix devices from a specified Symmetrix array regardless of whether the devices are visible to this host.

`addall pd`

Adds to an existing device group all ungrouped Symmetrix devices (that are visible to this host) from a specified Symmetrix array.

`break`

Breaks SCSI device reservations on one or all devices in the device group that are currently reserved.

`hold`

Creates a hold on all, or specified, devices from an existing device group. When a hold is placed on a device, TimeFinder and Snap operations are blocked.

`list`

Lists all available devices from an existing device group.

move

Moves a standard device from a source device group to a specified destination device group. The source and destination groups must be compatible types.

moveall

Moves all standard devices from a source device group to a specified destination device group. The source and destination groups must be of the same type. The device logical name is retained unless the `-rename` option is specified.

not_ready

Sets the device(s) to be Not Ready. The device(s) must be in a User Ready status for this action to succeed.

ready

Sets the device(s) to be Ready. The device(s) must be in a User Not Ready status for this action to succeed.

relabel

Applies the SYMCLI defined disk label to the device. (Refer to the `symlabel` command to predefine these labels.) The device(s) must be in a User Not Ready status for this action to be accepted.

remove

Removes a device from a specified device group.

rmall

Removes all devices from a specified device group.

rename

Renames a device within a device group.

rw_enable

Sets the device(s) to be Read and Write Enabled to its (their) locally attached host(s) on the specified front director port(s). If no ports are specified, then the device(s) will be Read and Write Enabled on all ports that the device(s) is (are) visible on.

`show`

Shows status information about a device in the device group.

`unhold`

Releases devices previously set to the hold state.

`write_disable`

Sets the device(s) to be Write Disabled to its (their) locally attached hosts on the specified front director port(s). If no ports are specified, then the device(s) will be Write Disabled on all ports on which that the devices is (are) visible.

OPTIONS

`-bcv`

Confines the action to specified local BCV device(s) that are associated with the device group.

`-brbcv`

Targets the action at the specified remotely-associated RDF BCV device(s) in the device group.

`-CAP`

Sets a minimum device size (in megabytes) to the selection criteria of a number of devices to add, move, remove to/from a device group.

`-cyl`

Lists the device capacity in cylinders in the output. The default is megabytes (MB).

`-force`

Applies force with the specified action on a device group that would otherwise be rejected.

`-g`

Applies a device group name to the command. Required for all `syml` operations.

`-h`

Provides brief, online help information.

-held

Lists the devices in the device group that have device holds for a Snap session.

-host

Limits the devices added to those mapped to the host's front-end directors.

-N

Sets a maximum number of devices to the selection criteria to add, move, or remove all devices to/from a specified device group.

-noprompt

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

-offline

Makes the Symmetrix data connection offline from the host in-memory database for this action.

-P

Applies the front-end (SCSI or fibre) director port number to the command that selects only devices which are primarily visible through this director port. By default, all ports are selected.

-RANGE

Sets a range of Symmetrix device names to the selection criteria to add, move, or remove to/from a specified device group.

-rbcv

Targets the action at the device group's locally-associated RDF BCV device(s), that can be BCV paired with the remote mirror(s) of the standard RDF device(s).

-rename

Renames a device within a device group.

-RDFG

Specifies the RDF (RA) group number to only add devices that belong to the specified RDF group number.

-resv

Lists devices in the device group that have SCSI reservations.

-rrbcv

Target the action at the specified SRDF connected BCVs that are paired with the R2 mirror of the remote RDF BCV devices (RRBCV) in the device group.

-SA

Specifies the front-end (SCSI or Fibre) director (adapter) number to only select devices that are primarily visible through this director. Alternatively, if `ALL` (the default) is specified, all devices satisfying the director port selection criterion will be selected.

-sid

Specifies the Symmetrix ID to add only devices belonging to the specified Symmetrix array.

-v

Provides a more detailed, verbose listing.

-vdev

Targets the indicated action to TimeFinder/Snap virtual devices (VDEV) that are associated with this specified device group.

PARAMETERS

DestDgName

Destination device group to which the standard device(s) is (are) moved.

DgName

The device group name.

HostName

The name of your host machine.

LdevName

The logical device name, either supplied by the user or automatically assigned when a device is added to a device group.

NewLdevName

The renamed logical device name.

PdevName

The host name for the device, such as `/dev/rdisk/c2t0d2s2`.

SymDevEnd

The Symmetrix device name, ending the range of selected devices, unique per Symmetrix array, such as 001C.

SymDevname

The Symmetrix device name, unique per Symmetrix array, such as 001C.

SymDevStart

The Symmetrix device name, starting the range of selected devices, such as 0000.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To add a Symmetrix host device to group `prod` and assign a logical device name `temp1`, enter:

```
symld -g prod add pd c2t0d2s2 temp1
```

To add a Symmetrix device to group `ProdDB` and assign a logical device name `temp2`, enter:

```
symld -g ProdDB add dev 001C temp2
```

To add to group `ProdDB` all devices that are primarily visible from this host on Port 0 (top port) of Symmetrix front-end director 1B, enter:

```
symld -g ProdDB addall pd -SA 1B -P 0
```

To add to group `ProdDB` all devices (not to exceed 17 devices) that are primarily visible from this host and fall within the Symmetrix device name range `0000` to `002F`, enter:

```
symld -g ProdDB addall pd -RANGE 0000:002F -N 17
```

To list all devices in device group `ProdDB`, enter:

```
symld -g ProdDB list
```

To rename device `DEV001` to `log1` in group `ProdDB`, enter:

```
symld -g ProdDB rename DEV001 log1
```

To remove device `log1` from device group `ProdDB`, enter:

```
symld -g ProdDB remove log1
```

To remove all devices from device group `ProdDB` that connect through fibre director `SA-16B`, enter:

```
symld -g ProdDB rmall -SA SA-16B
```

To move all devices (not to exceed 300) from device group `ProdDB` to `ProdDB6` with Symmetrix device names ranging from `000C` to `01FF` that have at least 4 megabytes of storage, enter:

```
symld -g ProdDB ProdDB6 moveall -CAP 4\  
-RANGE 000C:01FF -N 300
```

To show detailed information about device `log1`, enter:

```
symld -g ProdDB show log1
```

To write-disable devices `DEV001`, `DEV005`, and `DEV016` in group `ProdDB`, enter:

```
symld -g ProdDB write_disable DEV001 DEV005 DEV016
```

To relabel all BCV devices that are locally associated with device group `ProdDB`, enter:

```
symld -g ProdDB relabel -bcv -v
```

The following example adds to group `ProdDB` all virtual devices that are primarily visible from this host that fall in the following device range:

```
symld -g ProdDB -RANGE 000:00F addall pd -vdev
```

symlmf

Registers Solutions Enabler license keys.

SYNTAX

```
symlmf license_key
```

DESCRIPTION

The `symlmf` command is used to register a Solutions Enabler license key. If successful, the key is stored within an internal license data base.

If `symlmf` is invoked with no arguments, it prompts you to supply a key.

Registering a key with a remote server is allowed (by setting the `SYMCLI_CONNECT` environment variable) -- but only if the server is running on a Symmetrix service processor.

ARGUMENTS

`license_key`

A valid key, with syntax as in the following example:
1234-5678-9ABC-DEF0.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLE

To input a Solutions Enabler license key 1234-5678-9ABC-DEF0, enter:

```
symlmf 1234-5678-9ABC-DEF0
```


symlv

Displays performance statistics and detailed mapping information about one or more logical volumes that are defined in a logical volume group and performs control operations on logical volumes.

SYNTAX

```
symlv -h

symlv -g VgName [-type VgType] [-kb|-blocks|-mb]

list [-v]

show LVolName [-expand|-collapse|-no_extents|-pdev_extents]
             [-stripe_column]

symlv -g VgName [-type VgType]

stats [-i Interval] [-c Count] [-g VgName [-lv LVolName]]

create LVolName -size Size [-nmirror Mirrors]
               [-striped|-RAID5] [-ncols Columns]
               [-strsize StripeSize] [-pd Pdevname...]

delete LVolName

add LVolName -nmirror Mirrors [-striped|-RAID5]
            [-ncols Columns] [-strsize StripeSize]
            [-pd Pdevname.....]

remove LVolName [-nmirror Mirrors] [-mir MirName]

extend LVolName -size Size [-pd Pdevname...]

reduce LVolName -size Size [-pd Pdevname...]
```

DESCRIPTION The `symlv` command displays detailed logical-to-physical mapping information specific to a volume in a logical volume group. It also supports control operations like `create` and `remove` on logical volumes.

Refer to the *EMC Solutions Enabler Support Matrix* for the supported logical volume managers.

The logical volume provisioning operations such as `create`, `delete`, `add`, `remove`, `extend`, and `reduce` are supported only on the following logical volume managers:

- ◆ AIX LVM on the AIX platform (default LVM for AIX)
- ◆ HP LVM on the HP-UX platform (default LVM for HP-UX)
- ◆ VERITAS VxVM on the AIX, HP-UX, SunOS, and Linux platforms
- ◆ VERITAS VxVM (Version 3.0 and above) on the Windows 2000 platform
- ◆ DEC Logical Storage Manager (LSM) on the Tru64 UNIX platform
- ◆ EMC PowerPath Volume Manager on the SunOS (Solaris), HP-UX, and AIX platforms
- ◆ Native LVM on Linux (default LVM for Linux)

In the lists of mirror physical extents and mirror physical devices for the logical volume, CLARiiON devices are distinguished from other device types with a (C) indicator.

ARGUMENTS

`add`

Adds mirror images to a logical volume of the specified type. The default *VgType* is assumed if no *VgType* is specified. Not all *VgTypes* are supported.

`create`

Creates a logical volume of the specified type. The default *VgType* is assumed if no *VgType* is specified. Not all *VgTypes* are supported.

`delete`

Deletes a logical volume of the specified type. The default *VgType* is assumed if no *VgType* is specified. Not all *VgTypes* are supported.

`extend`

Extends (grows) a logical volume of the specified type. The default *VgType* is assumed if no *VgType* is specified. Not all *VgTypes* are supported.

`list`

Lists all the defined logical volumes in a specified logical volume group.

show

Shows detailed logical-to-physical mapping information about a volume in a specified logical volume group.

stats

Shows performance statistics about logical volumes. The default *VgType* is assumed if no *VgType* is specified.

reduce

Reduces (shrinks) a logical volume of the specified type. The default *VgType* is assumed if no *VgType* is specified. Not all *VgTypes* are supported.

remove

Removes mirrors of a logical volume of the specified type. The default *VgType* is assumed if no *VgType* is specified. Not all *VgTypes* are supported.

OPTIONS

-blocks

Displays size information in 512-byte blocks.

-collapse

Collapses (if possible) the list of extents within the logical volume (default).

-expand

Expands (if possible) the list of extents within the logical volume.

-g

Applies the command to a logical volume manager's group name.

-h

Provides brief, online help information.

-kb

Displays size information in kilobytes.

`-mb`

Displays size information in megabytes (default).

`-mir`

Provides the name of the mirror to remove.

`-ncols`

Provides the number of stripe columns.

`-no_extents`

Shows information about the object without the extent information.

`-nmirror`

Provides the number of mirrors in the logical volume. For the `create` action, if this option specifies a number less than or equal to 0, then 1 is assumed by default.

`-pd`

Lists the device names used for the operation.

`-pdev_extents`

Shows information about pdev-level extents without showing the underlying meta device information.

`-RAID5`

Specifies a RAID 5 logical volume type.

`-size`

Displays the size of the logical volume in 512-byte blocks. An optional suffix can be specified to indicate the unit of size measurement. The optional suffixes supported are `b` (size in blocks), `k` (size in kilobytes), and `m` (size in megabytes).

For Windows platforms, if the size specified is less than 1 MB, a volume of 1 MB size will be created.

`-stripe_column`

Displays the extent's stripe column number on striped volumes.

`-striped`

Specifies a striped logical volume type.

`-strsize`

Provides the size of each stripe column in 512-byte blocks. An optional suffix can be specified to indicate the unit of size measurement. The optional suffixes supported are `b` (size in blocks), `k` (size in kilobytes), and `m` (size in megabytes).

`-type`

Targets a specific volume group type.

`-v`

Provides a more detailed, verbose listing.

PARAMETERS

Columns

The number of stripe columns.

LvolName

A specific logical volume manager's logical volume name.

MirName

The name of the mirror.

Mirrors

The number of mirrors in logical volume.

PdevName

A fully-qualified host or physical device name.

Size

The logical volume size in 512-byte blocks or size with the appropriate suffix specified.

StripeSize

A logical volume stripe size in 512-byte blocks, or the size with the appropriate suffix.

VgName

A specific logical volume manager's volume group name.

VgType

A specific logical volume group type. Possible values are:

DEFAULT
 HP_LVM
 HP_VXVM
 SUN_VXVM
 NT_DISKADM
 NT_LDM
 OSF1_LSM
 DYNIX_SVM
 AIX_LVM
 AIX_VXVM
 SUN_SOLSTICE
 EMC_PVM
 LINUX_LVM
 LINUX_VXVM
 AS400_LVM

Note: Statistics are not available for AIX_LVM, DYNIX_SVM, LINUX_LVM, and AS400_LVM.

RETURN CODES Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES To list all the volumes in a volume group called `ProdVG`, enter:

```
symlv -g ProdVG list
```

To display detailed logical-to-physical mapping information about a volume (`vol1`) in a volume group called `ProdVG`, enter:

```
symlv -g ProdVG show vol1
```

To display statistics about all logical volumes of VxVM on SunOS every 30 seconds for one hour, enter:

```
symlv stats -i 30 -c 120 -type SUN_VXVM
```

The following describes the output headings:

```
Volume Group Type : SunOS VxVM
```

```
H:M:S VgName LvName RW/s R/s W/s KbRW/s KBR/s KbW/s %Busy %Wait
```

Where the first column provides the time of day, and the other columns (from left to right) are as follows:

- ◆ `VgName` – Volume group name

- ◆ LvName – Logical volume name
- ◆ RW/s – Read and write requests per second
- ◆ R/s – Read requests per second
- ◆ W/s – Write requests per second
- ◆ KbRW/s – KB read and written per second
- ◆ KbR/s – KB read per second
- ◆ KbW/s – KB written per second
- ◆ %Busy – 100 * (logical volume active time / elapsed time)
- ◆ %Wait – 100 * (non-empty wait queue time / elapsed time)

To list all volumes in the HP-UX VxVM volume group `vg00`, enter:

```
symlv -g vg00 -type HP_VXVM list
```

symmask

Sets up or modifies Symmetrix device masking functionality.

SYNTAX

```
symmask -h

symmask discover hba [-rename] [-v]

symmask list hba [-v]

symmask -sid SymmID -wn wwn |
                        -awwn awwn |

                        set lockdown <on <fcid>|off>
                        -dir # -p #

symmask -sid SymmID -wn wwn |
                        -awwn awwn |
                        -iscsi iscsi |
                        -aiscsi aiscsi |

                        list logins [-pdev PdevName] [-v]
                        [-dir all [-p all] | -dir # [-p #|all]]

                        set visibility <on|off>
                        -dir # -p #

                        set lunoffset <on <offset> <base>|off>
                        -dir # -p #

                        set heterogeneous <on <hostConfigFlag>|off>
                        -dir # -p #

                        add devs startSymDevname:endSymDevname |
                                SymDevname|SymDevname,,...
                        -dir # -p # [-noprompt]

                        remove devs startSymDevname:endSymDevname |
                                SymDevname|SymDevname,,...
                        -dir # -p # [-force]

                        replace <wwn | iscsi>

                        delete [-dir # -p # | -dir all -p all] [-login]

symmask -sid SymmID <-wn wwn | -iscsi iscsi>
                        rename      <awwnNew | aiscsiNew>

symmask -sid SymmID [-noprompt]
refresh
```



```
symmask -sid SymmID -iscsi iscsi | -aiscsi aiscsi
    set authentication -type authentication_type
    -credential credential_name
    -secret secret_value
```

```
symmask -sid SymmID -iscsi iscsi | -aiscsi aiscsi
    [ enable | disable | show ] authentication
```

DESCRIPTION

This command performs control and monitoring operations on a device masking environment. Specific operations are:

- ◆ Finds (discovers) the HBAs on the host and assigns AWWNs to the login history table entries for those WWNs that are not set.
- ◆ Lists the host HBA information.
- ◆ Associates the Fibre Channel ID (FCID) of a switch in a fabric to a host device. This provides additional restrictions of the path a host uses to connect to a Symmetrix array, to avoid WWN spoofing.
- ◆ Lists the login history table contents.
- ◆ Sets the device's visibility. This allows the host to find all devices it has been assigned to, even if they are assigned noncontiguous addresses when required by the OS.
- ◆ Sets the LUN base/offset skip.
- ◆ Changes some Fibre Channel port protocol characteristics (heterogeneous attributes) within the director for compatibility to host-specific platforms on a per HBA/WWN basis.
- ◆ Adds or removes Symmetrix devices (*SymDevnames*) to a masked channel. Modifies the device masking database.
- ◆ Replaces the host WWN/iSCSI initiator without losing established permissions.
- ◆ Removes (deletes) a WWN/iSCSI and all associated masked devices from the device masking database.
- ◆ Associates (renames) a user-friendly name (AWWN/AISCSI) with a WWN/iSCSI. To NULL the alias name, use a slash (/) as input.
- ◆ Refreshes the Fibre Channel directors (cache) with the latest copy of the data from the device masking database.
- ◆ Manages the authentication data for connections using native iSCSI paths.

ARGUMENTS**add**

Adds devices to the device masking record in the database with the matching WWN.

delete

Deletes all the device masking record(s) matching the specified WWN from the database.

disable

Disables the use of authentication by the Symmetrix array for the indicated host HBA.

discover

Finds the WWN of the HBAs on the host and writes an AWWN to the login history table when the AWWN field is empty.

enable

Enables the use of authentication by the Symmetrix array for the indicated host HBA. The authentication data must have previously been established using the `set` command.

list

Lists the requested data concerning the device masking environment.

refresh

Refreshes the WWN-related profile tables in director cache with the latest copy of the data in the device masking database (VCMDB). Since this refreshes the data in the Symmetrix array only, any connected hosts should be rebooted.

remove

Removes masked devices from the record in the database that matches the WWN.

rename

Changes the AWWN in the database and login history table.

replace

Changes the WWN in the database without losing the pre-established permissions with the replaced WWN.

set

Allows certain device masking features to be enabled or disabled.
Allows authentication data to be established for iSCSI connections.

show

Shows the current authentication data for the specified iSCSI host HBA. The CHAP secret does not display.

KEYWORDS

authentication

Indicates iSCSI authentication data is being managed.

devs

Indicates the devices to be added or removed.

hba

Specifies the WWNs of the HBAs on the host for the `list` or `discover` actions.

heterogeneous

Sets the record in the database to hold connection protocol information on the host type that may differ from the current Fibre Channel protocol setting on the director.

lockdown

Sets the FCID value in the database to correlate that entry with a specific path.

logins

Specifies to list the entries in the login history table.

lunoffset

Sets the record in the database to hold base and offset information about a skip hole in the host-visible sequence of LUN addresses.

visibility

Sets information in the database to note that the host should find all devices even if they are not contiguous.

OPTIONS

-aiscsi

Specifies a user-given name or an alias iSCSI name.

-awwn

Specifies a user-given name in an ASCII WWN format.

-credential

Specifies the credential name associated with CHAP's authentication data.

-dir

Applies a director number designation.

-force

Forces the SYMAPI server to allow actions that ordinarily would fail. Use of this option can be used to allow devices that should not be masked, such as meta members, to be removed, or to mask devices in a range of devices that may normally not be masked.

-h

Provides brief, online help information.

-iscsi

Specifies the iSCSI name.

-login

Deletes the entries from the login history table and the device masking database.

-noprompt

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

-p

Applies a port number designation.

`-pdev`

Applies a physical device name (host path) to the `list login` action, which allows you to determine if an HBA is logged on to this device.

`-rename`

Forces the discovered hostname/adaptor (HBA name) to be written to the login history table and the device masking database. This will overwrite any existing AWWN record you have established.

`-secret`

Specifies the secret associated with CHAP's authentication data.

`-sid`

Applies a Symmetrix array's serial number or ID.

`-type`

Specifies the type of authentication protocol being established, currently only CHAP is supported

`-v`

Provides a more detailed, verbose listing.

`-wwn`

Applies a World Wide Name (WWN).

PARAMETERS

`#`

Specific director or port number.

aiscsi

User-given name, in two parts, separated by a slash (/).

all

All directors or ports.

authentication_type

The only authentication type currently supported is CHAP.

awwn

User-given name, in two parts, separated by a slash (/).

base

Base value for the skip hole in a LUN address sequence.

credential_name

CHAP's credential name, a user-defined string of between 8 and 256 characters.

dev

Symmetrix device to be added or removed.

endSymDevName

The end of a range of logical devices.

fcid

Six-digit Fibre Channel ID associated with the switch.

hostConfigFlag

The heterogeneous host configuration flag specifying a certain interface protocol or attribute required by the specific host platform.

AS400	AS400_LSE	BULL_AIX
BULL_AIX_PP15	DEC_OVMS	DEC_UNIX
DG_AViiON	HP-UX	IBM_AIX
IBM_AIX_PP15	IBM_AIX_DMP	IBM_AIX_DMP_PP15
IBM EMC	IBM EMC_PP15	ICL_OPEN
FSC_BS2000	LINUX	LINUX_DMP
NCR	NCR_MP	NCR_NT
NCR_NT_MP	NOVELL	NOVELL_CLUSTER
PRIMEPOWER	PRIMEPOWER_DMP	PRIMEPOWER_PP15
RELIANT	SEQUENT	SEQUENT_FCSW
SOLARIS	SOLARIS_DMP	SOLARIS_PP15
SUN_CLUSTER	SUN_CLUSTER30	VERITAS
VERITAS20	VERITAS_DMP	

VMWARE	WINDOWS	WINDOWS_DMP
WINDOWS_DMP_PP15	WINDOWS_HP	WINDOWS_HP_DMP
WINDOWS_HP_DMP_PP15	WINDOWS_HP_PP15	WINDOWS_PP15

iscsi

The iSCSI name.

on

Turn the specified feature on.

off

Turn the specified feature off.

offset

The number of LUN addresses in the skip hole (for a skip offset from the skip base LUN).

PdevName

A physical device name (path) for the specified action.

secret_value

The CHAP protocol's secret value, a user-defined string of up to 32 ASCII characters, or 64 binary characters. Binary values should be prefixed with the string '0X'. Microsoft users must specify between 12 and 16 characters.

startSymDevname

The start of a range of Symmetrix devices.

SymDevname

A Symmetrix device name (device) to be removed or added.

SymmID

The 12-digit ID of the Symmetrix array.

wwn

The system-generated World Wide Name.

RETURN CODES Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

symmaskdb

Allows the administrator to back up, restore, initialize and show the contents of the device masking VCMDB. Also provides limited conversion and attribute options.

SYNOPSIS

```
symmaskdb -h
```

```
symmaskdb -sid SymmID | -file BackupFilename
```

```
list database [-v]
  [-dir all [-p all] | -dir # [-p # |all]]
  -wnn wnn |
  -awwn awwn |
  -iscsi iscsi |
  -aiscsi aiscsi |
```

```
list devs
  -wnn wnn |
  -awwn awwn |
  -iscsi iscsi |
  -aiscsi aiscsi |
```

```
symmaskdb -sid SymmID [-v]
```

```
list assignment [-v]
-dev StartSymDevName:EndSymDevName
  | SymDevName | SymDevName,SymDevName..
```

```
list capacity -host Hostname
```

```
symmaskdb -sid SymmID -file BackupFilename [-noprompt]
```

```
restore [-skip_authentication] [-vcmdb_type 4|5]
```

```
backup
```

```
symmaskdb -sid SymmID -file BackupFilename [-noprompt]
```

```
init [-vcmdb_type 3 | 4 | 5 ]
```

```
symmaskdb -sid SymmID [-noprompt]
```

```
convert [-vcmdb_type 4 | -vcmdb_type 5
  -file FileName]
```

```
set no_direct_io | direct_io
```

```
remove -meta_member
```


DESCRIPTION

The `symmaskdb` command performs control and monitor operations concerning the device masking database (VCMDB). The operations include:

- ◆ Lists the contents of the device masking database.
- ◆ Lists the devices assigned to an HBA in the device masking database.
- ◆ Lists the HBAs assigned to the specified devices.
- ◆ Displays the capacity of the devices assigned to a particular host.
- ◆ Restores the device masking database from a backup file stored on the host.
- ◆ Backs up the device masking database to a file on the host previously created by the `init` argument.
- ◆ Initializes the device masking database and also requires you to name a file to be created on the host so that a backup can be performed for the first time.
- ◆ Provides the ability to convert Type 3 databases to Type 4. Type 4 databases require a database device of at least 48 cylinders.
- ◆ Provides the ability to block direct I/O writes to the database area. Enginuity level 5670 allows updates to the VCM database using a gatekeeper device instead of direct I/O. If your environment will be using only SYMCLI Version 5.3 (or later) and Enginuity 5670, enabling this attribute will provide additional security to your database.
- ◆ Removes meta members from the device masking database, but keep the meta heads in place.

ARGUMENTS

`backup`

Specifies a backup of the database to be copied to a given file.

`convert`

Converts the database from a Type 4 to a Type 5 database.

`init`

Requests the database to be initialized.

`list`

Lists various records in the database.

remove

Removes the meta member devices.

restore

Restores the database from a given file.

set

Allows setting of the `[no_]direct_io` attribute.

KEYWORDS

assignment

Names of HBAs that are assigned in device masking VCMDB.

capacity

Specifies the size of the device.

database

For the `list` action, to list records within the device masking database (VCMDB).

devs

For the `list` action, to list devices assigned by records in the device masking database.

direct_io

Directly reads and writes from the host to the VCMDB device.

no_direct_io

Blocks direct reads and writes from the host to the VCMDB device.

OPTIONS

`-aiscsi`

Specifies a user-given name or an alias iSCSI name.

`-awwn`

Specifies a user-given name in an ASCII WWN format.

`-dir`

Applies a director number designation.

`-file`

Applies a backup file to the specified action.

`-h`

Provides brief, online help information.

`-host`

Specifies the host name.

`-iscsi`

Specifies the iSCSI name.

`-meta_members`

Specifies the meta members, other than the meta heads.

`-noprompt`

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

`-p`

Applies a port number designation.

`-sid`

Applies a Symmetrix array's serial number or ID.

`-skip_authentication`

Skips over the authentication information in a backup file and does not restore it.

`-v`

Provides a more detailed, verbose listing.

`-vcmdb_type`

Type of database to initialize.

`-wwn`

Applies a World Wide Name (WWN).

PARAMETERS

#

Specific director or port number.

3

VCMDB Type 3 database (24 cylinders, allowing up to 32 fibre or iSCSI connections per port).

4

VCMDB Type 4 database (48 cylinders, allowing up to 64 fibre or 128 iSCSI connections per port).

5

VCMDB Type 5 database (96 cylinders, allowing up to 64 fibre or 128 iSCSI connections per port).

aiscsi

User-given name, in two parts, separated by a slash (/).

all

All directors or ports.

awwn

User-given name, in two parts, separated by a slash (/).

dev

Symmetrix device to be added or removed.

end

The end of a range of logical devices.

Filename

Name of the device masking backup file.

Hostname

The host name.

iscsi

The iSCSI name.

start

The start of a range of logical devices.

SymmID

The 12-digit ID of the Symmetrix array.

wwn

The system-generated World Wide Name.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

symmir

Performs Symmetrix BCV control operations on a device group or composite group, on a device within the group, or on pairs listed in a device file. The group must have one or more associated BCV devices.

SYNTAX

symmir -h

```
symmir -g DgName [-v] [-force] [-symforce] [-reverse]\
                [-noprompt] [[-rdf] [-bcv] | [-rrbcv]] [-i Interval]\
                [-c Count] [-preserveTGTLocks -lockid LockNum]\
                [-preaction Script] [-postaction Script]

establish [-full [-opt|-exact] [-protbcvest] [-skip]
          [-concurrent]
          <<[LdevName [BCV pd PdevName]]>...> |
          <<[LdevName [BCV dev SymDevName]]>...> |
          <<[LdevName [BCV ld LdevName]]>...>

restore      [-full [-exact] [-remote] [-bypass] [-not_ready]\
             [-protect]
             <<[LdevName [BCV pd PdevName]]>...> |
             <<[LdevName [BCV dev SymDevName]]>...> |
             <<[LdevName [BCV ld LdevName]]>...>

split        [-remote] [-bypass] [-not_ready] [-diff] [-protect]\
             [-skip] [ -instant [-both_sides]\
             [-vxfs <MountPoint...> |
             -ppath <STDDEVS | PowerPathPdevName...> |
             -rdb -dbtype DbType [-db DbName] ] | -consistent ]
             <<[LdevName [BCV pd PdevName]]>...> |
             <<[LdevName [BCV dev SymDevName]]>...> |
             <<[LdevName [BCV ld LdevName]]>...>

symmir -g DgName [[-rdf] [-bcv] | [-rrbcv]]\
              [-offline] [-i Interval] [-c Count]

query        [[-attach] [-multi] [-protect] [-protbcvest]\
             [-bg [-percent]]] | [-summary]
             [LdevName [LdevName...]]

verify       [-synched|-restored [-protect] | -split
             [-bg]|-syncinprog|-restinprog [-protect] ]\
             [-concurrent] [-force]
             <<[LdevName [BCV pd PdevName]]>...>
             <<[LdevName [BCV dev SymDevName]]>...>
             <<[LdevName [BCV ld LdevName]]>...>
```

```

-bcv_mirrors [-ready | -syncinprog | -restinprog]
<<[LdevName [BCV pd PdevName]]>...> |
<<[LdevName [BCV dev SymDevName]]>...> |
<<[LdevName [BCV ld LdevName]]>...>

symmir -g DgName [-v] [[-rdf] [-bcv] | [-rrbcv]]\
[-i Interval] [-c Count] [-noprompt]
attach <<[LdevName BCV pd PdevName]>...> |
<<[LdevName BCV dev SymDevName]>...> |
<<[LdevName BCV ld LdevName]>...>

detach <<[LdevName [BCV pd PdevName]]>...> |
<<[LdevName [BCV dev SymDevName]]>...> |
<<[LdevName [BCV ld LdevName]]>...>

cancel <<[LdevName BCV pd PdevName]>...> |
<<[LdevName BCV dev SymDevName]>...> |
<<[LdevName BCV ld LdevName]>...>

symmir -cg CgName [-v] [-force] [-symforce] [-reverse]\
[-noprompt] [[-rdf] [-bcv] | [-rrbcv]] [-i Interval]\
[-c Count] [-sid SymmID]\
[-preaction Script] [-postaction Script]

establish [-full [-opt|-exact] [-protbcvest] [-skip]\
[-concurrent]
<<[LdevName [BCV pd PdevName]]>...> |
<<[LdevName [BCV dev SymDevName]]>...> |
<<[LdevName [BCV ld LdevName]]>...>

restore [-full [-exact] [-remote] [-bypass] [-not_ready]\
[-protect]
<<[LdevName [BCV pd PdevName]]>...> |
<<[LdevName [BCV dev SymDevName]]>...> |
<<[LdevName [BCV ld LdevName]]>...>

split [-remote] [-bypass] [-not_ready] [-diff] [-protect]\
[-skip]\
[-instant [-both_sides] [-vxfs <MountPoint...> |
-ppath <STDDEVS | PowerPathPdevName...> |
-rdb -dbtype DbType [-db DbName] ] | -consistent ]
<<[LdevName [BCV pd PdevName]]>...> |
<<[LdevName [BCV dev SymDevName]]>...> |
<<[LdevName [BCV ld LdevName]]>...>

symmir -cg CgName [[-rdf] [-bcv] | [-rrbcv]]\
[-offline] [-i Interval] [-c Count] [-sid SymmID]\
[[[-attach] [-multi] [-protect] [-protbcvest]\
[-bg [-percent]]] | [-summary]

query [LdevName [LdevName...]]

```

```

verfiy      [-synched|-restored [-protect] | -split
             [-bg]|-syncinprog|
             -restinprog [-protect] ]\
             [-concurrent] [-force]
             <<[LdevName [BCV pd PdevName]]>...> |
             <<[LdevName [BCV dev SymDevName]]>...> |
             <<[LdevName [BCV ld LdevName]]>...>
             -bcv_mirrors [-ready | -syncinprog |-restinprog]
             <<[LdevName [BCV pd PdevName]]>...> |
             <<[LdevName [BCV dev SymDevName]]>...> |
             <<[LdevName [BCV ld LdevName]]>...>

symmir -cg CgName [-v] [[-rdf] [-bcv] | [-rrbcv]]\
          [-i Interval] [-c Count] [-noprompt]
attach     <<[LdevName BCV pd PdevName]>...> |
          <<[LdevName BCV dev SymDevName]>...> |
          <<[LdevName BCV ld LdevName]>...>

cancel     <<[LdevName BCV pd PdevName]>...> |
          <<[LdevName BCV dev SymDevName]>...> |
          <<[LdevName BCV ld LdevName]>...>

          [-sid SymmID]

detach     <<[LdevName [BCV pd PdevName]]>...>
          <<[LdevName [BCV dev SymDevName]]>...>
          <<[LdevName [BCV ld LdevName]]>...>

symmir -sid SymmID <-file DeviceFileName | 'redirect stdin'>
          [-v] [-force] [-symforce] [-reverse] [-noprompt]\
          [-i Interval] [-c Count]\
          [-preaction Script] [-postaction Script]\
          [-preserveTGTLocks -lockid LockNum]

establish  [-full] [-protbcvest] [-skip]

restore    [-full] [-bypass] [-not_ready] [-protect]

split      [-diff] [-bypass] [-not_ready] [-skip]\
          [ -instant [-vxfs <MountPoint...>
                    -ppath <STDDEVS | PowerPathPdevName...>
                    -rdb -dbtype DbType [-db DbName] ]
                    -consistent ]

symmir -sid SymmID <-file DeviceFileName | 'redirect stdin'>
          [-force] [-i Interval] [-c Count]

query      [[-attach] [-multi] [-protect] [-protbcvest]\
          [-bg [-percent]]] | [-summary]

verify     [ -synched | -restored [-protect] | -split [-bg]\

```



```

        | -syncinprog | -restinprog [-protect] ]
        [-concurrent]

verify    -bcv_mirrors [-ready | -syncinprog | -restinprog]

symmir -sid SymmID <-file DeviceFileName | 'redirect stdin'>
        [-v] [-noprompt] [-i Interval] [-c Count]

attach

detach

cancel

```

DESCRIPTION The `symmir` command performs mirroring operations on a device group, a composite group, a list of devices, or on a device within a device group or composite group. These operations include establishing (mirroring) the device with a BCV device, splitting the device pair, restoring the device from the BCV device, and querying the state of the device pair.

Both the establish and restore operations can be done fully (entire copy) or incrementally (only changed tracks are synchronized). By default, if the `-full` option is not specified, an incremental establish or restore is attempted.

Note: You cannot perform an incremental establish or restore if the BCV pair state is Never Established.

Before a BCV device can be established with a standard device, the BCV device must have been previously associated with the device group and the BCV device must be of the same size as the standard device.

All these operations can be done on a group basis, individual device basis, or list basis (for more than one device with one command). For device lists, you can either concatenate the list of standard device names (*LdevNames*) and/or BCV device names within the command, or:

On UNIX only, specify a specific import file that contains the device names. For example, to perform an establish operation on multiple device pairs listed in a file, use the form:

```
symmir -g DgName establish -nop 'cat LdevListFile'
```

The file, read by this UNIX command, must have logical device names with one device or pair of names per line.

For example, the following is the file format for listing BCV device pairs:

```
DEV001 bcv 1d BCV001
DEV002 bcv 1d BCV002
```

ARGUMENTS

attach

Attaches a BCV to a standard device to become the preferred BCV device to be paired with the standard device when a full establish or full restore action is issued.

cancel

Cancels the existing internal DeltaMark session between the specified standard and BCV device(s). Once the DeltaMark session is cancelled, the corresponding BCV device goes into the SplitNoInc state, and the BCV pair can no longer be incrementally established or restored. Cancel can also be used to remove any one of the multi-BCV devices from a multi-BCV set.

detach

Detaches a BCV device from the standard device and disassociates (unmarks) this pair as the preferred pair when full establish and restore operations occur.

establish

Establishes (mirrors) one or all standard devices in a device group with one or more BCV devices that are associated with the group. Depending upon whether the establish operation is full or incremental, all or only the changed tracks are internally copied to the BCV device.

While the operation is in progress, the state of the device pair is SyncInProgress. When the operation completes, the state of the device pair changes to Synchronized.

The establish action may return the following unique return code:

Code #	Code Symbol
47	CLI_C_WONT_REVERSE_SPLIT
51	CLI_C_PAIED_WITH_A_DRV

Refer to Appendix D, *SYMCLI Return Codes* for more information.

restore

Restores one or all standard devices in a device group from one or more BCV devices that are associated with the group. Depending upon whether the restore operation is full or incremental, all or only the changed tracks are internally copied to the standard device.

While the operation is in progress, the state of the device pair is RestInProg. When the operation completes, the state changes to Restored, except for Symmetrix arrays using Engenuity 5x63, the state changes to Synchronized.

The restore action may return the following unique return code:

Code #	Code Symbol
20	CLI_C_WP_TRACKS_IN_CACHE
47	CLI_C_WONT_REVERSE_SPLIT
51	CLI_C_PAIRED_WITH_A_DRV

Refer to Appendix D, *SYMCLI Return Codes* for more information.

split

Splits one or all BCV devices from the mirror pair(s) in a device group.

While the operation is in progress, the state of the device pair is SplitInProg. When the operation completes, the state changes to Split.

query

Returns information about the state of mirroring of one or all device pairs in a device group.

verify

Verifies whether one or all device pairs in a device group are in the Synchronized, Restored, Split, SyncInProg, or RestInProg states.

The verify action returns the following unique return codes if the verify criteria was not met:

Code #	Code Symbol
4	CLI_C_NOT_ALL_SYNCHRONIZED
5	CLI_C_NONE_SYNCHRONIZED
10	CLI_C_NOT_ALL_SYNCHED
11	CLI_C_NONE_SYNCHED
12	CLI_C_NOT_ALL_RESTORED
13	CLI_C_NONE_RESTORED
25	CLI_C_NOT_ALL_SPLIT
26	CLI_C_NONE_SPLIT
27	CLI_C_NOT_ALL_SYNCINPROG
28	CLI_C_NONE_SYNCINPROG
29	CLI_C_NOT_ALL_RESTINPROG
30	CLI_C_NONE_RESTINPROG

Refer to Appendix D, *SYMCLI Return Codes* for more information.

OPTIONS

-attach

Alters the query to display BCV attachment information for the standard device(s) in the device group.

-bcv

Indicates that the BCV control operation is targeted at the remote standard mirror of a host-connected BCV SRDF device and the SRDF-connected BCV device that is associated with the device group. This option is used in conjunction with the **-rdf** option.

-bcv_mirrors

Verifies that the mirrors of the BCV device(s) are in the indicated state. The default verification is to verify that the mirrors are in the synchronized and ready states. Alternatively, when the **-syncinprog** or **-restinprog** flag is also specified, then the mirrors of the BCV device(s) are verified against the state that corresponds to the specified flag. If **-ready** is specified, then the state of the mirrors is verified to be synchronized as well as ready to the host.

-bg

Applies to a `query` or `verify` operation. For `query` operations, shows the BCV pairs that are still in the background split mode. For `verify` operations with the `-split` option, verifies that the BCV pair(s) are in the Split state after completing a background split.

-both_sides

For SRDF environments, performs an instant consistent split to both locally and remotely connected BCV devices within a specified device group.

-bypass

Bypasses device reservations by other hosts.

-c

Specifies the number (count) of times to display or to acquire an exclusive lock on the Symmetrix host database. Can also be used to wait for Symmetrix device and gatekeeper locks. If this option is not specified and an interval (`-i`) is specified, the program will loop continuously to display or to start the mirroring operation.

-cg

Applies a composite group name to the command.

-concurrent

With `verify` action, verifies the STD device and the two most recent BCVs. With `establish`, establishes a second available BCV.

-consistent

Causes the STD devices being managed to be consistently split. Requires a TimeFinder/CG license and cannot be combined with the `-instant` option.

-db

Specifies the relational database name (not required for Oracle) used with consistent instant splits.

-dbtype

Specifies a relational database type used with a consistent instant split (refer to parameter *DbType*).

-diff

Indicates that the split operation should initiate a differential data copy from the first mirror set member to the rest of the BCV mirror set members when the BCV pair split is done. For Engenuity 5x65 only, as the differential split is now the default mode.

-exact

Applies to the full establish or restore operation that causes the standard and BCV device pairing algorithm to select the pairs according to the exact order in which they were added to the specified device group. This option overrides all other pairing algorithms.

-file

Applies a device file to the command. The device file contains device pairs (*SymDevnames*) listing a pair per each line (the standard first, a space, and the BCV last within each line entry). Device files can include comment lines that begin with the pound sign (#). Using **-f** is synonymous with **-file**.

-force

Attempts to force the operation even though one or more paired devices in the device group may not be in the normal, expected state(s) or the specified operation.

-full

Requests a full establish or restore operation. The default, if the **-full** option is not specified, is an incremental establish.

-g

Applies a device group name to the command.

-h

Provides brief, online help information.

-i

Specifies the repeat interval, in seconds, to display or to acquire an exclusive lock on the Symmetrix host database. The default interval is 10 seconds. The minimum interval is 5 seconds. Can also be used to wait for Symmetrix device and gatekeeper locks.

When used with the `verify` action, the number of seconds specified, indicates the interval of time (in seconds) to repeat the `verify` command(s) before the `verify` action finds and reports the pairs fully synchronized.

`-instant`

Improves the performance of a typical split operation by performing a quick foreground split. Cannot be combined with the `-consistent` option.

`-lockid`

As a companion option with `-preservetgtlocks`, specifies the lock holder ID for preserving the target locks on the control operation. Lock number ID must be provided as a hexadecimal number.

`-multi`

Applies to a `query` operation in a multi-BCV or concurrent BCV environment to show all BCVs that can be incrementally established/restored to the standard device. It lists the devices in chronological order.

`-noprompt`

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

`-not_ready`

For `restore` and `split` operations, this option sets the target device(s) as Not Ready. Upon completion of a `split`, each BCV device is set Not Ready. Upon initiation of a `restore`, each standard device is set Not Ready.

`-offline`

Specifies that the Symmetrix data connection is offline from the host in-memory database.

`-opt`

Applies to the full establish operation that optimizes the standard/BCV pair selection to achieve the highest copy speed between them. (Basically, the device pair selection is such that they are not connected to the same disk adapters to distribute the I/O.) This option overrides all other pairing algorithms, which allows devices to be assigned as BCV pairs regardless of previous

pair assignment since previously paired standard devices are normally paired with the same BCV devices. For remote BCV operations, use the `-opt_rag` option.

`-opt_rag`

The RA group optimize (`-opt_rag`) option applies to the full establish operation for remote device optimization to distribute the I/O load in that the remote adapters are not connected to the same devices of the selected pair. Requires that the `-rdf` option also be specified.

`-percent`

For a query action in companion with the `-bg` option, shows the percentage of progress in background split operation.

`-postaction`

Applies a script as a post action to the specified operation.

`-ppath`

Applies a list of one or more PowerPath devices used with a consistent instant split. As an alternative to specific PowerPath device names, you can specify STDDEVS that targets all standard devices in the split action.

`-preaction`

Applies a script as a pre-action to the specified operation.

`-preserveTGTLocks`

Causes the action not to take out device locks on the target devices. The target devices must already be locked by the same lock holder ID. Requires the `-lockid` option.

`-protbcvest`

Applicable only with an `establish` or `query` command. Applies to two-way mirrored BCV devices. Moves all mirrors of the BCV device to join the mirrors of the standard device. For query actions, displays whether or not BCVs were established with the `-protbcvest` flag.

`-protect`

Indicates that the BCV should be write-protected before initiating a restore operation. When used with the `query` argument, displays whether the restored BCVs were protected. When used

with the `verify` argument and the `-restored` or `-restinprog` options, verifies that the restore operation has completed. You can use the `-i` and `-c` options to repeat the command until the restore can be protected.

`-rdb`

For consistent split actions, freezes all the devices of the specified database just before the instant split is performed, and thaws them as the foreground split completes.

The host physical devices where the database files reside must be PowerPath devices. For information about required database environment variables, refer to *Environment Variables* on page 1-168.

`-rdf`

Indicates that the BCV control operation is targeted at the remote mirror of the local standard SRDF device(s) and the remotely attached BCV device(s).

`-ready`

Verifies that all of the BCV mirrors are ready to the host. This option can only be specified with `-bcv_mirrors`. This option is useful after a reverse split to indicate the data on the BCV is available.

`-remote`

Functions as a remote flag. Applicable only for split operations on a BCV RDF1 device, or a restore operation from a BCV to a STD RDF2 device. If this flag is not specified, then the mode defaults to not propagate the data to the remote mirror of the RDF device.

`-restored`

Used with the `verify` argument to verify whether one or all BCV device pair(s) in a device group are in the Restored state.

`-restinprog`

Used with the `verify` argument to verify whether one or all BCV device pair(s) in a device group are in the RestInProg state.

`-reverse`

When applied to a split operation, initiates a reverse data copy from the fixed BCV mirror(s) to the first (moving) mirror of the BCV upon the completion of the split operation.

When applied to an establish or restore operation, requests a verification check that the BCV's fixed mirror has valid data. If at establish or restore time you anticipate a need to perform future BCV reverse split operations, you must apply a reverse establish or restore so that no invalid tracks on the fixed BCV mirror become used.

`-rrbcv`

Indicates that the BCV control operation is targeted at the remote mirror of the remotely attached BCV (RBCV) and the remotely attached remote BCV (RRBCV) device associated with the device group.

`-sid`

Applies the command to a specified Symmetrix ID. (If you set environment variable `SYMCL_SID`, this option is not required.) This option with the device filename option allows you to operate on remote BCV pairs in Symmetrix units beyond the first SRDF multi-hop.

`-skip`

Skips the locks on standard devices. Does not lock the standard devices if the specified standard devices are either all locked or unlocked. However, all BCV devices will remain locked.

`-split`

Used with the `verify` argument to verify whether one or all BCV device pair(s) in a device group are in the Split state.

`-summary`

For a query action, provides a collapsed listing, summarizing just the current device states.

`-synched`

Used with the `verify` argument to verify whether one or all BCV device pair(s) in a device group are in the Synchronized state.

`-syncinprog`

Used with the `verify` argument to verify whether one or all BCV device pair(s) in a device group are in the SyncInProg state.

`-symforce`

Requests that the Symmetrix array force the operation to occur, which overrides instances where they are normally rejected.



CAUTION

Use care when applying this option as data can be lost or corrupted.

With `-symforce`, a split command will execute on a BCV pair, even when they are in a SyncInProgress or RestInProgress state. During the execution of an `establish` or `restore` command, `-symforce` will inhibit the verification of valid tracks on the device at the source.

`-v`

Provides a more detailed, verbose output.

`-vxfs`

Specifies a list (for Solaris and HP-UX hosts only) of one or more VERITAS VxFS file system mount points for a consistent split. The file systems mounted on this host will be frozen just before the instant split is performed, and thawed as soon as the foreground split completes.

PARAMETERS

CgName

The composite group name.

DbName

The relational database name.

DbType

The relational database type. Possible values:

- Oracle
- SQLServer
- IBMUDB
- Informix
- Sybase
- MVSDB2
- Exchange

DgName

The device group name.

DeviceFilename

The device filename. The device file contains device pairs (*SymDevnames*) listing a pair per each line (the standard first, a space, followed by the BCV name on each line).

LdevName

The logical device name of either the standard (such as DEV002) or the BCV device (such as BCV005).

LockNum

The lock ID number as a hexadecimal value.

MountPoint

File system mount point.

PdevName

The physical device (host) name for the BCV device (such as /dev/rdisk/c2t0d2s2).

PowerPathPdevName

A PowerPath device name (one or more physical device names can be entered).

Script

The full pathname of the script file to be executed.

SymDevname

The Symmetrix device name, unique per Symmetrix array, for the BCV device (such as 001C).

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To create device group `ProdDB` as a Regular device group, enter:

```
symdg create ProdDB
```

To define device group `ProdDB` as the default device group, enter:

```
setenv SYMCLI_DG ProdDB
```

To add standard device `/dev/rdisk/c1t1d1s2` to device group `ProdDB` and name it `act1`, enter:

```
symld add pd c1t1d1s2 act1
```

To associate BCV device `/dev/rdsk/c2t0d2s2` to device group `ProdDB` and name it `mybcv1`, enter:

```
symbcv associate pd c2t0d2s2 mybcv1
```

To establish standard device `act1` in group `ProdDB` with a specified BCV device (associated with the group), enter:

```
symmir -full establish act1 bcv pd c2t0d2s2
```

To wait until the BCV pair is fully synchronized, polling every 30 seconds, enter:

```
symmir -i 30 verify act1
```

To split all established devices in group `ProdDB`, enter:

```
symmir split
```

To perform an incremental restore onto standard device `act1` in group `ProdDB` from its paired BCV device, enter:

```
symmir restore act1
```

To issue a full establish with one command on multiple BCV pairs in group `ProdDB`, enter:

```
symmir -g ProdDB est -full DEV001 bcv ld BCV002 \  
                                DEV005 bcv ld BCV027 \  
                                DEV020 bcv ld BCV005
```

For UNIX only; to issue a full establish on multiple BCV pairs in group `ProdDB` that are listed in a separate file (`yourpairlist`), enter:

```
symmir -g ProdDB est -full 'cat yourpairlist'
```

In this example, the imported file has the exact same device and pair listing format as shown in the previous example.

To split three device pairs in group `ProdDB`, enter:

```
symmir split DEV001 DEV005 DEV020
```

To query information about all paired devices in device group `ProdDB`, enter:

```
symmir -g ProdDB query
```

To query information about the background split progress of all paired devices within a multi-BCV or concurrent BCV environment, enter:

```
symmir -g TestGrp query -multi -bg -percent
```

You or an application script can instantly generate two synchronized copies of the standard data. To concurrently establish BCV001 and BCV002 with standard DEV001 in device group CncGrp, enter:

```
symmir -g CncGrp establish -full DEV001 bcv 1d BCV001\  
DEV001 bcv 1d BCV002
```

symoptmz

Sets parameters that control the behavior of the Symmetrix Optimizer and displays its current status.

SYNTAX

```
symoptmz -h

symoptmz -sid SymmID
    enable
    disable
    rollback
    clear_stats
    query [-v]
    sync -version

symoptmz -sid SymmID
    list [-range <[Startdevname]:[Enddevname]>]
        [-n NumDevs]
    show [-parms | -swap_hist | -swap_list | -composite |
        -rollback_list]
    read -log_type <RUNTIME | ERROR>
        [-start DateTime] [-stop DateTime]

symoptmz [-sid SymmID]
    release

symoptmz [-sid SymmID] -file CommandFile | 'redirect stdin'
    [-v | -noecho]
    preview
    prepare
    commit
```

Syntax of commands allowed in <command_file>

The command file allows you to set control parameters, advanced parameters, time windows, swap lists, and swap priority.

For more information on the parameters in this section, refer to the white paper, *Symmetrix Optimizer*.

- ◆ For setting control parameters:

```
set control_parms [start_mode=<AUTO | MANUAL>,]  
                  [swap_mode=<AUTO | USER_OK>,]  
                  [min_perf_period=PerfTime,]  
                  [workload_period=WorkTime,]  
                  [max_simult_swaps=MaxSwapSimult,]  
                  [swap_rate=MaxSwapsDay];
```

where:

MaxSwapsDay is the maximum number of swaps allowed in a calendar day. The range is 2 to 200 swaps.

MaxSwapSimult is the maximum number of simultaneous swaps allowed. The range is 2 to 8 swaps.

PerfTime is the amount of initial samples required before Optimizer makes a recommendation.

WorkTime is the amount of workload sampling that Optimizer should maintain for analysis. The range is 1 to 672 hours.

- ◆ For setting advanced parameters:

```
set advanced_parms [max_rollback = MaxDays,]  
                  [hot_spot = <TRUE | FALSE>,]  
                  [phys_mirrors = <TRUE | FALSE>,]  
                  [adv_parms_flag = Adv_Flag,];
```

where:

MaxDays is the max number of days for which rollback information should be kept. The range is 1 to 180 days.

Adv_Flag is reserved for future use.

- ◆ For setting time windows:

```
set time_window id=<tw_id>,
                type=<SWAP | PERF>,
                flag=<INCLUDE | EXCLUDE>,
                period=<ONCE | WEEKLY | WEEKLY_BY_DAY>,
                starting=DateTime, ending=DateTime,
                [days=DayList, start_time=<hh:mm>,
                end_time=<hh:mm>];
```

where:

DateTime (your 24-hr local time) is in the form of
MMDDYYYY:HHMMSS.

DayList is any comma-separated combination of MON, TUE, WED, THU, FRI, SAT, or SUN. For the case of WEEKLY, *DayList* should also include one of the following: MON_START, TUE_START, WED_START, THU_START, FRI_START, SAT_START, or SUN_START. Each instance of *_START represents the corresponding day of the week when the time window starts.

When setting time windows, note that the time windows defined in a single command file are treated as a set, and replace the current time window definitions in the Optimizer. They are not treated as additions to the current definitions. Swap time windows are treated as one set and Performance time windows are treated as another set.

- ◆ For clearing time windows:

```
clear time_window type=<SWAP | PERF>;
```

- ◆ For setting manual swap lists:

```
set swap_list Hyper1 with Hyper2
                [, Hyper3 with Hyper4, ... ]
                [begin_at=DateTime];
```

where:

DateTime is in the form MMDDYYYY:HHMMSS.

HyperN is in the form DDD, I, T, HH:

DDD — is the director identifier
I — is the director interface
T — is the target
HH — is the hyper number

- ◆ For managing swap lists:

```
set swap <APPROVE | DECLINE>
        [begin_at=DateTime,]
        TIMESTAMP=DateTime
        [, ROLLBACK];
```

where:

DateTime is in the form MMDDYYYY:HHMMSS.

- ◆ For setting swap priority:

```
set swap_priority TO <NO_SWAP | NORMAL | HIGH> for
                    dev SymDevStart[:SymDevEnd];
```

DESCRIPTION

The `symoptmz` command displays and sets the values of the parameters that control the behavior of the Symmetrix Optimizer.

Note: Swapping a Snap target device is not allowed.

The `query` option displays the current status of the Optimizer. If you specify `-v` additional information is displayed about the Optimizer version and any open Optimizer API sessions.

The `show` option displays detailed information about the values of control parameters and optionally displays time windows, swap lists, swap history, and composite time windows of the Optimizer.

The `enable` and `disable` options enable and disable Optimizer algorithm processing, and the `clear_stats` option clears all the statistics.

The `rollback` option allows you to rollback a Symmetrix configuration to that of a previous point in time.

The `read` option displays the contents of log files that are read from the Optimizer.

Each time `symoptmz` is run it starts an Optimizer API session, and closes this session just before exiting. Whenever an action updates Optimizer, `symoptmz` automatically locks the Optimizer API and releases it just before exiting.

The `release` option forcefully releases any Optimizer session locks that were inadvertently left in place.

The `list` option displays the Optimizer-specific device attributes of Symmetrix devices.

You use a command file (`command_file`) to set any parameters or time windows. This file is then processed by `symoptmz`. Alternatively, you can use `stdin` redirection with *here documents* in UNIX shell scripts. You must terminate each command in the file with a semi-colon (;). There is no limit to the number or type of commands that can be placed in a command file. All the commands in the file are executed in a single Optimizer session. The parsing of the commands in the file is case insensitive, and the data itself is case-sensitive.

There are two arguments that analyze the command file for accuracy without actually executing the commands. Although it is not mandatory to use these arguments, if you run them one at a time you will limit the range of errors that might occur when you actually want to make changes to the Symmetrix.

The `preview` argument checks that the command file has the correct syntax. The `prepare` argument checks syntax and performs some range checks.

Finally, the `commit` argument carries out the same syntax and range checks and then updates the Optimizer with the modified parameters.

We recommend that you run `preview` on your command files, and then correct any syntax errors. Then run `prepare` and correct any out-of-range figures. Finally, run `commit`.

ARGUMENTS

`clear_stats`

Clears disk statistics maintained by the Optimizer.

`commit`

Updates the Optimizer with the changes defined in the command file.

`disable`

Disables the Optimizer algorithm processing.

`enable`

Enables the Optimizer algorithm processing.

`list`

Displays the Optimizer-specific device attributes of Symmetrix devices.

prepare

Carries out extra range checks on changes specified in the command file.

preview

Verifies the syntax of the changes specified in the command file.

query

Queries Optimizer and displays the current state and version information of the Optimizer. If you specify `-v`, displays further version information and open Optimizer API sessions.

read

Reads from Optimizer's log file.

release

Attempts to gain control of an existing Optimizer API session to abort it and release the Optimizer API lock.

rollback

Rolls back a Symmetrix configuration to that of a previous point-in-time.

show

Shows information about the current Symmetrix Optimizer parameters.

sync

Queries the Symmetrix Optimizer itself for version information rather than relying on information in the SYMAPI database on the host.

OPTIONS**clear**

Clears the specified time window entry of all data (Optimizer will now ignore the entry in its calculations).

`-composite`

Displays composite time windows. Composite time windows are generated by Optimizer by combining all known user-defined windows.

`-file`

Specifies the name of the command file containing changes to Optimizer.

`-h`

Provides brief, online help information.

`-log_type`

Defines the type of log file to be read. The types of log files supported are: RUNTIME and ERROR.

`-n`

Specifies the number of devices to list or set.

`-noecho`

Used with `preview`, `prepare`, and `commit` actions. Blocks the printing of session status and progress messages during the Optimizer change session. Cannot be used with the `-v` option.

`-parms`

Displays information about the control parameters of Symmetrix Optimizer.

`-range`

Specifies the start and end Symmetrix device names.

`-rollback_list`

Displays a list of possible rollback points.

`-sid`

Specifies the Symmetrix ID to only affect the Optimizer parameters on the specified Symmetrix array.

`-start`

Indicates to read the log file entries whose time stamp is after this date/time.

`-stop`

Indicates to read the log file entries whose time stamp is before this date/time.

`-swap_hist`

Displays a history of the swaps known to Optimizer.

`-swap_list`

Displays all the swap lists currently known to Optimizer.

`-v`

Provides a more detailed, verbose listing.

`-version`

Shows the Symmetrix Optimizer version.

PARAMETERS

Enddevname

The last Symmetrix device name in a range, such as 01F.

NumDevs

The number of devices to display or set.

Startdevname

The first Symmetrix device name in a range, such as 00C.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES To display the current Optimizer control parameters for a specific Symmetrix array, enter:

```
symoptmz -sid 123456789012 show -parms
```

To list the swap priorities of all Symmetrix devices that are configured in Symmetrix arrays connected to this host, enter:

```
symoptmz list
```

sympart

Displays partition information about a host device.

SYNTAX

```
sympart [-h] [-v] [-kb|-blocks|-mb]
        show HostDevName
```

DESCRIPTION

The `sympart` command displays detailed information about the geometry and layout of a host device. This includes information specific to the partitions of the device such as the partition name, type, attributes, offset into the full device, and the size of the partition.

ARGUMENTS

`show`

Shows the detailed partition for the specified host device.

OPTIONS

`-blocks`

Displays the partition offset and size information in 512-byte blocks.

`-h`

Provides brief, online help information.

`-kb`

Displays offset and size information in Kilobytes.

`-mb`

Displays offset and size information in Megabytes. This is the default.

`-v`

Provides a more detailed, verbose listing.

PARAMETERS

HostDevName

The physical (host) device name, such as `c2t0d2s2`.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES To display partition information in kilobytes about physical device `c2t0d2s2` on a SunOS system, enter:

```
sympart -kb show c2t0d2s2
```

To display partition information in blocks about a physical device 9 on a Windows system, enter:

```
sympart -blocks show PHYSICALDRIVE9
```

sympd

Displays information about one or all Symmetrix devices that are visible to your host.

SYNTAX

```
sympd -h

sympd [-sid SymmID] [-offline] [-v]

list [-SA <#|ALL>] [-P #] [-scsi] [-fibre] [-powerpath] \
    [-vcm] [-pdevfile] [-cyl]

list [-DA <#|ALL>] [-interface <#|ALL>] \
    [-disk <#|ALL>] [-hyper <#|ALL>]

list [-resv]

sympd show PdevName

sympd export -file FileName

verify -file FileName [-v]
```

DESCRIPTION

The `sympd` command performs operations on a device given the device's physical name, such as `/dev/rdisk/c3t0d3s2`, listing devices by Symmetrix ID and showing device-specific information.

The `export` command stores the current list of physical device names that the host can see, as well as other information about the physical device, such as the Symmetrix ID, device number, and director/port to a file.

The `verify` command compares the current list of physical device names to the ones stored in the file previously for any differences.

ARGUMENTS

`export`

Stores the physical device information to a given file.

`list`

Lists all Symmetrix devices visible to this host.

show

Shows status information about a Symmetrix device that is visible to this host.

verify

Compares the current physical device information to that stored in a given file.

OPTIONS

-cyl

Lists the device capacity in cylinders in the output. The default is megabytes (MB).

-DA

Lists Symmetrix devices that are visible to this host and are mapped to a certain DA director number. The interface, disk, and hyper numbers can also be used to confine the list further, but default to ALL unless specified.

-disk

Lists Symmetrix devices that are mapped to a certain disk SCSI ID. The DA, interface, and hyper IDs can also be used to confine the list further, but default to ALL unless specified.

-fibre

Lists devices mapped to Fibre front-end directors.

-file

Indicates the filename of the file to store or compare physical device information.

-h

Provides brief, online help information.

-hyper

Lists Symmetrix devices that are mapped to a certain hyper ID. The DA, interface, and disk IDs can also be used to confine the list further, but default to ALL unless specified.

-interface

Lists Symmetrix devices that are mapped to a certain interface ID. The DA, disk, and hyper IDs can also be used to confine the list further, but default to ALL unless specified.

-offline

Makes the Symmetrix data connection offline from the host in-memory database for this action.

-P

Lists devices mapped to a specific SCSI or fibre front-end director number port. By default, all ports are selected.

-pdevfile

Lists device names in a format for use as `pdevfile` entries. The display output can be redirected to a `pdev` file name.

-powerpath

Lists host-visible EMC PowerPath connected devices and their alternate paths.

-resv

Lists all Symmetrix devices that are visible to this host and have SCSI device reservations.

-SA

Lists devices mapped to a specific SCSI or fibre front-end director number.

-scsi

Lists devices mapped to SCSI front-end directors (SAs).

-sid

Limits listing of Symmetrix devices visible to this host to devices that belong to the specified Symmetrix array.

-v

Provides a more detailed, verbose listing.

-vcm

Lists all of the device masking (or VCM) devices in the Symmetrix array.

PARAMETERS

PdevName

Host name for the device, such as `/dev/rdisk/c2t0d2s3`.

FileName

Name of the file containing the list of devices.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To list all Symmetrix devices visible to this host, enter:

```
sympd list
```

To show detailed information about a Symmetrix device, enter:

```
sympd show /dev/rdisk/c2t0d2s3
```

To list only Symmetrix devices visible to this host that are mapped to all Fibre Channel directors, port 0, enter:

```
sympd -sa all -p 0 -fibre list
```

symqos

Provides Quality of Service controls on specified devices.

SYNTAX

```
symqos -h

symqos -g DgName [-bcv|-nobcv]
    set <BCV|RDF|BCS|MIR|CLONE pace|priority Value>
        [LdevName]
    set LRU <#,#,#|ALL> [LdevName]
    set LRUname LruName [LdevName]
    reset LRU [LdevName]
    query [-lru]

symqos [-sid SymmID]
    list [-range <SymdevStart:SymdevEnd>] [-lru <#|ALL>]
    list [-range <SymdevStart:SymdevEnd>] \
        [-lruname <LruName|ALL>]
```

DESCRIPTION This command allows you to view or change the storage copy pace (priority) levels and LRU cache assignments for a range of devices, or selected members of a device group.

ARGUMENTS

list

Lists the QoS copy priorities for a range of devices.

query

Returns the QoS copy pace (priority) levels for the specified members of a device group. Defaults to both the BCV and standard (all) devices in the group.

reset

Resets the QoS LRU assignment back to the default LRU.

set

Sets the QoS copy priorities or LRU assignment. Unless an *LdevName* is specified, it defaults to setting parameters on STD and BCV devices.

OPTIONS**-bcv**

Applies the action only to device group members that are BCV devices.

-g

Confines the action to target devices of a specific device group.

-h

Provides brief, online help information.

-lru

When used with the `list` action, lists the LRU cache management groups and the devices assigned to them (specify all or an LRU number). When used with `query` action, shows all the devices in the specified group and their assigned LRU numbers.

-lruname

When used with the `list` action, lists the device assignments to LRU cache management group by LRU name.

-nobcv

Applies the action only to device group members that are standard devices.

-range

Applies the action to a range of device names.

-sid

Confines the action to target devices of a specific Symmetrix ID.

PARAMETERS*DgName*

The device group name.

LdevName

The logical device name (such as BCV001).

LRU

The least-recently-used cache management group ID list. A comma-separated list of LRU IDs.

LruName

The least-recently-used cache management group name.

SymdevEnd

The Symmetrix ending device number to define a range of devices (largest device number within the Symmetrix is the default).

SymdevStart

The Symmetrix starting device number to define a range of devices (000 is the default).

SymmID

The 12-digit ID of the Symmetrix array.

Value

The pace-level value. Possible values are 0 to 10. Zero is the highest copy pace and the default.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To view the copy priorities for devices 10 through 20 on Symmetrix 1234, enter:

```
symqos -sid 1234 -range 10:20 list
```

To view the copy priorities for all STD and BCV devices in device group DeviceGroup, enter:

```
symqos -g DeviceGroup query
```

To set the BCS copy pace to 2 for all STD devices in group DeviceGroup, enter:

```
symqos -g DeviceGroup -nobcv set BCS pace 2
```

To assign all devices of device group DeviceGroup to LRU group 2, enter:

```
symqos -g DeviceGroup set LRU 2
```

To assign all devices of device group DeviceGroup to LRU group GROUP_2.

```
symqos -g DeviceGroup set LRUname GROUP_2
```


symrcopy

Performs remote copy control operations between two storage arrays on a collection of device pairs listed in a device file.

SYNTAX

```
symrcopy [-h]

symrcopy -file FileName [-v | -noprompt]

        create <-push|-pull> <-hot|-cold>
            [-name SessionName]
            [-copy [-differential]]

symrcopy -file FileName [-v | -noprompt] [-force]
        activate [-consistent]
        recreate [-name SessionName]
        set mode <copy | nocopy>
        set pace Value
        terminate [-symforce]

symrcopy list [-sid SymmID] [-offline] [-detail|-wwn]

symrcopy -file FileName [-offline] [-detail|-wwn]
        [-i Interval] [-c Count]
        query

symrcopy -file FileName [-offline]
        [-i Interval] [-c Count]

        verify [-createinprog | -created | -recreateinprog |
            -recreated | -copyinprog | -copyonaccess |
            -copyonwrite | -copied | -terminateinprog |
            -failed | -verifyinprog]
```

DESCRIPTION

The `symrcopy` command creates, starts, terminates, and recreates a Symmetrix DMX remote copy session between devices of two arrays. A device file must be used to define devices in the copy session. One of the arrays must be a Symmetrix DMXTM, which acts as the controlling array.

ARGUMENTS

`activate`

Starts the copying process on an existing session.

`create`

Defines a new session.

`list`

Lists all the sessions for a given Symmetrix array or both Symmetrix arrays, when you don't specify a SymmID, and both are Symmetrix arrays.

`query`

Queries for the status of sessions.

`recreate`

Creates an incremental session on an existing session. Only valid for sessions not created with the `-differential` and `-copy` options.

`set mode`

While in the CopyInProg state, allows the session to be changed to nocopy, causing the session state to change to CopyOnAccess if the session was created with the pull option, or to CopyOnWrite if the session was created with the push option.

While in the CopyOnAccess or CopyOnWrite state, allows the session to be changed to Copy, causing the session state to be changed to CopyInProg.

`set pace`

While in the CopyOnProg state, allows the session pace to be changed to a value from 0 to 9, where 0 is the fastest pace, and 9 is the slowest pace.

`terminate`

Terminates a session and removes it from the Symmetrix array.

verify

Verifies that a session is in a specified state.

The verify action returns the following unique return codes if the verify criteria was not met:

Code #	Code Symbol
209	CLI_C_NOT_ALL_VERIFIED
	Some but not all of the devices are in the specified state.
210	CLI_C_NONE_VERIFIED
	None of the devices are in the specified state.

OPTIONS

-c

Runs the specified query this many times. (Defaults to forever if **-i** is specified.)

-cold

Any directors that are mapped to the local device and can reach the targets may be used. Therefore, the source devices must be set to User Not Ready.

Also, on a push, there may be up to 16 targets.

-consistent

Causes the source and target pairs to be consistently copied.

-copy

Used with create. Causes the device copy to take place in the background. Normally the copying of tracks is not completed unless all tracks have been accessed during a pull, or all tracks have been written during a push.

After the operation is executed, the state of the device pair is CopyInProgress. If all of the tracks are eventually moved to the target device, the state changes to Copied.

-detail

A more detail list or query. May not fit in some displays.

-differential

Used with the `-copy` option when creating a copy session, so that the session can later be recreated for a differential (incremental) copy.

-file

Specifies a file that contains device pairs for the `symrcopy` command. A device pair is a control device and a remote device.

Note that the data flows from the control to the remotes on a `-push`, but on a `-pull`, data flows from the remote to the control.

Control and remote devices may be specified as LUN World Wide Names or Symmetrix or CLARiiON device names.

Valid tags for the file are `symdev`, `clardev`, and `wwn`.

Only use white space to separate source and remotes.

Lines that start with a '#' are ignored. Control devices are always in the left hand column, and remotes are always in the right.

The usual file format will be:

```
"symdev="<SymmID: SymDevName>" wwn="<LUN WWN>
...
...
```

To specify more than one target per source device, include more records, indicating the new remote while duplicating the source device. Valid only for `-push -cold`.

-force

Attempts to force the operation even though one or more paired devices in the device file may not be in the normal, expected state(s) for the specified operation.

-h

Provides brief, online help information.

-hot

All directors that are mapped to the local device must be able to reach the targets. The source devices may be Read Write. Also, on a push, there may be only 1 target.

`-i`

Runs the specified query repeatedly with this many seconds between iterations. (Defaults 10 seconds if `-c` is used; 5 seconds is the minimum.)

`-offline`

Used with list or query action to not query the Symmetrix for updated session information. Instead it relies on information in the database.

`-pull`

If the session is created with the `-pull` option, when activated it will pull data from the remote to the control device.

`-push`

If the session is created with the `-push` option, when activated it will push data from the control to the remote.

`-symforce`

The Valid only for terminate. Used to terminate a session that has not yet finished copying.

`-v`

Provides a more detailed, verbose listing.

PARAMETERS

FileName

The name of the file that contains source and target pairs.

SessionName

An optional name that can be ascribed to a session.

SymdevName

A Symmetrix device name, such as, 001C.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

symrdb

Displays mapping and performance information about one or more schemas, tables, files, tablespaces, or segments that are defined in a specified database instance.

SYNTAX

```
symrdb -h

symrdb [-h] [-v] -type Option [-db DbName] [-sid SymmID]
        [-RDFG GrpNum] [-R1|-R2] [-bcv|-nobcv|-vdev]
        [-data] [-log] [-control] [-force]

rdb2dg DgName [-dgtype REGULAR|RDF1|RDF2]

rdb2cg CgName [-cgtype RDF1|RDF2] [-apidb |
        -ppath | -rdf_consistency]

symrdb [-h] [-v] -type Option [-db DbName] [-sid SymmID]
        [-RDFG GrpNum] [-R1|-R2] [-bcv|-nobcv|-vdev]
        [-data] [-log] [-control] [-force]

tbs2dg -tbs TblSpName DgName [-dgtype REGULAR|RDF1|RDF2]

tbs2cg -tbs TblSpName CgName [-cgtype REGULAR|RDF1|RDF2]
        [-apidb | -ppath | -rdf_consistency]

symrdb list -type DbType [-db DbName] [-kb|-mb|-blocks] [-v]
        [TBS|FILE [-datalog]|SCHEMA|TABLE] [-unalloc]
        [FILE|SEG|TABLE] -tbs TblSpName
        [FILE|SEG|TABLE] -schema SchemaName

symrdb show -type DbType [-db DbName] [-kb|-mb|-blocks] \
        [-expand|-collapse|-no_extents]
        [TBS TblSpName|FILE FileName|SCHEMA SchemaName|
        TABLE TableName]
        [-tbs TblSpName \
        [FILE FileName|SEG SegmentName|TABLE TableName]]
        [-schema SchemaName \
        [FILE FileName|SEG SegmentName|TABLE TableName]]

symrdb show -config [-all] [-h] [-v] -type DbType [-db DbName]
```

`symrdb startup`

```
-type Oracle [ [FORCE] [RESTRICT] [PFILE=filename] [QUIET]
               [MOUNT [-db DbName] |
               [ [OPEN | OPEN_READ_ONLY | OPEN_READ_WRITE |
OPEN_READ_WRITE_RECOVER | OPEN_RECOVER]
               [-db DbName] ] | NOMOUNT]] |
               [ [PFILE=FileName] MIGRATE [QUIET]]

-type SqlServer -s instance [-c] [-f] [-m] [-n] [-x]
                        [-p master_file_path] [-e error_log_path]
                        [-l master_log_path] [-g virtual_addr_space]
                        [-t trace_number]

-type Sybase -f runserver_file [-m] [-t delay_time]

-type IBMUDB [-n Node [ADDNODE -u Hostname -p Port
                    [-c Computer] [-nt Netname] [NODE | CATALOG
                    -tsn tablespace_node]] |
               [RESTART [-u hostname] [-p Port] [-nt Netname]] |
               [STANDALONE]]
```

`symrdb shutdown`

```
-type Oracle [ABORT | IMMEDIATE | NORMAL |
              TRANSACTIONAL [LOCAL]]

-type SqlServer -s instance

-type Sybase [-f srvname] [-w <wait|nowait>]

-type IBMUDB [FORCE | DROP] [DROP_ACT | CONTINUE | TERMINATE]
              [-f profile] [-n node]
```

`symrdb stats -type DbType -target DBtarget [-h] [-v]
 [-i Interval] [-c Count]`

DESCRIPTION The `symrdb` command displays SRM information specific to a schema, table, file, tablespace or segment in a database instance. Detailed information can be obtained for tablespaces, schemas, files and tables by specifying the `-v` option with the `list` command or issuing the `show` command.

The `symrdb rdb2cg` and `rdb2dg` commands are used to convert a specified database into a composite group or device group. The `symrdb tbs2cg` and `tbs2dg` commands are used to convert a specified tablespace into a composite group or device group.

For database objects that are defined on Symmetrix devices, you can obtain logical-to-physical information about where the file, table, schema or tablespace extents are mapped on Symmetrix devices.

Note: Not all object types are supported by every RDBMS product. A segment only applies to the Oracle environment. A tablespace does not apply to Sybase.

The `symrdb startup` and `shutdown` commands allow the user to startup and shutdown the database manager instance on the client side. The supported platforms include Oracle, SQLServer, Sybase, and IBM DB2/UDB.

Note: The `startup` and `shutdown` commands do not support Informix databases.

Refer to the *EMC Solutions Enabler Support Matrix* for the list of supported platforms and versions.

Table 1-3 lists the environment variables that you can set to eliminate the repetition of arguments or options in your command line sequences. These are particularly useful when you are about to apply multiple database calls.

Table 1-3 Database Environment Variables

Variable Name	Description	Default
SYMCLI_RDB_CONNECT	Specifies a user name, password, and remote service name for a user's relational database account (<i>user/password@service</i>).	None. Must be specified by user.
SYMCLI_RDB_NAME	Specifies the default relational database name (<i>DbName</i>).	NULL

Table 1-3 Database Environment Variables

Variable Name	Description	Default
SYMCLI_RDB_TYPE	Specifies a specific type (<i>DbType</i>) of database: Oracle Informix Exchange SharePoint SQLServer Sybase IBMUDB	NULL
SYMCLI_SCHEMA_NAME	Specifies a relational database schema name (<i>SchemaName</i>).	NULL
SYMCLI_TBS_NAME	Specifies a relational database tablespace name (<i>TblSpName</i>).	NULL

Note: SYMCLI_RDB_CONNECT must be set with your username and password for you to access the specified database with this command.

For SQL Server, the username and password are not required. In this case, the existing Windows credentials are used from the currently logged-in user. For SQL Server, the service name depends on the type of connection and MSCS configuration. For nontrusted connections, the service name is the ODBC System DSN. For trusted connections, use the SQL Server name, which is the hostname for the default instance, and the hostname/instancename for named instances. For trusted connections with SQL Server running on MSCS, use the virtual SQL Server name for the default instance, and for named instances use the VirtualSQLServerName/instancename.

For Oracle, the database user specified must have one of the following in order to run this utility:

- ◆ "Select any table" privilege (Oracle8i and earlier)
- ◆ SELECT_CATALOG_ROLE (Oracle9i and later)
- ◆ DBA role

If `list` is specified without a key word and neither `-tbs` nor `-schema` are present on the command line, the default is to list the database names. If `-db`, `-tbs`, or `-schema` are present on the command line, the default is to list the tables of the specified database, tablespace, or schema.

Given a database name, you can obtain the following:

- ◆ A list of files defined to make up the database
- ◆ A list of schemas defined within the database
- ◆ A list of tablespaces defined within the database
- ◆ A list of tables defined within the database

Given a database name and tablespace or schema name, you can obtain the following:

- ◆ A list of files that make up the tablespace or schema
- ◆ A list of segments defined within the tablespace or schema
- ◆ A list of tables defined within the tablespace or schema

If a name specified on the command line contains special shell characters, those characters must be escaped with a `\\` back slash (e.g., `$`, `'`, `\\`, etc.).

If `symrdb` is being run in client/server mode and the required RDBMS environment variables are set in the client's environment, they will be sent to the server to be used.

DB2

For more detailed information about configuration values, refer to the *Administration Guide: Performance* or the configuration parameters in the DB2 Information Center.

Sybase DB Mapping

When you run `symrdb` with a Sybase instance and the `OCS-12_0` directory is not located in the `$SYBASE` directory, you need to set `LD_LIBRARY_PATH`, `LIBPATH` or `SHLIB_PATH`, depending whether you are running on SunOS, AIX, or HP-UX. As long as `$SYBASE/OCS-12_0` is the location for the OCS libraries, the API will use this path. The caller can also set the `SYBASE_OCS` environment variable to specify the root directory for OCS.

IBM/UDB Mapping

When you call `symrdb` with an IBM DB2/UDB instance, you need to set `LD_LIBRARY_PATH`, `LIBPATH`, or `SHLIB_PATH`, depending if you are running on Solaris, AIX, or HP-UX.

Sybase, IBM/UDB, and Informix

IBM DB2/UDB, and Informix mapping are only available in the 32-bit SYMCLI kits.

ARGUMENTS**list**

Lists all defined databases for the database instance. For Oracle, the name of the database instance is returned.

list FILE

Lists all defined files for a specified database instance, tablespace, or schema.

list TBS

Lists all defined tablespaces for a specified database instance.

list SCHEMA

Lists all defined schemas for a specified database instance.

list TABLE

Lists all defined tables for a specified database instance, tablespace, or schema.

list SEG

Lists all defined segments for a specified tablespace or schema.

rdb2cg

Translates the devices of a specified database into a composite group.

rdb2dg

Translates the devices of a specified database into a device group.

shutdown -type IBMUDB

Specifies the shutdown options for IBMUDB:

FORCE—Issues the FORCE APPLICATION (ALL) command.

DROP—Drops the node from the `db2nodes.cfg` file.

DROP_ACT—Indicates an initial call.

CONTINUE—Indicates a subsequent call. Continue processing after a prompt.

TERMINATE—Indicates a subsequent call. Terminate processing after a prompt.

profile—The name of the profile.

node—The node number.

`shutdown -type Oracle`

Specifies the shutdown options for Oracle:

ABORT—Proceeds with the fastest possible shutdown. Does not wait for calls to complete or users to disconnect.

IMMEDIATE—Does not wait for current calls to complete, prohibits further connects, and closes and dismounts the database. Finally, shuts down the instance. Does not wait for connected users to disconnect. Does not require instance recovery on next startup.

NORMAL—Waits for currently connected users to disconnect from the database, prohibits further connects, and closes and dismounts the database. Finally, shuts down the instance. Does not require instance recovery on next startup. NORMAL is the default option.

TRANSACTIONAL—Performs shutdown of an instance while minimizing interruption to clients. No client can start a new transaction on the instance.

LOCAL—Specifies a transactional shutdown on the local instance only.

`shutdown -type Sybase`

Specifies the shutdown options for Sybase database, where:

srvname—Specifies the logical name by which the Backup Server is known in the Server's sys.servers system table.

wait—Brings the server down slowly.

nowait—Shuts the server down immediately.

`shutdown -type SqlServer`

Specifies the shutdown options for SQL Server, where *instance* is the instance name to be shut down.

`show`

Shows database names, states pertaining to the connected server, status and usage of each of the databases.

`show FILE`

Shows detailed logical to physical mapping information about a file in the database instance, tablespace, or schema.

`show TBS`

Shows detailed logical to physical mapping information about a tablespace in the database instance.

`show SCHEMA`

Shows detailed logical-to-physical mapping information about a schema in the database instance.

`show TABLE`

Shows detailed logical-to-physical mapping information about a table in a tablespace.

`startup -type IBMUDB`

Specifies the startup options for DB2 databases, where:

ADDNODE—Issue the ADD NODE command.

RESTART—Issue the RESTART DATABASE command.

STANDALONE—Start the node in STANDALONE mode.

NODE—The containers for the temporary table spaces should be the same as those for the specified node.

CATALOG—The containers for the temporary table spaces should be the same as those for the catalog node of each database.

Profile—The name of the profile.

Node—The node number.

Hostname—The system name.

Port —The port number.

Netname—The net name.

tablespace_node—The node number from which the temporary table space definitions should be obtained.

computer— The computer name.

username/password— It is set in the environment variable SYMCLI_RDB_CONNECT. The parameters are mandatory with option ADDNODE on Windows, but is ignored on other operating systems.

```
startup -type Oracle
```

Specifies the startup options for Oracle databases, where:

FileName—To be used while starting up the instance.

DbName—The database name to mount or open. Refer to the Oracle document for the definition.

FORCE—Shuts down the current Oracle instance (if it is running) with the shutdown option ABORT, before restarting it.

RESTRICT—Allows only Oracle users with the RESTRICTED SESSION system privilege to connect to the database.

QUIET—Suppresses the display of the System Global Area information for the starting instance.

MOUNT—Mounts the database but does not open it.

OPEN —Mounts and opens database.

NOMOUNT—Causes the database not to be mounted upon instance startup.

MIGRATE—Starts the database in OPEN MIGRATE mode and sets system initialization parameters to specific values required to enable the database upgrade or downgrade scripts to run.

OPEN_RECOVER— Specifies to open the database, and that media recovery should be performed, if necessary, before starting the instance.

OPEN_READ_ONLY—Specifies READ ONLY to restrict users to read-only transaction, preventing them from generating redo logs.

OPEN_READ_WRITE— Specifies READ WRITE to open the database in read/write mode, allowing users to generate redo logs. This is the default.

OPEN_READ_WRITE_RECOVER— Specifies READ WRITE to open the database in read/write mode, and specifies that media recovery should be performed, if necessary, before starting the instance.

```
startup -type SqlServer
```

Specifies the startup options for SQL Server databases, where:

instance—Instance name to be started.

master_file_path—Master database file.

error_log_path—Error log file.

master_log_path—Master database log file.

virtual_addr_space—Amount of virtual address space in megabytes.

trace_number—Trace number.

-c—Shortens startup time.

-f— Starts an instance with minimal configuration.

-m—Starts an instance in single-user mode.

-n—Does not use the Windows application log to record SQL Server events.

-x—Disables the keeping of CPU time and cache-hit ratio statistics to allow the maximum performance.

```
startup -type Sybase
```

Specifies the startup options for Sybase databases, where:

runserver_file—The absolute path name of a runserver file used as a reference each time you restart a Sybase server.

-m—Starts the database in single-user mode.

delay_time—Estimated time to startup the Sybase server in seconds.

```
stats
```

Shows performance statistics about a specified database (type). The current supported databases are Oracle, SQL Server, Sybase, and IBM DB2/UDB.

tbs2cg

Translates the devices of a specified tablespace into a composite group. Only data database files are translated.

tbs2dg

Translates the devices of a specified tablespace into a device group. Only data database files are translated.

OPTIONS

-all

Displays all the possible database configuration values, when used with `-config`.

-apidb

Creates the composite group only in the SYMAPI database.

-bcv

Adds BCV devices only to the target group.

-blocks

Displays size information in 512-byte blocks.

-c

Specifies the number (count) of times to display statistics. If this option is not specified and an interval (`-i`) is specified, statistics will display continuously.

-cgtype

Specifies the composite group type of devices to be translated.

-collapse

Collapses (if possible) the list of extents within the object (default).

-config

Displays the database configuration value.

-control

Operates on only the *control* database files. The default is all database files.

-data

Operates on only the *data* database files.

-datalog

Displays *data and log* as a separate file type item. The default is to treat *data and log* as file type *data*. This is for Sybase only.

-db

Targets a specific relational database name.

-dgtype

Specifies the device group type of devices to be translated.

-expand

Expands (if possible) the list of extents within the object.

-force

Attempts to force the operation, even though one or more devices in the volume group may already be part of another device or composite group.

-h

Provides brief, online help information.

-i

Indicates the repeat interval in seconds. The default interval is 10 seconds. The minimum interval is 5 seconds.

-kb

Displays size information in kilobytes.

-log

Operates on only the *log* database files.

-mb

Displays size information in megabytes (default).

`-nobcv`

Adds only standard devices to the target group. (The default behavior is to add both standard and BCV devices.)

`-no_extents`

Shows information about the object without the extent information.

`-ppath`

Creates the RDF composite group in PowerPath.

`-R1`

Adds R1 devices to the target device group.

`-R2`

Adds R2 devices to the target device group.

`-rdf_consistency`

Creates a composite group and allows it to be enabled for RDF consistency once devices have been added to the group.

`-RDFG`

Selects RDF devices that belong to the specified Symmetrix RA (RDF) group number.

`-schema`

Restricts the list to a schema name.

`-sid`

Applies a Symmetrix ID as a target for this operation.

-target

Specifies a database statistics output option.

Database Type	Target Metric Supported
Oracle	INSTANCE SESSION FILE ALL
SqlServer	INSTANCE DATABASE OBJECT FILE ALL
Sybase	SERVER OBJECT DEVICE ALL
IBMUDB	DATABASE TABLE TABLESPACE ALL

-tbs

Restricts the list to a tablespace name.

-type

Applies a database type to the command.

Note: Statistics are not available for Informix, Exchange, and SharePoint databases.

-unalloc

Displays unallocated space for Sybase database files only.

-v

Provides a more detailed, verbose listing.

-vdev

Adds VDEVs (virtual devices) to the target group.

PARAMETERS

CgName

The composite group name.

DgName

The device group name.

DbName

A specific database name.

DbTarget

The metrics available for the specified database statistic.

DbType

The database type. Possible values are:

Oracle, SQLServer, Sybase, IBMDB2, Informix, IBMUDB, Exchange, and SharePoint.

Note: Statistics are not available for Informix, Exchange, and SharePoint databases.

FileName

A specific database filename.

GrpNum

An RDF group number.

SchemaName

A specific database schema name.

SegmentName

A specific database segment name.

SymmID

The 12-digit ID of the Symmetrix array.

TableName

A specific database table name.

TblSpName

A specific database tablespace name.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

Before any commands are executed, variable SYMCLI_RDB_CONNECT must be set for database access. For example, to access Scott's database account on remote server acme, enter:

```
setenv SYMCLI_RDB_CONNECT \ "scott/tiger@acme"
```

To list all tables that reside in table space tbl_space1, enter:

```
symrdb -type Oracle -tbs tbl_space1 list TABLE
```

To display a detailed listing of the table name `EMP` that resides in schema `SCOTT`, enter:

```
symrdb -type Oracle -schema SCOTT show TABLE EMP
```

To display a detailed listing of the table name `SYS$TABLE` that resides in tablespace `tbl_space1`, with the extent information in expanded mode, and in megabytes, enter:

```
symrdb -type Oracle -tbs tbl_space1 \  
show TABLE SYS\\$TABLE -expand -mb
```

To define the database name `HR` as the default database name, enter:

```
setenv SYMCLI_RDB_NAME HR
```

To define the database login parameters to be user = `sa`, password = `sa_pass`, and service = `local`, enter:

```
setenv SYMCLI_RDB_CONNECT "sa/sa_pass@local"
```

To list all tablespaces that define database `master`, enter:

```
symrdb -type SQLServer -db master list TBS
```

To list all files that define database `master`, enter:

```
symrdb -type SQLServer -db master list FILE
```

To list all tables that reside in database `master`, enter:

```
symrdb -type SQLServer -db master list TABLE
```

To create a REGULAR device group named `newdg` with only the R1-BCV devices from the SQL Server database named `master`, enter:

```
symrdb -type SQLSERVER -db master rdb2dg newdg \  
-R1 -bcv -dgtype REGULAR
```

To create a composite group named `newcg` with the R1 and R1-BCV devices from the Oracle table space named `tbl_space1`, enter:

```
symrdb -type ORACLE -tbs tbl_space1 tbs2cg newcg \  
-cgtype RDF1 -R1
```

To start up an Oracle data manager with the mode `OPEN READ ONLY`, enter:

```
symrdb startup -type ORACLE OPEN_READ_ONLY
```

To shut down an Oracle data manager with the mode NORMAL, enter:

```
symrdb shutdown -type ORACLE NORMAL
```

To display statistics about a specified database Oracle every 30 seconds for one hour, enter:

```
symrdb stats -type ORACLE -i 30 -c 120 -target SESSION
```

H:M:S	sessionID	memory
A	B	C

Where:

A Time of day

B Session ID

C memory usage per second

Note: All the statistics values are per second.

symrdf

Performs Symmetrix SRDF® ping, control, or modify operations on a device group, composite group, device file, or on a device within a device or composite group. The group must have a type of either RDF1 or RDF2. The command lists all RDF devices, regardless if they are in a group. Performs Dynamic RDF group controls to add, modify, or remove a dynamic RDF group.

SYNTAX

symrdf -h

symrdf [-sid *SymmID*] [-i *Interval*] [-c *Count*]

ping [-rdf]

list [pd|dev] [-v] [-R1|-R2|-both] [-rdfg *GrpNum*] \
 [-bcv|-nobcv] [-resv] [-offline] [-dynamic] \
 [-concurrent] [-consistency] [-rdfa]

Device Groups

symrdf -g *DgName*

[-v|-noecho] [-noprompt] [-force] [-symforce] \
 [-bypass] [-bcv|-rbcv|-brbcv|-all] [-RDFG *GrpNum*] \
 [-i *Interval*] [-c *Count*]

establish [-full] [*LdevName* [*LdevName...*]]

restore [-full] [*LdevName* [*LdevName...*]] [-remote]

split [*LdevName* [*LdevName...*]]

failover [*LdevName* [*LdevName...*]] [-establish]

failback [*LdevName* [*LdevName...*]] [-remote]

suspend [*LdevName* [*LdevName...*]]

resume [*LdevName* [*LdevName...*]]

merge [*LdevName* [*LdevName...*]]

update [-until *InvalidTracks*] [*LdevName* [*LdevName...*]] \
 [-remote]

deletepair

ready [*LdevName* [*LdevName...*]] r1|r2

not ready [*LdevName* [*LdevName...*]] r1|r2

rw_enable [*LdevName* [*LdevName...*]] r1|r2

write_disable [*LdevName* [*LdevName...*]] r1|r2

refresh [*LdevName* [*LdevName...*]] r1|r2

invalidate [*LdevName* [*LdevName...*]] r1|r2

rw_disable [*LdevName* [*LdevName...*]] r2

```

symrdf -g DgName [-v|-noecho] [-noprompt] [-force][-symforce] \
          [-bypass] [-bcv|-all] [-i Interval][-c Count]
swap      [-refresh R1|R2]

symrdf -g DgName [-bcv|-rbcv|-brbcv|-all] [-RDFG GrpNum] \
          [-offline] [-i Interval] [-c Count] [-rdfa]
query     [LdevName [LdevName...]]
verify    [-synchronized |-suspended [-enabled]|
          -susp_offline |-split |-failedover |-updated |
          -syncinprog |-updateinprog |-partitioned |-valid |
          -consistent [LdevName [LdevName...]]

symrdf -g DgName [-v] [-noprompt] [-bcv|-rbcv|-brbcv|-all] [-force] \
          [-bypass] [-i Interval] [-c Count] [-RDFG GrpNum]

set mode sync|semi|acp_disk|acp_wp|acp_off \
          [skew SkewVal] [LdevName [LdevName...]]
set mode sync [-consistent]
set mode async
set domino on|off          [LdevName [LdevName...]]
set acp_skew SkewVal       [LdevName [LdevName...]]
set nr_if_invalid on|off   [LdevName [LdevName...]]

```

Device Group Operations Specific to SRDF/A

```

symrdf -g DgName [-v|-noecho] [-noprompt] [-force] [-symforce] \
          [-bypass] [-bcv|-all] [-i Interval] [-c Count]

enable
disable
failover [-immediate] [-establish]
split    [-immediate]
suspend  [-immediate]

symrdf -g DgName [-bcv|-rbcv|-brbcv|-all] [-RDFG GrpNum] \
          [-offline] [-i Interval] [-c Count] [-rdfa]

checkpoint

```

Composite Groups

```

symrdf -cg CgName [-v|-noecho] [-noprompt] [-force][-symforce] \
          [-bypass] [-i Interval][-c Count] [-sid SymmID] \
          [-bcv |-rbcv |-brbcv] [-RDFG sid:GrpNum,...] \
establish [-full] [LdevName [LdevName...]]
restore   [-full] [-remote][LdevName [LdevName...]]
split     [LdevName [LdevName...]]
failover  [LdevName [LdevName...]]
failback  [-remote][LdevName [LdevName...]]
suspend   [LdevName [LdevName...]]
resume    [LdevName [LdevName...]]
merge     [LdevName [LdevName...]]

```



```

update      [-until InvalidTracks] [-remote] [LdevName...]
ready       r1|r2 [LdevName [LdevName...]]
not ready   r1|r2 [LdevName [LdevName...]]
rw_enable   r1|r2 [LdevName [LdevName...]]
write_disable r1|r2 [LdevName [LdevName...]]
refresh     r1|r2 [LdevName [LdevName...]]
invalidate  r1|r2 [LdevName [LdevName...]]
rw_disable  r2 [LdevName [LdevName...]]

symrdfs -cg CgName [-offline] [-i Interval] [-c Count] [-sid SymmID] \
        [-bcv | -rrbcv | -brbcv] [-RDFG sid:GrpNum,...]
query [LdevName [LdevName...]]
verify [-synchronized | -suspended [-enabled] |
        -susp_offline | -split | -failedover | -updated |
        -syncinprog | -updateinprog | -partitioned | -valid |
        -cg_consistent]]
symrdfs -cg CgName [-v] [-noprompt] [-force] [-bcv | -rbcv | -brbcv] \
        [-bypass] [-i Interval] [-c Count] [-sid SymmID] \
        [-RDFG sid:GrpNum,...] \
set mode sync|semi|acp_disk|acp_wp|acp_off [SkewVal]
        [LdevName [LdevName...]]
set mode async
set domino on|off [LdevName [LdevName...]]
set acp_skew SkewVal [LdevName [LdevName...]]
set nr_if_invalid on|off [LdevName [LdevName...]]

```

Composite Group Operations Specific to SRDF/A

```

symrdfs -cg CgName [-v|-noecho] [-noprompt] [-force] [-symforce] \
        [-bcv | -rbcv | -brbcv] [-bypass] [-i Interval] \
        [-c Count] [-sid SymmID] [-RDFG sid:GrpNum,...] \
failover [-immediate] [-establish]
split [-immediate]
suspend [-immediate]

symrdfs -cg CgName [-offline] [-i Interval] [-c Count]
checkpoint

```

Device File

```

symrdfs -file Filename -sid SymmID -RDFG GrpNum [-v|-noecho] \
        [-noprompt] [-force] [-symforce] [-i Interval] [-c Count] \
        [-bypass]
establish [-full] [-remote]
restore [-full] [-remote]
split
failover [-establish]
failback [-remote]
suspend

```

```

resume
merge
update      [-until InvalidTracks] [-remote]
createpair -type <RDF1 | RDF2> -RDFG GrpNum \
            -establish | -restore | -invalidate [R1 | R2] \
            [-g NewDg] [-remote]

deletepair

swap [-refresh R1|R2]

ready          r1|r2
not ready      r1|r2
rw_enable      r1|r2
write_disable  r1|r2
refresh        r1|r2
invalidate     r1|r2
rw_disable     r2

symrdf -file Filename [-sid SymmID] [-RDFG GrpNum] [-offline] \
        [-i Interval][-c Count]

query [-rdfa]

verify [ -synchronized | -suspended [-enabled] |
        -susp_offline | -split | -failedover | -updated |
        -syncinprog | -updateinprog | -partitioned | -valid |
        -consistent ]

symrdf -file Filename -sid SymmID -RDFG GrpNum [-force] \
        [-v] [-noprompt] [-bypass] [-i Interval][-c Count]

set mode semi|acp_disk|acp_wp|acp_off [skew SkewVal]
set mode sync [-consistent]
set mode async
set domino on|off
set acp_skew SkewVal
set nr_if_invalid on|off

```

Device File Operations Specific to SRDF/A

```

symrdf -file Filename -sid SymmID -RDFG GrpNum [-v|-noecho] \
        [-noprompt] [-force] [-symforce] [-i Interval] [-c Count] \
        [-bypass]

enable
disable
split      [-immediate]
failover   [-immediate] [-establish]
suspend    [-immediate]

symrdf -file fileame -sid SymmID -RDFG GrpNum [-offline] \
        [-i Interval] [-c Count]

checkpoint

```

Dynamic Groups

```
symrdf addgrp -label GrpLabel -rdfg GrpNum -sid SymmID \
  -dir Dir -remote_rdfg GrpNum -remote_sid SymmID \
  -remote_dir Dir [-i Interval] [-c Count] \
  [-link_domino] [-remote_link_domino] \
  [-farpoint] [-fibre] [-gige] \
  [-auto_link_recovery] [-remote_auto_link_recovery] \
  [-link_limbo Secs] [-rem_link_limbo Secs]

symrdf modifygrp <-add|-remove> <-rdfg GrpNum|-label GrpLabel> \
  -sid SymmID [-dir Dir] [-remote_dir Dir] \
  [-i Interval] [-c Count]

symrdf removegrp -sid SymmID <-rdfg GrpNum|-label GrpLabel> \
  [-i Interval] [-c Count]
```

DESCRIPTION

The `symrdf` command invokes an RDF operation on a group of remotely mirrored standard devices, or on one remotely mirrored standard device. These operations include establishing (data copy from the source side to the target side), splitting the remotely mirrored pair, restoring (data copy from the target side to the source side), and querying the state of the remotely mirrored pair.

Both the `establish` and `restore` operations can be done fully (entire copy) or incrementally (only changed tracks are synchronized). By default, if the `-full` option is not specified, an incremental establish or restore is attempted.

Note: You cannot perform an establish or restore if the remote pair state is not Split or Suspended.

All these operations can be done on a device or composite group basis, individual device basis, list basis (for more than one device with one command), or device file. For device lists, you can either concatenate the list of device names (*LdevNames*) within the command, or on UNIX only, specify a specific import file that contains the device names. For example, to perform a split operation on multiple devices listed in a file, use the form:

```
symrdf -g DgName split `cat LdevListFile`
```

The file, read by this UNIX command, must have logical device names with one *LdevName* per line. A composite group that has been enabled for remote database consistency is called an RDF consistency group. With dynamic RDF group operations, dynamic RDF groups can be added, modified, and removed.

ARGUMENTS**addgrp**

Creates a Dynamic RDF group.

checkpoint

For SRDF/A-capable devices participating in an active SRDF/A session, the command returns to the caller when the data in the current cycle has been committed to the R2 side. All supplied devices should be in the same SRDF/A session.

createpair

Creates Dynamic RDF pairs between the devices specified in the device file. The Symmetrix ID specified will be the R1 side by default, but can be the R2 side if the `-type RDF2` option is specified.

deletepair

Deletes the Dynamic RDF pairing in the specified device group and changes the device group to a regular device group.

disable

Disables consistency protection for SRDF/A-capable devices.

enable

Enables consistency protection for SRDF/A-capable devices.

establish

Resumes remote mirroring and initiates a data copy from source (R1) side to the target (R2) side. Depending on whether the establish operation is full or incremental, all or only the changed tracks are copied to the target (R2) side.

Write-disables the target devices to their local hosts. Subsequently, for each RDF pair, invalidates all or the needed tracks for the target (R2) side. Finally, a full data copy is started from the source (R1) side to target (R2) side.

This action can only be executed if the standard RDF device(s) in the group have been RDF split or Suspended.

`failback`

Switches data processing back to the source (R1) side.

If the target (R2) is operational, write-disables the devices on the target side to their local hosts, and resumes I/O traffic on the RDF links. Then it write enables the device(s) on the source (R1) side to its/their local hosts.

`failover`

Switches data processing from the source (R1) to the target (R2) side.

If the source (R1) is operational, suspends I/O traffic on the RDF links and write-disables the devices on the source (R1) side to their local hosts. Then, it suspends traffic on the RDF links, and write-enables the device(s) on the target side to its/their local hosts.

`invalidate`

Invalidates the source (R1) device(s) or the target (R2) device(s) so that a full copy can be initiated from the remote mirror.

`list dev`

Lists all RDF devices that are configured on the Symmetrix arrays attached to this host. `dev` is the default name type, which lists the devices using Symmetrix device names.

`list pd`

Lists all RDF devices that are visible to this host. `pd` lists the devices using physical device (host) names.

`modifygrp`

Modifies an existing Dynamic RDF group.

`merge`

Merges the device track tables between the source (R1) side and the target (R2) side for one or all devices in a device group.

`not_ready`

Sets the source (R1) device(s) or the target (R2) device(s) to be RDF Not Ready to their respective local host(s).

ping

Pings one or more Symmetrix arrays. By default, only the remotely connected Symmetrix arrays are pinged through the RDF links.

If the `-rdf` option is specified, an RDF-configured Symmetrix array that is locally attached is pinged via the RDF links. The default is to ping it locally via the I/O channel.

The ping action returns the following unique return codes if all or some of the targeted Symmetrix arrays were successfully pinged:

Code #	Code Symbol and Description
8	CLI_C_NOT_ALL_PINGED
9	CLI_C_NONE_PINGED

query

Returns information about the state of RDF mirroring of one or all device pairs in a device group.

ready

Sets the source (R1) device(s) or the target (R2) device(s) to be RDF Ready to their respective local host(s).

refresh

Marks the source (R1) device(s) or the target (R2) device(s) to refresh from the remote mirror.

removegrp

Removes a Dynamic RDF group.

restore

Resumes remote mirroring and initiates a data copy from the target (R2) side to the source (R1) side. Depends whether the establish operation is full or incremental; all or only the changed tracks are copied to the source (R1) side.

Write-disables the target devices to their local hosts. Subsequently, for each RDF pair, invalidates all or the required tracks for the source (R1) side. Finally, a data copy is started from the target (R2) side to the source (R1) side.

This action can only be executed if the standard RDF devices in the group have been RDF split or suspended.

`resume`

Resumes I/O traffic on the RDF links for the remotely mirrored pair(s) in the group.

`rw_disable`

Disables the source (R1) device(s) or the target (R2) devices to their local hosts.

`rw_enable`

Sets the source (R1) devices or the target (R2) devices to be Read and Write enabled to the local hosts.

`set acp_skew`

Modifies the value of the skew factor for the set adaptive copy mode.

`set domino`

Sets the domino mode of one or more RDF pairs in a device group to be ON or OFF.

`set mode`

Sets the RDF mode for one or more RDF pairs in a device group to be synchronous (`sync`), semi-synchronous (`semi`), adaptive copy - disk mode (`acp_disk`), adaptive copy - write pending mode (`acp_wp`), or turns off the adaptive copy mode (`acp_off`), and sets mode to asynchronous (`async`) for SRDF/A-capable devices.

`set nr_if_invalid`

Sets the Not Ready if Invalid setting to enabled or disabled (ON/OFF) for devices in the device list. When enabled for an R2 device, the device will become Not Ready if there are invalid tracks. Invalid tracks could be either remote invalids on the source (R1) side or target (R2) invalids on the source (R1) side.

`split`

Stops remote mirroring for the RDF pair(s) in the group. For each RDF pair, suspends I/O traffic on the RDF links and write enables the target devices to their local hosts.

Note: This action can only be executed if the remotely mirrored standard device(s) in the group are synchronized.

`suspend`

Suspends I/O traffic on the RDF links for the remotely mirrored pair(s) in the group.

`swap`

Swaps the RDF personality of the RDF device designations of a specified device group. Source R1 device(s) become target R2 device(s) and target R2 device(s) become source R1 device(s).

`update`

Starts an update of the source (R1) side after a failover and while the target(R2) side may still be operational to its local host(s).

`verify`

Verifies whether one RDF device pair or all RDF device pairs in a device group are in the Synchronized state. Optionally, it can verify whether the RDF device pair or all device pairs in a device group are in the Updated state, or in any valid RDF pair state.

The RDF verify action returns the following unique return codes if the verify criteria was not met:

Code #	Code Symbol and Description
4	CLI_C_NOT_ALL_SYNCHRONIZED
5	CLI_C_NONE_SYNCHRONIZED
6	CLI_C_NOT_ALL_UPDATED
7	CLI_C_NONE_UPDATED
14	CLI_C_NOT_ALL_VALID
15	CLI_C_NONE_VALID
31	CLI_C_NOT_ALL_SUSPENDED
32	CLI_C_NONE_SUSPENDED
33	CLI_C_NOT_ALL_FAILED_OVER
34	CLI_C_NONE_FAILED_OVER
35	CLI_C_NOT_ALL_UPDATEINPROG
36	CLI_C_NONE_UPDATEINPROG
37	CLI_C_NOT_ALL_PARTITIONED
38	CLI_C_NONE_PARTITIONED
39	CLI_C_NOT_ALL_ENABLED
40	CLI_C_NONE_ENABLED
41	CLI_C_NOT_ALL_SYNCHRONIZED_AND_ENABLED
42	CLI_C_NONE_SYNCHRONIZED_AND_ENABLED
43	CLI_C_NOT_ALL_SUSP_AND_ENABLED
44	CLI_C_NONE_SUSP_AND_ENABLED
45	CLI_C_NOT_ALL_SUSP_AND_OFFLINE
46	CLI_C_NONE_SUSP_AND_OFFLINE
70	CLI_C_NOT_ALL_CONSISTENT
71	CLI_C_NONE_CONSISTENT

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

write_disable

Write-disables the source (R1) devices or the target (R2) devices to their local hosts.

OPTIONS

-add

Adds supporting RDF directors to a Dynamic RDF group.

-all

Targets the SRDF action to all devices in the device group: standard RDF devices and locally attached BCV RDF devices.

This option is only supported for device group operations and for list operations.

-auto_link_recovery

Enables auto-link recovery locally.

-bcv

Targets the SRDF action at the specified locally associated BCV device(s) that are configured as RDF Hop 1 BCV devices.

-brbcv

Targets the SRDF action at the specified remotely associated RDF (Hop 2) BCV devices that can be paired with the remote mirrors of the local BCV devices.

-bypass

Bypasses any existing Symmetrix exclusive locks during the SRDF operation.



CAUTION

Use this option ONLY if you are SURE that no other SRDF operation is in progress in either the local and/or remote Symmetrix arrays.

`-c`

Specifies the number (count) of times to display or to acquire an exclusive locks on the Symmetrix host database, the local Symmetrix array, and the remote Symmetrix arrays. If this option is not specified and an interval (`-i`) is specified, the program will loop continuously to display, or until RDF control or set operation starts.

`-cg`

Applies a composite group name to the operation.

`-cg_consistent`

Verifies that the RDF enabled composite group is consistent across the entire composite group.

`-concurrent`

Confines the list to devices configured as concurrent RDF.

`-consistency`

Displays the RDF consistency state when listing RDF devices.

`-consistent`

Verifies that the R2 mirror of SRDF/A device pairs are in the consistent RDF pair state. When used with `set mode sync`, transition from `async` to `sync` mode will be consistent.

`-dir`

Specifies a comma-separated list of local Symmetrix directors, such as 1a, 1b, etc.

`-dynamic`

Confines the list to just Dynamic RDF devices.

`-enabled`

Verifies whether the RDF device pair(s) are in the Enabled Consistency state.

-establish

When used with `createpair` option, begins a full copy from the source to the target, synchronizing the dynamic RDF pairs in the device file.

When used with the `failover` option, swaps the personality of dynamic RDF pairs and initiates an incremental establish.

-failedover

Verifies whether the RDF device pairs are in the Failed Over state.

-farpoint

Uses the FarPoint communication protocol.

-fibre

Uses the Fibre Channel communication protocol.

-file

Specifies a device file for RDF operations. Device pairs are a standard device number on the specified Symmetrix ID, and a standard device on the remote Symmetrix array accessible by the specified RA group.

-force

Attempts to force the operation even though one or more devices in the device group may not be in the normal, expected state(s) or the specified operation.

-full

Requests a full establish or restore operation. If this option is not specified, an incremental establish or restore is attempted.

-g

Applies a device group name to the operation. For `createpair`, the device group will be created with the devices in the device file.

-gige

Uses the Gigabit Ethernet protocol.

-h

Provides brief, online help information.

-i

Specifies the repeat interval, in seconds, to display or to acquire an exclusive locks on the Symmetrix host database, the local Symmetrix array, and the remote Symmetrix arrays. The default interval is 10 seconds. The minimum interval is 5 seconds.

-immediate

Applies only to SRDF/A-capable devices. Causes the SRDF/A session to be dropped immediately if a failover, split, or suspend operation is requested.

-invalidate

Marks the (R1) device(s) or the (R2) device(s) in the list to be invalidated for a full copy when an RDF pair is created.

-label

Specifies the label for a Dynamic RDF group.

-link_domino

Enables local link domino.

-link_limbo

This option is for advanced users only. Specifies a link limbo period (range is 0-120 seconds). This period specifies the length of time for Enginuity to wait from the point of link-down-detection before actually updating the link status as down. If the link status is still sensed as Not Ready after the link limbo time expires, devices then are then marked Not Ready to the link. Default time is 10 seconds.

-nobcv

Lists standard SRDF devices only (excludes RDF BCV devices).

-noecho

Does not echo to the screen the progress status of the RDF action.

-noprompt

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

-offline

Makes the Symmetrix array data connection offline from the host in-memory database for this action.

-partitioned

Verifies whether the RDF device pairs are in the Partitioned state.

-R1

Lists RDF1 (R1) devices only.

-R2

Lists RDF2 (R2) devices only.

-rbcv

Targets the SRDF action at the specified remotely associated RDF (Hop 2) BCV devices that can be paired with the remote mirrors of the local standard devices.

-rdf

Pings the specified Symmetrix array via the RDF links even though it may be also attached locally to the host.

-rdfa

Lists or queries only devices that are SRDF/A-capable.

-RDFG

Applies a Symmetrix RDF (RA) group number to the command to restrict the list to just the RDF devices of an RDF group. When used with control, modify, and query actions, this option targets a specific RDF group number or ALL when devices are configured as RDF concurrent.

For composite groups the format is *sid:GrpNum,sid:GrpNum*. There can be multiple combinations, separated by commas.

-refresh

Marks the source R1 device(s) or the target R2 device(s) to refresh from the remote mirror after a swap operation.

-remote

Requests a remote data copy with the `failback`, `restore`, and `update` actions. When the concurrent link is Ready, data will also be copied to the concurrent RDF mirror. These operations require the remote data copy option for the concurrent link to be suspended.

When used with the `createpair` action, converts a dynamic R1 device to a concurrent RDF device by dynamically adding a second remote mirror.

-remote_auto_link_recovery

Enables auto-link recovery remotely.

-remote_dir

Specifies a comma-separated list of remote Symmetrix directors, such as 1a, 1b, etc.

-remote_link_domino

Enables link domino remotely.

-remote_link_limbo

This option is for advanced users only. Specifies a remote link limbo period (range is 0-120 seconds). This period specifies the length of time for Enginuity to wait from the point of remote-link-down-detection before actually updating the remote link status as down. If the remote link status is still sensed as Not Ready after the link limbo time expires, devices are then marked Not Ready to the remote link. Default time is 10 seconds.

-remote_rdfg

Specifies the RDF group number for a remote Symmetrix array.

-remote_sid

Specifies the remote Symmetrix array's unique ID.

-remove

Removes supporting RDF directors from a Dynamic RDF group.

-restore

Begins a full copy from the target to the source, synchronizing the dynamic RDF pairs in the device file.

-resv

Lists all Symmetrix devices that are visible to this host and that have SCSI reservations.

-sid

Limits listing of Symmetrix devices visible to this host to ones that belong to the specified Symmetrix array.

-split

Verifies whether the RDF device pairs are in the Split state.

-suspended

Verifies whether the RDF device pairs are in the Suspended state.

-susp_offline

Verifies whether the RDF device pairs are in the Suspended state and the SRDF link is Offline.

-symforce

Requests that the Symmetrix array force the operation to occur that overrides instances where they are normally rejected.



CAUTION

Use care when applying this option as data could be lost or corrupted. Use of this option is not recommended, except in an emergency.

To enable the -symforce option for RDF use, a parameter called SYMAPI_ALLOW_RDF_SYMFORCE in the options file must be set to TRUE.

With `-symforce`, a split command will execute on an RDF pair, even when they are in a Sync in Progress or Restore in Progress state. During the execution of an establish or restore command, `-symforce` will inhibit the verification of valid tracks on the device at the source.

`-synchronized`

Verifies whether the RDF device pairs are in the Synchronized state.

`-syncinprog`

Verifies whether the RDF device pairs are in the SyncInProgress state.

`-type`

When creating RDF devices, indicates the RDF type of the devices in the Symmetrix ID specified (RDF1 or RDF2).

`-until`

Used with the `update` argument ; identifies a number of invalid tracks that are allowed to build up from the active R2 local I/O before another update (R2 to R1 copy) is retriggered. This allows continuous R1 updates to occur every time the invalid track threshold is reached on the active R2 side. Note that these update sequences start with an immediate update once this command is started.

`-updated`

Verifies whether the RDF device pairs are in the R1 Updated state.

`-updateinprog`

Verifies whether the RDF device pairs are in the R1 UpdInProgress state.

`-valid`

Verifies whether the RDF device pairs are in a Valid state.

`-v`

Provides a more detailed, verbose listing.

PARAMETERS*CgName*

The composite group name (user-defined and unique to this host).

DgName

The device group name.

Dir

A comma-separated list of Symmetrix directors (such as 1a, 1b, etc.).

GrpNum

The RDF (RA) group number for `-rdfg`. Possible values are *nn* | ALL. The value ALL specifies all RDF groups.

Filename

The device file name.

GrpLabel

The Dynamic RDF group label.

LdevName

The logical device name, such as DEV002.

PdevName

The hostname for the physical device, such as
`/dev/rdisk/c2t0d2s3`.

R1

The operation is targeted at the local SRDF device, known as the source (R1) device.

R2

The operation is targeted at the remote SRDF device, known as the target (R2) device.

SkewVal

The skew factor for the adaptive copy mode. Possible values range from 0 to 65534 tracks. For devices larger than a 2 GB capacity drive, a value of 65,535 can be specified to target all the tracks of any given drive.

SymmID

The 12-digit ID of the Symmetrix array.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To create an RDF R1 device group called `prod`, enter:

```
symdg create prod -type RDF1
```

To add an RDF R1 device, `acct1`, to the device group `prod`, enter:

```
symld -g prod add dev 0006 acct1
```

To fully establish standard device `acct1` (fully copy the R1 mirror to the R2 mirror) in group `prodDB`, enter:

```
symrdf -g prodDB establish -full acct1
```

To split all standard RDF devices in group `prod`, enter:

```
symrdf -g prod split
```

To perform an incremental restore from the R2 target side to the R1 source side for the RDF pair `acct1` in group `prodDB`, enter:

```
symrdf -g prodDB restore acct1
```

To query information about all RDF standard devices in group `prodDB`, enter:

```
symrdf -g prodDB query
```

To invoke a failover operation on multiple logical RDF devices (DEV001, DEV002, DEV010, and DEV011) in group `prodDB`, enter:

```
symrdf -g prodDB failover DEV001 \
                           DEV002 \
                           DEV010 \
                           DEV011
```

For UNIX only, to invoke a failover operation on multiple logical RDF devices in group `ProdDB` that are listed in a separate file (`yourldevlist`), enter:

```
symrdf -g ProdDB failover `cat yourldevlist`
```

In this UNIX example, the imported file has the exact same logical device name listing and format as shown in the previous example.

The following example creates an SRDF Dynamic RDF pair executed from a file called devices. The devices file contains Symmetrix device names that will constitute the dynamic pairs. The local source Symmetrix is sid 810.

```
symrdf createpair -g ProdDB -file devices -sid 810  
-rdfg 2 -invalidate r2 -nop -type RDF1
```

Communication is via RDF group 2. The `-invalidate` option indicates that the R2 devices are the targets that will be refreshed from the R1 source devices.

The device file syntax contains 2 columns. R1 devices are listed in the first column and R2 devices on the remote system are listed in the second column as follows:

```
010A  00B7  
010F  00BF  
0106  00C5
```

To delete the RDF created pair, enter:

```
symrdf deletepair -g ProdDB -rdfg 2
```

symreplicate

Performs automated consistent replication of data via BCV pairs and over SRDF links.

SYNTAX

symreplicate -h

```

start [-g DgName | -cg CgName] -options OptionFile \
      [-sid SymmID] [-log LogFile] [-noprompt]\
      [-preaction ScriptFile] [-postaction ScriptFile]\
      [-foreground] [-recover] \
      [-postcycle ScriptFile] [-steperror ScriptFile]\
      [-vxfs MountPoint... |
      -ppath <STDDEVS|PowerPathPdevName...> |
      -rdb -dbtype DbType [-db DbName] |
      -consistent]\
      [-setup [-optimize | -optimize_rag | -exact]]

setup  [-g DgName | -cg CgName] -options OptionFile \
      [-optimize | -optimize_rag | -exact]\
      [-foreground] [-noprompt] [-recover]

stop   [-g DgName | -cg CgName | -log LogFile] [-noprompt]\
      [-sid SymmID] [-step]

restart [-g DgName | -cg CgName | -log LogFile] [-noprompt]\
      [-foreground] [-options OptionFile] [-recover]\
      [-sid SymmID]

query  [-g DgName | -cg CgName | -log LogFile] [-sid SymmID]\
      [-i Interval] [-c Count]

show   [-g DgName | -cg CgName | -log LogFile] [-sid SymmID]\
      [-args] [-devs] [-opts] [-all]

list   [-sid SymmID] [-sort Field]

delete [-sid SymmID] [-log LogFile]

release [-g DgName | -cg CgName | -log LogFile] [-sid SymmID]
      [-force]

```

DESCRIPTION Following a path over SRDF links and cascading via BCVs, the symreplicate command performs automated incremental data copies of the standard device. By default, the replication process is performed in the background. symreplicate supports both single-

and multi-hop SRDF configurations. You can start, stop, or restart a replicate session.

If the replicate session should unexpectedly terminate due to a system crash, you may need to manually release the locks. For more information on locks, refer to the *EMC Solutions Enabler Symmetrix Base Management CLI Product Guide*.

ARGUMENTS

`delete`

Deletes the `symreplicate` log files written to the Symmetrix file system. Requires either the `-log` or `-g` option.

`list`

Lists the `symreplicate` log files written to the Symmetrix file system.

`query`

Returns the status of a current replicate session.

`release`

Releases device locks that are still held from a terminated `symreplicate` session.

`restart`

Restarts a terminated replicate session at the point where it was stopped.

`setup`

Places all devices into the initial state, then waits you start the replication session.

`show`

Displays the information contained in the `symreplicate` log file. Requires either the `-log` or `-g` option.

`start`

Starts a new replicate session.

`stop`

Stops the existing replicate session.

OPTIONS

-all

The default option for the `show` command. Displays all available information including the arguments, devices, and options in the `symreplicate` session.

-args

Used with the `show` command. Displays information about the command line arguments used to begin the `symreplicate` session.

-c

Specifies the number (count) of times to display. If this option is not specified and an interval (`-i`) is specified, the program will loop continuously to display or to start the mirroring operation. When no interval (`-i`) is specified, it uses a default of 10 seconds.

-cg

Applies a composite group name to the command.

-consistent

Consistently splits all of the BCV pairs on the local Symmetrix array for a typical SRDF configuration, or on the Hop 1 remote Symmetrix array for a multi hop configuration. Requires a TimeFinder/CG license and Engenuity Version 5x67 or higher.

-db

Specifies the relational database name (not required for Oracle) used with consistent instant splits.

-dbtype

Specifies a relational database type used with a consistent instant split (refer to the parameter *DbType*).

-devs

Used with the `show` command. Displays devices participating in the `symreplicate` session.

-exact

Causes the setup to split all STDs and BCVs exactly as they appear (or associated/ added) in the group. Used only with the `setup` argument or option.

-force

Force option. Valid for a release action only.

-foreground

Makes the replicate process run in the foreground (background is the default). (Does not apply to Windows platforms.)

-g

Applies the device group name to the command.

-h

Provides brief, online help information.

-i

Specifies the interval of time (in seconds) to repeat the query commands before the action finds and reports the pairs fully synchronized. Used with the `query` action.

-log

Specifies a log file (defined by the user) that is used internally by `symreplicate`.

-noprompt

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

-optimize

Causes the setup to split all pairs and perform an optimized STD-BCV pairing within the Symmetrix array. Used only with the `-setup` option.

-optimize_rag

Causes the setup to split all pairs and perform an optimized STD-BCV pairing within the Symmetrix RA groups. Used only with the `-setup` option.

-options

Specifies an option file that specifies required parameters of the replicate behavior. (Not all these parameters are optional as some are required to properly perform your replicate session.)

-opts

Displays options from the `symreplicate` options file that were used to start the `symreplicate` session. Used with the `show` command.

-postaction

Applies a script as a post-action to the instant split operation.

-postcycle

Specifies a script file to be performed after each replication cycle. Information about the completed cycle is provided through the following command line arguments:

P1=Device group name

P2=Current cycle number

P3=Number of cycles (*NumCycles*, refer to *Symreplicate FILE PARAMETERS* on page 1-292)

P4=Cycle duration in seconds

Note: The `-postcycle` option is not available on all platforms.

-ppath

Applies a list of one or more PowerPath devices for which I/O is to suspend just before the instant split action is performed and resumed (as soon as the foreground split portion completes).

As an alternative to specific PowerPath device names, you can specify `STDDEVS` that targets all standard devices in the replication session.

-preaction

Applies a script as a pre-action to the instant split operation.

-rdb

For consistent split actions. Indicates that the device I/O of the specified database will be frozen just before the instant split is performed and thawed as soon as the foreground split completes.

The host physical devices where the database resides must be PowerPath devices.

-recover

Recovers locked devices. Under certain circumstances, `symreplicate` may exit with devices left in a locked state. This may happen when an RDF link goes down unexpectedly. `symreplicate` will not be able to start (or restart) after the link is brought back up because of the locked devices. When this situation is detected, `symreplicate` will suggest that you use the `-recover` option to recover the locked devices so that you are not required to manually release the device locks. Use this option with caution and ensure that no other `symreplicate` session is currently running that uses the same devices.

-setup

Performs the necessary steps to place devices in the initial state before replication begins.

-sid

Specifies the Symmetrix ID of the array where the `symreplicate` log file is written. The specified Symmetrix array must be running Enginuity Version 5669 or higher.

-sort

Specifies how the `symreplicate` log filenames are to be sorted, either by name or type. The default is to sort by name.

-step

Used with the stop action. Stops the replication session after the current execution step completes. Otherwise, the session will stop at the end of a complete copy cycle.

-steperror

Specifies a script file to be performed when `symreplicate` encounters an error during normal cycling. This script file takes effect after a `symreplicate` session has been successfully launched. Diagnostic information about the error is provided through the following command line arguments:

P1=Device group name

P2=Current cycle number

P3=Number of cycles (*NumCycles*, refer to *Symreplicate FILE PARAMETERS* on page 1-292)

P4=Cycle duration in seconds

P5=Step number at which the error occurred

P6=Text message describing when the error occurred. Details about the error are written to the SYMAPI log file.

This option does not replace the necessity to check for a nonzero exit status from `symreplicate`. Errors that occur before the `symreplicate` session is launched do not cause the script to execute.

Note: The `-steperror` option is not available on all platforms.

-vxfs

For consistent splits. Specifies a list (for Solaris and HP-UX hosts only) of one or more VERITAS VxFS file system mount points. The file systems mounted on this host will be frozen just before the instant split is performed and thawed as soon as the foreground split completes.

PARAMETERS*CgName*

The composite group name (user-defined to span Symmetrix arrays and RA groups).

DbName

The relational database name.

DbType

The relational database type.

Oracle
 SQLServer
 IBMUDB

DgName

The device group name (user-defined and unique to this host).

Field

The field to use when sorting the filenames. Valid fields are *name* and *type*.

LogFile

The filename and path of an internal log file belonging to the user.

OptionFile

The name of the text file that contains required parameters of the replicate behavior.

MountPoint

The file system mount point.

PowerPathPdevName

A PowerPath device name (one or more physical device names can be entered).

ScriptFile

The filename of your pre- or post-action script.

SymmID

The Symmetrix ID.

Symreplicate FILE PARAMETERS

The `symreplicate` file is where you can set and edit required parameter entry lines to control the replicate behavior. The following are possible parameter entries and values for the options file:

`SYMCLI_REPLICATE_HOP_TYPE=RepType`

Defines your configured environment in which to operate the data replication session. This parameter is not optional and must be specified. Possible *RepType* values are:

SINGLE — Single-hop configuration

MULTI — Multi-hop configuration

`SYMCLI_REPLICATE_USE_FINAL_BCV=TRUE|FALSE`

Indicates whether to update the BCV in the final (last) remote Symmetrix array (for multi-hop only) with a replicate data copy (`TRUE` is the default). If the option is set to `FALSE`, the second hop BCV devices will be omitted.

`SYMCLI_REPLICATE_PROTECT_BCVS=NONE|BOTH|LOCAL|REMOTE`

By default (`NONE`), establishes BCV-STD pairs without the protective establish behavior, relating to two-way mirrored BCV devices. When set to just `LOCAL` or just `REMOTE`, it causes the two mirrors of the BCV to be moved or joined to the standard device. When set to `BOTH`, both the local BCV mirrors and the remote BCV mirrors get joined to their standard device.

`SYMCLI_REPLICATE_CYCLE=CycleTime`

Defines the period to wait between copy operations in total *minutes* or in an *hours:minutes (hh:mm)* format.

`SYMCLI_REPLICATE_CYCLE_DELAY=Delay`

Specifies the minimum time to wait between adjacent cycles. Even if a cycle overruns the specified *CycleTime* and *OvfMethod* is set to `IMMEDIATE` when *Delay* is specified, the session waits this delay time before beginning another cycle.

`SYMCLI_REPLICATE_NUM_CYCLES=NumCycles`

The *NumCycles* value is the number of cycles to perform before exiting. If you specify a value of zero, the replicate session cycles forever. The *NumCycles* default value is zero.

`SYMCLI_REPLICATE_CYCLE_OVERFLOW=OvfMethod`

Describes what to do if the cycle overruns the specified *CycleTime*. Possible *OvfMethod* values are:

`IMMEDIATE` — Begins next cycle immediately (the default)

`NEXT` — Skips this copy cycle and wait for the next to begin

`SYMCLI_REPLICATE_LOG_STEP=TRUE|FALSE`

When set to `TRUE`, writes a log entry to the SYMAPI log file after each step of the `symreplicate` cycle is completed. The entry displays the time that the step ended and whether the step was successful.

`SYMCLI_REPLICATE_GEN_TIME_LIMIT=<TimeLimit>`

Indicates how long errors of a general nature should be retried (for example, attempting to acquire a Symmetrix array lock). Currently, the general *TimeLimit* only applies when initiating an RDF split or establish operation. The default general *TimeLimit* is 00:30 if not specified.

The *TimeLimit* value enables you to control how long `symreplicate` retries certain types of operations. *TimeLimit* must be specified using one of the following formats:

hh:mm — Specifies the number of hours and minutes

sss — Specifies the number of seconds

A *TimeLimit* specified as zero (0) indicates that no time limit applies, causing the operation to be retried indefinitely.

`SYMCLI_REPLICATE_RDF_TIME_LIMIT=<TimeLimit>`

Indicates how long to wait for RDF devices to enter a specific state. For example, after successfully issuing the command to establish an R2 BCV device with the corresponding R1 standard device, `symreplicate` waits the indicated length of time for the devices to become synchronized. The default RDF *TimeLimit* is 04:00 if not specified.

`SYMCLI_REPLICATE_BCV_TIME_LIMIT=<TimeLimit>`

Indicates how long to wait for BCV devices to enter a specific state. For example, after successfully issuing the command to establish a BCV device with the corresponding standard device, `symreplicate` waits the indicated length of time for the devices to become synchronized. The default BCV *TimeLimit* is 02:00 if not specified.

`SYMCLI_REPLICATE_GEN_SLEEP_TIME=<SleepTime>`

Indicates how long `symreplicate` should sleep before retrying a general operation (for example, attempting to acquire a Symmetrix array lock). Currently, the general *SleepTime* only applies when initiating an RDF split or establish operation. The default general *SleepTime* is 10 seconds if not specified.

The *SleepTime* value enables you to control how long `symreplicate` sleeps before retrying certain types of operations. *SleepTime* must be specified using one of the following formats:

hh:mm — Specifies the number of hours and minutes

sss — Specifies the number of seconds

A *SleepTime* must be specified as greater than zero (0).

`SYMCLI_REPLICATE_RDF_SLEEP_TIME=<SleepTime>`

Indicates the minimum length of time that `symreplicate` should sleep before retrying an RDF device operation. For example, after issuing the command to establish an R2 BCV device with the corresponding R1 standard device, `symreplicate` sleeps the indicated length of time before retrying the operation. The default RDF *SleepTime* is 15 seconds if not specified.

`SYMCLI_REPLICATE_BCV_SLEEP_TIME=<SleepTime>`

Indicates the minimum length of time that `symreplicate` should sleep before retrying a BCV device operation. For example, after issuing the command to establish a BCV device with the corresponding standard device, `symreplicate` sleeps the indicated length of time before retrying the operation. The default BCV *SleepTime* is 10 seconds if not specified.

`SYMCLI_REPLICATE_MAX_BCV_SLEEP_TIME_FACTOR=<Factor>`

Provides a way to specify the maximum time that `symreplicate` sleeps before checking again to see if BCV devices have entered a specific state. The product of this value multiplied by the sleep time gives the maximum time that `symreplicate` sleeps. The factor is specified using a nonzero integer. If not specified, the default factor is 3.

By default, `symreplicate` sleeps between 10 and 30 seconds when checking on the state of BCV devices, up to a maximum time of 2 hours.

`SYMCLI_REPLICATE_MAX_RDF_SLEEP_TIME_FACTOR=<Factor>`

Provides a way to specify the maximum time that `symreplicate` sleeps before checking again to see if RDF devices have entered a specific state. The product of this value multiplied by the sleep time gives the maximum time that `symreplicate` sleeps. The factor is specified using a nonzero integer. If not specified, the default factor is 4.

By default, `symreplicate` sleeps between 15 and 60 seconds when checking on the state of RDF devices, up to a maximum time of 4 hours.

`SYMCLI_REPLICATE_PROTECT_BCVS=<Protection>`

Indicates how `symreplicate` should perform the TimeFinder establishes when two-way mirrored BCV devices are used. If specified, all mirrors of the specified BCV devices join with the mirrors of the standard device. You may specify one of the following values:

NONE	Performs a normal TimeFinder establish (default).
LOCAL	Performs a protected BCV establish for the local devices only in a single hop configuration.
FIRST_HOP	Performs a protected BCV establish for the first hop devices only in a multi-hop configuration.
REMOTE	Performs a protected BCV establish for the remote devices only in a single hop configuration.
SECOND_HOP	Performs a protected BCV establish for the second hop devices only in a multi-hop configuration.
BOTH	Performs a protected BCV establish for both the local and remote devices (single hop) or the first and second hop devices (multi-hop).

Option File Format

The options file should conform to the following syntax example, where the desired value is entered for the italicized text. Lines beginning with a "#" (comment) are ignored by SYMCLI.

```
#Comment
SYMCLI_REPLICATE_HOP_TYPE=<RepType>
SYMCLI_REPLICATE_CYCLE=<CycleTime>
SYMCLI_REPLICATE_CYCLE_OVERFLOW=<OvfMethod>
SYMCLI_REPLICATE_CYCLE_DELAY=<Delay>
SYMCLI_REPLICATE_NUM_CYCLES=<NumCycles>
SYMCLI_REPLICATE_USE_FINAL_BCV=<TRUE|FALSE>
SYMCLI_REPLICATE_LOG_STEP=<TRUE|FALSE>
SYMCLI_REPLICATE_GEN_TIME_LIMIT=<TimeLimit>
SYMCLI_REPLICATE_GEN_SLEEP_TIME=<SleepTime>
SYMCLI_REPLICATE_RDF_TIME_LIMIT=<TimeLimit>
SYMCLI_REPLICATE_RDF_SLEEP_TIME=<SleepTime>
SYMCLI_REPLICATE_BCV_TIME_LIMIT=<TimeLimit>
SYMCLI_REPLICATE_BCV_SLEEP_TIME=<SleepTime>
SYMCLI_REPLICATE_MAX_BCV_SLEEP_TIME_FACTOR=<Factor>
```



```
SYMCLI_REPLICATE_MAX_RDF_SLEEP_TIME_FACTOR=<Factor>
SYMCLI_REPLICATE_PROTECT_BCVS=<Protection>
```

Note that for proper session behavior, either a *CycleTime* or a *Delay* time nonzero value should be specified, even though their default values are zero. The *RepType* must be specified.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To start a replicate session for device group newdg with parameters in options file `opt.txt`, enter:

```
symreplicate -g newdg start -options opt.txt
```

where file `opt.txt` contains the following parameters and comment lines:

```
#Copy the data in a single hop setup...
SYMCLI_REPLICATE_HOP_TYPE=SINGLE

#...every 15 minutes
SYMCLI_REPLICATE_CYCLE=15

#...or as often as possible, if 15 minutes isn't enough
SYMCLI_REPLICATE_CYCLE_OVERFLOW=IMMEDIATE
```

To query the status of the above session, enter:

```
symreplicate -g newdg query
```

To terminate the session, enter:

```
symreplicate -g newdg stop
```

To resume the replicate session, enter:

```
symreplicate -g newdg restart
```

symreturn

Indicates a return value within pre-action and post-action scripts.

SYNTAX `symreturn [-h] [<return code>]`

DESCRIPTION `symreturn` is the suggested method of exiting a command script used by the `symmir -instant split` command.

The command script is specified as an argument to the `-preaction` or `-postaction` option to the `symmir` command.

ARGUMENTS `<return code>`

A return code can be supplied to indicate a success or failure result code from the script. If no return code is supplied, a success is assumed.

The return code can be user-defined to indicate a unique error condition that might occur in a specific situation during script processing.

OPTIONS `-h`

Provides brief, online help information.

RETURN CODES Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES To exit the script with a successful return code, enter:

```
symreturn 0
```

symrslv

Displays logical-to-physical mapping information about a logical object that is stored on a disk.

SYNTAX

```
symrslv -h

symrslv [-version] [-kb|-blocks|-mb]
        [-no_extents|-expand|-pdev_extents]

pd PdevName

lv LvolName -g VgName [-stripe_column]
    [-type VgType]

file FileName [-collapse|-phys_collapse]

dir Directory

fs MountPoint
```

DESCRIPTION

The `symrslv` command displays detailed logical-to-physical mapping information about a disk storage object. Specifically, it provides detail concerning the physical extents of these objects. The object types supported are:

- ◆ Physical devices
- ◆ Logical volumes
- ◆ Regular files (in file systems mounted on physical devices)
- ◆ Regular files (in file systems mounted on logical volumes of a logical volume manager)
- ◆ Directories
- ◆ File systems

Note: VERITAS Quick I/O devices (or the symbolic links to them) are treated like physical devices by `symrslv` and require the `pd` argument.

The `-collapse` flag is applicable to files that reside on file systems that are mounted on a striped or RAID 5 LVM mirror. This collapse is a logical collapse, meaning the data can be reconstructed with the metadata returned. The `phys_collapse` flag causes a physical collapse, which means that the data cannot be reconstructed with the metadata returned.

In the lists of mirror physical extents and mirrored physical devices for the disk storage object, CLARiiON devices are distinguished from other device types by a (C) indicator.

symrslv on Windows 2000

On Windows 2000, `symrslv` does not support files stored on NT DiskAdmin logical volumes.

On Windows 2000, `symrslv` does not support directories or system files like `PAGEFILE.SYS`.

ARGUMENTS

None.

MODIFIERS

The following are command modifiers:

`dir`

Applies the command to a regular host directory name.

`file`

Applies the command to a regular host filename.

`fs`

Applies the command to a specific file-system mount point.

`lv`

Applies the command to a logical volume name of a logical volume manager.

`pd`

Applies the command to a physical device name.

OPTIONS

`-blocks`

Displays size information in 512-byte blocks.

`-collapse`

Displays the file information with extent data collapsed (when possible). Particularly, in striped or RAID 5 environments, the collapse behavior filters out the extents in the output list that are physically contiguous and logically consistent.

`-expand`

Expands (if possible) the extent information about the specified object (the default is to collapse the listing).

`-g`

Applies the command to a volume group name of a logical volume manager.

`-h`

Provides brief, online help information.

`-kb`

Displays size information in kilobytes.

`-mb`

Displays size information in megabytes (default).

`-no_extents`

Shows information about the object without the extent information.

`-pdev_extents`

Shows information about Pdev-level extents only (without showing the underlying meta device configuration).

`-phys_collapse`

Physically collapses the extent (where possible).

`-stripe_column`

Displays the extent's stripe column number on the striped volume.

`-type`

Targets a specific logical volume group type.

`-version`

Displays SYMAPI build and runtime versions.

PARAMETERS*Directory*

A specific directory name.

FileName

A specific filename.

LvolName

A specific logical volume name.

MountPoint

A specific file-system mount point.

PdevName

A specific physical device name.

VgName

A specific volume group name.

VgType

A specific logical volume group type. Possible values are:

DEFAULT

AIX_LVM

AIX_VXVM

AS400_LVM

DYNIX_SVM

EMC_PVM

LINUX_LVM

LINUX_VXVM

HP_LVM

HP_VXVM

NT_DISKADM

NT_LDM

OSF1_LSM

SUN_VXVM

SUN_SOLSTICE

Note: On the AS/400 platform, only the `lv` and `pd` arguments are supported.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To display the physical extent information in kilobytes about the physical device `/dev/rdisk/c2t0d2s2`, enter:

```
symrslv -kb pd /dev/rdisk/c2t0d2s2
```

To display the physical extent information in blocks about logical volume `lv011` in volume group `ProdVG`, enter:

```
symrslv -blocks -g ProdVG lv lv011
```

To display the physical extent information in megabytes about file `accounts_hr`, enter:

```
symrslv -mb file accounts_hr
```

To display the physical extent information in megabytes about the file system with mount point `/`, enter:

```
symrslv -mb fs /
```

To display the physical extent information in blocks about directory `/usr`, enter:

```
symrslv -blocks dir /usr
```

symsnap

Performs TimeFinder/Snap control operations on a device group, composite group, devices within the group, or on pairs listed in a device file.

SYNTAX

symsnap -h

```
symsnap -g DgName [-v] [-noprompt] [-i Interval] [-c Count]\
[-force] [-preserveTGTLocks -lockid LockNum]\
```

```

create      [-exact] [-bcv] [-skip] [-svp PoolName]
            <[LdevName [VDEV pd PdevName]]>...> |
            <[LdevName [VDEV dev SymDevName]]>...> |
            <[LdevName [VDEV ld LDevName]]>...>

activate    [-not_ready] [-bcv] [-skip]\
            [-preaction ScriptFile] [-postaction ScriptFile]\
            [-vxfs <MountPoint...>]\
            [-consistent]\
            [-ppath <SRCDEVS | PowerPathPdevName...> |
            [-rdb -dbtype DbType [-db DbName] ]
            <<[LdevName [VDEV pd PdevName]]>...> |
            <<[LdevName [VDEV dev SymDevName]]>...> |
            <<[LdevName [VDEV ld LdevName]]>...>

terminate   [-symforce] [-bcv] [-skip] [-restored]
            <<[LdevName [VDEV pd PdevName]>...]> |
            <<[LdevName [VDEV dev SymDevName]>...]> |
            <<[LdevName [VDEV ld LdevName]>...]> |
            <<[LdevName [SYM pd PdevName]>...]> |
            <<[LdevName [SYM dev SymDevName]>...]> |
            <<[LdevName [SYM ld LdevName]>...]> |
            <<[LdevName [BCV pd PdevName]>...]> |
            <<[LdevName [BCV dev SymDevName]>...]> |
            <<[LdevName [BCV ld LdevName]>...]>

restore     [-full [-bcv]] [-not_ready]
            <<[LdevName [VDEV pd PdevName]>...]> |
            <<[LdevName [VDEV dev SymDevName]>...]> |
            <<[LdevName [VDEV ld LdevName]>...]>

```



```

symsnap -g DgName [-offline] [-i Interval] [-c Count] [-bcv]\

    query      [LdevName [LdevName...] [-multi] [-restore]
                [-attach]]

    verify      [-created | -copied | -copyinprog | -copyonwrite |
                -restinprog | -restored]\
                <<[LdevName [VDEV pd PdevName]]>...> |
                <<[LdevName [VDEV dev SymDevName]]>...> |
                <<[LdevName [VDEV ld LdevName]]>...> |
                <<[LdevName [SYM pd PdevName]]>...> |
                <<[LdevName [SYM dev SymDevName]]>...> |
                <<[LdevName [SYM ld LdevName]]>...> |
                <<[LdevName [BCV pd PdevName]]>...> |
                <<[LdevName [BCV dev SymDevName]]>...> |
                <<[LdevName [BCV ld LdevName]]>...>

symsnap -g DgName [-v] [-noprompt] [-i Interval] [-c Count]\

    attach      <<LdevName VDEV pd PdevName>...>
                <<LdevName VDEV dev SymDevName>...>
                <<LdevName VDEV ld LdevName>...>

    detach      <<LdevName VDEV pd PdevName>...>
                <<LdevName VDEV dev SymDevName>...>
                <<LdevName VDEV ld LdevName>...>

symsnap -cg CgName [-v] [-noprompt] [-i Interval] [-c Count]\
                [-force] [-sid SymmID]

    create      [-exact] [-bcv] [-skip] [-svp PoolName]\
                <<[LdevName [VDEV pd PdevName]]>...>
                <<[LdevName [VDEV dev SymDevName]]>...>
                <<[LdevName [VDEV ld LDevName]]>...>

    activate     [-not_ready] [-bcv] [-skip]\
                [-preaction ScriptFile] [-postaction ScriptFile]\
                [-vxfs <MountPoint...>] |
                [-ppath <SRCDEVS | PowerPathPdevName...>] |
                [-rdb -dbtype DbType [-db DbName]] |
                [-consistent]
                <<[LdevName [VDEV pd PdevName]]>...> |
                <<[LdevName [VDEV dev SymDevName]]>...> |
                <<[LdevName [VDEV ld LdevName]]>...>

    terminate    [-symforce] [-bcv] [-skip] [-restored]\
                <<LdevName [VDEV pd PdevName]>...> |
                <<LdevName [VDEV dev SymDevName]>...> |
                <<LdevName [VDEV ld LdevName]>...> |
                <<LdevName [SYM pd PdevName]>...> |
                <<LdevName [SYM dev SymDevName]>...> |
                <<LdevName [SYM ld LdevName]>...>

```

```

<<LdevName [BCV pd PdevName]>...> |
<<LdevName [BCV dev SymDevName]>...> |
<<LdevName [BCV ld LdevName]>...>

restore      [-full [-bcv]] [-not_ready]\
<<LdevName [VDEV pd PdevName]>...> |
<<LdevName [VDEV dev SymDevName]>...> |
<<LdevName [VDEV ld LdevName]>...>

symsnap -cg CgName [-offline] [-i Interval] [-c Count] [-bcv]\

query        [-multi] [-restore] [-attach] [-sid SymmID]\
[LdevName [LdevName...]]

verify       [-created | -copied | -copyinprog | -copyonwrite |
              -restinprog | -restored]/
<<[LdevName [VDEV pd PdevName]]>...> |
<<[LdevName [VDEV dev SymDevName]]>...> |
<<[LdevName [VDEV ld LdevName]]>...> |
<<[LdevName [SYM pd PdevName]]>...> |
<<[LdevName [SYM dev SymDevName]]>...> |
<<[LdevName [SYM ld LdevName]]>...> |
<<[LdevName [BCV pd PdevName]]>...> |
<<[LdevName [BCV dev SymDevName]]>...> |
<<[LdevName [BCV ld LdevName]]>...>

symsnap -cg CgName [-v] [-noprompt] [-i Interval] [-c Count]\
[-sid SymmID]\

attach       <<LdevName VDEV pd PdevName>...> |
<<LdevName VDEV dev SymDevName>...> |
<<LdevName VDEV ld LdevName>...>

detach       <<LdevName VDEV pd PdevName>...> |
<<LdevName VDEV dev SymDevName>...> |
<<LdevName VDEV ld LdevName>...>

symsnap -sid SymmID <-file DeviceFileName | 'redirect stdin'> \
[-v] [-force] [-noprompt] [-i Interval] [-c Count]\
[-preserveTGTLocks -lockid LockNum]\

create       [-skip] [-svp <PoolName>]

activate     [-not_ready] [-skip]\
[-preaction ScriptFile] [-postaction ScriptFile]\
[-vxfs <MountPoint...>]
[-ppath <SRCDEVS | PowerPathPdevName...> |
[-rdb -dbtype DbType [-db DbName] ]
[-consistent]

terminate    [-symforce] [-skip] [-restored]\

```

```

restore      [-full] [-not_ready]

symsnap -sid SymmID <-file DeviceFileName | 'redirect stdin'>
          [-force] [-i Interval] [-c Count]

query        [-multi] [-restore]

verify       [-created | -copied | -copyonwrite | -restinprog |
             -restored]

attach       [-created | -copied | -copyonwrite | -restinprog |
             -restored]

detach       [-created | -copied | -copyonwrite | -restinprog |
             -restored]

symsnap [-sid SymmID] [-i Interval] [-c Count] [-offline]

list         [-savedevs [-ckd] [-all]] [-svp PoolName]
             -pools [-all] [-v]

symsnap -sid SymmID [-offline]\

show pool PoolName [-all] [-ckd]

symsnap [-sid SymmID] [-i Interval] [-c Count] [-offline]
          [-percent <1-100> -action <ScriptFile> [-norepeat]]
          [-svp PoolName]\

monitor

```

DESCRIPTION The `symsnap` command performs EMC TimeFinder/Snap operations on a device group, on a device within a device group, on a composite group, on a device within a composite group, or on pairs listed in a device file. These operations include creating and activating a source device with a target device in a copy session, restoring, and terminating the copy session. Other operations include `query` and `list` features for checking the state of the device pair. Save devices can also be listed and monitored for a percentage full.

All Snap operations can be performed on a group or individual device basis. The source device can be a standard device or a BCV device, and the target device must be a virtual device. Before a target device can be paired with a source device, the target must have previously been associated with the device group or composite group. The target and source devices must be of the same size and emulation type.

ARGUMENTS**activate**

Activates a virtual copy session with the devices in the device group with one or more target devices that are associated with the group.

While the operation is in progress, the state of the device pair is CopyOnWrite or CopyOnAccess. If the source device is completely written to, the state changes to Copied.

attach

Attaches a virtual (VDEV) target device to a source device to become the preferred target device to be paired with the source device when a device create is issued.

create

Creates a virtual copy session with the devices in the device group with one or more target devices that are associated with the group. While the operation is in progress, the state of the device pair is CreateInProgress. When the operation completes, the state changes to Created.

detach

Detaches a VDEV target device from the source device so that it is no longer the preferred target device to be paired with that source device.

list

Lists Snap sessions, SAVE devices, or SAVE device pools.

monitor

Checks the total percentage full of the save devices currently configured and can optionally execute a script file if a specified percentage is encountered.

query

Returns information about the state of mirroring of one or all device pairs in a device group.

restore

Restores a virtual device (VDEV) to another device. After the restore operation, the target of the restore is left in a Ready state unless the `-not_ready` option is used.

`show pool`

Shows detailed information about the SAVE device pool.

`terminate`

Terminates (stops) the existing internal copy session between the specified source and target devices in a device group.

`verify`

By default, verifies whether one device pair is or all device pairs in a device group are in the CopyOnWrite state.

The verify action returns one of the following possible return codes if the verify criteria was not met:

Code #	Code Symbol
12	CLI_NOT_ALL_RESTORED
13	CLI_C_NONE_RESTORED
29	CLI_C_NOT_ALL_RESTINPROG
30	CLI_C_NONE_RESTINPROG
55	CLI_C_NOT_ALL_COPIED
56	CLI_C_NONE_COPIED
60	CLI_C_NOT_ALL_CREATED
61	CLI_C_NONE_CREATED
66	CLI_C_NOT_ALL_COPYONWRITE
67	CLI_C_NONE_COPYONWRITE

Refer to RETURN CODES for more information.

OPTIONS

`-action`

Selects a script that should be run when the specified percent value is encountered. Used with the `monitor` command. This option requires the `-percent` option.

`-all`

Specifies to include active and inactive information in the display calculations for the group(s).

`-attach`

Displays target attachment information for the standard device(s) in the device group.

`-bcv`

Signifies BCV devices as the source devices and VDEV devices as the target devices. This option can only be used with groups, that is, device groups or composite groups.

`-c`

Specifies the number (count) of times to display or to acquire an exclusive lock on the Symmetrix host database. If this option is not specified but an interval (`-i`) is specified, the program will loop continuously to display or start the mirroring operation.

`-cg`

Applies a composite group name to the command.

`-ckd`

Confines the `list` action to display only the CKD devices.

`-consistent`

Causes the source and target pairs to be consistently activated.

`-copied`

Verifies that the device pair(s) are in the Copied state.

`-copyonwrite`

Verifies that the device pair(s) are in the CopyOnWrite state.

`-created`

Verifies that the Snap device pair(s) are in the Created state.

`-db`

Specifies the name of the relational database. This is not required for Oracle.

`-dbtype`

Specifies the relational database type.

`-exact`

Applies to group operations that causes the standard and BCV device pairing algorithm to select the pairs according to the exact order in which they were added to the specified device group. This option overrides all other pairing algorithms.

-file

Applies a device file to the command. The device file contains device pairs (by device number) listing a pair per each line (the source device first, a space, and the VDEV target device last within each line entry). Device files can include comment lines that begin with the pound sign (#).

-force

Attempts to force the operation even though one or more paired devices in the device group may not be in the normal, expected state(s) or the specified operation.

-full

Used on the `restore` command, this option requests a full restore operation.

-g

Applies a device group name to the command.

-h

Provides brief, online help information.

-i

Repeat interval, in seconds, to display or to acquire an exclusive lock on the Symmetrix host database. The default interval is 10 seconds. The minimum interval is 5 seconds. When used with the `verify` action, the number of seconds specified, indicates the interval of time (in seconds) to repeat the verify command(s) before the verify action finds and reports the pairs fully copied.

-lockid

As a companion option with `-preservetgtlocks`, specifies the lock holder ID for preserving the target locks on the control operation. Lock ID number must be provided as a hexadecimal value.

-multi

Applies to a `query` operation in a multi-target environment to show all targets that are paired with source devices. It lists the devices in chronological order.

-noprompt

Requests that no prompts are returned after the command is entered. The default is to prompt the user for confirmation.

-norepeat

When the `monitor -action` action is used, signifies that the action script should only be run once if the percent threshold has been met.

-not_ready

Performs the Snap operation, but leaves the target device(s) as Not Ready to its host(s). That is, each target will be set to to Not Ready prior to the completion of the operation.

-offline

Specifies that the Symmetrix array data connection is offline from the host in-memory database.

-percent

Used with the `monitor` action; displays a message and optionally executes an action script when the specified percentage full argument has been reached.

-pools

Displays a list of SAVE device pools.

-postaction

Causes the script argument to be executed after a Snap session has been activated.

-ppath

Lists one or more PowerPath devices for which I/O is to be suspended just before the activate is performed and resumed, as soon as `activate` completes.

As an alternative to the list, the key word `SRCDEVS` can be supplied, which will use the pathnames from the standard devices being controlled.

-preaction

Causes the script file to be executed before a Copy session is activated.

`-preservetgtlocks`

Prevents the action from engaging device locks on the target devices. The target devices must already be locked by the same lock holder ID. Requires the `-lockid` option.

`-rdb`

Freezes the log files and specified database just before the activate is performed, and thaws them as soon as the activate completes.

The host physical devices that the database log files reside must be PowerPath devices.

`-restinprog`

Verifies that the device pair(s) are in the RestInProgress state.

`-restore`

When querying, shows which virtual device that the Snap pair was restored from. Shows the restore session as being either in the RestInProgress or Restored state.

`-restored`

Verifies that the device pair(s) are in the Restored state.

`-savedevs`

When used with the `list` action, displays the current space used on save devices.

`-sid`

Applies the command to the specified Symmetrix ID. Used with the `-file` option to select the Symmetrix array on which to perform the operation, or with the `-cg` option to restrict the operation to a single Symmetrix array.

`-skip`

Skips the source locks action. Will not lock the source devices if all of the specified source devices are either locked or all are unlocked.

`-svp`

Filters the list based on the supplied *PoolName*.

`-symforce`

Requests that the Symmetrix array force the operation to occur where they are normally rejected. On terminate, it causes the Symmetrix array to stop a Snap session.



CAUTION

Use care when applying this option as data can be lost or corrupted.

When used with the `terminate` action, the Symmetrix terminates the synchronized Snap pair.

`-v`

Provides a more detailed, verbose output.

`-vxfs`

Lists one or more VERITAS VxFS file system mount points. The file system(s) mounted on this host are frozen just before the `activate` is performed, and thawed when the `activate` completes.

PARAMETERS

CgName

The composite group name.

DbName

The relational database name.

DbType

The relational database type. Possible values:

Oracle
 SQLServer
 IBMUDB
 Informix
 IBMUDB

DgName

The device group name.

DeviceFilename

The device filename. The device file contains device pairs (*SymDevnames*) listing a pair per each line (the standard first, a space, followed by the BCV name on each line).

LdevName

The logical device name of either the standard (such as DEV002) or the BCV device (such as BCV005).

LockNum

The lock number ID as a hexadecimal value.

MountPoint

File system mount point.

PoolName

The name of the SAVE device pool.

PdevName

The physical device (host) name for the Snap target device (such as `/dev/rdisk/c2t0d2s2`).

PowerPathPdevName

A PowerPath device name (one or more physical device names can be entered).

ScriptFile

The full pathname of the script to be executed.

SymDevname

The Symmetrix device name, unique per Symmetrix array, for the snap target device (such as 001C).

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To create device group `ProdDB` as a Regular device group, enter:

```
symdg create ProdDB
```

To define device group `ProdDB` as the default device group, enter:

```
setenv SYMCLI_DG ProdDB
```

To add standard device `/dev/rdisk/c1t1d1s2` to device group `ProdDB` and name it `act1`, enter:

```
symld add pd c1t1d1s2 act1
```

To add a standard device `/dev/rdisk/c1t1d1s2` to device group `ProdDB` and name it `act1`, enter:

```
symld add pd c1t1d1s2 act1
```

To add VDEV device `/dev/rdisk/c2t0d2s2` to device group `ProdDB` and name it `myvdev1`, enter:

```
symld add pd c2t0d2s2 myvdev1
```

To create a copy of the source device `act1` in group `ProdDB` with a specified target device (associated with the group), enter:

```
symsnap create act1 vdev ld myvdev1  
symsnap activate act1 vdev ld myvdev1
```

To terminate the device `act1` in group `ProdDB`, enter:

```
symsnap terminate act1 vdev ld myvdev1
```

To query information about all paired devices in device group `ProdDB`, enter:

```
symsnap query
```

symstat

Displays statistics information about a Symmetrix array, any or all directors, a device group, a disk, or a device.

SYNTAX

```
symstat -h

symstat [-i Interval][-c Count]
        [-type REQUESTS [-g DgName [-bcv | -all]]]

        -sid SymmID -RepType rdfa [-type REQUESTS] [-v]
                                [-g ALL | -rdfg <#|ALL>]

        -g DgName -RepType rdfa [-type REQUESTS] [-v]

        -dir <#|ALL>

        -type PREFETCH [-sid SymmID] [-DA <#|ALL>]
        -type CACHE    [-sid SymmID] [-CA <#|ALL>]
        -type CACHE    [-sid SymmID] [-EA <#|ALL>]
        -type CACHE    [-sid SymmID] [-RA <#|ALL>]
        -type CACHE    [-sid SymmID] [-SA <#|ALL>]
        -type CACHE    [-sid SymmID] [-dir <#|ALL>]
        -type CACHE    [-sid SymmID] [-lru <#|ALL|name>]
        -type CACHE    -sid SymmID -rdfa [-rdfl | -rdf2]
        -type CACHE    -sid SymmID -RepType rdfa
                        [-g ALL | -rdfg <#|ALL>]
        -type CACHE    -g DgName -RepType rdfa

        -type CYCLE    -sid SymmID -RepType rdfa
                        [-g ALL | -rdfg <#|ALL>]
        -type CYCLE    -g DgName -RepType rdfa

        -type PORT     [-sid SymmID] -dir <#|ALL> [-port <#|ALL>]

        -type DISK     -sid SymmID
                        [-disk <DA|ALL>[,<int|ALL>[,<id|ALL>]]]

        -type BACKEND  -g DgName -ld LdevName [-mirror #]
        -type BACKEND  -pd PdevName [-mirror #]
        -type BACKEND  -dev SymDevname [-sid SymmID] [-mirror #]
```

```

-type MEMIO      -g DgName [-ld LdevName | -bcv | -all]
-type MEMIO      -pd Pdevname
-type MEMIO      -dev SymDevname [-sid SymmID]
-type DMSP       -g DgName -ld LdevName
-type DMSP       -pd PdevName
-type DMSP       -dev SymDevname [-sid SymmID]

```

DESCRIPTION The `symstat` command provides statistics information about a Symmetrix array, a director, a device group, a disk, or a device. This statistic call can also be used to display DMSP (dynamic mirroring service policy) information for a device.

ARGUMENTS None.

OPTIONS

`-all`

Returns statistics for standard and BCV devices in the device group.

`-bcv`

Returns statistics for BCV devices in the device group. The default behavior excludes BCV devices.

`-c`

Specifies the number (count) of times to display statistics. If this option is not specified and an interval (`-i`) is specified, statistics will be displayed continuously.

`-CA`

Confines the action to a channel director number. To select all channel directors, specify `ALL`.

`-DA`

Confines the action to a disk director number. To select all disk directors, specify `ALL`.

`-dev`

Applies Symmetrix device names to the action.

`-dir`

Confines the action to a director number. To select all directors, specify `ALL`.

-disk

Applies the action to a physical disk (*DA, int, id*).

-EA

Confines the action to a ESCON director number. To select all ESCON directors, specify *ALL*.

-g

Confines the action to a device group name. The *-dg* option is also valid.

-h

Provides brief, online help information.

-i

Specifies the repeat interval in seconds. The default interval is 10 seconds. The minimum interval is 5 seconds.

-ld

Applies logical device names to the action.

-lru

Specifies the Least Recently Used cache management group.

-mirror

Requests stats from a specified mirror (1-4).

-pd

Applies physical device names to the action.

-port

Specifies the director port number. The *ALL* selects all ports for the specified director.

-RA

Confines the action to a RDF director (adapter) number. To select all RDF directors, specify *ALL*.

-rdfa

Returns statistics for the SRDF/A sessions on the Symmetrix array.

-rdfg

Returns statistics for the SRDF/A sessions by RA group number.

-rdf1

Returns statistics for only the R1 SRDF/A sessions on the Symmetrix.

-rdf2

Returns statistics for only the R2 SRDF/A sessions on the Symmetrix.

-RepType

Specifies the replication type. Currently, only `rdfa` is supported.

-SA

Confines the action to a front-end (SCSI or Fibre) director number. To select all front-end directors, specify `ALL`.

-sid

Applies the action to the specified Symmetrix ID.

-type

Type of performance information to display. The default is to display REQUESTS information. Individual disk/director subtotals and totals are provided. Possible statistics type values are:

BACKEND

Report back-end I/O requests and throughput for selected devices.

CACHE

Report cache activity for selected front-end or remote link director(s) only.

CYCLE

Report cycle summary information for SRDF/A sessions that have active status or have non zero cache usage.

DMSP

Report dynamic mirroring service policy (DMSP) stats for the selected device(s).

DISK

Report back-end I/O requests and throughput for the selected disks or all disks.

MEMIO

Report cache memory to disk activity for selected device(s).

PORT

Report performance statistics for a director port.

PREFETCH

Report track prefetch disk activity for selected back-end director(s) only.

REQUESTS

Report I/O requests and throughput for selected device(s) or any type of director(s). This is the default.

-v

Provides a more detailed, verbose listing.

PARAMETERS

DgName

Device group name given by user. The name must be unique to this host.

LdevName

The logical device name either supplied by the user or automatically assigned when a device is added to a device group.

PdevName

The physical (host) name for the device, such as
/dev/rdisk/c2t0d2s3.

SymDevname

The Symmetrix device name, such as 000C.

SymmID

The 12-digit ID of the Symmetrix array.

DA

The disk director (DA) number.

int

The director interface number to the specified physical disk.

id

The director SCSI number of the specified physical disk to the statistics action.

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To display statistics about all Symmetrix devices in device group `ProdDB` every 60 seconds, enter:

```
symstat -g ProdDB -i 60
```

To display statistics about Symmetrix device `log1` in device group `ProdDB` every 2 minutes (120 seconds), enter:

```
symstat -g ProdDB -ld log1 -i 120
```

To display statistics about all RDF directors in the specified Symmetrix array every 60 seconds for 10 times, enter:

```
symstat -i 60 -c 10 -RA ALL -sid 098712341357
```

To display statistics about all devices in the specified Symmetrix array every 5 minutes (300 seconds), enter:

```
symstat -sid 098712341357 -i 300
```

To display MEMIO statistics about all devices in the `prodDB` device group every 10 seconds 100 times, enter:

```
symstat -g ProdDB -i 10 -c 100 -type MEMIO
```

To display REQUEST statistics about all devices in the `prod` device group every 10 seconds 100 times, enter:

```
symstat -g prod -i 10 -c 100 -type REQUEST
```

To display REQUEST statistics about all front-end SA directors in the specified Symmetrix array every 10 seconds 100 times, enter:

```
symstat -SA ALL -c 100 -sid 57
```

To display CACHE statistics about all front-end SA directors in the specified Symmetrix array every 7 seconds 100 times, enter:

```
symstat -SA ALL -i 7 -c 100 -type cache -sid 57
```

To display PREFETCH statistics about ALL back-end DA directors in the specified Symmetrix array every 10 seconds, enter:

```
symstat -DA ALL -type prefetch -sid 57
```

To display BACKEND statistics about device 068 in the specified Symmetrix array every 10 seconds, enter:

```
symstat -type backend -i 10 -dev 068 -sid 57
```

To display DISK statistics about physical drive 02A:C5 in the specified Symmetrix array every 5 seconds, enter:

```
symstat -type disk -i 5 -sid 57 -disk 2A,C,5
```

To display DMSP statistics about device 0068 in the specified Symmetrix array every 10 seconds, enter:

```
symstat -type DMSP -i 10 -dev 0068 -sid 57
```

symvg

Displays information and performs operations on logical volume groups that are defined by the platform's logical volume manager.

SYNTAX

```
symvg -h

symvg [-type VgType]

list [-v]

show VgName

deport VgName [-newvg NewVgName] [-overwrite]
        [-mapfile FileName] [-host HostID]

import [VgName] [-newvg NewVgName]
        [-mapfile FileName] [-cluster] [-clear]

rescan

create VgName [-p PartitionSize] PdevName...

destroy VgName

adddev VgName PdevName...

rmdev VgName PdevName...

recover VgName

symvg [-v] [-type VgType] [-force] [-sid SymmID]
        [-RDFG GrpNum] [-R1 | -R2] [-bcv | -nobcv | -vdev]

vg2dg VgName DgName [-dgtype REGULAR | RDF1 | RDF2]

vg2cg VgName CgName [-cgtype RDF1 | RDF2]
        [-apidb | -ppath]
```

DESCRIPTION

The `symvg` command displays information and performs operations on logical volume groups that are defined by the platform's logical volume manager.

Note: Users should run `symcfg sync` before running `symvg show` to make sure the device status is reported correctly.

Additionally, the user can convert the devices of a specified volume group to a device or composite group.

In the list of physical device members for a volume group, CLARiiON devices are distinguished from other device types by a (C) indicator.

Refer to the *EMC Solutions Enabler Support Matrix*, for the list of the supported host operating systems and their associated Logical Volume Managers (LVMs).

Note: The `recover` action is not supported for the following volume managers: AIX LVM on the AIX platform, HP LVM on the HP-UX platform, and native LVM on the Linux platform.

The `import` and `deport` operations have different requirements, as listed in Table 1-4.

Table 1-4 Options Table for Import and Deport Operations

Type	Action	VgName	-newvg	-mapfile	-cluster
AIX_LVM	Import	Mandatory	Optional	Mandatory	N/A
AIX_LVM	Deport	Mandatory	N/A	N/A	N/A
AIX_VxVM	Import/Deport	Mandatory	Optional	N/A	N/A
EMC_PVM	Import	Optional	Optional	Mandatory	N/A
EMC_PVM	Import	Mandatory	Optional	Optional	N/A
EMC_PVM	Deport	Mandatory	N/A	Optional	N/A
HP_LVM	Import/Deport	Mandatory	N/A	Mandatory	N/A
HP_VxVM	Import/Deport	Mandatory	Optional	N/A	N/A
LINUX_LVM	Import/Deport	Mandatory	N/A	Mandatory	N/A
LINUX_VxVM	Import/Deport	Mandatory	Optional	N/A	N/A
NT_LDM	Import	Mandatory	Optional	N/A	Optional
NT_LDM	Deport	Mandatory	N/A	N/A	N/A
OSF1_LSM	Import/Deport	Mandatory	Optional	N/A	N/A
SUN_VxVM	Import/Deport	Mandatory	Optional	N/A	N/A

Note: On the Windows platform `import` and `deport` operations are supported for VERITAS VxVM 2.7 and higher, whereas the provisioning operations such as `create`, `destroy`, `adddev`, and `rmdev` are supported for VERITAS VxVM 3.0 and higher.

Note: For AIX LVM import operations the `-mapfile` option is used to specify a device name that existed as part of the volume group.

Note: For VERITAS volume managers on all host operating systems, the `deport` operation on volume groups named `rootdg` is not allowed.

ARGUMENTS

`adddev`

Extends a volume group by adding the specified devices to the volume group.

`create`

Creates a volume group using the specified devices.

`deport`

Deports a specified volume group so that it can be imported later.

`destroy`

Destroys a volume group.

`import`

Imports a specified volume group into the system.

`list`

Lists all the logical volume groups that have been defined for this host.

`recover`

Recovers a failed volume group.

`rescan`

Rescans all the volume groups. This operation is currently supported for only the logical disk manager (LDM) volume groups on the Windows 2000 platform.

`rmdev`

Reduces a volume group name removing the specified devices from the volume group.

`show`

Shows information about a specified logical volume group.

`vg2cg`

Translates the devices of a specified volume group into a composite group.

`vg2dg`

Translates the devices of a specified volume group into a device group.

OPTIONS

`-apidb`

Creates the composite group in the SYMAPI database only.

`-bcv`

Adds BCV devices only to the target group.

`-cgtype`

Specifies the composite group type of devices to be translated.

`-clear`

Imports a volume group and clears the host ID on the volume group. This flag is for VERITAS volume managers only.

`-cluster`

Imports a Windows NT LDM volume group as a cluster.

`-dgtype`

Specifies the device group type of devices to be translated.

`-force`

Attempts to force the operation, even though one or more devices in the volume group may already be part of another device or composite group.

-h

Provides brief, online help information.

-host

Specifies the ID of the host on which the deported volume group can be imported.

-mapfile

Provides the filename where the volume group information is stored when an import or deport is performed.

-newvg

Provides the new volume group name for the volume group.

-nobcv

Adds only standard devices to the target group. (The default behavior is to add both standard and BCV devices.)

-overwrite

Overwrites an existing mapfile. Used in conjunction with the `-mapfile` option.

-p

Specifies the partition size in megabytes. This option is valid only for AIX_LVM type LVM.

-ppath

Creates the RDF composite group in PowerPath.

-R1

Adds R1 devices to the target device group.

-R2

Adds R2 devices to the target device group.

-RDFG

Selects RDF devices that belong to the specified Symmetrix RA (RDF) group number.

-sid

Applies a Symmetrix ID as a target for this operation.

-type

Targets a specific volume group type.

-v

Provides a more detailed, verbose listing.

-vdev

Adds virtual devices to the target group.

PARAMETERS

CgName

Defines a composite group name.

DgName

Defines a device group name.

FileName

Defines a filename where the volume group information is stored when an import or deport is performed.

GrpNum

Defines an SRDF RA group number.

HostID

Defines the host on which the deported volume group can be imported.

NewVgName

Defines a new logical volume group name.

PartitionSize

Defines the partition size for a device in megabytes.

PdevName

Specifies a fully qualified device path of a character device.

SymmID

Defines a unique Symmetrix ID.

VgName

Defines a specific logical volume group name.

VgType

Defines a specific logical volume group type. Possible values are:

AIX_LVM
 AIX_VXVM
 AS400_LVM
 DEFAULT
 DYNIX_SVM
 EMC_PVM
 HP_LVM
 HP_VXVM
 LINUX_LVM
 LINUX_VXVM
 NT_DISKADM
 NT_LDM
 OSF1_LSM
 SUN_SOLSTICE
 SUN_VXVM

RETURN CODES

Refer to Appendix D, *SYMCLI Return Codes*, for a complete list of return codes.

EXAMPLES

To list all the logical volume groups, enter:

```
symvg list
```

To list all the Sun Solaris VERITAS VxVM logical volume groups in a list format, enter:

```
symvg list -type SUN_VXVM
```

To create a composite group named *newcg* with the R1 and R1 BCV devices from the volume group named *thisvg*, enter:

```
symvg vg2cg thisvg newcg -cgtype RDF1 R1
```

To create a REGULAR device group named *newdg* with only the R1 BCV devices from the volume group named *thisvg*, enter:

```
symvg vg2dg thisvg -R1 -bcv newdg -dgtype REGULAR
```

To deport a volume group named *testvg* out of the system, enter:

```
symvg deport testvg
```

The following example deports the volume group named `testvg` so that it can be imported on a host named `foo`. This option is available only with VxVM on HP and SUNOS platforms.

```
symvg deport testvg -host foo
```

To import a volume group named `testvg` into the system, enter:

```
symvg import testvg
```

The following example illustrates an import operation on an AIX LVM volume group named `aixtestvg`:

```
symvg import aixtestvg -mapfile hdisk22
```

In the previous example, the `-mapfile` option specifies a device name, in this case `hdisk22`, which existed as part of the volume group `aixtestvg` when the volume group was deported.

To create a volume group named `testvg` on the host system, enter:

```
symvg create testvg /dev/rdisk/c0t0d0s2
```

To create a volume group named `aixtestvg`, of type AIX LVM, with partition size of 16 MB, enter:

```
symvg create aixtestvg -p 16 /dev/rhdisk40
```

To add a device to the volume group named `testvg`, enter:

```
symvg adddev testvg /dev/rdisk/c0t0d1s2
```

To remove two devices from the volume group named `testvg`, enter:

```
symvg rmdev testvg /dev/rdisk/c0t0d1s2 /dev/rdisk/c0t5d5s2
```

To remove the volume group named `testvg` from the system, enter:

```
symvg destroy testvg
```


**SYMCLI Environment
Variables**

This appendix describes the environment variables for the SYMCLI.

◆ Environment Variables A-2

Environment Variables

SYMCLI provides environment variables that can be preset to streamline and expedite your command line session. These environment variables can be set to common argument values for a series of associated commands, which eliminates repeated key strokes for your given session.

To view a list of environment variables that can be set for a given SYMCLI session, enter:

```
symcli -env
```

To view the environment variables you currently have set, enter:

```
symcli -def
```

Table A-1 describes the environment variables that are supported.

Table A-1 Environment Variables

Variable Name	Description	Default
SYMCLI_ACCESS_PIN	For <code>symacl</code> with ADMIN privileges, to enable the commit, prepare, and release actions, this variable must be set to the ADMIN PIN (4 to 12 characters). If this is not set, you will always be prompted for a PIN.	NULL
SYMCLI_BCV_PAIR_POLICY	Specifies the BCV pair cancel policy that SYMCLI subsequently uses when incrementally establishing a new BCV pair or when the maximum number of BCV pairs is reached. Possible values: CANCEL_OLDEST (the default) CANCEL_NEWEST DONT_CANCEL	CANCEL_OLDEST
SYMCLI_CG	Specifies a default composite group name.	None
SYMCLI_CLONE_COPY_MODE	Specifies the mode in which Clone sessions are created. Can be set to NOCOPY, COPY, PRECOPY, COPY_DIFF, or PRECOPY_DIFF.	NOCOPY
SYMCLI_CLONE_EMULATION	Specifies whether TimeFinder commands should be mapped to Clone commands by default. Can be set to ENABLED or DISABLED.	DISABLED
SYMCLI_CLONE_PAIR_POLICY	Specifies the CLONE terminate policy, that SYMCLI uses when establishing a new clone and the maximum number of clones has been reached. Can be set to TERM_OLDEST or DONT_TERM.	DONT_TERM

Table A-1 Environment Variables (continued)

Variable Name	Description	Default
SYMCLI_CONNECT	Specifies the SYMAPI server connection information.	NULL
SYMCLI_CONNECT_TYPE	Defines the local or remote mode of the host or client connection to the Symmetrix array. Possible values for the client are: LOCAL Defines a local connection to the Symmetrix array. (Not used for a client/server connection.) REMOTE Defines a client operation in which all the remote SYMCLI commands are strictly executed on the server, and the Symmetrix configuration database is strictly read and updated remotely. REMOTE_CACHED Defines a client operation in which the remote Symmetrix configuration database is modified remotely but cached in memory locally. Those functions that are control operations or that modify the configuration database are executed remotely. These modifications to the remote configuration database are then cached locally.	LOCAL (when SYMCLI_CONNECT is NOT set) REMOTE (when the SYMAPI thin client is installed) REMOTE_CACHED (when SYMCLI_CONNECT is set)
SYMCLI_CTL_ACCESS	Specifies how to obtain a lock on the Symmetrix configuration database file before starting a Symmetrix control operation. Possible values are: EXCLUSIVE PARALLEL	EXCLUSIVE
SYMCLI_DB_FILE	Specifies the configuration database file pathname for the host Symmetrix array's configuration data.	symapi_db.bin
SYMCLI_DG	Specifies a default device group name.	None
SYMCLI_GENERATOR_FILE	Specifies a file to write a log of all active commands (BCV, SRDF, and Snap).	None
SYMCLI_LDEV_NAMING	Specifies a default device naming convention other than logical device names. Possible values are: DEFAULT, SYMDEV, or PDEV. SYMDEV or PDEV are for Symmetrix device names or physical device names, respectively. (DEFAULT = <i>LdevNaming</i>)	DEFAULT (LdevNaming)
SYMCLI_LOCKID	Specifies the lock holder ID for commands that require the lock ID.	None
SYMCLI_LOG	Specifies a single file to be used as the log file where all new entries are appended to the file.	None

Table A-1 Environment Variables (continued)

Variable Name	Description	Default
SYMCLI_MAP_PRESERVE_CASE	When set to 1, the case of the output fields is preserved. This setting is only valid for Windows environments.	None
SYMCLI_MODE	Specifies the command output reporting style to be compatible with prior SYMCLI versions. Possible values are V43, V50, V51, V52, V53, V54, V55, V60.	None
SYMCLI_NOLOGGING	When set to 1, logging is disabled.	0
SYMCLI_NOPROMPT	When set to 1, disables verification prompts.	0
SYMCLI_OFFLINE	When set to 1, online access to Symmetrix device status is disabled (Symmetrix configuration database access only).	0
SYMCLI_OSM_VERSION	Specifies the version reported by the SYMCLI OSM SRDF Compatibility mode.	4.0.0
SYMCLI_OUTPUT_MODE	Can be set to a specific mode to output SYMCLI utilities. Valid modes are limited to <i>Standard</i> and <i>XML</i> .	Standard
SYMCLI_PAGINATE	Can be set to FALSE to force inhibit of <i><press any key></i> message.	TRUE
SYMCLI_PDEV_FILE	Can be set to specify the pathname location of a physical-device definitions file. These definitions replace the physical devices previously discovered or defined.	NULL
SYMCLI_RCOPY_COPY_MODE	Specifies the mode in which Rcopy sessions are created. Can be set to COPY_DIFF, NOCOPY_DIFF, COPY_NODIFF, or NOCOPY_NODIFF.	0
SYMCLI_RDFG_CONSISTENCY	Can be set to enable consistency verification on an RDF Group level for consistent operations.	DISABLE
SYMCLI_RDB_CONNECT	Can be set to specify the default relational database connection information in the format <i>user/password@service</i> .	NULL
SYMCLI_RDB_NAME	Specifies the default relational database name (<i>DbName</i>).	NULL
SYMCLI_RDB_TYPE	Specifies a specific type (<i>DbType</i>) of database. Possible values: Oracle Informix SQLServer Sybase IBMUDB Exchange SharePoint	NULL

Table A-1 Environment Variables (continued)

Variable Name	Description	Default
SYMCLI_REMOVE_SYMS	When set to 1, a discover will remove from the Symmetrix configuration database, any record of a Symmetrix array and its dependent devices and device groups, when the Symmetrix array is no longer reachable.	0
SYMCLI_RETURN_MODE	When set to FORMATTED for UNISYS platforms only, prints return code mnemonics and error strings following the execution of each SYMCLI command. DEFAULT disables this feature.	DEFAULT
SYMCLI_SCHEMA_NAME	Specifies a relational database schema name (<i>SchemaName</i>).	NULL
SYMCLI_SID	Specifies a default Symmetrix ID.	None
SYMCLI_SKIP_ON_FAILURE	When set to 1, causes the <code>symcfg discover</code> command (which scans all bus-connected devices) to skip over any Symmetrix array encountered in an error state. This allows the command to complete the scan of the remaining units. (Otherwise, the command faults as it fails to complete the interrogation of all the Symmetrix arrays.)	0
SYMCLI_SNAP_PAIR_POLICY	Specifies the SNAP terminate policy, that SYMCLI uses when establishing a new snap and the maximum number of snaps has been reached. Can be set to TERM_OLDEST or DONT_TERM. The default is DONT_TERM which causes the snap operations to fail.	DONT_TERM
SYMCLI_SVP	Can be set as the default savedev pool name.	DEFAULT_POOL
SYMCLI_TBS_NAME	Specifies a relational database tablespace name (<i>TbSpName</i>).	NULL
SYMCLI_UPPERCASE	When set to 1, specifies that any user input in lowercase is entered as uppercase.	0
SYMCLI_VERBOSE	When set to 1, enables the verbose response mode for SRDF and BCV control operations.	0
SYMCLI_VG	Specifies a default logical volume group name.	None

Table A-1 Environment Variables (continued)

Variable Name	Description	Default
SYMCLI_WAIT_ON_DB	When set to 1, SYMCLI will wait to obtain a lock on the Symmetrix configuration database when locked by another user. By default, a busy database will return an error.	0
SYMCLI_WAIT_ON_GK	When set to 1, causes the SYMCLI to wait for the retrieval of Symmetrix information when all gatekeepers are busy. Otherwise, a busy gatekeeper will cause an error.	0
SYMCLI_XML_SCHEMA	Can be set to specify a URL to the XML Schema document describing the output of SYMCLI in XML mode. It is advised that the schema is placed in a public location and this variable set to point to it. Without this variable set, no mention of a schema will occur. Note that this setting does nothing in non-XML mode.	None

For more information about these environment variables, refer to the *EMC Solutions Enabler Symmetrix Base Management CLI Product Guide*.

SYMCLI Options File

This appendix describes the SYMCLI options file.

- ◆ Options File..... B-2

Options File

The `options` file in the SYMAPI configuration directory contains behavior parameters that can be set to critically change the default behavior of SYMCLI operations, SYMAPI calls, and their control actions. It can be used to impart certain global restrictions as well as customize and streamline command line coding to your specific environment.



CAUTION

This file and the text in this appendix are for experienced SYMCLI or SYMAPI users and are not a prerequisite for normal use. Improper adjustment of these parameters can impose unwanted restriction of features or possibly render your Symmetrix environment inoperative.

The `options` file is located in the SYMAPI configuration directory:

Directory	System
<code>/var/symapi/config</code>	UNIX
<code>C:\Program files\EMC\Symapi\config</code>	Windows
<i>your_specific_installation_directory</i>	OpenVMS, AS/400, MVS

Editing and File Format

This is an editable file to change behavior defaults of certain SYMCLI or SYMAPI commands. The file contains editable behavior parameters set to certain optional defaults in the line entries. Commented lines beginning with a pound sign (#) are ignored by SYMCLI.

Removing Parameters

To remove any parameter option, remove the line entry, rename the file, or comment the line by adding a pound sign (#) at the beginning of the line entry.

Possible Optional Parameters

The following are possible optional parameter entries for the options file:

Table B-1 Possible Optional Behavior Parameters for Options File

Optional Behavior Parameter	= <optionalvalue defaultvalue>	Component Affected
SYMAPI_ACC_ADMIN_VIA_SERVER	= DISABLE ENABLE	Access Control
SYMAPI_ACC_DISPLAY_VIA_SERVER	= DISABLE ENABLE	Access Control
SYMAPI_ALLOW_RDF_SYMFORCE	= TRUE FALSE	SRDF
SYMAPI_ALLOW_SCRIPTS_VIA_SERVER	= ENABLE DISABLE	TimeFinder
SYMAPI_APPREG_AUTO_EXPIRATION	= DISABLE ENABLE	Base
SYMAPI_APPREG_EXPIRATION_PERIOD	= <i>nnn</i> (15 to 365) 90	Base
SYMAPI_BCV_SINGULAR_INTERVAL	= <i>nn</i> (0 to 30) 0	TimeFinder
SYMAPI_CG_TIMEOUT	= <i>nnn</i> (10 to 120) 30	SRDF Consistency Groups
SYMAPI_CG_TIMEOUT_ACTION	= FAIL RETRY	SRDF Consistency Groups
SYMAPI_COLLAPSE_STRIPED_META_EXTENTS	= DISABLE ENABLE	Mapping
SYMAPI_CTRL_OF_NONVISIBLE_DEVS	= DISABLE ENABLE	Base, (All)
SYMAPI_CTRL_VIA_SERVER	= DISABLE ENABLE	Base, (All)
SYMAPI_DATED_LOGFILE_NAME	= DISABLE ENABLE	Base, (All)
SYMAPI_DB_FILE_COMPRESSION	= DISABLE ENABLE	Base, (All)
SYMAPI_DEFAULT_BCV_ESTABLISH_TYPE	= SINGULAR SERIAL PARALLEL	TimeFinder
SYMAPI_DEFAULT_BCV_RESTORE_TYPE	= SINGULAR SERIAL PARALLEL	TimeFinder
SYMAPI_DEFAULT_BCV_SPLIT_TYPE	= INSTANT REGULAR	TimeFinder
SYMAPI_DEFAULT_SNAP_TERM_TYPE	= PARALLEL SERIAL	TimeFinder
SYMAPI_GNS_CS_STALE_DATA_TIMEOUT	1 - 15 1	Base, GNS/ client-server REMOTE_CACHED
SYMAPI_GNS_MIRROR_GROUP_CONTROL	= ENABLE DISABLE	Base, GNS
SYMAPI_IO_DRAIN_TIMEOUT	= <i>nnn</i> (5 - 120) DEFAULT 60	TimeFinder, Mapping
SYMAPI_IO_THAW_INTERVAL	= <i>nnn</i> (5 - 120) DEFAULT <i>never timeout</i>	TimeFinder, Mapping

Table B-1 Possible Optional Behavior Parameters for Options File (continued)

Optional Behavior Parameter	= <optionalvalue defaultvalue>	Component Affected
SYMAPI_LOGFILE_DATE_FORMAT	= FORMAT2 FORMAT1	Base, (All)
SYMAPI_LOGFILE_RETENTION	= <i>nnn</i> (0, 5 to 1825) 30 (on Service Processor) 0 (on all other hosts)	Base, (All)
SYMAPI_MAX_CLIENTS	= <i>nnn</i> 100 (on other hosts) 10 (on Service Processor)	Base
SYMAPI_PARALLEL_RA_GROUPS	= ENABLE DISABLE	SRDF
SYMAPI_RDF_CG_TO_PPATH	= ENABLE DISABLE	Base (RDF1 and RDF2 composite groups)
SYMAPI_RDF_RW_DISABLE_R2	= ENABLE DISABLE	SRDF
SYMAPI_SERVER_SECURITY_LEVEL	= SECURE NONSECURE ANY	SYMAPI Client/Server
SYMAPI_SNAP_CONTROL_INTERVAL	= <i>nn</i> (0 to 30) 0	TimeFinder
SYMAPI_SNAP_PERSISTEN_RESTORE	= DISABLE ENABLE	TimeFinder
SYMAPI_SYNC_DIRECTION	= ESTABLISH RESTORE BOTH	SRDF, TimeFinder
SYMAPI_TF_COUNT_MODIFIED_TRACKS	= TRUE FALSE	TimeFinder
SYMAPI_THREE_CHAR_SYMDEVNAME	= DISABLE ENABLE	Base, (All)
SYMAPI_TRACK_SIZE_32K_COMPATIBLE	= DISABLE ENABLE	SYMAPI Client/Server
SYMAPI_USE_GNS	= ENABLE DISABLE	Base, GNS
SYMAPI_WAIT_FOR_BCV_BG_SPLIT	= TRUE FALSE	TimeFinder
SYMAPI_WAIT_FOR_BCV_SYNCH	= TRUE FALSE	TimeFinder
SYMAPI_WAIT_ON_LOCKED_GK	= ENABLE DISABLE	Base, (All)

As shown in the table, a parameter may affect all components or just certain SYMCLI component areas.

SYMCLI Events

This appendix describes the events reported for the SYMCLI environment.

- ◆ Reported Events C-2

Reported Events

The following table details the Symmetrix events reported via the Solutions Enabler SYMCLI, their event code, severity, and string:

Table C-1 Reported Events

Event Code	Severity	Event String
12_VOLTS_ON	Warning	One of the Symmetrix subsystems is running in the abnormal 12-Volts mode
AC_LINE_INTERRUPTED	Warning	A Symmetrix power subsystem AC line interruption was detected
ACCESS_TO_NR_DEVICE	Warning	Access was attempted to a Not Ready device
ALARM_SIGNAL	Warning	An alarm signal was set but no alarm was found
ALARM_SIGNAL_POWER	Warning	An alarm signal was set indicating a power subsystem error
ALL_DEVICES_MIGRATED	Informational	All Symmetrix migration devices have completed the data migration
ALL_RDF_LINKS_DOWN	Warning	No RDF links in an RDF group are operational
ALL_RDF_LINKS_NOW_UP	Informational	All RDF links in an RDF group are now operational after an 'All Links Down' event
BATTERY_FAILED_TEST	Warning	Automatic battery tests detected failures
BUS_PROBLEM	Informational	Bus Arbiter problem: primary arbiter has experienced a problem
CANT_QUERY_MII_DIR	Warning	The Service Processor could not query a director
CANT_READ_ENVIR_SENSOR	Warning	The Service Processor failed to read an environmental sensor
COMM_BOARD_MISMATCH	Error	The Symmetrix communication board software data has a mismatch
DB_CHECKSUM_TRIGGER	Informational	A Database Double Checksum detection event was triggered
DEVICE_RESYNC_STARTED	Informational	A Symmetrix device resynchronization process has started
DIAG_TRACE_TRIG	Informational	A Symmetrix diagnostic event-trace was triggered
DIAG_TRACE_TRIG_REMOTE	Informational	A diagnostic event-trace was triggered for a Symmetrix remotely-attached via RDF links

Table C-1 Reported Events (continued)

Event Code	Severity	Event String
DIRECTOR_DEAD	Fatal	A Symmetrix Director is not responding
DISABLED_MEMORY_BANK	Warning	A Symmetrix Director reported 'Disabled Memory Bank' to a host
DISK_ADAPTER_DEAD	Fatal	A Symmetrix Disk Director is not responding
ENABLED_ENVIR_TESTING	Informational	An event was detected to enable environmental testing in diagnosis mode
ENVIR_READING_OUT_OF_LIMIT	Warning	The Service Processor found environmental readings to be out of limits
EXCESS_TEMP_DETECTED	Warning	The Service Processor detected excessive temperature
FC_OPTICAL_MOD_ERROR	Warning	A Fibre Channel optical module has experienced a problem
HIGH_CHARGE_MISSING	Warning	The Symmetrix battery system is not fully charged
HIGH_TEMP_DETECTED	Warning	The Service Processor detected high temperature
INVALID_ENVIR_BITS	Warning	A validity problem was detected during an environmental test
LATCHED_ALARMS	Warning	A Symmetrix power subsystem discovered latched alarms
M1_RESYNC_WITH_M2	Informational	An M1 mirror of a Symmetrix Device is resynchronizing with the M2 mirror
M2_RESYNC_WITH_M1	Informational	An M2 mirror of a Symmetrix Device is resynchronizing with the M1 mirror
MEM_DISABLE_INVOKED	Informational	One or more memory banks were disabled due to cache errors
MIRROR_NR	Warning	A device has a mirror that is Not Ready
MIRROR_WD	Warning	A device has a mirror that is Write Disabled
NO_COMM_TO_MII_DIR	Warning	The Service Processor could not communicate to a director
OLD_BOARD_MISMATCH	Error	The Symmetrix communication board old information does not match current information
ONE_RDF_LINK_DOWN	Warning	A single RDF link in an RDF group is not operational
ONE_RDF_LINK_NOW_UP	Warning	A single RDF link in an RDF group is now operational after a 'Single Link Down' event
PHONEHOME_TRIGGER	Informational	A certain event triggered a Call Home for service

Table C-1 Reported Events (continued)

Event Code	Severity	Event String
POWER_ON_TIME_FAILED_TEST	Error	The Symmetrix environment tests found inconsistencies in Power-on-Time
RDF_CG_TRIGGER	Informational	An RDF CG trip event was triggered
RDF_ERROR	Error	The RDF subsystem has experienced an error
RDF_SIM_MESSAGE	Informational	The RDF subsystem initiated a SIM message to a Symmetrix remotely-attached via RDF links
RDF2_DEVICE_NR	Informational	One of the RDF2 devices was found to be Not Ready
SAVEDEVS_FULL	Error	The save device pool for TimeFinder/Snap sessions is full
SAVEDEVS_NEAR_FULL	Warning	The save device pool for TimeFinder/Snap sessions is 90% full
SENSE_CABLE_MISSING	Warning	A Symmetrix power subsystem Environment sense cable is missing
SMOKE_DETECT_ALERT	Warning	The Service Processor detected a smoke detector alert
SMOKE_DETECT_MALFUNCTION	Warning	The Service Processor detected a malfunction in the smoke detector
SP_COMM_TO_MII_DIR	Informational	The Service Processor is communicating via a local director
SP_CONNECT_TIME_NOT_FOUND	Error	The Symmetrix has no records of the last Service Processor connection time
SP_CONNECT_VIA_SERIAL_LINE	Informational	The Service Processor is currently communicating via a serial line
SP_DISK_FULL	Warning	The Service Processor disk is full
SP_EXCESS_MEMORY_USAGE	Warning	The Service Processor software detected excessive memory usage
SP_NOT_RESPONDING	Warning	The Symmetrix Service Processor is not communicating with the Symmetrix
SP_PHONEHOME_FAIL	Warning	The Symmetrix Service Processor could not complete a Call Home for service
SP_PHONEHOME_SUCCESS	Informational	The Symmetrix Service Processor completed a Call Home for service
SP_REBOOT_SUCCESS	Informational	The Service Processor has successfully rebooted

Table C-1 Reported Events (continued)

Event Code	Severity	Event String
SPARE_INVOKED	Informational	A Hot Spare was invoked against a Symmetrix disk
SPARE_INVOKED_REMOTE	Informational	A Hot Spare was invoked against the disk of the R2 mirror in Symmetrix remotely-attached via RDF links
SRDFA_ACTIVE	Informational	SRDF/A is now active
SRDFA_INACTIVE	Warning	SRDF/A is now inactive
SYMREMOTE_CONNECTED	Informational	A SymmRemote session is currently connected to the SERVICE PROCESsor
SYMREMOTE_DISCONNECTED	Informational	A SymmRemote session to the Service Processor was disconnected
SYMREMOTE_REJECTED	Informational	A SymmRemote session to the Service Processor was denied access
TEMPERATURE_PROBLEMS	Warning	The Symmetrix is experiencing temperature problems
THERMAL_DET_FAILED_TEST	Error	The Symmetrix thermal tests detected a failure
THERMAL_EVENT	Error	A thermal event was detected in the Symmetrix
TOO_MANY_SUSPHALT_CHAINS	Informational	Too many suspend/halt chains switching to Adaptive Copy Write Pending Mode
UNABLE_TO_SET_REGISTER	Warning	A Symmetrix communication subsystem was unable to set a shared register
UNRECOGNIZED_EPO_CARD	Warning	The Service Processor has detected a failed or unrecognized communication card

SYMCLI Return Codes

This chapter describes the SYMCLI base component commands that support the core operations required in the management of a storage enterprise. The commands appear in alphabetical order:

- ◆ Return Code Handling for Windows and UNIX.....D-2
- ◆ Return Code Handling for OpenVMS D-8

Return Code Handling for Windows and UNIX

Table D-1 lists possible status or error codes that can be returned by the various SYMCLI commands on a Windows or UNIX platform (for example, in a UNIX C shell, returned using `echo $status`).

Table D-1 Return Code Handling for Windows and UNIX

Code	Code Symbol and Description	Returnable By
0	CLI_C_SUCCESS CLI call completed successfully.	All
1	CLI_C_FAIL CLI call failed.	All
2	CLI_C_DB_FILE_IS_LOCKED Another process has an exclusive lock on the Host database file.	symbcv, symcfg, symdev, symgate, symdg, symld, symsnap, symmir, symcfg, symclone, symrdf, symlabel
3	CLI_C_SYM_IS_LOCKED Another process has an exclusive lock on the Symmetrix.	symrdf
4	CLI_C_NOT_ALL_SYNCHRONIZED NOT all of the mirrored pairs are in the 'Synchronized' state.	symmir, symrdf
5	CLI_C_NONE_SYNCHRONIZED NONE of the mirrored pairs are in the 'Synchronized' state.	symmir, symrdf
6	CLI_C_NOT_ALL_UPDATED NOT all of the mirrored pairs are in the 'Updated' state.	symrdf
7	CLI_C_NONE_UPDATED NONE of the mirrored pairs are in the 'Updated' state.	symrdf
8	CLI_C_NOT_ALL_PINGED NOT all of the remote Symmetrix units can be pinged.	symrdf
9	CLI_C_NONE_PINGED NONE of the remote Symmetrix units can be pinged.	symrdf
10	CLI_C_NOT_ALL_SYNCHED NOT all of the mirrored pairs are in the 'Synchronized' state.	symmir
11	CLI_C_NONE_SYNCHED NONE of the mirrored pairs are in the 'Synchronized' state.	symmir

Table D-1 Return Code Handling for Windows and UNIX (continued)

Code	Code Symbol and Description	Returnable By
12	CLI_C_NOT_ALL_RESTORED NOT all of the pairs are in the 'Restored' state.	symmir, symsnap
13	CLI_C_NONE_RESTORED NONE of the pairs are in the 'Restored' state.	symmir, symsnap
14	CLI_C_NOT_ALL_VALID NOT all of the mirrored pairs are in a valid state.	symrdf
15	CLI_C_NONE_VALID NONE of the mirrored pairs are in a valid state.	symrdf
16	CLI_C_SYM_NOT_ALL_LOCKED NOT all of the specified Symmetrix units have an exclusive Symmetrix lock.	symcfg
17	CLI_C_SYM_NONE_LOCKED NONE of the specified Symmetrix units have an exclusive Symmetrix lock.	symcfg
18	CLI_C_ALREADY_IN_STATE The Device(s) is (are) already in the desired state or mode.	symld, symmir, symrdf, symsnap, symclone
19	CLI_C_GK_IS_LOCKED All GateKeeper devices to the Symmetrix unit are currently locked.	symbcv, symcfg, symdev, symdg, symgate, symld, sympd, symstat, symmir, symcfg, symrdf, symdrv, symsnap, symlabel, symclone
20	CLI_C_WP_TRACKS_IN_CACHE Operation cannot proceed because the target device has Write Pending I/O in the cache.	symmir
21	CLI_C_NEED_MERGE_TO_RESUME Operation cannot proceed without first performing a Merge of the RDF Track Tables.	symrdf
22	CLI_C_NEED_FORCE_TO_PROCEED Operation cannot proceed in the current state except if you specify a force flag.	symmir, symrdf, symcfg, symsnap, symclone

Table D-1 Return Code Handling for Windows and UNIX (continued)

Code	Code Symbol and Description	Returnable By
23	CLI_C_NEED_SYMFORCE_TO_PROCEED Operation cannot proceed in the current state except if you specify a symforce flag.	symmir, symsnap, symclone
24	CLI_C_NOT_IN_SYNC The Symmetrix configuration and the database file are NOT in sync.	symcfg
25	CLI_C_NOT_ALL_SPLIT NOT all of the mirrored pairs are in the 'Split' state.	symmir, symrdf
26	CLI_C_NONE_SPLIT NONE of the mirrored pairs are in the 'Split' state.	symmir, symrdf
27	CLI_C_NOT_ALL_SYNCINPROG NOT all of the mirrored pairs are in the 'SyncInProg' state.	symmir
28	CLI_C_NONE_SYNCINPROG NONE of the mirrored pairs are in the 'SyncInProg' state.	symmir
29	CLI_C_NOT_ALL_RESTINPROG NOT all of the pairs are in the 'RestInProg' state.	symmir, symsnap
30	CLI_C_NONE_RESTINPROG NONE of the pairs are in the 'RestInProg' state.	symmir, symsnap
31	CLI_C_NOT_ALL_SUSPENDED NOT all of the mirrored pairs are in the 'Suspended' state.	symrdf
32	CLI_C_NONE_SUSPENDED NONE of the mirrored pairs are in the 'Suspended' state.	symrdf
33	CLI_C_NOT_ALL_FAILED_OVER NOT all of the mirrored pairs are in the 'Failed Over' state.	symrdf
34	CLI_C_NONE_FAILED_OVER NONE of the mirrored pairs are in the 'Failed Over' state.	symrdf
35	CLI_C_NOT_ALL_UPDATEINPROG NOT all of the mirrored pairs are in the 'R1 UpdInProg' state.	symrdf
36	CLI_C_NONE_UPDATEINPROG NONE of the mirrored pairs are in the 'R1 UpdInProg' state.	symrdf
37	CLI_C_NOT_ALL_PARTITIONED NOT all of the mirrored pairs are in the 'Partitioned' state.	symrdf

Table D-1 Return Code Handling for Windows and UNIX (continued)

Code	Code Symbol and Description	Returnable By
38	CLI_C_NONE_PARTITIONED NONE of the mirrored pairs are in the 'Partitioned' state.	symrdf
39	CLI_C_NOT_ALL_ENABLED NOT all of the mirrored pairs are in the 'Enabled' consistency state.	symrdf
40	CLI_C_NONE_ENABLED NONE of the mirrored pairs are in the 'Enabled' consistency state.	symrdf
41	CLI_C_NOT_ALL_SYNCHRONIZED_AND_ENABLED NOT all of the mirrored pairs are in the 'Synchronized' rdf state and the 'Enabled' consistency state.	symrdf
42	CLI_C_NONE_SYNCHRONIZED_AND_ENABLED NONE of the mirrored pairs are in the 'Synchronized' rdf state and in the 'Enabled' consistency state.	symrdf
43	CLI_C_NOT_ALL_SUSP_AND_ENABLED NOT all of the mirrored pairs are in the 'Suspended' rdf state and 'Enabled' consistency state.	symrdf
44	CLI_C_NONE_SUSP_AND_ENABLED NONE of the mirrored pairs are in the 'Suspended' rdf state and the 'Enabled' consistency state.	symrdf
45	CLI_C_NOT_ALL_SUSP_AND_OFFLINE NOT all of the mirrored pairs are in the 'Suspended' rdf state and 'Offline' link suspend state.	symrdf
46	CLI_C_NONE_SUSP_AND_OFFLINE NONE of the mirrored pairs are in the 'Suspended' rdf state and the 'Offline' link suspend state.	symrdf
47	CLI_C_WONT_REVERSE_SPLIT Access to the configuration server is locked.	symmir
48	CLI_C_CONFIG_LOCKED Access to the configuration server is locked.	symconfigure symacl
49	CLI_C_DEVS_ARE_LOCKED One or more devices are locked.	symmir

Table D-1 Return Code Handling for Windows and UNIX (continued)

Code	Code Symbol and Description	Returnable By
50	CLI_C_MUST_SPLIT_PROTECT If a device was restored with the protect option, it must be split with the protect option.	symmir
51	CLI_C_PAIRIED_WITH_A_DRV The function can not be performed since the STD device is already paired with a DRV device.	symmir
52	CLI_C_PAIRIED_WITH_A_SPARE NOT all of the Snap pairs are in the 'Copy in progress' state.	symmir
53	CLI_C_NOT_ALL_COPYINPROG NOT all of the Snap pairs are in the 'CopyInProgress' state.	symclone
54	CLI_C_NONE_COPYINPROG NONE of the Snap pairs are in the 'CopyInProgress' state.	symclone
55	CLI_C_NOT_ALL_COPIED NOT all of the Snap pairs are in the 'Copied' state.	symsnap, symclone
56	CLI_C_NONE_COPIED NONE of the Snap pairs are in the 'Copied' state.	symsnap, symclone
57	CLI_C_NOT_ALL_COPYONACCESS NOT all of the Snap pairs are in the 'CopyonAccess' state.	symclone
58	CLI_C_NONE_COPYONACCESS NONE of the Snap pairs are in the 'CopyonAccess' state.	symclone
59	CLI_C_CANT_RESTORE_PROTECT The protected restore operation can not be completed because there are write pendings or the BCV mirrors are not synchronized	symsnap
60	CLI_C_NOT_ALL_CREATED NOT all of the Snap pairs are in the 'Created' state.	symsnap, symclone
61	CLI_C_NONE_CREATED NONE of the Snap pairs are in the 'Created' state.	symsnap, symclone
62	CLI_C_NOT_ALL_READY NOT all of the BCVs local mirrors are in the 'Ready' state.	symmir
63	CLI_C_NONE_READY NONE of the BCVs local mirrors are in the 'Ready' state.	symmir

Table D-1 Return Code Handling for Windows and UNIX (continued)

Code	Code Symbol and Description	Returnable By
64	CLI_C_STD_BKGRND_SPLIT_IN_PROG The operation cannot proceed because the STD Device is splitting in the Background	symmir
65	CLI_C_SPLIT_IN_PROG The operation cannot proceed because the pair is splitting	symmir
66	CLI_C_NOT_ALL_COPYONWRITE NOT all of the Snap pairs are in the 'Recreated' state.	symsnap
67	CLI_C_NONE_COPYONWRITE NONE of the Snap pairs are in the 'CopyOnWrite' state.	symsnap
68	CLI_C_NOT_ALL_RECREATED Not all source devices are in the 'Recreated' state.	symclone
69	CLI_C_NONE_RECREATED No source devices are in the 'Recreated' state.	symclone
70	CLI_C_NOT_ALL_CONSISTENT NOT all of the mirrored pairs are in the 'Consistent' state.	symrdf
71	CLI_C_NONE_CONSISTENT NONE of the mirrored pairs are in the 'Consistent' state.	symrdf
72	CLI_C_MAX_SESSIONS_EXCEEDED The maximum number of sessions has been exceeded for the specified device.	symrdf
73	CLI_C_NOT_ALL_PRECOPY Not all source devices are in the 'Precopy' state.	symclone
74	CLI_C_NONE_PRECOPY No source devices are in the 'Precopy' state.	symclone
75	CLI_C_NOT_ALL_PRECOPY_CYCLED Not all source devices have completed one precopy cycle.	symclone
76	CLI_C_NONE_PRECOPY_CYCLED No source devices have completed one precopy cycle.	symclone

Return Code Handling for OpenVMS

A set of return codes for the various conditions possible with each SYMCLI command are provided for UNIX and Windows platforms. However, for the OpenVMS platforms, discernible return codes are not yet available and, therefore, require interpolation or special processing of the returned hexadecimal value (resulting from a `$STATUS` query).

This is because the format of the OpenVMS return value also includes a severity level field in the three least significant bits (00-02). The return code is described in the next field (03-15). Table D-2 describes the set of possible return hex values and their associated meaning with SYMCLI on OpenVMS.

Table D-2 OpenVMS Return Code Interpolation Table

Returned Hex Value ^a	SYMCLI Return Code	OpenVMS Severity Level	SYMCLI Name
%X1FFF0001	00	1 (S)	SUCCESS
%X1FFF000C	01	4 (F)	FAIL
%X1FFF0012	02	2 (E)	DB_FILE_IS_LOCKED
%X1FFF001A	03	2 (E)	SYM_IS_LOCKED
%X1FFF0023	04	3 (I)	NOT_ALL_SYNCHRONIZED
%X1FFF002B	05	3 (I)	NONE_SYNCHRONIZED
%X1FFF0033	06	3 (I)	NOT_ALL_UPDATED
%X1FFF003B	07	3 (I)	NONE_UPDATED
%X1FFF0043	08	3 (I)	NOT_ALL_PINGED
%X1FFF004B	09	3 (I)	NONE_PINGED
%X1FFF0053	10	3 (I)	NOT_ALL_SYNCHED
%X1FFF005B	11	3 (I)	NONE_SYNCHED
%X1FFF0063	12	3 (I)	NOT_ALL_RESTORED
%X1FFF006B	13	3 (I)	NONE_RESTORED
%X1FFF0073	14	3 (I)	NOT_ALL_VALID

Table D-2 OpenVMS Return Code Interpolation Table (continued)

Returned Hex Value ^a	SYMCLI Return Code	OpenVMS Severity Level	SYMCLI Name
%X1FFF007B	15	3 (I)	NONE_VALID
%X1FFF0083	16	3 (I)	SYM_NOT_ALL_LOCKED
%X1FFF008B	17	3 (I)	SYM_NONE_LOCKED
%X1FFF0093	18	3 (I)	ALREADY_IN_STATE
%X1FFF009A	19	2 (E)	GK_IS_LOCKED
%X1FFF00A2	20	2 (E)	WP_TRACKS_IN_CACHE
%X1FFF00AA	21	2 (E)	NEED_MERGE_TO_RESUME
%X1FFF00B2	22	2 (E)	NEED_FORCE_TO_PROCEED
%X1FFF00BA	23	2 (E)	NEED_SYMFORCE_TO_PROCEED
%X1FFF00C3	24	3 (I)	NOT_IN_SYNC
%X1FFF00CB	25	3 (I)	NOT_ALL_SPLIT
%X1FFF00D3	26	3 (I)	NONE_SPLIT
%X1FFF00DB	27	3 (I)	NOT_ALL_SYNCINPROG
%X1FFF00E3	28	3 (I)	NONE_SYNCINPROG
%X1FFF00EB	29	3 (I)	NOT_ALL_RESTINPROG
%X1FFF00F3	30	3 (I)	NONE_RESTINPROG
%X1FFF00FB	31	3 (I)	NOT_ALL_SUSPENDED
%X1FFF0103	32	3 (I)	NONE_SUSPENDED
%X1FFF010B	33	3 (I)	NOT_ALL_FAILED_OVER
%X1FFF0113	34	3 (I)	NONE_FAILED_OVER
%X1FFF011B	35	3 (I)	NOT_ALL_UPDATEINPROG
%X1FFF0123	36	3 (I)	NONE_UPDATEINPROG
%X1FFF012B	37	3 (I)	NOT_ALL_PARTITIONED
%X1FFF0133	38	3 (I)	NONE_PARTITIONED
%X1FFF013B	39	3 (I)	NOT_ALL_ENABLED

Table D-2 OpenVMS Return Code Interpolation Table (continued)

Returned Hex Value ^a	SYMCLI Return Code	OpenVMS Severity Level	SYMCLI Name
%X1FFF0143	40	3 (I)	NONE_ENABLED
%X1FFF014B	41	3 (I)	NOT_ALL_SYNCHRONIZED_AND_ENABLED
%X1FFF0153	42	3 (I)	NONE_SYNCHRONIZED_AND_ENABLED
%X1FFF015B	43	3 (I)	NOT_ALL_SUSP_AND_ENABLED
%X1FFF0163	44	3 (I)	NONE_SUSP_AND_ENABLED
%X1FFF016B	45	3 (I)	NOT_ALL_SUSP_AND_OFFLINE
%X1FFF0173	46	3 (I)	NONE_SUSP_AND_OFFLINE
%X1FFF017A	47	2 (E)	WONT_REVERSE_SPLIT
%X1FFF0182	48	2 (E)	CONFIG_LOCKED
%X1FFF018A	49	2 (E)	DEVS_ARE_LOCKED
%X1FFF0192	50	2 (E)	CLI_C_MUST_SPLIT_PROTECT
%X1FFF019A	51	2 (E)	CLI_C_PAIRED_WITH_A_DRV
%X1FFF01A2	52	2 (E)	CLI_C_PAIRED_WITH_A_SPARE
%X1FFF01AB	53	3 (I)	CLI_C_NOT_ALL_COPYINPROG
%X1FFF01B3	54	3 (I)	CLI_C_NONE_COPYINPROG
%X1FFF01BB	55	3 (I)	CLI_C_NOT_ALL_COPIED
%X1FFF01C3	56	3 (I)	CLI_C_NONE_COPIED
%X1FFF01CB	57	3 (I)	CLI_C_NOT_ALL_COPYONACCESS
%X1FFF01D3	58	3 (I)	CLI_C_NONE_COPYONACCESS
%X1FFF01DA	59	2 (E)	CLI_C_CANT_RESTORE_PROTECT
%X1FFF01E3	60	3 (I)	CLI_C_NOT_ALL_CREATED
%X1FFF01EB	61	3 (I)	CLI_C_NONE_CREATED
%X1FFF01F3	62	3 (I)	CLI_C_NOT_ALL_READY
%X1FFF01FB	63	3 (I)	CLI_C_NONE_READY
%X1FFF0202	64	2 (E)	CLI_C_SYM_IS_LOCKED

Table D-2 OpenVMS Return Code Interpolation Table (continued)

Returned Hex Value ^a	SYMCLI Return Code	OpenVMS Severity Level	SYMCLI Name
%X1FFF020A	65	2 (E)	CLI_C_SPLIT_IN_PROG
%X1FFF0213	66	3 (I)	CLI_C_NOT_ALL_COPYONWRITE
%X1FFF021B	67	3 (I)	CLI_C_NONE_COPYONWRITE
%X1FFF0223	68	3 (I)	Reserved for future use.
%X1FFF022B	69	3 (I)	Reserved for future use.
%X1FFF0233	70	3 (I)	CLI_C_NOT_ALL_CONSISTENT
%X1FFF023B	71	3 (I)	CLI_C_NONE_CONSISTENT
%X1FFF0242	72	2 (E)	CLI_C_MAX_SESSIONS_EXCEEDED
	73		CLI_C_NOT_ALL_PRECOPY
	74		CLI_C_NONE_PRECOPY
	75		CLI_C_NOT_ALL_PRECOPY_CYCLED
	76		CLI_C_NONE_PRECOPY_CYCLED

- a. For OpenVMS, use `write sys$output $status` to view a return code. The following special DCL program can automatically convert these OpenVMS values to the proper SYMCLI return codes:

```
[SAMPLE-DCL]
$ ! Example: Convert SYMCLI return codes.
$ !
$ a = ( %x0000ffff .and. 'p1) ! Mask off bits 16-31.
$ a = ( a/8 ) ! Shift 3-15 right.
$ write sys$output 'a ! Print return code
$ ! without severity
$ ! level.
$ !
```

For example, an OpenVMS status of %X1FFF002B converts to a return code of 5, which maps to NONE_SYNCHRONIZED.

This glossary contains terms related to Solutions Enabler. Many of these terms are used throughout the Solutions Enabler documentation set.

A

Access Pool

A set of devices made accessible to a host, whose access is limited by the access rights assigned.

Adaptive Copy - Disk Mode

An SRDF mode of operation designed for transferring large amounts of data without loss of performance. New data for a remotely mirrored pair is stored on the source (R1) device of that pair as invalid tracks. This operation continues until data can be successfully transferred to the target (R2) device.

Adaptive Copy - Write Pending Mode

An SRDF mode of operation where all writes to the source (R1) device are acknowledged as if they were to a local device. New data for a remotely mirrored pair is stored in the cache of the local Symmetrix array until it can be successfully written to both the source (R1) and target (R2) devices.

Asynchronous Mode

See *SRDF/A*.

B

BCV Device

A Symmetrix business continuance volume (BCV) that functions as a mirrored media to a standard device for a protected storage environment.

BCV Pair	A combination of a standard device and a BCV device that provides a protected storage environment.
Business Continuance	A protected storage environment solution that has defined specially configured Symmetrix devices as mirrors or Business Continuance Volumes (BCVs) to protect data on standard devices.
Business Continuance Volume (BCV)	See <i>BCV Device</i> .
C	
Cache	Randomly accessed, electronic storage used to retain frequently used data from disk for faster access by the channel. On a Symmetrix array, cache memory resides on cards that occupy slots on a Symmetrix backplane. Cache memory buffers I/O transfers between the director channels and the storage devices.
Checksum Checking	A process that checks each RDBMS write in the Symmetrix array, with a checksum value that is computed and compared to test the data for any corruption picked up along the way from the host.
Composite Group (CG)	A user-defined group of devices that can span multiple Symmetrix arrays and RA groups. The CG type may be defined as REGULAR, RDF1, or RDF2 and may contain various device lists for standard, BCV, virtual (VDEV), and remote BCV devices.
Concatenated Meta Device	Disk volume sets that are organized and addressed beginning with the first byte of data of the first device, continuing to the end of the first device before any data on the next device is referenced. On writes to a concatenated device, all the data is written to the first meta device member until it is full, then data is directed to the next member, and so on.
Concurrent RDF	An SRDF configuration where a single source (R1) device is remotely mirrored to two target (R2) devices, allowing identical remote copies to be available at any point in time. Concurrent RDF supports asynchronous, synchronous, semi-synchronous, and adaptive copy SRDF operational modes.
Consistency Group	A composite group that is comprised of RDF devices (RDF1 or RDF2) and has been enabled for RDF consistency. The devices within the RDF consistency group act in unison to preserve dependent write consistency of a database distributed across multiple SRDF systems.

Consistency is maintained via PowerPath, which respects the logical relationships between dependant I/O cycles.

D

Daemon	A service that improves performance on a number of applications or scripts running at once. It runs in the background with root privileges to a local Symmetrix storage array.
Data Block	A logical storage structure that is the smallest unit of storage and I/O.
Data Object	A set of extents that contain all the data blocks associated with the object; can be a file, file system, dataset, or database object.
Database Extent	A logical storage structure that holds a contiguous string of data blocks that are allocated by the database server for the management of a particular database file.
Database Instance	A set of database operating system processes, or threads, running on a host.
Database Partition	A manageable unit of a large database or object.
Database Schema	A collection of related database objects including tables, views, and other objects.
Database Segment	A set of extents that contain all the data blocks for a specific logical storage structure or object within a tablespace.
Database Table	A relational database structure that comprises vertical columns and horizontal rows of data
Database Tablespace	A named storage area that physically allocates space for the database files.
Delta Sets	The predefined, timed cycles of collected data within an SRDF/Asynchronous session. Delta sets are used to transfer data efficiently by minimizing the redundancy of same track changes over the link between a source (R1) device and a remote target (R2) device.
Dependent Write Consistency	A state that is achieved when all writes to a target (R2) device are consistent with data on the source (R1) device.

Destage	The asynchronous write from cache to disk device of new or updated data.
Device	An entity, physical or logical, on which data can be stored. In the Symmetrix array, multiple devices (hyper-volumes) can be defined on a single, physical disk drive.
Device Address	The hexadecimal value that uniquely defines a physical I/O device on a channel path. A SCSI address consists of a Target ID and a Logical Unit Number (LUN).
Device Group	A user-defined name that specifies a group of associated devices, which support a common function, application, or database.
Differential Split	The splitting of a BCV pair that will only archive changed (differential) data from the first mirror to the remaining mirror set when the BCV split completes.
Director	An adapter (such as SA, EA, DA, DF, RA, RF) in the Symmetrix subsystem that acts as the interface between the host channels and disk devices during all control and data transfers.
Disk	An addressable part of the Symmetrix array that consists of a set of access arms, the associated disk surfaces, and the electronic circuitry required to locate, read, and write data.
Disk Group	A set of physical disks set aside to be used in creating devices of a particular protection level.
Domino Effect	An optional SRDF feature used to ensure that a remotely mirrored pair is always synchronized.
Dynamic RDF Group	RDF groups that are added on-the-fly (while the Symmetrix array is in operation).
Dynamic Reallocation Volume (DRV)	A non-user-addressable Symmetrix device used by Symmetrix Optimizer to temporarily hold user data while reorganization of the devices is being executed. It is typically used by Symmetrix Optimizer during logical volume swapping operations.
Dynamic Spare	A Symmetrix feature that automatically transfers data from a failing non-mirrored disk device to an available spare disk device without affecting data availability.

E

Enginuity Consistency Assist (ECA)	A TimeFinder feature that allows BCV devices to be split from their standard devices across multiple, heterogeneous hosts without the use of PowerPath.
Environment Variable	Defines an aspect of the SYMAPI environment that can vary. Setting an environment variable changes the default environment and establishes a consistent rule for a specific component of the user's working environment for all affected calls that follow.
Establish	A business continuance process that assigns a BCV or RDF device as the next available mirror.

F

Failover	In an SRDF configuration, enables the target (R2) devices for read/write operations in the event that the source (R1) devices are unavailable.
-----------------	--

G

Gatekeeper	A host accessible Symmetrix device, accessible by the host, through which SCSI commands executed by SYMAPI are routed to all Symmetrix devices.
Group Naming Services (GNS)	An optional function of SYMAPI that provides the ability to store device and composite group definitions in a shared repository within each Symmetrix array. All GNS-enabled hosts across a Symmetrix environment will see the same group definitions, while sharing real-time updates to group definitions made by other hosts.

H

Hit Ratio	A percentage of I/O requests that resulted in cache hits (reads and writes serviced by cache).
Host Visible	A host connection to a specific entity exists in the current context. A device is host visible when a SCSI bus or Fibre connection exists and the Symmetrix configuration database has been updated to include that device (via a discovery operation).

Hyper-Volume	A storage area of a physical disk which was sectioned into 2 or more logical volumes (hyper-volumes). The host views hyper-volumes as individual physical devices. The number of possible hyper-volumes per disk depends on disk capacity.
Incremental Establish	A time-saving operation that copies from the source device to the target device only new data updated on the source device while the SRDF pair was split.
Incremental Restore	A time-saving operation that copies from the source device to the standard device only new data updated on the source device while the pair was split.
I	
I-Node	An internal file system data structure (for UNIX-based operating systems) that describes an individual file.
Invalid Tracks	The number of changed tracks on a device that are not synchronized between two or more mirrored devices forming a mirrored pair.
L	
Local Device	A Symmetrix device that has a direct I/O channel connection to a host.
Logical Device Name	A name assigned to a device either at the command line or, automatically, when it is added to a device group (for example, DEV003 or BCV001).
Logical Unit Number (LUN)	A unique number that identifies a specific logical unit; in the case of Symmetrix array it refers to storage devices. On a SCSI bus, it is a unique identifier that enables an array to differentiate devices for a given target (each of which is a logical unit). For Fibre Channel and iSCSI, it identifies a device address visible to the host HBA.
Logical Volume	Virtual devices that are made available to applications and databases.

M

Meta Device	A linked group of Symmetrix devices that can be acted upon as one target on the SCSI bus. A meta device consists of one meta head device and one or many member devices.
Mirrored Pair	A pair of locally or remotely established Symmetrix devices that are used to copy and synchronize data between the two devices for the purpose of creating an exact copy.
Mirroring	The replication of data on separate devices for the purpose of creating and identical copy. Each copy automatically updates during a write operation. If one disk device fails, the Symmetrix automatically uses one of the other copies from another disk drive.
Mount Point	A directory that can be associated with specified volumes in a persistent manner.
Multi-Hop	From the point of the managing host, a complex Symmetrix site configuration comprised of multiple (three or more) Symmetrix arrays that are linked together locally and remotely, which are used to manage and mirror data between devices in the arrays. Multi-hop configurations are limited to two hops (SRDF links) between Symmetrix sites.

P

PermaCache	An area (slots) in Symmetrix cache memory that is reserved by a running SYMAPI storage process for preserving I/O throughput (defers the destaging of readily needed data). It improves program access speed to prioritized, but infrequently used data.
Physical Device Name	The fully qualified path name or host name for a device (such as <code>/dev/rdisk/c2t0d2s2</code>). The physical device name can be referenced in a command or function argument, or shown in a display.
Physical Extents	A specified number of disk blocks; the smallest unit of disk space that can be assigned to a logical volume.

R

R1 See *Source (R1) Device*.

R2 See *Target (R2) Device*.

RA Groups The device groups in an SRDF environment. See *RDF Groups*.

RAID Redundant Array of Independent Disks. Technology that allows a single set of data in different places on multiple hard disks, which improves performance and increases fault-tolerance.

RDBMS Relational Database Management Systems. Software that creates and maintains a database system and the data stored in the system.

RDF Consistency Group See *Consistency Group*.

RDF Groups Device groups (also known as RA groups) containing only RDF devices that define communications paths between two separate Symmetrix arrays. An RDF1 group type contains source (R1) devices and an RDF2 group type contains target (R2) devices.

RDF1/RDF2 The two types of RDF device groups containing RDF device pairs. See *RDF Groups*.

REGULAR Device A standard Symmetrix device type that is online and used for I/O operation from its host.

Restore A business continuance process that reassigns a BCV device as the next available mirror of the standard device with which it was previously paired. The other standard device mirrors receive a full data copy from the BCV mirror.

S

SAVE Device A predefined Symmetrix device (not mapped to the host) that provides the physical storage space used to store pre-update images or changed tracks during a virtual copy session. SAVE devices are configured into SAVE device pools for this purpose.

SAVE Device Pool A container for SAVE devices that acts as a group for storing data in striped form.

SCSI Address	The hexadecimal value that uniquely defines a physical I/O device on a SCSI channel path. A SCSI address consists of a Target ID and a Logical Unit Number (LUN).
Semi-Synchronous Mode	An SRDF mode of operation where applications are notified for each write once the data is in the cache of the local Symmetrix array. Writes are transferred to the target (R2) as the SRDF links become available. If source tracks are pending transfer to a target (R2) device, and a second write is attempted to the source (R1) device, the Symmetrix will disconnect (non-immediate retry request), and wait for the pending track to transfer to the remote Symmetrix array.
Single-Hop	From the point of the managing host, a Symmetrix site configuration comprised of two or more Symmetrix arrays linked together locally and remotely, which are used to manage and mirror data between the devices in the two arrays. Single-hop configurations are limited to one SRDF link between Symmetrix sites.
Source (R1) Device	A Symmetrix device that is participating in SRDF mirroring operations with a target (R2) device on a separate remote Symmetrix array. An R1 device must be assigned to an RDF1 group type (see <i>RDF1/RDF2</i>).
Split	A business continuance process that removes the BCV mirror from the existing BCV pair and assigns the BCV mirror back to its original device address. The BCV device then holds an instant copy of the data from the standard device.
SQL	Structured Query Language. The standardized relational database language for querying, manipulating, and updating information in a relational database.
SRDF	Symmetrix Remote Data Facility. An EMC business continuance solution that maintains a mirror image of data at the device level in Symmetrix arrays, which can be located at physically separate sites.
SRDF Link	The physical fiber optic connections and channels between the two Symmetrix arrays.
SRDF/A	An SRDF/Asynchronous mode of operation that provides a consistent point in time copy of data on the target (R2) device, which is a short period of time behind the source (R1) device.

SRDF/AR	An SRDF/Automated Replication business continuance solution that performs automated, consistent replication of data from standard devices via RDF1 BVC devices over SRDF links.
Standard Device	A Symmetrix device configured for normal Symmetrix operation under a desired protection method (such as RAID 1, RAID-S, RAID 5 and SRDF).
Storage Management Initiative (SMI)	A SNIA initiative to develop a standard for storage management. The result of which is a standard management interface defined in a comprehensive specification (SMI-Specification or SMI-S). The SMI-S defines the open storage management interface that enables the interoperability of multiple vendor's storage management technologies used to monitor and control storage resources in multi-vendor SAN topologies.
Striped Meta	A meta device in which each meta member device is divided into a set of stripes that cross all device members. When addressing a striped meta, data must be written (or read) across all devices (following the stripe) before advancing to the next stripe on the first device. When writing to a striped volume, equal size stripes of data from each participating drive are written alternately to each member of the set.
Symmetrix Device Name	A Symmetrix-assigned hexadecimal number of a physical device.
Symmetrix ID	A unique 12-character Symmetrix ID assigned to each Symmetrix array (such as AB0010020064).
Symmetrix Integration Utilities (SIU)	Disk management utilities used to setup and control a TimeFinder/Mirror or SRDF business continuance configuration for a Windows 2000 or Windows 2003 host. It provides the disk management functions missing from the Windows operating system when working with TimeFinder/Mirror and SRDF.
Symmetrix Ordered-Write Processing	An SRDF/A processing solution used to transfer host I/Os, that processes writes in groups as opposed to singularly. See <i>Delta Sets</i> .

Synchronous Mode An SRDF mode of operation where applications are notified that an I/O (or I/O chain) is complete when the remote Symmetrix array acknowledges that the data has been secured in its cache. Synchronous mode ensures 100% synchronized mirroring between two Symmetrix arrays.

T

Target (R2) Device A Symmetrix device that is participating in SRDF mirroring operations with a source (R1) device on a separate remote Symmetrix array. This device is not accessed by user applications during normal I/O operations. An R2 device must be assigned to an RDF2 group type. See *RDF1/RDF2*.

TimeFinder/Clone A business continuance solution for creating point-in-time copies of a source device on multiple target devices. Once activated, the copy can be instantly accessed by a target's host, even before the data is fully copied to the target device.

TimeFinder/Mirror A business continuance solution for creating mirror images of standard Symmetrix volumes that can be non-disruptively split, and used as stand-alone point-in-time copies, while the standard volumes remain online for regular host operations.

TimeFinder/Snap A business continuance solution for making pointer-based, space-saving copies of datasets or volumes on multiple target devices from a single source device. The copies are available to host immediately.

V

Virtual Device (VDEV) Used with TimeFinder/Snap, a host-accessible device containing track-level location information (address pointers), which indicate where the copy session data is located in the physical storage.

Volume A general term referring to a storage device. In the Symmetrix subsystem, a volume corresponds to single device visible to the host.

Volume Group A designated set of physical devices.

Volume Shadow Copy Service (VSS) A volume that represents a duplicate of the original volume taken at the time the copy began.

